New Farm Riverwalk Replacement Project

ICONIC

INNOVATION
John Holland is one of Australia’s leading and most diversified contracting, engineering, and service providers. Over their long and storied history, they have developed a reputation for providing smarter, safer, and more innovative solutions across a broad range of industry sectors.

Recently, that reputation was affirmed by the result the company achieved on the New Farm Riverwalk Replacement Project – a challenging and iconic job that John Holland delivered with skill, commitment, and vision.

The Riverwalk is one of Brisbane City Council’s key river connections between New Farm and the Brisbane city centre. The original floating walkway was constructed in 2003 and was used by more than 3,000 cyclists, pedestrians, and runners daily. It was a visionary project that was all but swept away in the Queensland floods of January 2011, when half of the walkway broke away from the restraining piles and floated downstream.

After the flood event, the Brisbane City Council was committed to reinstating the Riverwalk as a key river connection. First, they commissioned an assessment of the failure mechanism, which made it clear that a more flood resilient structure would be required for
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the Riverwalk’s replacement. In April 2013, John Holland was awarded the contract to deliver that structure.

The New Farm Riverwalk Replacement Project is comprised of an 850 metre integral walkway structure that connects from the Howard Smith Wharf Precinct to Merthyr Road, New Farm. It is supported on 30 single piers and two abutments. One section near the downstream end includes a Swing Bridge which opens to allow private boats to access the Brisbane River. By being fixed rather than floating, the new structure achieves its “flood-resilient” mandate, and is designed to last a minimum of 100 years.

In addition to being more durable, the new Riverwalk was also designed with a ‘zig-zag’ alignment to create a more interesting journey along its length by exposing users of the walkway to different river views. The ‘zig-zag’ formation also allows for the creation of five rest nodes at changes in direction, which provide users with interesting viewing points.

The new Riverwalk also features segregated, fibre-reinforced colour concrete pedestrian and cycle paths, which are 2.5 metres and 3.5 metres wide respectively. The segregated paths – combined with the changes in direc-
A ONE-TEAM APPROACH

John McDonnell was the Project Manager on the New Farm Riverwalk Replacement. He says the success he achieved on the project is a credit to the strong relationships John Holland formed with every member of the project team.

In the case of the client, Brisbane City Council (BCC), McDonell says a strong relationship was forged right from the beginning of the project. He recalls how BCC’s Project Director and Project Manager attended fortnightly meetings to discuss all aspects of the work, and how they demonstrated an “in-depth understanding of the design and the challenges that were required to be resolved.”

“A one-team approach was established early to ensure we maintained a mutually beneficial relationship throughout the duration of
the project,” he says. “It was very important for the team that transparency was maintained and that every effort was made to ensure the safe and successful delivery of the project.”

“BCC and their designers’ support was invaluable to the John Holland team and was a major factor in the overall success of Riverwalk,” he adds.

Speaking of the project’s designers, McDonnell says both the temporary works and Swing Bridge designers “performed diligently and established sound relationships with key personnel at the project.” He says this was an important working relationship, and was essential to producing the most advantageous solutions to design matters in a timely manner.

“Weekly meetings were held with the lead designers who all worked professionally and adopted a proactive approach to the process,” he explains. “These relationships formed at the project will continue to evolve in future projects delivered.”

Throughout the life of the project, strong relationships were also developed with the site team, workforce, and subcontractors. McDonnell says the site team demonstrated a high level of commitment and dedication to achieving the best outcome for the project.
“The relationship with our workforce and subcontractors was admirable,” he says. “There was mutual respect and a clear understanding of the site safety policies, allowing us to achieve many project milestones with positive results.”

Due to the strength of their relationships at every level, the team at John Holland was able to use innovative thinking to proactively address project challenges, and ensure they were identified and resolved efficiently.

One such challenge was the installation of a total of 30 steel piles into the river bed to anchor the walkway and provide solid foundations for the structure. These piles were a key component for facilitating flood resilience, guaranteeing the new Riverwalk would have a longer lifespan than the original, as well as reduced maintenance costs.

“The team developed a unique system to install the sacrificial oversized piles, 1,200 millimetres and 1,500 millimetres respectively, which allowed for the permanent piles to be installed within a tolerance of 100 millimetres,” McDonnell explains. “All 30 piles were installed within this tolerance.”

