

ADVANCEMENTS IN CIVIL CONSTRUCTION

THE FIRST CCF VICTORIA INTERNATIONAL STUDY TOUR

MARCUS VAN ENK
JHL CIVIL, MELBOURNE



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PROUDLY SPONSORED BY

Civil Contractors Federation Victoria
OAMPS Insurance Brokers
Municipal Engineering Foundation Victoria
Boston 2010

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I would like to thank Claude Cullino, CEO of the Civil Contractors Federation (CCF), Ian Sowerby President of the CCF, the Board of the CCF, Grant Stillman of OAMPS and QBE for awarding me the opportunity to partake in the 2010 overseas study tour and the American Public Works Association International Public Works Exposition and Congress. What a great initiative and a fantastic opportunity to lead by example for other state CCF offices around Australia.

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of single parent to our three year old daughter Evie and our most recent daughter Asha who was born just two weeks prior to my departing to the USA.

Marcus van Enk

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INTRODUCTION

BACKGROUND

This study tour concept began with Claude Cullino, CEO of the CCF, Ian Sowerby, President of the CCF, the CCF Board and Grant Stillman of OAMPS having a vision to develop a leadership proposal “to encourage and identify the next generation of civil contractor leaders”.

I have been fortunate to be part of a visionary team myself at JHL Civil, so when the opportunity arose to apply for this scholarship, the decision to pursue it was easily made.

In considering the content of my application to the CCF, I reflected on the challenges in our business, which naturally expanded into the challenges facing the civil construction industry – increasing regulations and legislation, the global financial crisis (GFC), climate change, national skills shortages, declining productivity and social pressures.

My vision, along with those of other recent reports commissioned by the CCF, is to see the civil construction industry undergo behavioural change. This will ultimately see the industry advance beyond the myriad of regulations and legislation.

TOUR OBJECTIVES

The objectives of the tour were to:

- A. Review the implementation of regulation and legislation on the roll out of large scale capital expenditure;
- B. Review of the typical behaviours that keep contractors ahead of regulation requirements whilst maintaining constructive thought;
- C. Review the effectiveness of Collaborative Contracting and Public Private Partnerships in developing local contracting companies;
- D. Assess sustainability in construction methods and materials used including reusable material and elimination of waste;
- E. Build on the knowledge locally by providing research for the education of my peers, clients, consultants and other stakeholders involved in the civil construction industry;
- F. Apply changes to JHL Civil's management of the flow of communication and information;
- G. Learn means and methods for developing our industry to one of excellence.

This report offers my observations and learning areas from the meetings with the government organisations outlined below, a five day attendance to the 2010 International Public Works Congress and Exposition – the largest international show in Public Works - and visits to specific locations to get first hand information on leadership in civil construction from the international standpoint.

- San Francisco Council, US – 9 August 2010
- Napa City Council, US – 10 August 2010
- Toronto City Council, Canada – 12 August 2010
- Waterloo City Council, Canada – 13 August 2010
- Medford City Council, US – 19 August 2010

Further information was taken from general observations, handouts provided to us by our hosts, follow up after the visits and extended industry research.

I believe I achieved the above objectives and more.

OBSERVATIONS AND LEARNING AREAS

CITY AND COUNTY OF SAN FRANCISCO, CALIFORNIA, USA

San Francisco is the financial, cultural, and transportation centre of the US. The City manages their own water supply, sewers and road infrastructure. The city has a population of approx 900,000. The closest town of this size in respect to population in Australia would be Adelaide.



Team Arrival at San Francisco International Airport minus Phil Jeffery

OBSERVATIONS

The City of San Francisco is a large entity with multiple departments running every facet of the cities operations. The Public Works Department itself has 1,100 employees. The City controls public works and public utilities and is headed by the Mayor. The following observations were made of the public works department.

At the time of our visit 105 project were in construction, 200 were in design and the total cost was \$557,000,000.

The City manages the sewer system and water supply system. It appeared that the benefit of this system was collaboration between the departments, however, it also provided for conflict as to which services had the right of way. If the city needs to install new sewers then they have the right of way over the gas and electricity and therefore the gas and electricity suppliers must move their assets in the easement to accommodate. A major issue that came out of this was the delays caused by non accurate as-built information and records of assets.

There is much to be said around this for research and development into improved recording of asset locations. GPS technology is advancing and suppliers of this technology should be considering offering cost effective technology to contractors to support accurate recording of as-built information.

The City has a history of underinvestment so they developed a 10 year plan to ensure capital is available for strategic planning rather than addressing concerns in an emergency. I believe this move from being reactive to strategic represents a good example of constructive behaviour. Leadership in this area could see this change further advanced by involving contractors in the development of these plans.

Contractors have a great knowledge bank when it comes to minimising the cost of construction through adopting practical methods or alternatively, providing more realistic estimations required for capital investment.

A number of projects that JHL Civil has spent a great deal of effort and money on tendering have been withdrawn or revised due to the market rates being substantially over the consultants or planning departments estimated budgets. On one occasion, we had the scope of works altered to achieve a 50% reduction in our original tender price due to the budget for the original scope being significantly less than the tender submissions.

This is an obvious area of waste that could be improved by contractors, clients and consultants working collaboratively. The market needs to recognise contractors' knowledge bank in this space and be prepared to compensate meritorious contractors for their advice in early contractor involvement.

I discovered an example of this working well at the City of Toronto. When the City engages contractors in a more formal business process (as opposed to personal advice) they compensate the contractors for their knowledge and time. The caution here is that if a contractor is paid for advice on a certain project they cannot bid that project as there is a perceived conflict of interest. The City also encourages peer review, constructability workshops and value engineering all of which contractors' time is paid for. This is certainly a value proposition for the CCF to be lobbying authorities in this space to develop a similar program. I believe the ten tools (explained further in recommendations) outlined in the report "Achieving Civil Infrastructure Procurement Best Practice – a Study by the Civil Contractors Federation in conjunction with Vicroads" by Aurecon is a great start.

Project reporting was managed through Capital Improvement Planning Software - <http://www.cipsoftware.com/> - (previously stored the info on Excel spreadsheets), which although is great for collecting high level data for the 10 year plan, it was not able to be integrated with the existing financial and project management systems and processes.

Whilst a shift in adopting technology/software to achieve efficiencies was certainly evident, the consideration to integration was and is not yet there. Without integration of software programs, we fail to achieve the efficiencies that we set out to achieve in the adoption of software in the first place. Real time progress is not possible, quality of information can be distorted and accuracy is subjective.

The hot topic was certainly climate change. The City was undertaking a report to assess the current position and set the baseline for the department to prepare for changes up to 2050ⁱ. The majority of emissions were found to be from vehicles used within the City's departments.

Some initial ideas to reduce their carbon footprint and a clear driver to legislative reform included:

- Review and modification of design practices to include green concepts which resulted in the City adopting the United States Green Building Council (USGBC) “Leadership in Energy and Environmental Design (LEED) standards which is a system for designing, constructing, operating and certifying green buildings.
- To reduce the carbon footprint of buildings heating, ventilation, air conditioning (HVAC) systems, the concept of green roofs was becoming a very popular method to reduce rainwater runoff whilst adding insulation
- Increase reclaimed/recycled and rainwater use, however the question with this was if these methods are cheaper or more effective than potable water. This is certainly a case point for establishing value on a triple bottom line benefit – economic, social, environmental.
- A move towards carbon sequestration by replacing hardscape with more landscape “pavement to parks”
- Strategic goal to partner with contractors in an effort to minimise mobilisation of contractors.

It was unclear to me how the City planned to extend this baseline data to capture contractors’ emissions/data from construction practices. What’s encouraging then is the clear forward thinking of the CCF Victoria in its commissioning of a report prepared by Pitt and Sherry in 2009 entitled ‘Civil Construction and Climate Change’. This report puts forward a number of recommendations for both civil contractors and the CCF to adopt constructive behaviour and lead with change rather than wait for instruction. Many initiatives borne from the climate change awareness can actually save contractors money on the bottom line. This means achieving the social, environmental and economic triple bottom line should not be challenge. Good governance is good business. To assist this action, could tender criteria consider additional points for contractors that:

- have technology that is fuel efficient
- utilise GPS to track greenhouse gas emissions and provide accurate reporting;
- accurately measure and report on their carbon footprint;
- can demonstrate methods and innovations that reduce the construction carbon footprint?

