

## STABILISATION OF BUILDING ELEVATOR SHAFT

### Site Profile

A commercial building company had been contracted by the University of Newcastle to carry out renovations to The Conservatorium, a key landmark for the Newcastle, NSW community providing access to music and art events.

Part of the renovations included installing an elevator into the five-story structure to provide easy access to all floors.



Figure 1: The Conservatorium at The University of Newcastle

### The Situation

To install the elevator, a shaft was cut through all five stories of the building and then down into the ground between 2-3 metres.

On investigation by the engineering team, it was found that there was a concrete pier pad obstructing the elevator shaft.

In order for the elevator shaft to drop far enough into the ground to allow people out onto the ground floor, a section of the foundational pier pad would need to be removed.

To cut out a section of the main structural support of the building, it was necessary to improve the

load-bearing capacity of the earth surrounding the existing pier pad.

As this pier pad was an integral part of the foundation and stability of the entire building, Collaborative Construction Solutions sought and attempted a number of solutions to their problem.

A sand stabilising product was tried and failed. The commercial building company had exhausted all options prior to contacting the team at Resinject.

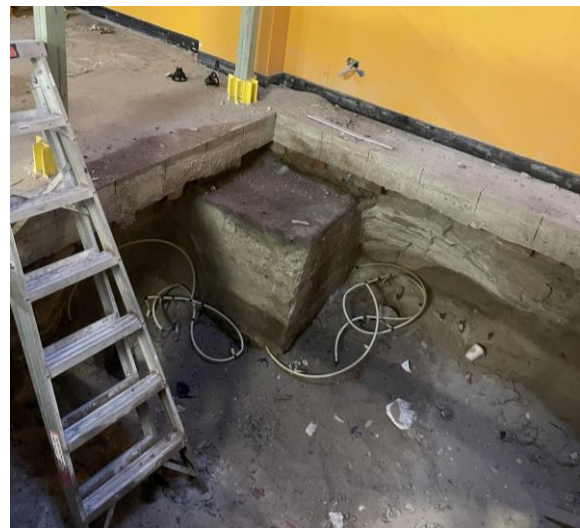


Figure 2: The bottom of the elevator shaft showing the concrete pier pad

### Our Solution

Resinject inspected the site and proposed a combined solution of ground consolidation, load bearing improvement, and sand permeation grouting. Our client agreed to the solution and work commenced soon thereafter.

The area surrounding the concrete pier pad was injected with RSJ170 structural resin to fill the

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voids, agglomerate the loose material and increase the strength of the ground.

In a process similar to keyhole surgery, Resinjects Operators drilled a number of injection points at 500mm under the elevator shaft to a depth of 2,500mm before injecting the RSJ170 expanding polyurethane resin mix through very small tubes. The liquids mix, solidify and expand, strengthening the ground and consolidating the remaining earth.

Post permeation and ground treatment by Resinject, a third-party team of geotechnical and structural engineers tested and verified that the works had been successful and that a section of pier pad could now be safely removed without compromising the structure of the entire building.



Figure 3: The Resinject Team drilling holes to inject RSJ170 structural resin

### The Results

Work was completed by the Resinject team over a Saturday and Sunday so as to minimise disruptions to the renovation site and other trades.

Post permeation and ground treatment, a section of the pier pad was successfully removed saving our client hundreds of thousands of dollars and

having to move the elevator shaft for which holes had already been cut through all five floors of the building.

The engineering team noted that should the load bearing capacity of the ground beneath the building not been successful, it would have been a catastrophic event for The Conservatorium.

Resinject's solution has ensured that users can now enjoy The Conservatorium for many more years to come and have ease of access through the use of the newly installed elevator.

### Testimonial

*"Resinject was a critical partner in completing this project, providing a cost-effective and innovative solution. The whole team (onsite and in the office) was dedicated, professional, hardworking, and committed to excellence. Resinject is a pleasure to work with."* Jamie, Project Manager

### Acknowledgements

Resinject would like to thank the commercial building company and the University of Newcastle for the opportunity to demonstrate our sustainable, and cost and time effective solutions.

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