SYDNEY AIRPORT RESA

JET GROUTING

Client: Sydney Airport Corporation Ltd
Consultant: Aurecon

Contractor: Baulderstone Pty Ltd

THE PROJECT

The Runway End Safety Area (RESA) is a part of the upgrade plan for the Sydney International Airport to achieve compliance with new international safety requirements.

The extension of the East-West runway involved the construction of a 90m x 90m land bridge spanning over: the heritage listed main Sydney Southern Sewer (SWSOOS), the M5 Motorway, in tunnel at this location, and a new underground Perimeter Road for the airport.

The construction of the underpass for the Perimeter Road below the SWOOS, to a depth of 6m below sea level was mostly in the soft clay and posed specific geotechnical problems.

MENARD BACHY'S ROLE

Menard Bachy proposed the use of the technique of Jet Grouting, to resolve the multiple problems of ground stabilisation and thereby facilitate the construction of the cast in situ underpass. Temporary works involved a buttressed cofferdam of interlocking jet grouted columns, designed to prevent water ingress and provide ground retention around the underpass structure. The base of the coffer dam was treated by jet grouting which allowed the resulting, improved ground to provide a brace for the excavation, as well as enhancing the properties of the soft clay material, creating stable ground for the construction of the base slab, drainage lines, pit and pump station.

Stringent requirements limited movements in the sensitive SWSOOS structure and the piles supporting it to few millimetres; complex staging, difficult ground conditions and a number of site constraints dictated a very comprehensive design, supported by finite element analyses using Plaxis Modelling.

The very complex scheme of Jet Grouting included around 1600 columns ranging in length from 1.5m to 13m and varying in diameters from 1m to 2.5m. About 500 of these columns were installed under the SWSOOS and in between its supporting piles, with a head-room limited to 2.7m, using a jet grouting mini-rig.

The overall results were extremely satisfactory, delivering a dry cofferdam, stable bottom of excavation. The project was successfully finished in the middle of February 2010.

SYDNEY
13-15 Lyonpark Road, Macquarie Park NSW 2113
Tel: 61 2 9491 7100 Fax: 61 2 9491 7111

BRISBANE
3 Harvton Street, Stafford QLD 4053
Tel: 61 7 3354 9100 Fax: 61 7 3354 9111

MELBOURNE
41 Boundary Road, North Melb. VIC 3051
Tel: 61 3 9321 1333 Fax: 61 3 9326 8996

AUCKLAND
PO Box 72734, Papakura, Auckland NZ
Tel: 64 9 236 3385 Fax: 64 9 236 3385