

Gold Coast Rail Link, Queensland - Australia



Over 1,000 No. Rock Bolts used to stabilise a major railway cutting.



▲ Drilling rig suspended from mobile crane

Queensland Rail called tenders in early 1996 for major civil works associated with the new Gold Coast Rail link between Beenleigh and Robina 73 km south of Brisbane. The Abigroup company was the successful contractor for the Civil 7 Section

of the works including 5 km of rail formation and 5 bridges. The critical section of the work was the removal of rock from a deep cutting.

On completion of the excavation, Queensland Rail carried out a

geotechnical report to assess various alternatives for the stabilisation of the rock face. VSL was awarded the contract to carry out the rock bolting works for the stabilisation and started on site in late August 1996. The western cut face was over 500 m long and

Scope of works performed

- 371 No. Y20 galvanised rock bolts, each 1.5 m long
- 32 No. 20 mm galvanised VSL Threadlok soil nails, each 2.5 m long
- 141 No. 20 mm galvanised VSL Threadlok soil nails, each 5.0 m long
- 42 No. 25 mm galvanised VSL Threadlok rock bolts, each 3.0 m long
- 327 No. 25 mm galvanised VSL Threadlok rock bolts, each 4.0 m long



▲ Rock bolted cutting

stepped up through four batters and three benches to a height of 20 m from the proposed track level. The benches and batters were unstable and offered very limited access for drill rigs and operators to carry out our works.

VSL's solution was to construct a purpose built drill rig, mounted on an enclosed platform, to gain access to all areas with the assistance of a 50 tonne mobile crane.

Speed of construction was a major concern for Abigroup as the stabilisation works were added to their construction programme.

For the drilling, VSL mobilised two air track rigs and compressors for drilling the first batter of the eastern and western faces, a small air track rig to drill on the limited bench area and the crane supported drill rig. The majority of the rock bolting was completed by early November 1996 with final crane access works completed by late the same month. All rock bolts and soil nails were installed in 100 mm diameter drill holes with plastic spacers placed at 1,500 mm centres over the length of the bar.



▲ *Drilling for chemical anchors*

A 150 mm square domed plate and dome washer were dry packed onto the finished rock face.

Part of VSL's work on site included the placement of rock fall mesh to hold three unstable areas. Chemical anchors were installed at the top and bottom of the areas to locate and secure the mesh with a galvanised wire thread.

CLIENT

The State of Queensland

ENGINEER

Queensland Rail

MAIN CONTRACTOR

Abigroup Contractors (Qld) Pty Ltd

GEOTECHNICAL ENGINEER

Coffey Partners International Pty Ltd

SUB CONTRACTOR

VSL Prestressing (Aust) Pty Ltd

DATE

1996

Existing rock bolts in the rock fall mesh area provided additional fixing points for the galvanised wire. The 100 chemical anchors were installed into a 27 mm diameter hole up to 1.2 m long.

VSL met the challenge of this project by drilling 1,300 holes and installing over 1,000 rock bolts in a very short time with difficult access.

▼ *Stabilised cutting with shotcrete facing*



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