In reiterating the suggestions posed by the Pitt and Sherry reportⁱⁱⁱ, the CCF could work with client groups, suppliers and contractors to establish baseline carbon footprint data for typical construction activities which could then be used to drive innovative measures that contractors could use for competitive advantage.

What about going as far as adopting a paperless construction site?! Technology currently utilised in the trucking industry has seen a total transition from paper based systems to fully automated and integrated electronic platforms. The information technology is available here and now we just need to embrace it.

Key client groups, namely local and state government, need to understand that the civil construction industry is taking steps to improving our environment, initiatives for change are on the agenda but the best laid plans will go awry without continued client support.

On a number of occasions JHL Civil has proposed viable and warranted innovations that have been rejected due to government regulations. Leadership is required in key client groups to get past the red tape and take on the challenge of adopting new technologies proposed by contractors and suppliers. The industry needs integrated collaboration to achieve positive results for our communities and environment.

I found a good example of this in action at the conclusion of our visit in the City of San Francisco when we attended a construction site of a hospital redevelopment. This particular project was being constructed under an Integrated Project Delivery (IPD) arrangement which involved a partnership between the City, Designers and Construction Contractor.

IPD is a project delivery model that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and constructionⁱⁱⁱ.

There are eight main sequential phases to the Integrated Project Delivery method^{iv}:

- Conceptualisation phase [Expanded Programming]
- Criteria design phase [Expanded Schematic Design]
- Detailed Design phase [Expanded Design Development]
- Implémentation Documents phase [Construction Documents]
- Agency Review phase
- Buyout phase
- Construction phase
- Closeout phase

The City was working with the Contractor heavily in the planning phase. This particular project was an example of how collaboration can achieve improved construction outcomes and save on construction costs. Examples cited were significantly reduced construction timeframes and costs for variations.

The IPD model was brought about as an answer to declining productivity in the Construction Industry. Project delivery programs such as the IPD need to be more widely accepted and developed in Australia. This change will require funding, leadership and innovative technology. IPD could see the breakdown of inflexible regulations and box-ticking conformity which are currently hanging contractors out to dry.

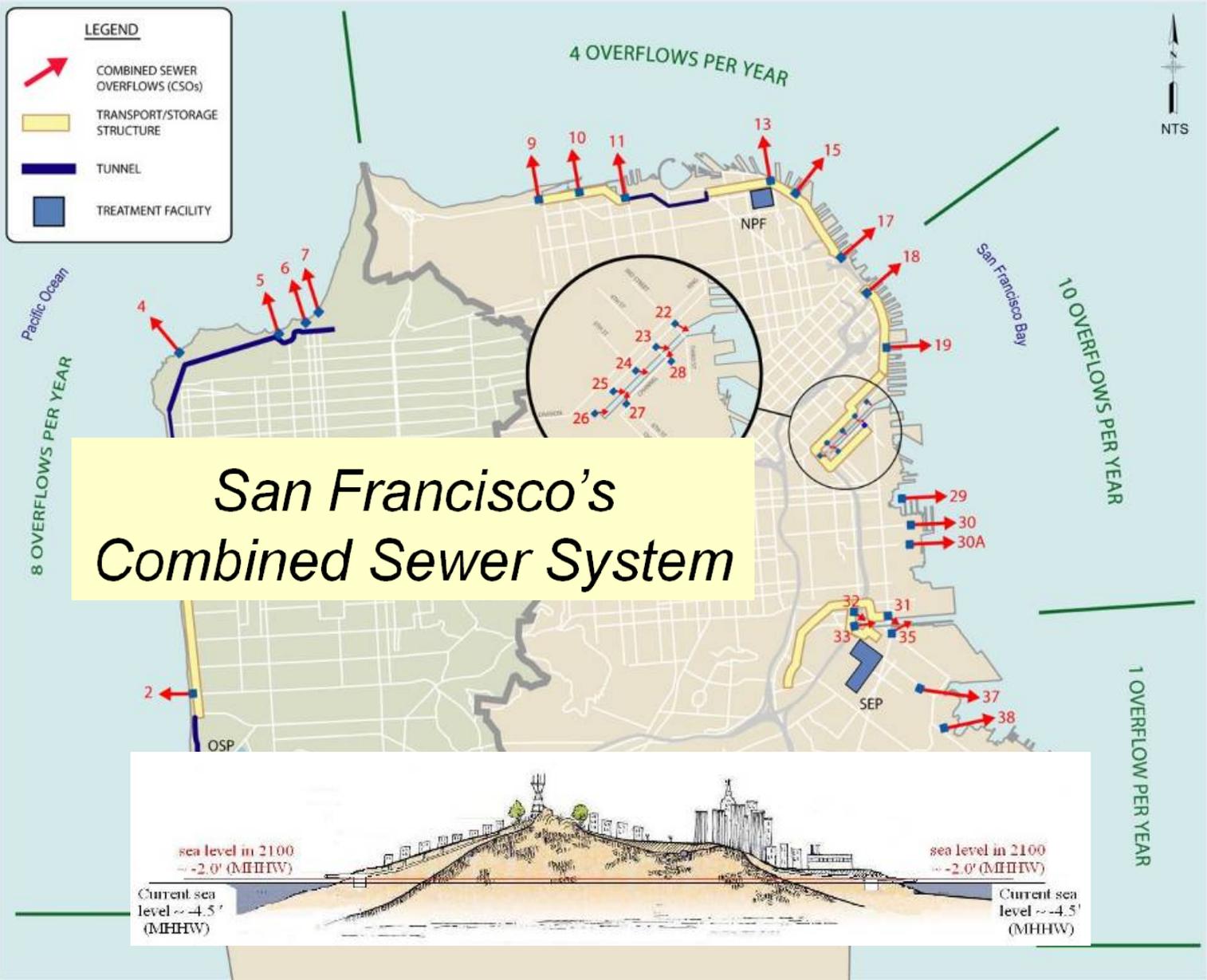
LEARNING AREAS

- Future tours should seek to have feedback from the Public Utilities department
- Legislation and regulations will continue to increase as a greater emphasis is placed on climate change. Leadership within client groups will assist in facilitating a pilot program that can measure contractor's emissions and generate a baseline for civil construction. JHL Civil is currently required to collate and record this data manually onto paper which is prone to data entry errors. The utilisation of modern technology such as GPS and other software programs will aid to measure and report accurately on greenhouse gas emissions.. This pilot program could then be used to identify cost savings for contractors through waste minimisation initiatives.

- Green roof tops appear to be a good concept for reducing carbon footprint and improving stormwater runoff. It also adds to the public amenity. Australia needs to have a greater uptake of the green roof concept. This will require civil contractors to become experts in this space. Civil contractors will need to learn about the process and technology available for constructing green roof tops and could achieve business development by promoting expertise in this area to developers, councils and other governmental and private organisations. All sources of water must be considered as an asset. For more information review <http://www.roofmeadow.com/>.
- Rigorous goals can promote innovative and proactive thought process. It will take leadership by Australian Civil Contractors to develop environmental consciousness in standard construction practices and remain abreast of requirements of new standards such as LEED. In an effort to make this commercially viable, clients will need to adopt requirements in their tender documents that require a certification of this kind to be a mandatory requirement for tendering, such as the CCF has done with the CCF-CMS.
- Projects require more detail on the planning phase between the principal and the contractor. Collaboration can ensure results such as improved timelines and reduce costs for both parties. Consideration needs to be given to the time that contractors have to tender on a project and then construct considering that most projects are in the planning phase for months to years. Clients need to start devising methods of compensation for drawing on contractor's knowledge base early in the planning phase of projects. Consider advice taken from a consultant, the client has to pay per hour and yet advice/time provided by a contractor is expected to be free of charge! It is time that the industry acknowledges the wealth of practical experience and knowledge that is embedded within the experts in the civil construction industry.
- Information technology has provided us with many benefits of which the civil industry is yet to capitalise on. We have not yet caught up with the true benefit that IT can provide us to achieve greater efficiencies and productivity.

