

# EMBRACING THE UNKNOWN: A FRAMEWORK FOR INNOVATIVE PROJECT MANAGEMENT

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## ABSTRACT

Water Infrastructure Services (WIS) successfully tendered for the removal and replacement of the roof structure on a Unitywater reservoir. As part of the tender, and due to very restrictive access to the site, WIS elected to utilise ‘aerial transportation of roof sheeting materials’ – a helicopter. This approach is innovative for both WIS and Unitywater. Thorough planning culminated in 20 lifts, 251 sheets weighing 7,800 kg ranging in length from 2.5 - 13.5 m being placed onto the reservoir roof undamaged.

This paper will provide a framework and approach for delivering innovation in project management regardless of the specific task. It uses our experience in performing the helicopter lift as the background, but these methods and approach can be applied to a multitude of settings.

## 1.0 INTRODUCTION

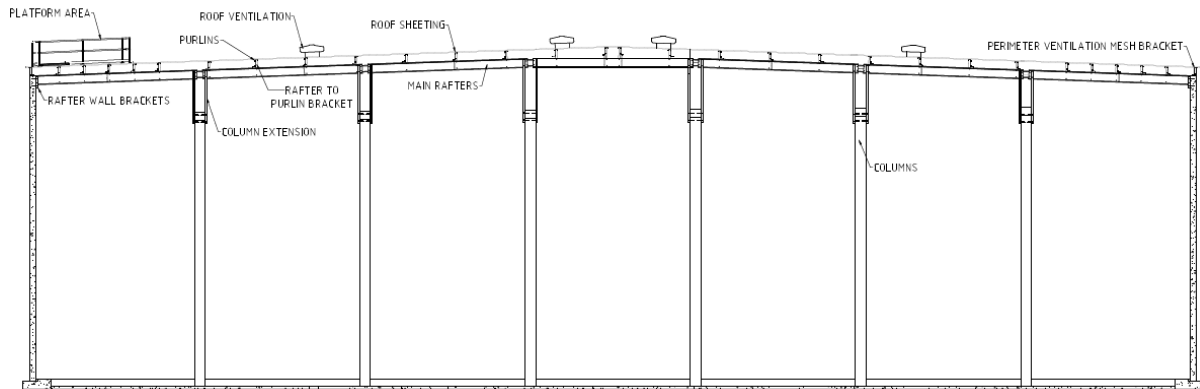
The reservoir roof structure consists of a circular external concrete wall with internal columns that support the rafters, which bear the main structural load. The rafters support the purlins which provide the surface to affix the roof sheets.

As the tank is used to hold potable water, water quality is a primary focus in design. Proper design will ensure no untreated water, vermin, or other contaminants can enter the tank. To accomplish this, roof sheet lengths should be maximised as it reduces the number of overlaps/transitions which can be potential ingress points. Longer roof sheets also minimise labour time and costs in installation, reduce the overall amount of material required, and lessen future maintenance requirements.

While beneficial in design, long roof sheets present other challenges. They are easily damaged by bending or twisting, can be difficult and even unsafe to work with in windy conditions, require large laydown areas, and require a large footprint for a crane to lift.

The site has 1 access road which is only traversable by 4WD in all but the best conditions. The gradient is steep (16°), narrow and has many curves. The largest truck that could safely approach was required to be under 8 m in length. Other avenues of approach included through a densely treed area. This area is designated as a koala habitat, and any disturbance would be deemed too high of an environmental impact.

These factors lead to the conclusion that aerial transportation proved to be the best option and a sound business case in terms of cost, efficiency and quality.



**Figure 1:** *Cross section of the Reservoir Roof*

## 2.0 DISCUSSION

### 2.1 An idea is born

WIS fosters a collaborative and innovative culture. Small, experienced teams allow for an agile approach where ideas can be transformed into outcomes in a short period of time with minimal red tape. The idea to utilise aerial transportation of roof sheets formed in one of several brainstorming sessions, where several alternative methods were also tabled.