In an effort to overcome the varying ground conditions of the riverbank, the team also de-
developed a number of unique solutions to ensure sustainability, and adopted innovative processes for heavy lifting technologies. Piling rigs were mounted onto barges in the Brisbane River to allow concrete pumps to connect to the bridge via a secure floating pipeline from land.

Another challenge was supplying concrete to the marine piles. To do that, the team at John Holland utilised an innovative 150 millimetre floating concrete line in the Brisbane River.

To ensure that the floating line would be successful, the project set up a trial on land with 1,000 millimetres of pipe, which included a number of curves to simulate difficult pumping conditions. The trial was successful and the line was incrementally installed as the piling works progressed.

“All concrete works were carried out successfully without incident,” McDonnell reports.

Finally, unpredictable weather conditions whilst working on the river bed represented another significant challenge. To overcome that challenge, the project team installed a number of anchor systems to keep the barge stable during the construction operations. A temporary works check was also carried out
allowing anchorage to some of the permanent piles. Where anchorage was not possible, pre-cast blocks were used.

Again, McDonnell says the solutions were implemented successfully, ensuring no unplanned barge movements.

**INDUSTRY RECOGNISED**

At the 2015 AIB National Professional Excellence Awards, McDonnell and John Holland’s innovative work on the New Farm Riverwalk Replacement Project was recognised with a win in the Infrastructure category.

The AIB awards celebrate building professionals who have demonstrated leadership and assisted with the on-time and on-budget delivery of challenging projects. They reflect the highest standards of building and construction management in Australia, and they are considered to be among the most prestigious honours in the building industry.

McDonell credits the recognition on the New Farm Riverwalk Replacement Project to the dedication and hard work of the project team, and in particular their talent for innovation. He reiterates that everyone came together to develop a number of innovative ideas, which were implemented on the project to help
overcome challenges and ensure its success.

Such ideas included: 3D analysis of girder reinforcement for early detection of issues; construction of reinforcement jigs and lifting frames unique to the project; construction of temporary running rails for girder transportation; and construction of a purpose built steel mould, which could be jacked up and down to facilitate girder production.

Other innovations on the project included the utilisation of polystyrene void formers in girder construction, as well as the recycling of those polystyrene void formers. There was also the aforementioned innovative floating concrete line.

The team also developed temporary girder seating plates, which were welded to the top of the pile liner. After the girders were placed on those plates, they were stitched together by casting an in-situ section of concrete between adjacent girders over the top of the pier. This ‘stitch’ eliminated the need for bearings on the project, allowing the structure to rely on the flexibility of relatively tall piers to absorb the deck movements.

The project’s approach to safety was also innovative, McDonnell adds.

“The workforce was committed and dedi-
cated to the project,” he says. “The high level of professionalism which was displayed when carrying out duties ensured safety was always top of mind.”

To recognise good safety behaviour, the team at John Holland introduced “Monthly Safety Awards,” where staff were nominated and awarded by their peers. The winners received an award at a dedicated presentation during a monthly BBQ onsite.

“The awards program was greatly appreciated by the team and highlighted the importance and commitment they all played in ensuring safe working at all times.”

McDonnell says a strong safety message was demonstrated first by himself as the Project Manager in order to allow a flow-on effect to the workforce. As Project Manager, he attended project inductions, tool box talks, as well as all the monthly safety awards in order “to keep the safety message current.”

Through the effective implementation of the Safety Management Plan, the New Farm Riverwalk Replacement Project was delivered with no Lost Time Injuries.

“While maintaining all aspects of our Safety, Quality, Environment (SQE) and community obligations, we reconstructed one of Brisbane’s most iconic features,” McDonnell says. “We successfully installed 30 steel piles with rock sockets in the sloping rock terrain of the Brisbane River; poured all 30 piles using an 850 metre long floating concrete line; constructed 30 precast, 250T, 30 metre long post-tensioned girders onsite; transported the girders by site rail to a purpose built dock; installed all 30 girders using an innovative synchronised hoist system and completed all balustrade and Node Construction without incident.”

McDonnell reiterates that the New Farm Riverwalk Replacement Project was a complex and technically challenging project, and that every aspect of the permanent and temporary construction required “careful planning and execution to ensure success.”

“The project had a number of unique aspects which were predominately self-performed by the John Holland team,” he concludes. “I am very proud of the team who delivered the project and who I had the opportunity to lead on such a high profile infrastructure upgrade for the Brisbane city. I utilised all of my previous experience to assist in the management and execution of the project tasks.”