- There was a significant emphasis placed on climate change and very little reference to OHS and quality concerns. It appeared that these items were a given and the City was not required to regulate this heavily due to the influence of Occupational Safety and Health Administration - OSHA. OSHA is part of the United States Department of Labour. The department operates under the Occupational Safety and Health Act of 1970 as amended through January 1, 2004. OSHA operates on both a federal and a state level. More information on OSHA is available at www.osha.gov.
- According to the Associated General Contractors of American (AGC) website (www.agc.org), the AGC are calling for members to oppose OSHA's efforts to increase record-keeping requirements which force employers to reallocate more resources for administrative costs and fewer resources for safety on jobsites. This is currently a concern for JHL Civil and from my discussions with other contractors, we are not the only ones concerned with this movement. It will take leadership to adopt innovation to manage the increase in paperwork. I believe part of the answer is in utilising software programs to automate the process of paperwork. This has been achieved in other industries such as the trucking industry.
- The AGC has a great website that offers relevant information including forums on IT, the Building Information Modelling Education Program, Executive Management and Project Management training all in an effort to develop leadership in the industry. Can the CCF consider improved education programs such as these supplied by the AGC in an effort to support our industry's progress?
- Estimating is the foundation of our game and yet the CCF does not offer any formal education or training in this space. In America they have the American Society of Professional Estimators – see <http://www.aspenational.org/> - and they have developed universal coding systems for identifying activities. Each activity defined for a project is identified by a pre-defined code specific to that activity. This system is governed by the Construction Specifications Institute - <http://www.csinet.org/default.aspx>. If we are to improve as an industry we need to seriously consider standardising estimating principles.

- Despite all the modern technology available to us today, estimates and tenders are still completed with pen and paper. In an effort to encourage the utilisation and uptake of technology and software in our industry, can the CCF offer a back to basics computer usage training program? Why do our authorities continue to request hardcopy tender submissions? Through the influence of the CCF, let's develop Victoria into a leader by using legislation for positive action like mandating electronic bidding. This has been successfully applied in Louisiana, USA.^v
- The AGC website also notes that the Construction industry in America has seen its safety record improve from an Occupational Safety and Health Administration (OSHA) recordable case incidence rate per full time worker was reduced more than 200 percent from 11.5 in 1994 to 5.4 per hundred workers in 2007. The number of lost work days has dropped more than 250 percent from 4.8 per hundred full time workers in 1994 to 1.9 in 2007. This is a good indication that the safety message and education in our industry is working at reducing the number of claims. The construction industry is doing a great job of reducing the risks on site; I believe it is time to start seeing some rewards for the efforts.
- Workers Compensation premiums are set to rise in the coming years due to the rising cost of medical claims and insurance companies looking to reduce their risk. Insurance premiums have a significant impact on the company's bottom line. I have identified that innovative insurance companies in America are now offering a solution to cost control which is self-insurance. Self-insurance makes workers compensation a controllable part of the management process, provides for cash flow benefits as it is a low-cost start up – any funds not immediately needed to pay claims stay with the employer until they are needed, it can be taken as a stand-alone or under association programs. Can the CCF consider this as an opportunity to provide its members discounted insurance premiums in an effort to reward the industry for its reduction in the number of claims? An example of this program working successfully in the US can be found at www.acig.com



CITY OF NAPA, USA

The City of Napa is an old city that has been going through a transition over the last 30 to 40 years to a more modern city. The city is now home to some of California's finest Victorian homes and is well known for its wineries. The County has a population of 128,000.

OBSERVATIONS

Funding of major projects was an issue due to a complex tax structure which saw increased taxes to the local residents. Collaboration and communication was used to mitigate the effects of this by involving the community in the planning process for long term projects. With the support and buy-in from the community, the additional funding was approved and the additional works were constructed in shorter timeframes.

A priority was placed on the condition of their roads. They had an objective to overlay 10 miles of streets per year to keep the roads in good condition. They actually did not have a system that saw them repair only the roads that needed repair. A suggestion in this space could be to learn what is working well for other Cities and take this information and apply locally. I.e. The City of San Francisco has engaged the system of Pavement Maintenance Management Systems which is working well for them to prioritise road repairs. Other considerations could be adopting a scale for condition reporting which is commonly utilised here in Victoria, Australia.

The City made the decision to use and grow their in house construction crews as a first choice over contractors so that they could have the construction crews spend more time connecting with the community as they worked. This model is a threat to contracting in general and gives rise to the 'us vs. them' mentality. As cited in the City of San Francisco IPD example above, a shift to focusing on

collaboration and communication will ensure that the expectations of both parties are met to achieve the best outcomes for the project and all involved.

As with San Francisco, climate change was high on The City agenda. The City of Napa was working to reduce energy usage; they had a budget of \$31M for energy reduction. Innovation was a key component adopted by the City in considering methods for energy reduction. At the time of our visit they were proposing a demonstration project that will markedly reduce greenhouse gas emissions while reducing the cost of road rehabilitation by recycling existing asphalt concrete pavements in place, eliminating the need to produce new material or transport it to the worksite. The technology is known as Cold In Place Recycling (CIR). The objective then was to partner with contractors that could provide this service/equipment.

Other innovations included the implementation of new software systems to manage their work orders. It was evident that the benefits and efficiencies enabled by IT were not fully recognised in this City. The City did not have a clear system of prioritising renewal works vs. new capital projects as noted from our visit to other Cities.

Being a flood prone region, I noted that innovation did not play out in the area of storm water harvesting. Taking into account that the City went through a drought from 1991 to 1993^{vi}, constructive behaviours applied here could see this excess water captured locally for on selling to neighbouring cities or reusing for energy creation - ultimately creating value from a social, economic and environmental viewpoint.

Our site visit to Napa concluded with a tour of a flood control project at the Riverfront, Veterans Park, Soscol and a Railroad Relocation. During our tour I spoke with Eric Whan – Deputy Public Works Director, and we discussed how they were dealing with the increase in regulation and legislation with their major projects. Eric suggested that OHS had become an expectation and that the onus of safety was on the contractor, that they had a good handle of the requirements and it was up to OSHA to manage any major concerns. He highlighted that the partnership and collaboration achieved with large scale projects should be a benchmark for constructing projects and filtered down to projects of lesser dollars.

We discussed the importance of communication in ensuring productivity is kept high and that through open communication departments can avoid getting bogged down in slow decision making. A method Eric had seen work well to avoid this was early contractor involvement which consisted of sending out projects at 35% for comment, then again at 65% for comment. Their purpose for this was to achieve effective collaboration, foster a culture of constructive behaviour and ultimately minimise “change orders” or “variations”. Eric highlighted that this was not currently a standardised process in City Councils and commented on the need to overhaul legislation in a bid to keep up with the developments in IT.

Interestingly, I found the attention to OHS matters on the particular major job site (relocation of the railroad) was quite low in comparison to our operations in Australia. You will note in the photos below, there has been minimal effort to restrain the public from entering the construction site, and next to zero pedestrian traffic management. It also appeared that their traffic management was not managed as well as we do in Australia. There was no pre-warning of the traffic hazard nor was there any attempt to slow the traffic.

In discussing this amongst our group we got the feeling that this was a result of lower community expectations – the perception appeared to be an acceptance and greater tolerance to construction as being a way of life and that everywhere you go, construction is all around us. This appeared to then lead to lower principal’s expectations as the perceived pressure from the community was not as evident.

Perhaps we can take stock of the amazing credits that OHS has achieved to date within our industry and in accepting that the message of safety is well and truly ingrained into our operations, start fostering a move away from ruling construction through regulations towards focusing on the intelligence and common sense approach.

