

STABILISING MINE SITE CONVEYOR INFRASTRUCTURE FOUNDATIONS

Site Profile

Our Client (name withheld at their request) is one of Australia's largest producers of coal for export, with many operational mines across New South Wales and Queensland, and in 2019 produced nearly 120 million tonnes of saleable thermal and coking coal across all their operations.

Our Client acquired this particular Underground Mine (location withheld at Clients request), which produces metallurgical coal for export, in 2016. The operation is located near Singleton in the Hunter Valley, New South Wales.



Figure 1. The Underground Coal Mine

The Situation

This Underground Coal Mine was at risk of experiencing significant downtime on their main trunk conveyor belt line arising from the foundation issues on the main drive head and two gantry trestle pad foundations dropping over 50mm each. This settlement was so significant that there was no more tolerance available to adjust the conveyor belt to counteract the settlement, a more permanent solution was required.



Figure 2. Main Conveyor Drive Head

Due to the potential large costs to shut down the conveyor for extended periods of time whilst the infrastructure was relocated and the foundations removed and replaced, Our Client sought a more cost and time efficient solution to this problem.

Our Solution

Our Client engaged Resinject to propose a suitable solution to raise and re-level the effected foundation slabs, that would have the conveyor down for as little time as possible. Subsequently, Resinject's experienced consultants promptly attended the site and assessed the foundation issues.

It was discovered that the pad footings for the trestle and the slab for the main drive head were sitting on a considerable amount of under-compacted overburden which was also experiencing regular ingress of surface and ground water. These were deemed as the primary mechanisms causing the settling and subsiding of the foundations.

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Figure 3. Main Conveyor Trestle Footings

To raise and re-level the Main Conveyor Drive Head foundation slab, Resinject proposed a slab-jacking solution consisting of a 1.2m x 1.2m grid of injection points across the slab area.

Following this, a series of stabilising piers were proposed to a depth of 1.5m centres around the perimeter of the slab to counteract any future subsidence by improving the load bearing capacity of the ground ensuring longevity of the re-leveling works.

To raise and re-level the Trestle Leg footings, Resinject proposed a tiered 'pier pad' solution with deep injections at 1.0m, 1.5m, 2.0m, 2.5m, 3.0m and 3.5m underneath the 750mm footings.

Our Client agreed to the proposed solution and Resinject's services were booked in for shortly thereafter.

The Results

After completing the proposed slab-jacking and pier-pad injection solution, Resinject re-measured the levels of the Main Drive Head foundation slab and Gantry Trestle Pad footings.

It was found that Resinject had achieved a lift of 38mm from the previous settled position on the gantry trestle pad footings, raised to a corrected level of within 2mm of each other.

Furthermore, Resinject services were completed within a 3-day timeframe, and with the foundations and footings successfully raised and re-levelled, the conveyor was able to be re-started immediately thereafter.

Acknowledgements

Resinject would like to thank Our Client and their Underground Coal Mine Site featured herein for the opportunity to demonstrate our sustainable, time and cost-effective solutions, and for their permission to publish this case study.

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