

## VOID-FILLING ADITS AND STABILISING OVERLYING ROAD STRUCTURE

### Site Profile

The Royal National Park is located just south of Sydney, a short distance inland from the eastern coastline of Australia.

During World War II, the NSW Department of Main Roads worked closely with the armed forces to build and fortify roads. In addition, large chambers called adits were built beneath the roads that were stockpiled with explosives.



Figure 1. World War II Adit. Image courtesy of The Leader.

### The Situation

Road maintenance workers employed by Transport for NSW Sydney unearthed one of these hidden tunnels whilst carrying out regular maintenance work in the park.

The tunnel was approximately 7 metres long and 1.2 metres high with the only access via rope. The area had been previously supported with timber and sandstone blocks, but it was obvious that these had eroded over time and were likely to collapse in the near future.

Recognising that the situation imposed an immediate safety risk, Transport for NSW sought an immediate cost-effective and long-lasting solution.



Figure 2. Resinject Crew preparing for the injection methodology.

### Our Solution

It was identified that the adit roof support was too dilapidated to repair and imposed an unacceptable safety risk to work crews so Transport for NSW engaged Resinject to void fill the ammunition adit and re-support the overlying roadway. Resinject work crews attended the site and developed complete safety protocol for team members to be able to reach the work site. This involved many levels of personal protective equipment, ropes, pulleys and support systems.

A single self-contained Resinject Rig, with all equipment and material needed for project delivery, was positioned as close to the injection site as possible on the road above. This allowed the crew to run the resin delivery hoses down to the site with minimal traffic interference. Once the team were able to reach the adit they expertly pumped the chamber full of our specialised, fast-acting resin solution to void fill the chamber and provide steady support to the

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road overhead. Resinject used its proprietary engineered resin injection solution, RSJ170. The resin penetrates hard to reach areas and can travel up to several metres in every direction from the injection point to fill the open spaces. RSJ170's unique two-in-one capability made it ideal for the project because it fills the space and strengthens weak ground, reducing the risk of similar voids forming in future. The application maximises ground support as the structure is lifted by using the controlled force of the expanded resin.

RSJ170, fully complies with the Roads & Maritime Services M232 Quality Assurance Specification for Injected Expanding Resin Slab Jacking / Stabilisation and is engineered to lift over ninety (90) tonnes per square metre area.



Figure 3. Resinject Team Member Safely Sealing the Adit

### The Results

After completing the void-filling and stabilising solution, Resinject confirmed that the adit was now compactly filled and the overlying roadway supported, stabilised and safe to use. Furthermore, Resinject services were completed within a single, overnight time period. The reason

for this was to minimise road closures in the area for those wishing to enjoy the park.

The contractors' Maintenance Director Gareth Sharp, applauded Resinject's professionalism, expertise, and the team's creative approach to problem-solving *"Resinject offered a cost-effective solution that was ideal for this project as it was able to be pumped directly into the underground void in a timely manner. We were also impressed with their level of experience and service throughout the project. I would recommend Resinject to future potential customers"*



Figure 4. The Void-Filled Ammunitions Adit

### Acknowledgements

Resinject would like to thank Transport for NSW for the opportunity to demonstrate our sustainable, and cost and time-effective solutions.

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