Advancements in Civil Construction
The First CCF Victoria International Study Tour





No attempt to restrain or guide the public from entering the construction site

LEARNING AREAS

- The local contractors were not listening / understanding what the City's needs were which resulted in the City developing their in house crews. This highlighted the need for collaboration between the city manager and contractors.
- Collaboration and effective communication between all departments and stakeholders is the key to the success of projects at all levels not just the major projects. The CCF together with the industry needs to place a much greater emphasis on collaboration and integration. It should be part of our education system and publications / media. By adopting constructive behaviours I believe we can encourage collaboration and integration into our company and industry cultures ensuring uptake for even the small projects. Establishing trust and open clear communication amongst the contractors and the clients is critical to maintaining high standards of quality and allowing contractors to do what they are good - being innovative, creative, cost effective, and optimising OHS. This can be supported by adopting the ten tools outlined in the Aurecon

Procurement Best Practice Report, all within an integrated IT environment. Support and profile must be provided to software programs such as Quest Estimating that provide integrated estimating software that links the estimating, project management and accounting. We need to start encouraging a shift from reactive to strategic thinking.

- Necessity is the mother of innovation. Water was not in demand and therefore, innovation on this front was minimal, whereas it appeared all the emphasis was on the innovation of the road pavement works. This provides a clear message for contractors to take the time to understand client needs and provide them with tailored solutions. In the case cited in our visit with the City of Napa, the City devised their own solutions to the detriment of the local contractors.
- Cold In Place Recycling is not a new methodology, it has been available to the industry for a number of years, yet the City of Napa are only just now piloting this in an effort to reduce greenhouse gas emissions. In order to encourage innovation and drive economic progress, can local and state government demonstrate leadership by being prepared to pay contractors for pilot programs? Consider the triple bottom line benefits such an initiative could produce? Could such a move go as far as putting Australia into the top 10 innovative countries in the world?



A good location for lunch – the old Napa Mill



Flood wall turned into a landscape feature used to beautify the city

CITY OF TORONTO, CANADA

Toronto is a great City which I felt was the closest resemblance to Melbourne. Toronto is Canada's economic engine and has one of the worlds most diverse and multicultural populations. Toronto has North America's largest public transit system after New York City and gets its water from Lake Ontario, the 8th largest fresh water lake in the world.

OBSERVATIONS

The City of Toronto had a huge focus on climate change which was driven by leadership from the top - the Mayor. On reflection of the previous visits, it became clear that without the push for climate change initiatives coming from the senior management together with appropriate funding and public policy, the initiatives did not constitute action. I could understand that the City of Toronto was serious about acting on climate change when we heard that the commitment was supported by a \$1 billion budget.

The City of Toronto was very much about creating action. It was clear that Canada had undergone a behavioural change as a result of great motivation from Al Gore, extreme weather, creative competitions, government grants and community animators.

Rather than the traditional approach to change which was make decisions and then get the community to comply, the City had taken on a democratic process of getting community involvement to assist for buy-in which was essential to the success of the program. This type of behaviour comes back to leadership, rather than imposing increased regulation, it is clear that leadership will drive change.

Some of the initiatives that the community and the City adopted to change behaviours included:

- Policies to support local food procurement.
- Creative advertising – i.e.. A tree can only do so much:



- Construction of a pipeline through the main lake to provide deep lake cooling for heating and cooling of the council building.
- Construction of high rise towers to work on greater density and encourage more businesses on the ground floors so employment is closer.
- Introduction of a by law requiring the construction of green roof tops for all residential, commercial and industrial development.
- The development of the “Toronto Green Standard^{viii}” for new buildings. The Green Standard introduced in 2006 was a voluntary program. The new Green Standard consists of a two-tier system. Tier-1 being the mandatory requirement and Tier-2 being voluntary and an

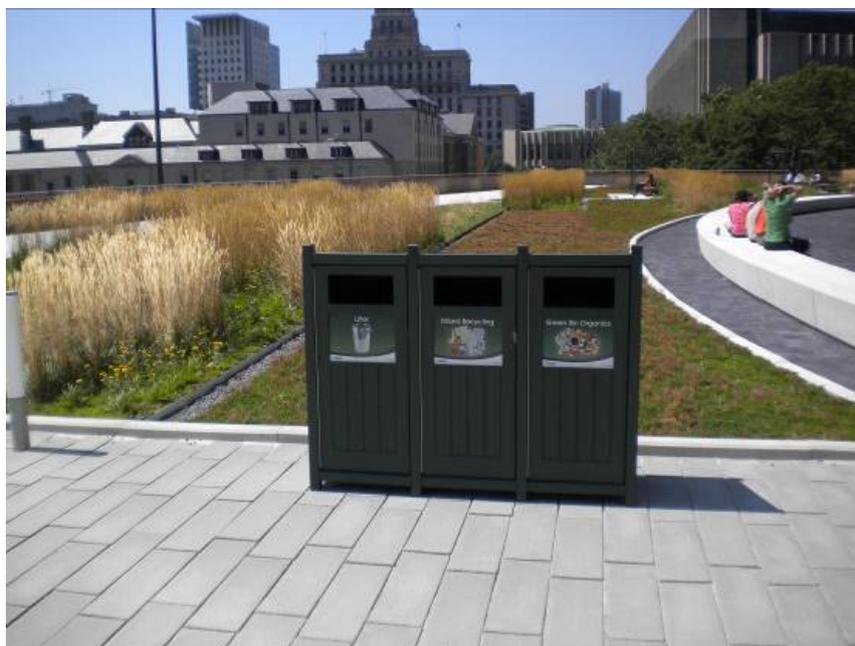
encouragement for developers/constructors to raise the bar. The standard is focused on three types of developments – Low-rise non residential, Low-rise residential, Mid-rise to High-rise. This standard provides incentives to developers to achieve the requirements under the tier 1 and 2. Under the standard, Tier-1 and Tier-2 require a minimum of 25% and 35% energy efficiency improvement over and above the model National Energy Code for all new buildings. Tier-1 includes requirements such as green roofs, stormwater retention and quality, ‘cool’ paving, tree planting and cycling infrastructure. Tier-2 includes requirements such as green walls, water efficiency and recycled building materials. The program offers financial incentives and a refund of 20% of the development charges paid for Tier-2 building. More information on this can be found at <http://www.toronto.ca/planning/environment/index.htm>.

The culture in the City itself was very pro-climate change. The culture was developed by an integrated approach, leadership from the top – the Mayor, support from the media and press, internal champions were selected in each division to drive climate change and everyone in the council was instructed to make change happen.

They also calculated the “do nothing” scenario vs. mitigation measures and found that by adopting mitigation measures they could actually document that savings from reduction in energy consumption actually served as a recovery initiative for the costs required to setup the mitigation measures. There is costs savings to be had in adopting a pro-active approach to climate change.



Green Rooftop above the City of Toronto's Council Building



Three bin recycling system

The City was very supportive of collaboration and community support which was demonstrated through their management of contractors. The City had a large project program to roll out and was finding the traditional competitive tender process difficult to manage the workload. The challenge presented was the 'need to find creative and innovative ways to deliver capital projects to meet increased volume of work and tighter delivery timelines'^{viii}.

Previous experience with the design, bid, build model had concluded that this does not work on expansive small scale works. A report was commissioned to take the lessons learned from fast project management and apply to all projects at a lower level.

Much like the issues currently facing contractors in here in Victoria as outlined in reports such as the *Inquiry into Streamlining Local Government Regulation*, CCF 2009, the report found that problems existed with over engineering, unnecessary processes, poor tendering and contract management practices and an unworkable attitude around risk mitigation which was ultimately found to create the 'us vs. them' mentality. A decision was made to open up the communications which involved getting the stakeholders, designers and contractors all communicating to achieve collaboration on projects.

An innovative delivery approach adopted by the City was 'General Services (Task Order) Contracting (GSC)'. This involved bundling of construction contracts, advancing the release of construction tender, establish unit prices master contract based on scope of work in the bundled Task Orders and award the GSC to multiple contractors to deliver work on a Task Order basis. This method provided contractors with guaranteed work. Risk Management relied on 'partnering' approach with the contractor as the scope was not as well defined as compared to conventional approaches.

Through consultation they arrived at the development of a bid committee which reduced the time to process a tender to just 3 weeks.

