

Briswest Precinct 6

Underground Mine Remediation with Grout Cone Construction for a major industrial precinct development at Swanbank, South East Queensland.



FLOOD FREE LOTS
2,800 SQM TO 23 HA

600+

Total Lineal Meters Drilled

12

Grout Cones Constructed

48 m

Maximum Drilling Depth

1000+ m³

Total Grout & Gravel Consumed

PROJECT OVERVIEW

Briswest is one of South East Queensland's largest greenfield industrial estate developments, located at Swanbank North, Ipswich. Precinct 6 (Site 6) comprises a series of lots designated for permanent warehouse and hardstand development by Rogan Development Solutions. The site is underlain by the Newhill Colliery Cochrane Seam mine workings, formed in the 1990s at depths ranging from 25 m to 50 m below the existing surface. These underground voids presented a direct subsidence risk to proposed structures, requiring expert remediation before any building development could safely proceed.

THE CHALLENGE

Geotechnical assessment by Ditton Geotechnical Services (DgS) identified that the Cochrane Seam bords and intersections beneath Site 6 posed an unacceptable sinkhole risk to the proposed development. While pillar stability was assessed as satisfactory, sinkhole analysis confirmed that cover depths below 28 m to 41 m (depending on bord geometry) were insufficient to prevent collapse chimneys propagating to the surface above 2-way bords, 3-way, and 4-way intersections respectively. Two Newhill mine entry tunnels also traversed the site, having been previously partially backfilled with cement-flyash grout to 74 m to 88 m depth from the portal. The mine workings were expected to be flooded, requiring a void-reducing solution that was effective in submerged conditions.



SITE GEOLOGY

The site geology consists of fill and residual soils overlying Triassic age Ipswich Coal Measures. The Cochrane Seam bord and pillar workings are characterised by a nominal 6 m bord width, 2.5 m mining height, and a seam dip of approximately 14 degrees to the south. Cover depths over the unfilled mine bords beneath Site 6 range from 25 m to 45 m. Four standing coal pillars with width-to-height ratios between 7.0 and 7.6 are located in the adjacent powerline easement, falling partly within the angle of draw from Site 6.

PROJECT SNAPSHOT

CLIENT

Rogan Development Solutions

OWNER

Briswest Holdings

LOCATION

Noblevale Way, Swanbank, Ipswich QLD

OUR SERVICES PROVIDED

Underground Mine Remediation
Grout Cone Construction

Cones Constructed

12 no.

TOTAL DRILLING

622.6 Lineal Meters

MAXIMUM CONE DEPTH

48 m

GROUT AND AGGREGATE VOLUME

511 m³ Grout / 539 m³ Gravel

VERIFICATION

Borehole Camera Inspection
Unconfined Compressive Strength (UCS)

Our Solution

GROUT CONE CONSTRUCTION

DGSA's remediation strategy centred on the construction of 12 grout cones at systematically determined locations across the site, designed to reduce available void volume between cones such that any future roof fall event would self-choke within 3 m above the mine roof line. Each cone location was targeted at bords and intersections where cover depths fell below the DgS-assessed minimums for nil sinkhole subsidence.

The construction sequence for each cone was as follows: a 114 mm cased borehole was drilled from the surface to 1 m below the mine working floor using a Hutte HBR605 drill rig; a borehole camera confirmed the void geometry and condition; aggregate (crushed gravel) was then placed through the casing to the floor of the working, and cement grout was pumped to bind the aggregate and make contact with the mine roof, forming a cone with an angle of repose of approximately 20 degrees in the flooded workings. Three dedicated monitoring holes were installed to allow camera verification of cone geometry and roof contact following each pour. Grout was supplied by ready-mix agitators to the concrete pump during peak production phases and supplemented by an on-site ICB mixer.

Total drilling reached 622.6 m across 13 drilled holes (12 cones and 1 monitoring hole backfilled with gravel), with a maximum depth of 48 m. Total grout delivered was 513 m³ and aggregate placed was 884 t, with individual cone volumes ranging from 33 m³ to 214 m³ depending on the void geometry encountered. A quality assurance programme of 189 Unconfined Compressive Strength (UCS) tests was carried out across the grout pours, confirming that the delivered grout met the minimum 5 MPa strength specified by DgS for durable, erosion-resistant mine void fill.



Drilling and Grouting in operation, Swanbank QLD



Borehole Camera Inspection, SwanbankQLD

OUTCOME

DGSA successfully completed all 12 grout cones across Briswest Site 6, eliminating the identified sinkhole risk and satisfying the geotechnical conditions required for Rogan Development Solutions to proceed with permanent warehouse and hardstand construction. Camera verification confirmed roof contact at each cone location. The project was delivered with zero recordable safety incidents. On completion, all plant was demobilised from Site 6 and DGSA mobilised directly to the adjacent Site 4 works, continuing DGSA's programme of mine remediation across the broader Briswest industrial estate.