LESSONS LEARNED FROM DELIVERY OF ROOKWOOD WEIR

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Rookwood Weir Project
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KEYWORDS

Rookwood, lessons, delivery

EXECUTIVE SUMMARY

Located 66 kilometres southwest of Rockhampton on the Fitzroy River, Rookwood Weir will provide valuable water supply for agriculture, urban and commercial customers across the Capricornia and Gladstone regions. The weir is the first in-river retention structure built in Queensland in a decade under an Alliance contracting model with Sunwater as the construction authority, operator, and water marketer (on behalf of the State Government). Sunwater has gained learnings in the process of moving through approvals, design and construction from the intricacies of fauna protection to the unpredictable nature of geological formations and challenges faced during construction including river inundations. Future delivery of such infrastructure would do well to be informed by these learnings.

INTRODUCTION

Rookwood Weir is the first significant water infrastructure project in Queensland for the past decade. The $367.2 million Rookwood Weir is jointly funded by the Queensland and Australian governments. It is currently the largest water infrastructure project in Australia and the biggest weir built since World War || and, when complete in late 2023, will hold more than 76,000 megalitres making it Queensland's largest weir. The weir is being constructed by an Alliance comprising Sunwater, ACCIONA, McCosker and GHD.

HIGHLIGHTS

The following key lessons have been learned during project delivery:

- Physical hydraulic model testing and computational fluid dynamics (CFD) modelling can be used to complement each other to enhance confidence in design outcomes.
- Conflicts of interest between fauna protection and production of an economical and efficient design.
- Risk allocation – how does a contract effectively deal with risks that are unable to be mitigated?
- Using flood predictive modelling software during in-river construction works to provide early warning notice for inundations and predicted recovery timeframes.
- Using 3D animation software to help visualise and communicate construction and river diversion sequencing.
- Large-scale infrastructure projects in regional Queensland can meet or exceed local participation targets using the right delivery partners.

CONCLUSION

The delivery of bulk water assets has historically been cyclical in Queensland. Rookwood Weir is at the forefront of the current water infrastructure boom. Being Australia's largest water infrastructure project in delivery, the opportunity to provide the learned experiences to future infrastructure projects in Queensland and Australia will only benefit the wider water industry.