It was refreshing to learn that the findings of the GSC approach revealed that it creates a partnership between the City and the Contractor which encourages open communication and creates synergy. Let's hope the same or similar result is achieved through the CCF's hard work to see regulations streamlined here in Victoria.

Taking on the community aspect, the City of Toronto considered themselves as competitors to neighbouring regions and hence they were competing for the best contractors so they needed to make the process attractive to these contractors.

Some of the ways they were doing this was to look at bundling the contracts to create larger contracts which they found typically attracted larger firms who have construction practices in place such as QA programs, scheduling, H&S programs that a larger firm can support. They found that although this is not always the case, it was identified as a trend. Other things they are doing is reviewing their general conditions and looking at ways of adopting the Canadian Construction Documents Committee industry standard specifications that are written less from an owners' perspective and finding a balance between owners' perspective and contractors' perspective.

Regular communication with the industry is an important factor for the City of Toronto in advance of releasing big or strategic projects. They found that contractors will target in their business plans certain project wins and they want to be on these lists as this means the contractors of choice will be bidding and the projects will be competitive. They also adopt pre-qualification process where a business case supports this to ensure that some projects that require specific qualifications, have prequalified the general contractors or specific subcontractors.

This trending towards the use of larger contractors is a concern for our industry. Further to the works already commissioned and in action by the CCF to address this trend for its majority membership base, I believe additional focus could be applied to the areas of estimating, effective project management and the use of technology for streamlining processes.

It will also be important to continue promotion to the market place that although smaller contractors do not have the overhead structure of the larger contractors, with the support of the CCF they can still maintain good corporate governance whilst providing competitive pricing. The contracting industry has suffered for too long from the effects of the larger contractors screwing the little guys. It is time to bring balance back into this industry.

LEARNING AREAS

- Effective leadership combined with appropriate funding and public policy is the key to driving constructive behavioural change.
- Early identification of emerging trends is crucial to the ongoing success of the civil industry. The CCF Victoria's International Study Tour is a fantastic initiative to achieve this year on year and should therefore be encouraged by the industry.
- To promote green building standards and green construction standards, developers and contractors could be provided with financial incentives. The CCF could form an advisory committee that sets green development and construction standards to encourage the increase of energy efficient construction practices, reduce green house gas emissions, conserve water, reduce stormwater runoff, advocate the government to introduce laws to make green roof tops compulsory and encourage neighbourhood green space. Return on investment could be recovered via audits and reviews, revenue generation through further training programs and increased membership base.
- Change in any instance requires strong leadership commitment. If we are to change the way our cities are developed and focus on sustainable living, we need to have an industry wide commitment to collaboration and commitment from community engagement, stakeholder engagement, contractors support and public policy.
- All civil contractors have a responsibility to encourage subcontractors to gain knowledge and step up to environmental changes and compliance to ensure our industry steps up as a whole. The question here is how to achieve this without crushing smaller contractors with administration and how to instil the passion to want to comply with these changes. The CCF is currently working on the inclusion of a percentage for training allowances within tenders. Further to this contractors could make the most of the current government up-skilling incentives which in some cases provide contractors with surplus funds.

THE CITY OF WATERLOO, CANADA

The home to RIM – Research in Motion – creator of the Blackberry, Waterloo is a affluent city. This city is known for fostering innovation and creativity. The population is just over 121,000 people.

OBSERVATIONS

As with the other cities we visited, climate change was a critical factor for the City. The City proposed implementation of environmental changes through integration into business and financial plans. They identified gaps that would potentially see this strategy go unused. The gaps and their solutions included:

- Gap 1 – Corporate structural support
 - Interim Measure included:
 - Setup an environmental steering committee
 - Prioritising environmental changes into budgeting
 - Used web based survey to get input from public and employees
 - Ads went out to request volunteers to sit on advisory committees
- Gap 2 – Process Oriented
 - Identify ‘opportunities for action’
 - Align business plans, budgets and performance measures of staff and teams

Another challenge was prioritising works. The City had identified a number of software systems that would assist them to achieve improved efficiencies and productivity however the challenge with this was bridging the age gap with the uptake of technology. They City concluded that they would start

with the younger workforce then move to the older guys. It was clear that software and IT is a long way ahead of the industry and it is the people with a resistance to change that is hampering the up take of modern technology.

Stormwater is becoming a big issue across all states – the question on how to manage and recover costs. Waterloo is now applying rates to charge for stormwater. Is this a direction for Australia? At current, councils in Australia do not recoup any revenue from owners tapping into their assets. In the US stormwater is a major problem in congested areas due to the impact that industrialisation and urbanisation has on the water balance. JHL Civil has constructed a number of stormwater harvesting projects for clients that have proactively sought funding to cover the capital costs of the infrastructure. We see this as an area worth developing. This will require leadership and collaboration of the CCF, suppliers, clients and contractors to encourage municipalities to take on pilot programs that can trial innovative products.



Another example of construction traffic management



Whilst we took in the opportunities to learn, we also enjoyed the locations & the travel

LEARNING AREAS

- Acceptance and uptake of environmental planning is dependent upon the level of integration the environmental planning has with business plans and budgets.
- Environmental steering committees should insist on having their plans and agendas prioritised in project budgets and also educate senior managers on the importance of environmental management and the reasons for including such elements in the budgets. Environmental steering

committees require a good cross section of members to ensure a balanced representation of ideas and input.

- All new initiatives for consideration must be process oriented to ensure that they align with business plans, budgets, performance measures of staff and teams etc.
- Innovative ideas are welcomed around reducing headaches from residents i.e. there is a greater uptake of trenchless and relining construction methodologies. Further consideration and industry support needs to be given to plough in technology for pipeline construction. Consider the reduction in the carbon footprint, increase in safety and reduction in resident's complaints. By adopting this technology, Australia could place itself ahead of the US.
- There is a realisation that software and modern technology can be utilised to generate more accurate reporting which can then be passed on to reducing/countering complaints from residents/clients. As mentioned earlier in my report, the industry as a whole has made incredible inroads into the reduction of accidents as a result of a greater acceptance of OHS. If the contractor can now utilise software to go another step further, apart from the financial benefits that the contractor will realise, what about support from the industry bodies such as Worksafe, the CCF, EPA to provide rewards as incentives to the contractors for a job well done?
- The uptake of software and IT technologies in our industry is slow. The strategy is to start with the younger workforce and then move onto the older generations to ensure uptake is successful. Unfortunately, the industry cannot afford the luxury of this time and action must be taken to generate a fast paced constructive change program.
- It is evident that there is a bridging issue in our industry between the benefits produced by systemising organisations processes with software and the current position of how things are done. Opportunity exists here for the CCF to collect and promote baseline data that will help identify productivity improvements resulting from systemisation.
- Communication and integration of thoughts will assist with the progression of innovation in our industry. Contractors live from project to project so I believe an opportunity exists in providing

contractors with visibility of projects that have prioritisation for construction. The CCF could expand on the recommendation for local and state government to publish this individually^{ix} by developing a national report and recoup revenue from a subscription based income model.

MEDFORD CITY COUNCIL, USA

Medford City is a small city with a population of 55,000. The city is the home of the Christmas tune 'Jingle Bells'. They have recently received a great deal of federal funding which has seen a big push to get projects rolled out.

OBSERVATIONS

The Mayor of Medford was very influential in the Medford City. He had a passion for triple bottom line benefits and lobbied to install a wind tower at his recently developed McGlynn School which was part of the Medford Energy Independence project. The project provided for a feel good initiative to the community but at a cost of \$645,490 with a 10 year payback.



The City of Medford joined the Cities for Climate Protection Campaign and pledged to reduce greenhouse gas emissions throughout the community.

We had a site visit to 'Rivers Edge' development site. This site started out as a waste refuge brownfields site. A local developer had a vision to turn the site into a living community housing estate.

