

Melbourne Convention Centre – Cement Bentonite Slurry Wall to limit long term groundwater draw down



Keller designed a slurry mix to achieve the very low permeability required together with the strain parameters to ensure long term integrity.

**AUSTRALIA
NEW ZEALAND
PACIFIC ISLANDS
INDONESIA**

Enquiries to:
PO Box 7974
Baulkham Hills NSW 1755

Level 1, 4 Burbank Place
Baulkham Hills NSW 2153
Australia
t: (02) 8866 1155
f: (02) 8866 1151
e: info@kellerge.com.au

Project

The new Convention Centre situated immediately adjacent to the Yarra River on Melbourne's South Bank required an excavation between 2m and 5m deep with a perimeter of approximately 1km. In order to limit groundwater draw down surrounding the basement a groundwater barrier was required to limit long term seepage into the basement. The cut-off wall was located around the perimeter of the site to depths of up to 17m.

Soil Conditions

The soil conditions onsite comprised of 2m of fills overlying soft Coode Island Silts to depths of between 2m and 12m and alluvial sands, clay and silt below. The Coode Island Silt has regular silt and fine sand partings that dictate its high horizontal permeability.

Solution

To accommodate the permeability, strength and strain specification required, Keller designed a slurry mix to achieve a very low permeability results in the order of $<1 \times 10^{-9}$ m/sec, with a UCS of >100 kPa, whilst maintaining a confined strain capacity at failure of $>5\%$.

The design incorporated a 600mm wide wall, and allowed continuation of bulk excavation works after a 14 day curing period.

Construction

Due to the size of the project a high capacity high speed colloidal mixer was used to batch the slurry. Colloidal mixing of the grout is of paramount importance in order to ensure that all individual particles of cement and bentonite are fully hydrated; failure to do so would result in failure to achieve the specified parameters. Keller had previously worked with plant manufacturers and material suppliers to develop a system that allows rapid bentonite hydration within the mixer as opposed to a standard 24 hour standing period.

Working to the highest of safety standards and working in close proximity to piling and earthworks contractors, Keller completed the 4 month project a week ahead of schedule.

Quality Assurance was provided by continuous testing of the grout mix as well as slurry sampling and laboratory testing.

Client:
Multiplex Plenary Consortium

Principle Contractor:
Multiplex Constructions Pty. Ltd.

Specialist Geotechnical Constructor:
Keller Ground Engineering Pty Ltd