

Solid Support Delivers Standout Animation to Help Win Tender for Australia's First Diagonal Arch Bridge

Despite Tight Deadlines, SYNCHRO™ Saves 50% in Time Executing Animated Tender Submission

DRIVING ECO-FRIENDLY INFRASTRUCTURE AND CITY ACCESSIBILITY

Alfred Street Bridge is a new pedestrian and cyclist bridge over the Parramatta River in Parramatta, 24 kilometers west of Central Sydney. The AUD 19 million project is part of the revitalization of the area and is a key element in planned transport infrastructure improvements. The aim is to deliver an accessible connection over the river to the Parramatta Light Rail and to popular city locations, as well as around the waterfront area. The investment supports creating an eco-friendly, urban gateway. "More local residents will be able to walk, run, or ride to Parramatta Park, Parramatta CBD, Sydney Olympic Park, the wider M4 regional cycleway, and the Alfred Street cycleway once these works are completed," said Robert Stokes, New South Wales's recently retired minister for infrastructure, cities, and active transport.

At 4.5 meters wide and almost 200 meters long, Alfred Street Bridge will be the first true diagonal arch bridge in Australia. It will feature an 80-meter-long and 30-meter-high steel arch, which crosses the river at an oblique angle and supports a composite steel-concrete deck. Abergeldie Contractors, a civil engineering contractor based in Regents Park, New South Wales, bid for the work on this complicated project. To assist with their tender submission, Abergeldie chose construction planning consultant Solid Support to demonstrate the sequence of work in the clearest, cleanest way by creating a digital presentation that would clearly depict how the tender company would construct the bridge. The goal was to provide an accurate visual insight into the construction methodology. "The animation was done to assist the tendering company in demonstrating their methodology, highlighting site establishment, crane locations, temporary works,

and management of the general public," said Alexander Stojevski, a BIM manager at Solid Support.

FACING SITE, STRUCTURAL, AND SCHEDULE CHALLENGES

Building this iconic bridge presented numerous site and structural challenges, requiring an innovative and precise construction methodology. Located along the riverfront, the team at Solid Support also had to consider sedimentation and tree protection. They needed to test different construction scenarios and mitigation strategies to minimize the impact of sedimentation to the environment, such as the type of sediment control measures needed.

Another challenge was to minimize environmental impact, as well as any impact to residents. Therefore, the contractors sought to build temporary pedestrian crossings and fabricate the arch and deck off site. Both sides of the river feature high-rise residential buildings, and the team could only deliver works during the day to minimize impacts on local roads and noise levels for residents. This plan required lifting the structural components into place, which left the team no room for error. Crane assembly and bridge installation were very complicated procedures, requiring meticulous coordination with various NSW government agencies and specialist skills from around the world. "It is the first true diagonal arch bridge in Australia, requiring a massive crane to lift the whole 200-ton arch in one go," said Jim Gao, a BIM manager at Solid Support.

With this bridge being the first of its kind in Australia, it was critical that the tendering company demonstrate their vision for installation. "For this particular project, Abergeldie wanted to demonstrate the impact that temporary works would have on the riverway," said Stojevski.

PROJECT SUMMARY

ORGANIZATION

Solid Support

SOLUTION

Digital Construction

LOCATION

Parramatta, New South Wales, Australia

PROJECT OBJECTIVES

- ◆ To assist a construction company with tender presentation for a winning bid.
- ◆ To use 4D simulation technology to accurately depict bridge construction works on a short timeline.

PROJECT PLAYBOOK

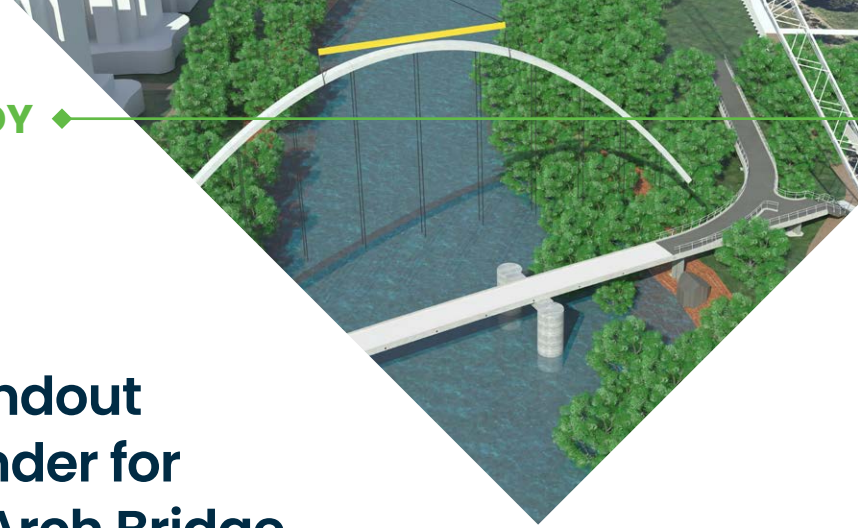
SYNCHRO 4D

FAST FACTS

- ◆ Alfred Street Bridge is an iconic diagonal arch pedestrian bridge supporting eco-friendly city accessibility in Parramatta, New South Wales, Australia.
- ◆ Local construction company Abergeldie Contractors retained Solid Support to assist with their tender submission.
- ◆ Solid Support used SYNCHRO to create a 4D animation for the tender company to submit, digitally articulating their construction methodology.

