

BAC implements innovative processes for innovative technology - a Toward Q2: Tomorrow's Queensland



A Toowoomba firm that worked with QMI Solutions to achieve innovations in its manufacturing processes says the outcomes helped it successfully deliver a major project.

Buchanan Advanced Composites (BAC) secured a contract from Brisbane City Council to supply fibre-composite replacements for six piles under a riverfront pedestrian walkway at the Queensland Cultural Centre, and a further 43 piles for the Shorncliffe Pier, near the bayside suburb of Sandgate.

Based at a 2,500m² factory and workshop in Toowoomba, west of Brisbane, BAC specialises in designing and manufacturing fibre-composite products and components using carbon fibre, glass fibre or aramids (heat resistant, synthetic fibres) of the type used in Kevlar body armour and other ballistic applications. Its customer base includes the Australian Defence Force and civil engineering, maritime and automotive clients.

Managing Director Norm Watt and his wife, Wendy, BAC's Administration Manager, have owned the company since 1996. Watt's background in aerospace engineering, previously working as Commanding Officer of the RAAF's F-111 maintenance unit at Amberley Air Base, led him to join the firm in 1993. Three years later he and Wendy took over the company on the departure of its previous owner. BAC employs 17 staff in design, manufacturing and administrative functions.

Watt said the council had approached the Centre of Excellence in Engineered Fibre Composites at the Toowoomba-based University of Southern Queensland, seeking to explore a fibre-composite solution for replacement pylons.

"The university told us the council had an interest in doing this work with composites because they had severe problems with timber and steel piles," he said.

Watt said "QMI approached me asking if I had a project that would be suitable for Value Stream Mapping (VSM). It happened that we were about to start the Brisbane City Council project so I said that would be ideal."

Watt welcomed QMI's involvement, being familiar with the organisation's work. He had attended several QMI Solutions training events and industry forums and had a connection through the Queensland node of the Cooperative Research Centre for Advanced Composite Structures (CRC-ACS). QMI Solutions is a CRC-ACS member and Watt has served on its board.

QMI's Senior Research Specialist said "the CRC-ACS link led to QMI's involvement with BAC in the council project. QMI and BAC were involved in a CRC-ACS project looking at aerospace manufacturing technology and facilities in Queensland. As part of that larger project, QMI was looking at doing some work with a Queensland manufacturer to improve its manufacturing capabilities."

As part of a seven-step assessment process, BAC undertook a VSM exercise with QMI to identify potential problems in the proposed manufacturing process and resolve them through redesigning or amending work flows before full implementation on the factory floor.

The process identified relatively fixed labour and material costs, meaning a reduction in production times was the key to the contract's profitability for BAC.



BAC pile testing

Watt said the upshot was a decision to streamline the manufacturing process by making standard 12 metre pylons for the South Bank and Shorncliffe projects that could then be cut to suitable lengths for their specific applications. That resulted in a 31% drop in the production time of each pylon.

Watt said QMI's assistance on the council contract helped BAC meet its commitments to the client and profit from the tender. "I have found QMI to be a very effective organisation and very practical. This was an excellent project from my perspective because of the way it was carried out and involved everybody in BAC" he said.

"The results we achieved came from involving people from all levels of the company and basically coming up with some really practical ways for doing things."

QMI's Senior Research Specialist said a significant step in achieving efficiencies for BAC was through identifying the seven wastes found in any manufacturing process.

A simple step of providing factory staff with tool belts led to a 25% cut in walking distance of between 300-400 metres to retrieve tools and equipment for each pylon. It also led to reduced operator fatigue and greater staff satisfaction.

QMI's Research Specialist said lessons learned in the council contract would position BAC in good stead. "They have been trained and now have had experience in applying Lean Manufacturing principles in planning and laying out jobs. It was really a transfer of knowledge and teaching that will help them next time they are approached to do a large, complex job."

Watt said the partnership with QMI Solutions delivered another valuable spin-off for BAC in its efforts to promote innovative use of fibre-composite products and components.

Despite being lighter, more durable and often stronger than traditional industrial components, there was still resistance to wider use of composite-fibre products. In particular, composites often lost against the use of traditional materials when clients applied a strict initial cost analysis.

"We spend a lot of time trying to explain to customers the value of composites," Watt said. A good outcome of this major project was the council's own analysis of the new piles. It went beyond a straight costs comparison and took a lifecycle approach by factoring in maintenance and replacement costs over time.

"The analysis showed a 5:1 cost advantage over 100 years in our favour" Watt said. The result would be used as a selling point with future potential clients.



BAC piles for Shorncliffe Pier

He said BAC's previous work was as varied as providing aircraft, truck, caravan and other vehicle parts and bodies, components for Royal Australian Navy submarines, moulds for concrete street furniture, windmills, pleasure boats and components for Brisbane's City Cat ferries.

Watt said BAC held patents to several of its own innovative composite-fibre products, including a portable intensive-care stretcher and a foldable, portable building suitable for use on construction or mine sites or for despatch to disaster areas.

"You can put one existing similar building on a truck, whereas you can fit three or four of ours on a truck once you fold them down," he said.

Mr Watt said BAC also was developing a composite saddle tree, the backbone of a horse saddle, which would be lighter than traditional saddle trees without losing strength.

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