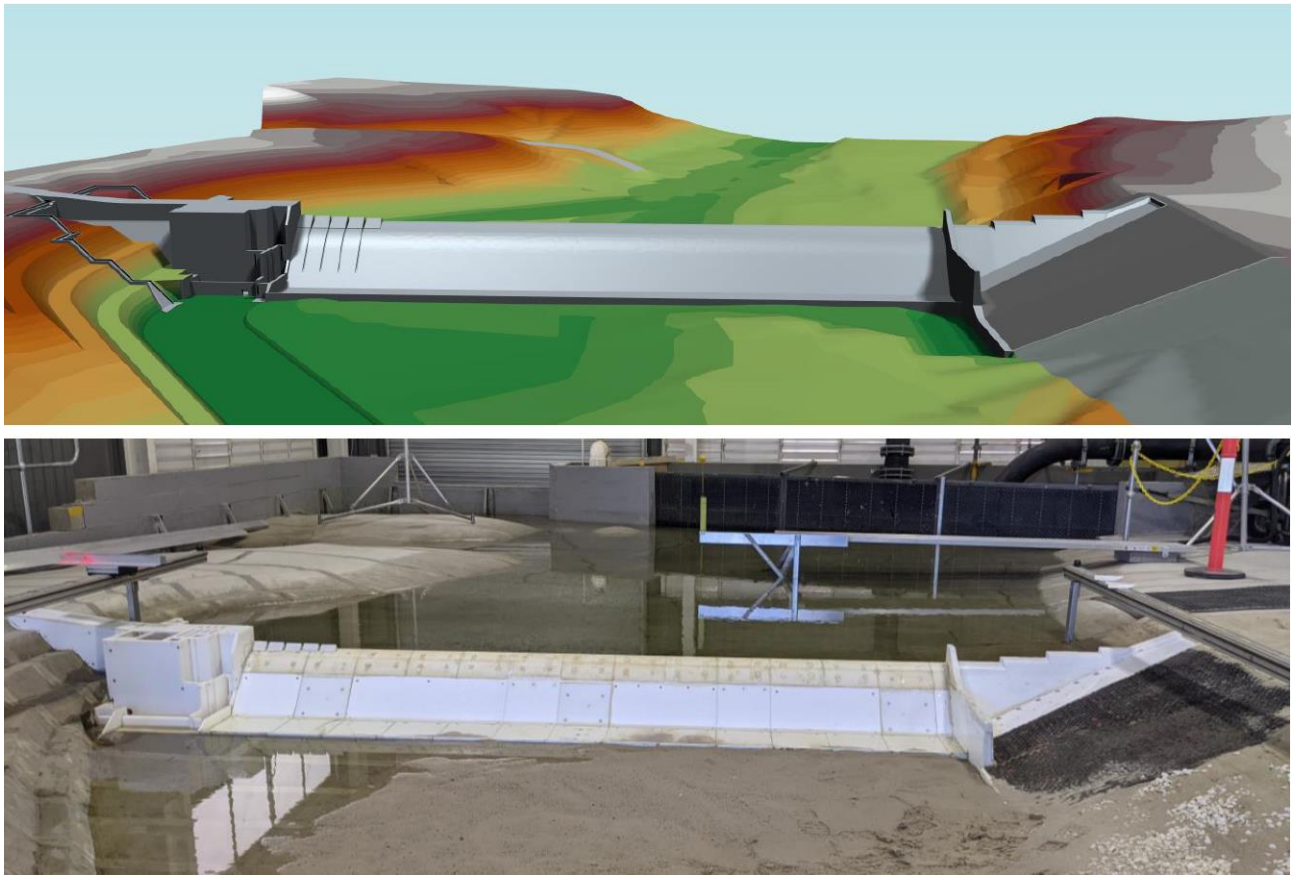

Figure 1: Rookwood Weir representations in CFD model and physical hydraulic model (PHM) (looking upstream)

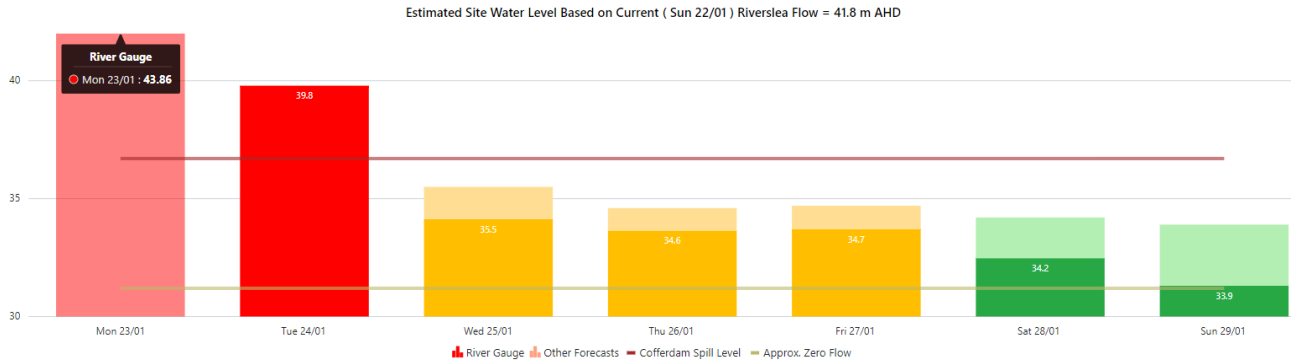

Figure 2: Example flood-predictive modelling software for early warning notice on Rookwood Weir

Figure 3: using animation visualisation tools to communicate construction and river diversion sequencing.

Biography

Thanh Cao

Thanh has 23 years' experience as a civil engineer with a multidisciplinary construction background across water, major earthworks, roads, rail and resource infrastructure projects, primarily in project execution and delivery. He prides himself on safe and consistent project delivery and promotes resourcefulness, innovation and flexibility on his projects.

With a passion for the water sector and specifically dams and weirs, Thanh gets great satisfaction from applying his experience and engineering knowledge to solve technically complex challenges. With most of his career spent on project execution and delivery before joining Sunwater, he understands key project risks and how to overcome them through lessons previously learned.

Thanh completed a Bachelor of Civil Engineering, majoring in Environmental from the Queensland University of Technology.

Tracey Williamson

Tracey Williamson is a chartered engineer with a Degree in Civil Engineering and a Fellow of the Engineers Australia. With 27 years' international experience in engineering and operational management of dams, rivers and coastal developments, Tracey is currently a senior technical director in the Dams Group at GHD based in Brisbane.

After starting her career in flood and coastal erosion risk management, Tracey changed focus to dams' engineering in 2005, working with both consultancy and client organisations. Prior to joining GHD in Australia, Tracey worked with Arup in the UK and, prior to that, with Welsh Water as their dam safety manager, where she was responsible for the management and performance of more than 100 dams.

Since moving to Australia in 2019, Tracey has managed the design of the first major water storage in Queensland for 10 years. This project, Rookwood Weir, is a 74,000 ML storage that is scheduled for completion early 2024.

Tracey qualified as a supervising engineer under the Reservoirs Act in the UK and an Registered Professional Engineer of Queensland (RPEQ) in Australia. She was elected Chair of the British Dam Society in the UK from 2017 to 2019 and is currently the Vice-Chair of the International Committee of Large Dams Environment Committee.