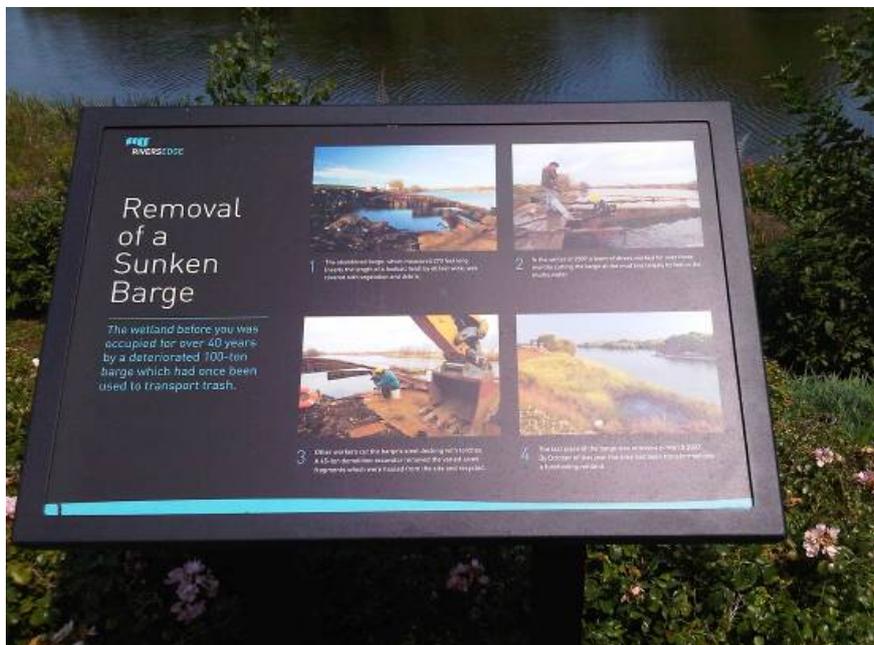
Nangle Consulting Associates – environmental engineers – said that planning and education was the key to the projects success. The consultants spent a great deal of time pre-consulting with contractors and educating/inducting them on the environmental requirements of the project.

This approach worked well when it came to the major financial risk to the project - budget blowouts due to the onsite contamination. Any soil contamination identified would need to be removed by specialist contractors that would need to be called in. Awarding standard contract packages would mean that contractors would have to go on stand down rates in the instance they uncovered contaminated soil. This was overcome by the engineers conferring with the contractors to agree to a favourable outcome for both parties. They resolved to accept contract rates for scope of works packages that could be clearly defined and opt for cost plus works when the site suffered from uncovering contaminated soil.

Another challenge was stormwater management. As development in the City increased, pervious areas were reduced, consequently contributing to mass flooding. In response, the City now imposes developments to provide onsite filtration and sequestration. An interesting contrast to Australia where we are doing all we can to capture and store stormwater, this City had the principal of capture and release. As stated above, I believe that a program of capture and storing of stormwater is far more effective. In the US they continue to use potable water for irrigation and toilet flushing. An opportunity exists for exchange of IP to the US to highlight and possibly market our stormwater harvest technologies.



Pre construction and during construction photos



Plaque detailing the works involved in improving the banks



Landscape to housing area



Natural barrier of prickly bushes to keep people from entering the water which was still contaminated from previous multiple years of abuse

LEARNING AREAS

- Australia is far more advanced in our stormwater harvesting and retention. Could an opportunity exist for the CCF to share its efforts focused on Water Sensitive Urban Design with international counterparts?
- Communication and collaboration with contractors will achieve a projects results/vision. Win/Win agreements should be the only process for ensuring success of a project. Defensive minds are neither creative nor cooperative.

**2010 APWA INTERNATIONAL PUBLIC WORKS CONGRESS &
EXPOSITION ~ BOSTON, USA**

The theme of this year's International Public Works Congress and Exposition was the Revolution. The American Revolution began on the Lexington Green on April 19, 1775. The true meaning of what the Revolution stood for was progress and innovation. The 2010 APWA International Public Works Congress and Exposition was heralded as "a time to celebrate the accomplishments of the past, and to chart a new pathway forward created around membership, emerging leaders, education, sustainability practices, international partnerships, progress and innovation". Whilst change and uncertainty has always been a part of life, what is starting to impact us clearly is the quantum and suddenness of change. An overall observation of my time in the USA was that the Americans are only just starting to recognise that they need to make drastic change to accommodate what is happening in the world around them.

I found the Congress event to be extremely informative. This event was certainly a leadership training ground.

There were a number of sessions on offer over the 5 day event. The sessions of interest that I felt connected to my study topic were structured around construction management, management and career and personal development. A summary of each of the sessions is given below (I have access to the full presentations in both PDF and MP3 formats for review):

EXECUTING A COMPLETE MULTI-DIVISION EFFICIENCY STUDY

The focus of this session was around performing an assessment of every division within an organisation in order to identify efficiency improvements.

The key findings from this session was that to identify efficiencies, you must first map and document all processes, identify strengths and weaknesses, focus on sustainable efficiencies and then establish an automated system as a tool to manage work. Our standard QA practices should take into account process maps and flow charts. Reading masses of text is difficult at the best of times. In order to further develop and encourage the communication from the office to the site, we need to consider process maps and flowcharts in our management and QA systems.

The study highlighted the need to place a greater focus on the best practice management flow which includes planning and controlling and apply less to organising and directing.

The results included documented savings of over \$5M to date with a forecast of improvement of \$2-\$3M annually as the system and improved management processes are further applied and others are 'on board'. These results were achieved through doing more with the same resources.

Lessons learned included:

- Management commitment is required
- Communication must occur at all levels
- Strong Project Manager who is independent of process is needed
- Real data must be used and confirmed in the real world
- Obtain "buy-in" from middle management prior to starting
- Take care and select the right person to lead
- Systematic process is asset independent and can work for any group
- Train...Train...Train – reinforcing the industry's need for improved education.

WATER RESOURCE STEWARDSHIP: REGULATION VS. REALITY

The EPA permit system in America use to be produced on a cost benefit. This is no longer the case which is allowing the EPA to imply unfunded conformities. This session identified a coalition – Water Resources Coalition www.waterresourcescoalition.org - that was formed to restore the relationship with other government authorities.

This coalition was basically a voice to the EPA to bring back practicality and sensibility in the development of legislation and regulation around permit requirements. They highlighted that they were not anti-environment, but rather wanting practicality to be the consideration for permit requirements.

They highlighted that in the development of the paperwork requirements, sustainability must be a consideration and the argument put forward was is all the paperwork that is now required of the current permit system actually sustainable itself?

A key directive was to consider outcomes when developing regulation and not developing regulation for regulations sake and staffing efficiencies must be considered, we are employing experts not robots, compliance bodies should remain the drivers of compliance, not the need to employ multi levels of compliance drivers internally. This can be achieved through education and a greater focus on planning and monitoring rather than directive by regulation.

THE “NEW NORMAL”: DESIGNING FOR SPEED, SCALE, AND SCOPE

This was a general session that was spoken by Christine Ervin. Christine has led innovative private-public collaborations to promote green market transformation for nearly 20 years. I found Christine to be a very inspirational speaker.

Christine highlighted that with all the technology at our finger tips, we are only just at the point of catching up with IT – i.e. apps, etc will make businesses work better and smarter. We need to consider ways to bring all the information available to us in a simplified format that can be used for making decisions. Converting complex information into easy to understand information. She outlined the need for supporting and creating integrative innovations as a means of overcoming the current barrier to change created by over 70% of businesses in construction having 5 or less employees.

A key point was that ‘smart and practical’ regulation together with technology which will allow for significant change. Legislation and regulation needs an overhaul as it is outdated and not keeping up with technology.

One method of speeding up acceptance of green integrated innovation developed whilst Christine was CEO of the US Green Buildings Council, was the LEED green building rating system and the Greenbuild conference and expo.

Christine challenged the room to teach the change – “Creativity & Can Do” and ask “Is it fast enough?” and “Is it scalable?”

**SMALL BUDGET, BIG THINKING: HOW TO LEAD IN TIMES OF
EXPANDING CHALLENGES AND DECLINING RESOURCES**

The detail of this topic was focused on encouraging the audience to stop complaining about the challenges we are all currently facing and that now is the time for extraordinary creativity, opportunity and action.

