

Leadership in bridge construction

by Patrick Durrant

Naturally, strong leadership skills are not just the purview of CEOs. At project level strong technical skills are also necessary for success. With this in mind *Engineers Australia* magazine spoke to a veteran bridge design engineer about leadership in bridge construction.

Marcos Sanchez is an associate director and bridges leader at Arup's Dublin office. Visiting Australia on a knowledge sharing mission recently, he held technical presentations and conceptual workshops with his local counterparts in Sydney, Melbourne and Brisbane. The sessions aimed to encourage knowledge sharing with the teams behind projects such as the Macleay River and Floodplain Bridge (Australia's longest at 3.2 km), and complex urban works such as the Anzac Parade Pedestrian Walkway and Homebush Bay Bridge.

Over the last 20 years, Sanchez has developed significant experience in bridge design and delivery across projects varying in materiality, traffic mode, construction methodology and form. With more than a decade's experience working as a lead designer for international contractors, he brings considerable knowledge regarding the interplay of design and construction.

Sanchez sees the ability to foster strong team spirit as being an important factor when leading teams in the design of large bridges. He said there is an obvious need for specific technical skills and experience, but the ability to identify early on a project's strengths and vulnerabilities, technically and in respect to resources is another must for a good leader.

"These projects tend to be complex to analyse and deliver, and nearly always under significant time pressure. Confidence in project understanding and interaction between all team members is key for the optimum performance of the design team," Sanchez said.

Extensive experience in construction methodologies is another key factor behind good leadership, and according to Sanchez, in the vast majority of cases there will be many elements of the structure that are governed by construction stage scenarios.

"In order to properly manage these scenarios, one needs to understand how design and construction impact each other," Sanchez said. He credits his experience in both consultancy and construction services with Spanish contractor Ferrovial as being an important stepping stone in his career.

"This was invaluable – it taught me the true philosophy of design and construction."

Sanchez singled out a particular bridge project as being one of the most challenging for him as a leader.

"The Los Tilos Arch, a 255 m span concrete arch, was a complex project in a remote, difficult site. Built on a

tiny island in the Canaries, resources and temporary works were very hard to bring to the site."

He said such constraints required every element of design and construction to be planned out very carefully many months in advance to ensure the efficient delivery of the project.

"From a leadership point of view, and as is usual in these types of bridges, many small unexpected issues happened at different stages," Sanchez said.

"Quick reaction to identify problems and produce the best alternatives required strong decision making to ensure the success of the project." 



Why do we need

by Mark Toner

Australia's engineers are rightly respected for their technical prowess. As their careers develop, many engineers accept more management and non-technical responsibilities and need more non-technical training. For them, and for engineers doing only technical work, continuing professional development (CPD) in areas like emotional intelligence (EQ) can significantly increase success and satisfaction in both their professional and personal lives.

The research of internationally renowned psychologist Dr Daniel Goleman and others shows that the most effective leaders all have high levels of EQ. They also have threshold levels of cognitive capability (IQ) and technical skills, but at high management levels, nearly 90% of the difference in leader effectiveness was attributable to emotional intelligence factors rather than cognitive abilities.

Every day, engineers need to assess their environment, the market their organisation competes in, its products and services, and just as importantly, the people they work with. Making appropriate assessments and decisions are important skills for engineers, but how to do this is often not part of standard engineering training. Higher levels of EQ help engineers to better assess situations, determine appropriate responses, and keep things in perspective. In addition, they can form stronger business and personal



The Los Tilos Arch, La Palma, Canary Islands, Spain. PHOTO: LUTZ HIRSCHMANN VIA WIKIMEDIA CC BIT.LY/1WHTZ25

emotional intelligence?

relationships, better manage conflict and stress, and achieve greater career success and satisfaction.

Let's take a typical example. Tom is a project engineer going to a meeting where there will be disagreements about aspects of his project. The more EQ Tom has, the more likely he will be able to use the meeting to achieve the best outcome for all. Firstly, his high EQ lets him know his own strengths and weaknesses, how he is perceived by others, and how to best communicate with his colleagues in the meeting. His higher level of empathy will allow him to better assess how strongly they feel about the issues, and his higher EQ will assist him to influence them towards solutions he believes in.

What is emotional intelligence?

The concept of emotional intelligence is not new. Inscribed on the temple of Apollo at Delphi are the famous words in ancient Greek: know thyself.

A useful definition of emotional intelligence is: EQ is our ability to recognise and understand emotions in ourselves and others, and use this awareness to manage our behaviour and our relationships.

The basic idea underlying the concept of emotional intelligence is our effectiveness in managing our emotions. Dr Evian Gordon's model of our brain demonstrates that it has one organising principle: to minimise danger and maximise reward. Our brains work in non-conscious

and/or conscious modes. Emotions come from our non-conscious brain and generate conscious feelings, which can lead to conscious thinking and self-regulation.

There are a number of available psychometric tests to measure our level of EQ and they can be based on a number of characteristics: our abilities, traits, competencies or behaviours. Which tool should be used will depend on various factors, including what other data is available from other psychometric instruments and sources.

While we are not able to significantly increase our cognitive capability (although there are ways to slow its decline as we get older), there are many ways to increase our EQ. These include mindfulness and brain training techniques; professional coaching; and understanding well-accepted theories of personality type, eg Myers Briggs.

For engineers, dealing with people is an important part of our professional and personal lives. Increased levels of emotional intelligence help us to be more effective leaders, have more successful careers and lead more satisfying lives. Isn't that what we all want? 📌

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