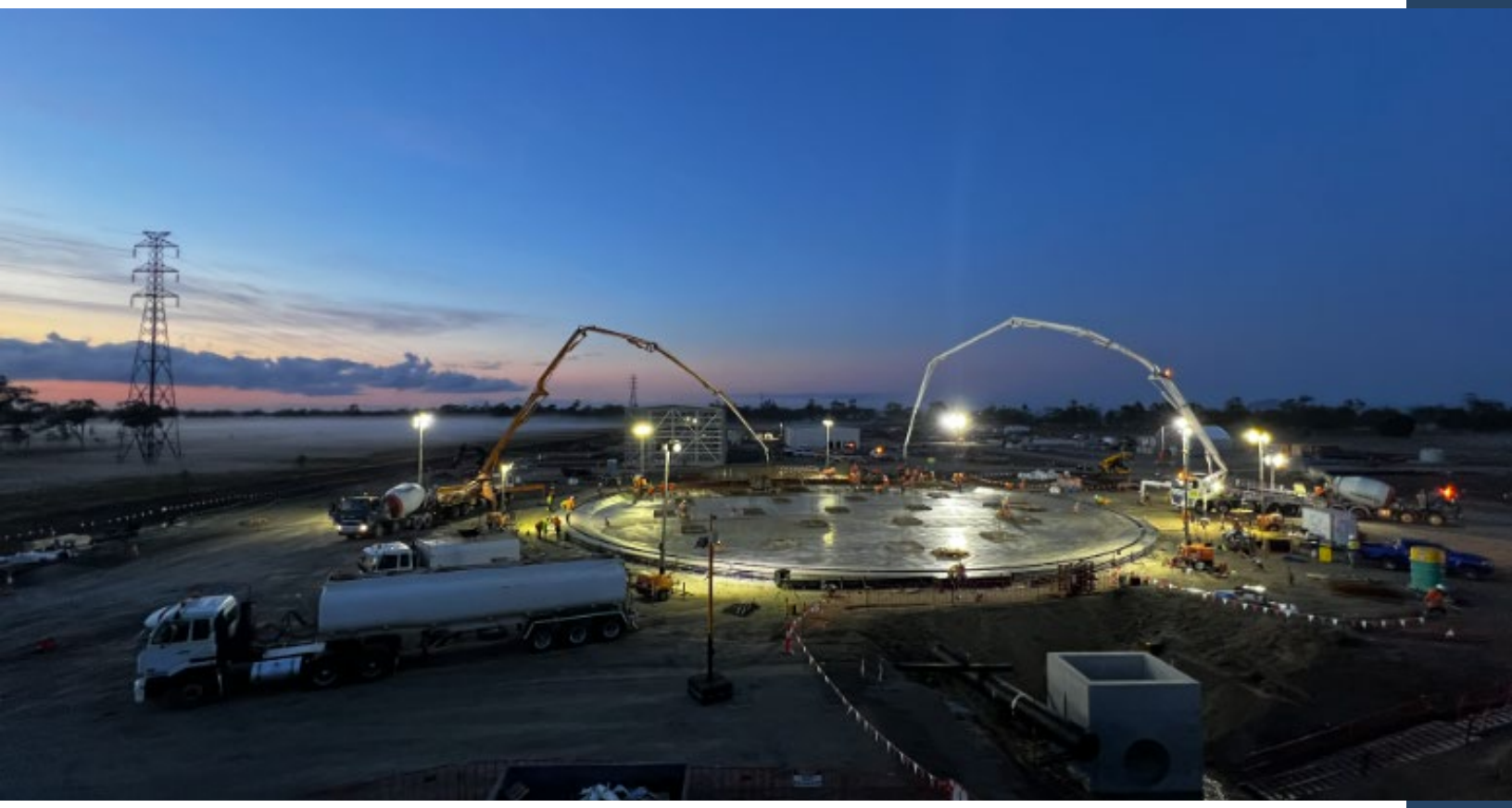
McCONNELL DOWELL
CREATIVE CONSTRUCTION

BMD

Case Study:

Complex Water Infrastructure Construction Pipeline Site Implements CupixWorks



Background

The Fitzroy to Gladstone Pipeline is a $983 million, 117 kilometre pipeline project and a crucial infrastructure initiative designed to enhance water security in Central Queensland, Australia. The project involves complex construction activities across varied terrains, necessitating coordinated efforts among a large team of stakeholders, including engineers, project managers, environmental specialists, and contractors.