The effectiveness of the brainstorming sessions relied on the project manager delivering a well-defined goal to a team with a diverse skillset and perspectives. Freedom to voice opinions and ideas is critical, and simple demonstrations shown on a whiteboard make for effective visual communication. It is also important that ideas can be built on by the team and do not happen in isolation.

After initial consideration, the aerial lift was deemed not only feasible, but delivered a strong business case in terms of cost, environmental impact, time, and job quality. A draft plan was formed, knowing this would change but would serve as a foundation for further iterations.

### 2.2 Risk in innovation

Innovation inherently brings risk and fear. These risks include;

- › Operational risk – the challenge of executing the unknown.
- › Technical risk – limitations of equipment (such as the impact of weather on helicopter flight).
- › Reputational risk – visually prominent activities will be remembered as a failure or success.
- › Regulatory risk – Ensuring no regulations or laws are broken in an unknown field.

To properly understand and minimise risk, all risks must first be known. Communication between various subject matter experts was key in compiling and rating risk.

Once understood and prioritised, risk mitigation strategies in the form of avoidance, reduction, transference and finally acceptance were used.

Details such as the selecting a flight path over park land as opposed to housing estates, and traffic closures allowed for the avoidance or reduction of interaction between the operation and the public.

Opportunity to transfer risk was minimal, beyond ensuring all parties were properly licenced and insured, aware of their scope of works, and acted within their role.

The acceptance of risk only took place after careful analysis and due diligence into the

above mentioned strategies yielded no results.

### **2.3 Stakeholder gathering**

To be able to operationalise the plan, WIS needed to identify and gather the necessary stakeholders. We begun with a suitable aerial transport company, and assistance from the Principal. The list grew to seven direct stakeholders including a community engagement consultancy, local council, traffic management, private land holder, multiple HSE departments and a small team of volunteers. It was critical to remember that the general public and media organisations should also be properly considered as stakeholders. While not having a direct input to the project, they would be affected and need to be engaged accordingly.

For those that will directly affect the outcome, effective stakeholder management requires not only gathering the right organisation, but the right person or people within the organisation. People with the authority to make the required decisions are required to have buy-in and be engaged. It is up to the project manager to ensure that the correct stakeholders have been engaged.

Without engagement of the right people, speed of decision making is reduced, and communication becomes complex as intermediaries are involved. This increases the risk of miscommunication and impacts efficiency.

### **2.4 Communication plan**

Clear communication channels were established whereby WIS acted as the main conduit between all parties. Each stakeholder was expected to perform their own key tasks, and encouraged to question all aspects.

All-hands meetings allowed for knowledge sharing, alignment of vision, increased awareness of roles, and reducing decision making time.

High engagement and a focused meeting are achieved by ensuring convenient timing, location, and pre-delivered agendas. Stakeholders appreciate ample notice, online meeting options when appropriate, and a well-distributed agenda in advance. This allows them to participate actively, arrive prepared, and feel less stressed.

This is followed up by distributing minutes containing a list of items discussed, actionable items, the responsible persons listed, clear due dates and other important information.

### **2.5 Program**

A detailed program management plan listing stakeholders, timing plans, resourcing and hold points was developed internally. It provided the comprehensive detail required for execution in a single point-of-truth. While suitable for the project management team, it would be inherently too complex and simply not useful to the broader array of stakeholders. While options such as Gantt charts or timelines were considered, a simple run-sheet was used as the tool for displaying the program to the wider group. This provided a simple way for people to see when and where they were required. It offered insight into the actions of others without delivering inconsequential information.

