

REMIEDIATING SUBSIDING FARM INFRASTRUCTURE

Site Profile

Pipiriki is a prominent and successful agri-business, based on a large wheat and barley farm near Moree in Northern NSW.

The Northern NSW region has a variety of soil types, including fertile alluvial soils in river valleys, nutrient-poor red earths, and less fertile sandy soils.



Figure 1. The Resinject Rig outside the three large grain silos

The Situation

The owners of Pipiriki noticed some stress cracking and subsidence in three key areas of their farm - three large grain silos, the farmhouse verandah and a concrete slab acting as a vehicle wash bay.

The three large grain silos were built on raft slabs. The subsidence beneath the foundations was likely due to long term settlement. Similarly, the subsidence beneath the rear verandah slab was likely due to the gradual sinking of the ground over an extended period of time.

The cause of subsidence beneath the 6m x 6m concrete slab wash bay was suspected to have been caused by inadequate subsurface drainage,

stormwater drainage and the high clay content of the soil.

Knowing that if left untreated, they would likely have to rip up and replace, the silos and augers, the wash bay and the verandah, Pipiriki was keen to find a more cost-effective and timely alternative treatment.



Figure 2. The concrete slab acting as a vehicle wash bay

The owners reached out to us after hearing about how Resinject had remediated a friend's house in Moree, and subsequently one of our experienced Structural Consultants promptly attended their farm to assess the situation and develop a tailored resin injection solution.

Our Solution

Resinject's Structural Consultant attended the site for an inspection and measured up to 94mm subsidence from original levels in some areas of the silo slabs, up to 48mm of subsidence on the verandah slab, and up to 24mm of subsidence on the wash bay slab. This subsidence was suspected to be the primary cause for the concrete cracking in all three cases.

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To remedy the subsidence beneath the silos, Resinject proposed to treat the approximate 90 lineal metres with their specialised Resinject RSJ170 solution. The plan was to initially “underseal” the affected area by injecting the resin solution directly beneath the slabs at various points across the area. It was then proposed that a series of deeper injection points be conducted to confirm consolidation and stabilisation and improve the structural integrity of the soils below the slabs. The final stage was to slab-jack the internal area of the slab to confirm the achievement of the ground’s consolidation, installing of robust support, fill existing voids, and gain the required lift for realignment.

To remedy the subsidence beneath the verandah and the wash bay, Resinject proposed to improve load-bearing capacity and minimise future movement by treating the area with Resinject RSJ170. An initial ‘underseal’ would be conducted through a series of injection points to strengthen and improve the existing ground beneath the slab. A slab-jacking method followed to the internal area of the slab to confirm consolidation and support, void-fill, and gain the lift required to realign the slabs.



Figure 3. Resin injection process inside a grain silo

With Pipiriki acceptance of our proposed solution, which came in at a fraction of the ‘remove and replace’ option cost, Resinject were on-site within a matter of weeks to complete the works over the course of two days.

The Results

At the completion of the works, Resinject had successfully strengthened the foundations in the silos, wash bay and verandah.

The resin injection methodology effectively raised the concrete slabs, filled the underlying voids, compacted the foundations, and installed stabilising piers to ensure a robust and enduring support structure remained for the future heavy loading.

All of this was completed through a pattern of small diameter drill holes through the concrete base slabs, which were re-filled with non-shrink grout upon completion of the resin injection works.

Pipiriki were thrilled with Resinject’s results and are now looking forward to many more successful harvests without having to worry about this potentially very costly problem anymore.

Acknowledgements

Resinject would like to thank the team at Pipiriki Agriculture Pty Ltd for the opportunity to demonstrate our sustainable, and cost and time effective solutions.

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