ROI

- ◆ SYNCHRO enabled Solid Support to save 50% in time by generating an accurate digital representation of the bridge installation for their client.



“SYNCHRO 4D for us is our go-to software for tenders.”

– Alexander Stojevski, BIM Manager, Solid Support

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To help their client present their tender submission and win the contract, Solid Support wanted to produce a 4D animation that would clearly define the bridge construction process from start to finish. The animation would help sequence equipment logistics and movement, showing what materials had to be moved to specific spots at specific times. They wanted to innovate traditional tender methods, using 4D modeling to create an accurate, visual plan for the construction team. However, they had to meet a very short delivery time frame. Previous experience using various simulation applications resulted in technical failures and rework that would not be sufficient or time efficient to meet their client's needs. “This meant we needed to deploy a reliable software to do the 4D animation to ensure on time delivery to our client,” said Stojevski.

LEVERAGING SYNCHRO TO DEMONSTRATE CONSTRUCTION METHODOLOGY

With time being of the essence, Solid Support selected Bentley's SYNCHRO 4D to deliver a digital visualization of the tender company's construction methodology, aware that the application was a leader in the industry. The software's reliability and ease of use were big factors in using the software from the very beginning. “We chose SYNCHRO for its reliability, as we had strict deadlines and couldn't afford any incidents or bugs,” said Gao.

Using SYNCHRO, they linked the 3D model with the tender program of works to create a 4D simulation video. Solid Support relied on the software's 3D path feature to create detailed animations of the installation of the main bridge arch and crane, accurately showing how Abergeldie intended to install the bridge on site. “From the simulation that we produced using SYNCHRO, the shareholders can clearly see the boundaries of the construction site and the diverted pedestrian path,” said Gao. Integrating Bentley's interoperable construction simulation technology with third-party rendering technology elevated the basic views into a realistic representation of how the job will look before actual construction. The animation also showed that Sydney Ferries services could operate continuously on the river, except for a limited shutdown period of only two to three weeks while the prefabricated steel bridge is installed.

Upon completion of the video animation, the tender company could see potential clashes and what needed to be changed in their construction methodology. Solid Support then collaborated with Abergeldie to make the appropriate

changes in the video and create multiple versions. The software provided complete freedom for animating equipment, crane movement, and lifting strategy. “We are mind blown at the freedom it gives you. The more information you put in, the more realistic you can make the animation,” said Gao.

4D SIMULATION TRANSFORMS CONSTRUCTION TENDERING

Using SYNCHRO 4D, Solid Support got the job done with assurance of the deliverables. Rather than demonstrating how to construct the project with a paper tender submission or multiple drawings, the video was a perfect environmentally friendly way to timely and accurately present the project. “SYNCHRO allows for a more immersive and interactive experience, as the client is able to visualize the construction process in a way that feels more realistic and engaging,” said Gao. Using Bentley's application saved 50% in time creating the digital animation and enabled Abergeldie to win the contract. “The stability of SYNCHRO 4D means we can always rely on it to complete a job on time and in budget,” said Stojevski. Had Abergeldie used staging diagrams, it would have taken longer and required 20 to 30 drawings. Additionally, they would not have been able to timely demonstrate the efficiency of their construction methodology, which could have lost them the bid. “SYNCHRO's user-friendly interface allows users to easily navigate through the simulation, making it simple to access and view different stages of the construction process,” said Gao. Working with Solid Support and SYNCHRO, the construction company quickly submitted the digital tender, demonstrating their advanced technical abilities on such a unique project.

Having used SYNCHRO successfully on over 200 projects, Solid Support relies on Bentley's application as their go-to software for tenders. “SYNCHRO offers powerful analysis capabilities that enable us to identify potential issues and make adjustments to the construction plan in real time,” said Gao. “This can help to reduce costs and improve the overall efficiency of the planning process.” While 4D animations used to be very niche, they now are becoming more mainstream for construction tendering and contractors risk losing jobs without these simulations. Solid Support's sales numbers on tenders have exploded and using SYNCHRO has put them ahead of the game. “Other software can create pretty pictures and designs, but the technology is less functional. SYNCHRO connects real-world outcomes to animations,” said Gao. By using SYNCHRO, Solid Support hopes to improve the way construction companies can communicate with their potential clients and win more work.



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