The goal is for simple and effective programming. Complexity should only be added where required and the 'audience' must always be considered.

| RES-BUD032 - Program<br>DD/MM/YYYY |                                               |                                               |                                                                                      |                                               |                                                             |                                               |                                               |
|------------------------------------|-----------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Time                               | Primary Contractor                            | Traffic Control                               | Aviation Contractor                                                                  | Local Council (Optional)                      | Unitywater                                                  | WIS                                           | Other Subcontractors                          |
| 6:00 AM                            | 0600 Onsite<br>0615 Pre-start at Laydown Area | 0600 Onsite<br>0615 Pre-start at Laydown Area | 0600 Onsite<br>0615 Pre-start at Laydown Area                                        | 0600 Onsite<br>0615 Pre-start at Laydown Area | 0600 Onsite<br>0615 Pre-start at Laydown Area               | 0600 Onsite<br>0615 Pre-start at Laydown Area | 0600 Onsite<br>0615 Pre-start at Laydown Area |
| 7:00 AM                            |                                               | Set-up Traffic Control                        | 1 Person to Traffic Control<br>2 Persons to Reservoir<br>Other Staff at Laydown Area |                                               | Final Community Engagement (door knock, phone calls etc...) | 4 People at Reservoir<br>1 Person at Laydown  | Watercart to Wet Area as Required             |
| 8:00 AM                            | <b>Helicopter Lift</b>                        |                                               |                                                                                      |                                               |                                                             |                                               |                                               |
| 9:00 AM                            |                                               |                                               |                                                                                      |                                               |                                                             |                                               |                                               |
| 10:00 AM                           |                                               |                                               |                                                                                      |                                               |                                                             |                                               |                                               |
| 11:00 AM                           |                                               |                                               |                                                                                      |                                               |                                                             |                                               |                                               |
| 12:00 PM                           |                                               | Pack-up Traffic Control                       | Demobilise                                                                           |                                               | Removal of Signage and Barricading                          | Removal of Signage and Barricading            |                                               |
| 1:00 PM                            |                                               |                                               |                                                                                      |                                               |                                                             | Secure sites                                  |                                               |
| 2:00 PM                            |                                               |                                               |                                                                                      |                                               |                                                             |                                               |                                               |

**Figure 2:** *Run Sheet for Lift Day*

## 2.6 Execution

Execution is the culmination of all previous planning. While it is a stressful time, stress is greatly reduced with proper planning. A skilled team with clear direction is essential, with all parties understanding their role. This allows them to maximise their output without additional input or discussion. During the lift, a member of the public was unobliging in accepting direction from the staff to not enter the closed area. As the helicopter requires a area clear of people underneath the flight path, operations had to be halted until the belligerent member of public had moved off the area. With proactive planning, this scenario had been anticipated. A pre-established communication plan was quickly enacted to instruct the helicopter not to fly over the area. While a slight delay occurred, quick and planned communication ensured everyone's safety and minimized disruption.

An aspect of project management not yet discussed is flexibility, and adapting to change. It is known that even the best plans do not go unchanged, or at least unchallenged. Flexibility and adaptability are crucial when delivering innovation, as executing a novel idea in an unknown environment brings uncertainty and a lack of familiarity. A balance between planning (which brings rigidity) and flexibility in achieving a goal must be struck and constantly assessed.

## 3.0 CONCLUSION

Innovation brings risk and stress, but it equally drives growth, efficiency, competitive advantage and increases problem solving skills. Through proper planning and management, we can minimise the former and maximise the latter in our projects. Our experience in executing a helicopter lift serves as an example of successfully performing an innovative project. The lessons learned can be translated, adjusted, and applied to almost any project in which something new is being completed.

It is communication that converts ideas into action. Clear, effective and concise communication is at the centre of all effective management. Understanding the audience and use of simple language increases engagement and minimises error. A critical part of communication is listening and allowing other to perform their duties.

From there, the knowledge and application of the correct tools maintain a clear picture with aligned goals.

With proper planning, the execution of innovative projects should be viewed with

enthusiasm, not apprehension.

#### **4.0 ACKNOWLEDGEMENTS**

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