



Client: Queensland Transport

Location: South East Busway, Mt Gravatt (Brisbane, Qld)

Situation: Soil nails had failed in a retaining wall, after heavy rain, causing rotation in the retaining wall.



(Above) Screw pile being installed through penetrations cut in the shotcrete wall

Ground

Decomposed Brisbane tuff, with competent tuff at penetrations of 6 – 12 metres

Solution

To stabilise the retaining wall tonnes of rail ballast were placed against the base of the embankment, to prevent further movement, and half of the road above it was blocked off.

Instant Screw Piling devised a procedure for cutting holes in the existing shotcrete wall, installing screw piles, tensioning them, and tying them in to the (repaired) shotcrete wall.

The consultants to the project were initially sceptical, but were convinced after they undertook rigorous testing.

Sections were cut out of the shotcrete wall to allow the screw sections to be driven in. A telescopic handler with a planetary drive head was selected for this job, as it could stand at the base of the wall, pick the screw pile sections from the road above, and install the screw piles. For longer screw piles, shorter sections were butt-welded together. A rock bit was welded to the screw pile to allow it to anchor in rock.

A flange with a protruding M20 rod was welded to the top of the piles. The shotcrete was reinstated, and then the pile was tensioned to 10 tonnes with a torque wrench, using bracing across the solid (uncut) sections of the wall, effectively transferring tension into the shotcrete wall.

(Below) Rock bit welded to the screw pile

In total, 180 x 12 metre piles, and 160 x 6 metre piles, were installed.



(left) Flange welded to the pile cap to allow tensioning



**CASE STUDY No 4:
SUPPORT FOR FAILED RETAINING WALL**