The speaker highlighted the need to change attitudes and thinking, to get motivated and bring back the passion that got us all into this industry. She also made the point that people in good moods are better at creative problem solving. This is an important factor when implementing regulations and the entire civil industry must respect this fact rather than policing regulations and legislation. Emphasis was placed on the qualities required to be a leader, understanding that money is not the number one motivator, developing a vision for a better future and that leadership is proactive.

DIVERSITY AND SUCCESSION PLANNING

This session was presented by a panel of speakers posing and answering questions. The panel focused on the requirement for sharing information between generations as the gap widens between the baby boomers and Gen Ys. Previous generations once hoarded information due to this being a power matter, however, with the recent onslaught of social media we are seeing a change in the way information is shared and communicated. It was highlighted that as an industry we need to slow down and take advantage of the changes in the economy to regroup and bridge the gap between generations. This includes mutual respect for all team members, developing a culture that encourages flexible schedules, a fun and engaging workplace, no need for over the shoulder review and respect to be shown to Gen Y's from the baby boomers that they are getting their jobs done.

Responsibility and autonomy to make decisions allowing for backing from senior managers had resulted in extended retention despite no promotions or limited promotion. A key factor in overcoming resistance to change had been collaboration and open communication. Gen Ys do not mind that a decision has been made so long as they understand why the decision has been made. This allows people to learn through osmosis and transition.

**SUSTAINABLE AND OBTAINABLE: INNOVATIONS
YOU CAN IMPLEMENT**

The focus on this session was around green roof tops. The concept requires public/private partnerships between organisations that have large warehouse operations. It will also require approved contractors to understand and implement the technology.

Wal-Mart is the largest monitored green roof space in the world. Green roof tops cool the building through evaporation from foliage as it absorbs heat, it has also been found to improve efficiency of rooftop HVAC units.

MASTERING THE POWER OF CHANGE

Ian Hill delivered a series of change workshops which included this one, Leadership in Changing Times and Public Works Leadership in a Time of Permanent Crisis.

The content highlighted that change is a difficult process at the best of times, but managed carefully, can be a powerful growth agent. Ian stated the importance of setting a strategy for change and establishing a change team to plan, execute and control the change strategy. He outlined the need for communication and collaboration and that all members must be on board to make change effective.

Leadership was identified as the key to delivering successful change into an organisation and an industry. Ian commented that leadership styles will need to change from autocratic to democratic and that trust, integrity and proven ability together with systems thinking will ensure the success of any change program.

The content also focused on the importance of networking. From my discussions with contractors that have been in the game for 30 plus years, I understand that networking was once the industries strength and that with the introduction of competitive tendering this has slowly been broken down.

As an industry we need to re-focus our attention to building better relationships through networking, getting to know our customers and stakeholders – change can be driven by 300 coffees (getting out and meeting people external and internal to your organisation).

OTHER SESSIONS OF INTEREST INCLUDED:

**STUDENT MENTORING STRENGTHENS THE PUBLIC WORKS AND
ENGINEERING PROFESSION**

According to the information presented in this session, the need for engineers in the US will grow by 11% until 2016. This is accounted to population growth, deteriorating infrastructure, retired engineers and engineers that move into management. Civil engineers will have the largest growth and environmental engineers will have the fastest growth. The APWA is working to answer this issue by offering student membership in the USA and Canada.

The program in the US involves mentors agreeing to commit time to visit students to explain to them topics of interest within the industry.

The mentoring volunteer serves to give advice, be a role model, be a resource, review the resumes and look for internships amongst other items. The budget for the program was \$0 as it is entirely reliant upon volunteers.

What a great constructive behaviour to promote effective change! Can the CCF Victoria lead in this space by adopting a similar program?

**HOW TO CONSERVE FUEL, SAVE MONEY, REDUCE CARBON
..... FOR FREE!**

This session was basically focused around cost cutting through driver education. The program detailed an employee fuel conservation incentive program. This program involves the employee entering into a 12 month agreement with the employer to participate in an eco-driving training course, accurately enter odometer readings at fuel sites, assure their vehicle is maintained on schedule, have no preventable crashes in 12 months. If all this together with fuel efficiency improvements of 5% or more were achieved, then the employer would split the fuel savings 50/50 with the employee.

By rolling this program out, the Polk County achieved a savings of \$500,000 in fuel usage and improved safety results which resulted in hard dollar savings of \$285,000!

JOB ORDER CONTRACTING --- ONE ANSWER TO MANY PUBLIC WORKS DILEMMAS

Job Order Contracting is a relationship-based process, a way for municipalities to get numerous, commonly encountered construction projects done quickly and easily through multi-year contracts. The current cap is \$1M per project or as determined by the contracting agency.

Although this is not a new way of contracting, it is a preferred method for contractors in the US.

How the Procurement works:

- Purchasing agency procures a contract
- Single trade scope or general construction
- Single award or award to multiple firms
- Contract outlines whole process for doing work
- Similar to 'blanket order' or 'on-call' contract.

How JOC works:

- End use calls JOC for work
- Site visit by JOC and end user
- JOC prepares scope and end user approves
- JOC prepares formal proposal with estimate and submits to end user for review
- End user reviews and negotiates the proposal with JOC
- End use issues job order to JOC

This system has proven to save procurement time and money, faster project delivery from start to finish, contractors are selected on qualifications, delivery process is collaborative and longer term contract fosters relationships.

Typical projects that have been executed under this system include:

- Asphalt overlay
- Bridge Repair
- Emergency Pavement Restoration
- Water/Wastewater Treatment facilities general construction
- Water line upgrade/replacements
- Emergency water line repairs
- Emergency water sewer repairs
- Water and Sewer Repair/Replacement

JOC advantages include the ability to pick ‘best qualified’ contractor, involvement for contractor in scope of work, enhanced project communications, better relationships among all project team members, fewer variations, more certain completion dates, smoother project close out, better contractor performance – want repeat business, faster work approach.

In speaking with a number of our customers over the past few years, I have noted an obvious deficiency / uniformity in the selection of a project delivery that works for both parties. I believe that the CCF could incorporate JOC into their current industry workshops to promote the adoption of JOC. A recent report commissioned by the Cooperative Research Centre for Construction Innovation, highlights the greater need for improved relationship management in the construction industry^{xi} – JOC could be part of the answer.

More information can be found at the Centre for Job Order Contracting Excellence (CJE) at www.jocexcellence.org

CONCLUSION

The changes and volatility in the current world economy is posing a significant challenge and is forcing a new way forward. We are seeing a shift in world powers from the US to China which is causing uncertainty. It is time to rethink how business is conducted. We all need to consider how to do more with less and promote collaboration and integration.

I believe this can be achieved by driving constructive behaviours that foster leadership through vision, values and innovation.

Constructive behaviours include proactive responses that embrace information technology, reflect on international trends, build up trust and encourage open communication.

If research is any foundation, the market is telling us it is our obligation to improve and that change is underway. According to a survey of OH&S professionals attending The Sydney Safety Show last month, it was identified that the use of software systems as a means of monitoring and analysing safety performance has risen from 44 per cent of organisations in 2009 to 55 per cent in 2010. The survey also highlighted that the number of organisations supplementing software systems with paper-based processes declined from over 50 percent in 2009 to 32 percent in 2010^{xii}.

In effect, there is a need to better understand the requirements around compliance and good governance. Good governance requires effective human interaction and appropriate, constructive behaviour as well as robust systems and processes that support and encourage ethical / good behaviour.

Good governance should deliver compliance, improved productivity, responsiveness and resilience driving greater and more sustainable profits with less risk. It makes sense that compliance and governance is a way of doing good business and therefore is 'a good way to do business'. In reality do we have a choice? I hope that my vision, along with other thought leaders, to see the civil construction industry undergo behavioural change is founded with enthusiasm.

Change will be driven through the vision of leadership from our next generation.

Let us make it happen.

RECOMMENDATIONS

Over the course of my trip, I could clearly see a number of key issues emerging for our industry. It was refreshing that with collaboration some can be dealt with easily, but some will require significant thought leadership to ensure a positive outcome for the industry as a whole; i.e. could a paperless construction site be a reality?