Challenge

As the construction site involves multiple teams, subcontractors, engineers and stakeholders, plus volumes of data, the enormous challenges were to develop a single source of truth, reduce inconsistencies in progress reporting, provide a virtual 3D siteview with BIM comparisons and spatial context, and avoid decision making delays. In addition, with the many ongoing construction activities the need for real-time progress updates on a very large regional site was paramount to avoid potential delays and cost overruns, plus validate weekly claim payments.

Furthermore, the Central Queensland based project presented a geographical logistical challenge for many stakeholders due to its significant distance of over 500 kilometres from the Joint Venture's Head office in Brisbane. As a result, physical travel to the site was time-consuming for various stakeholders.

Therefore an effective construction technology solution for monitoring and tracking the project's progress remotely was required, with the additional prerequisite of storing the ongoing progress data in the cloud, with a simple download link and access to the relevant parties.

Implementation of Reality Capture Software from Cupix

To address these challenges, BMD's Senior Project Engineer, Wei Kong, turned to CupixWorks from Cupix. Due to Wei Kong's previous background in reality capture, he was able to develop a proof of concept and a strong business case to present a "single source of truth" technology solution to the various function leads.

CupixWorks was implemented as the platform of choice, as the software provides:

- Photographic reality and 3D spatial context to capture progress of the water infrastructure project.
- A comprehensive digital twin of the site, which included accurate spatial data and BIM side by side comparison, to validate design and as-built.
- CupixWorks was also pivotal in establishing a single source of truth for the critical water infrastructure project and access for all stakeholders and geographically distant teams.

Before implementing CupixWorks, the site relied on capturing 2D photos. This method was challenging, also disorganised, out of context and did not capture all the details required, plus was a time consuming process. The site also used a time lapse camera which is complementary with Cupix and drones. However there is a disadvantage of time lapse cameras, as they cannot zoom in on the details.

Key Features of the CupixWorks

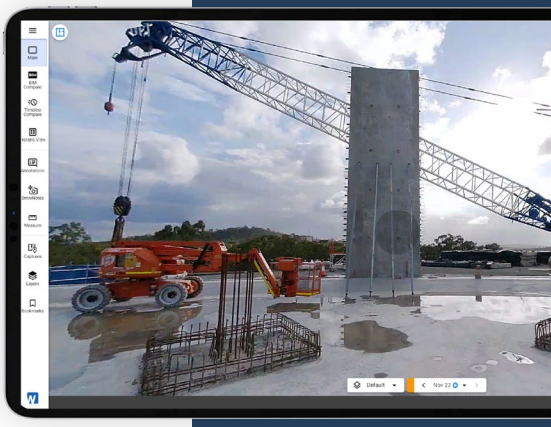
- **3D Reality Capture and Mapping**
  CupixWorks allowed for the creation of 3D models of the critical infrastructure and surrounding areas, providing a detailed view of site conditions.
- **Cloud-Based Access**
  The platform provided cloud-based access via a link, which was regularly emailed by Wei Kong to all stakeholders, ensuring that everyone had access to the latest data and project updates, no matter where they were located.
- **Collaboration Tools**
  Built-in collaboration features allowed teams to annotate and comment on the reality capture and also leverage the BIM models, facilitating discussions and decision-making.
- **Enhanced Communication**
  By implementing CupixWorks, Wei Kong was able to facilitate an effective communication process among multiple stakeholders with emails that included 360 SiteView images. Teams were able to visualise the project remotely, leading to more informed discussions and quicker decision-making.
- **Improved Data Accuracy**
  With a single source of truth, inconsistencies in project reporting were minimised. Stakeholders relied on accurate, up-to-date data for planning, execution and design to as-built verification.

> “The Cupix solution captures an enormous amount of data very elegantly and is automatically organised, including BIM models with side by side comparisons, organised by time. The platform has a very easy to use interface, to perform forensic analysis after the capture,”

Wei Kong
Senior Project Engineer,
BMD Group

Results

The implementation of CupixWorks at the Fitzroy to Gladstone Pipeline construction sites proved to be a transformative decision with the project team. By providing a single source of truth, visual progress tracking and improving data accuracy, the project team were able to successfully navigate the complexities of an extremely large construction site and progress reporting with near real-time SiteViewcaptures. Plus, the inability of many stakeholders to travel physically to the Fitzroy to Gladstone Pipeline, allowed them to remain actively engaged and informed, despite the geographical location challenges.



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