Our ability to meet the demands of a moving landscape will be the key factor in how the industry moves forward on key action items like Climate Change and other compliance requirements such as the rapidly approaching OHS Harmonisation Laws.

With the community, government and industry driving for change, we are in a unique position to evoke a revolution of ideas and thoughts and to lead a positive charge towards an implementation path that is achievable.

Like all significant change it will require the dedication of a passionate few, leaders who can instigate and drive these actions forward. With around one-quarter of our workforce or 3.5 million Gen Ys at work in Australia, the industry needs to culture the next group of leaders by allowing for progression through the provision of improved systems and processes to deal with the change.

Technology, communication and collaboration are essential to nurturing the transfer of knowledge between the older ones to the younger ones and vice versa. We need all four generations in the workforce to cooperate with each other and make the most of improvements in technology to gather, collect, interpret and integrate information in the most efficient, productive and practical means.

There is no doubt this will require behavioural change - we can no longer accept that things are done because that's the way it has always been and we cannot accept that regulation is always the answer either. We have responsibility and it sits in our backyard and somewhere in the middle lies the answer.

The CCF has come a long way in assisting and driving behavioural change. Initiatives such as this International Study Tour, reports such as Inquiry into ‘Streamlining Local Government Regulations’ submitted to the Victorian Competition and Efficiency Commission (VCEC), joint initiatives between the CCF and industry consultants reports such as ‘Civil Construction & Climate Change’ by Pitt and Sherry, the ‘Guide to Leading Practice for Dispute Resolution and Avoidance’ by CRC Construction Innovation and ‘Achieving Civil Infrastructure Procurement Best Practice – a Study by Civil Contractors Federation in conjunction with Vicroads’ by Aurecon Australia.

Upon reflection of the learning’s from this, the first CCF Victoria International Study Tour, the recommendations put forward in these reports above suggest the leaders in the civil construction industry in Victoria are advancing the industry in the right direction.

I therefore would like to see the findings and learning’s made throughout this report be used to reaffirm a selection of the recommendations from the reports mentioned above. I see this as an opportunity to encourage the CCF Victoria and the civil construction industry to warrant these through to fruition.

I have listed a selection here below that I feel complement the findings in my report:

Capital Works Programs Delivery

That a taskforce consisting of the Municipal Association of Victoria, Institute of Public Works Engineering Australia and the Victorian Civil Construction Industry Alliance be convened to develop a framework for the efficient planning and delivery of capital works.

Forward Capital Works Programs

That all local and state government entities be required by Regulation to prepare and publish their forward 3-year capital works programs on their website and to update the information by June 30 of each year. That the CCF comply this information into an easy to navigate report for distribution amongst its members.

Standardisation

That the VCEC consider the need for regulation to bring about standardisation in the delivery of civil infrastructure, including:

1. adoption by all councils of the principles embodied in the MAV/IPWEA/CCF *Best Practice Guide for Tendering and Contract Management*;
2. adoption by all councils [and water authorities] of AS4000 as the General Conditions of Contract for all infrastructure contracts;
3. development and adoption of a common tender evaluation tool;
4. development and adoption of a common electronic tendering platform;
5. reduction of the volume of material required to be submitted with tenders in the interest of meeting the Government environmental objectives;
6. resolution of contract disputes by mediation rather than costly arbitration;

Benchmarking

That the Essential Services Commission be asked to examine how the proposed benchmarking regime can be extended into the civil construction sector as a means of enhancing the planning and delivery of infrastructure.

Resolving Contractual Disputes

That Local Government Victoria, in conjunction with the Victorian Civil Construction Industry Alliance, develops alternative option to arbitration for inclusion in to standard contract documentation for Local Government. And that the guidelines established in the *Guide to Leading Practice for Dispute Avoidance and Resolution*, written by the CRC Construction Innovation, be incorporated into this decision making.

Development of Procurement Delivery Support Tools

The Aurecon report identified an ‘agenda for change’ in which it proposed the following ten tools that will provide practical solutions to drive improvements in procurement and processes.

- Tool T1 – Forward planning
- Tool T2 – Pre-qualification criteria
- Tool T4 – Risk registers
- Tool T5 – Value for money checks
- Tool T6 – Use of local contractors and labour
- Tool T7 – Jointly established training programmes
- Tool T8 – Staged issue resolution processes
- Tool T9 – Project reviews
- Tool T10 – Collaboration forum

The Aurecon report recommends that these tools be developed and expanded by the whole civil construction industry in a “spirit of mutual trust and cooperation” before they can be regarded as suitable for use in helping to improve the procurement processes and outcomes”^{xiii}.

Climate Change

The Civil Construction & Climate Change report by Pitt and Sherry identified the benefit of incorporating emissions and energy data collection into financial management systems as one initiative that can improve confidence in data accuracy along with GPS technology to track vehicle and plant data. I stand with the recommendation from this report for the CCF to investigate whether the Federal Government’s funding programs can help members utilise information technology through the purchase of GPS technology and work towards achieving accurate data collection.

Summary

I believe that a great majority of the recommendations come under the umbrella of ‘compliance’ and an opportunity exists for the development of an industry compliance standard. Making compliance a way of doing business in the way I envisage is not a simple change. Compliance: “acting according to

certain accepted standards^{xiv}” should not be seen as a whip, but rather a proactive approach, eliminating those concerns of the creation of ‘box-ticking conformance’ approach which could be driven by over regulation if we are not careful.

Compliance will make money for those companies that can see the light i.e. triple bottom line benefits – consider the value in energy reduction, productivity improvement, accident reduction/safety improvement, and reduced insurance premiums to name a few. Automation and simplification of compliance must be cost effective, realisable and show payback.

I believe the study tour provided great insight into the operations of government and its current processes in another part of the world. It was clear that with collaborative integration, change can be managed to produce great results, even to the degree of revolutionary results.

RECOMMENDATION FOR FUTURE STUDY TOURS

As this is a first report of its kind for the CCF, a recommendation for future study tours would be to obtain a greater cross section of thoughts and ideas from the construction industry. I was able to learn that a similar body to the CCF in America is that Associated General Contractors of America. A review of their website www.agc.org will provide further information.

REFERENCES

- ⁱ San Francisco Climate Action Plan
- ⁱⁱ Pitt and Sherry, Civil Construction and Climate Change, The challenges and impacts of climate change regulation and strategies to assist CCF members, November 2009
- ⁱⁱⁱ http://en.wikipedia.org/wiki/Integrated_Project_Delivery#cite_note-3
- ^{iv} "[Integrated Project Delivery: A Guide](http://www.aia.org/ipdg)". [American Institute of Architects](http://www.aia.org/ipdg) 2007 version 1. <http://www.aia.org/ipdg>. Retrieved 2008-11-13.
- ^v Electronic Bidding Mandated by legislature
- ^{vi} City of Napa website - http://www.cityofnapa.org/index.php?option=com_content&view=article&id=228:toilet-washer-rebate-save-shortage-drought-water-wise-retrofit-landscape-irrigation-lawn&catid=15:city-departments-and-divisions&Itemid=314
- ^{vii} The Toronto Green Standard – Making a sustainable city happen a leaflet
- ^{viii} Project Delivery Strategies Presentation, August 12, 2010
- ^{ix} CCF, Inquiry into Streamlining Government Regulation – Victorian Competition and Efficiency Commission,, 2009
- ^x APWA International Public Works, Congress & Exposition, Boston, 2010 – Program & Show Guide
- ^{xi} Cooperative Research Centre for Construction Innovation, Guide to Leading Practice for Dispute Avoidance and Resolution
- ^{xii} <http://www.tandlnews.com.au/2010/11/18/article/Safety-top-of-the-list/YTUPYXLAOG.html>
- ^{xiii} Aurecon, Achieving Civil Infrastructure Procurement Best Practice – a study by Civil Contractors Federation in Conjunction with Vicroads, November, 2009
- ^{xiv} <http://en.wikipedia.org/wiki/Compliance>