

Bermuda shopping centre



Dynamic replacement and compaction

Austress Freyssinet has entered a partnership with Menard Soltraitement to stabilize a site on which a 32,000 m² supermarket and retail complex will be built!

EASTLINK PROJECTS IS PLANNING TO BUILD A shopping village complex immediately adjacent to an existing residential housing estate, as part of the Varsity Lakes development in Robina on Queensland's Gold Coast in Australia. The 6-hectare site on Bermuda Street (opposite Bond University) will be developed in two stages. Stage 1 consists in building a 32,000 m² supermarket, specialty retail shops, fast food outlets, a petrol station and associated car parks.

A very precise specification

This site had lain dormant awaiting a suitable cost-effective use, due to its difficult underlying ground conditions. The geology varies greatly since it includes medium dense to dense sands in the southern end, and 5 to 6 m thick very soft organic clays in the north eastern end, overlain by very old topsoil. The building specification allowed for a maximum settlement of the foundations equal to 40 mm and maximum differential settlements

of 15 mm in 10,000 mm. In order to meet these design requirements as closely as possible, Austress Freyssinet worked with Menard Soltraitement to develop a fully turnkey design and construct a solution utilizing dynamic replacement and compaction techniques. This integrated solution proved to be more efficient and economic than the use of concrete piles. Construction and implementation of the ground improvement processes was thus started and required 41 days. Due to the close proximity of residential housing, Austress Freyssinet took great care not to disturb existing residences; and through careful monitoring, the company was able to minimize vibrations and noise, keeping them well below allowable levels.

Skills at all levels

A large construction site was necessary to implement this solution, on which Austress Freyssinet worked as the Main Contractor. A fixed contract was agreed upon, which included the following phases:

1- Preliminary phase:

- Construction of temporary site access
- Cleaning and grubbing
- Preparation of the 70 000 m³ borrow pit for building platform materials
- Condition surveys of 19 residential houses immediately adjacent to the site

2- Ground improvement phase

- Additional site investigation and trial compaction
- Dynamic compaction – 10 000 m²
- Dynamic replacement – 10 000 m²



- Ironing compaction – 12 000 m²
- Verification testing – Plate load tests and pressuremeter tests

3- Earthworks

- Winning, transportation, placement and compaction of about 50 000 m³ of bulk fill
- Excavation and drainage
- Final trim of building platforms
- Turfing of drainage areas
- Environmental, storm water and acid sulphate management

The work commenced in April 2002 and was successfully completed in July 2002.

Participants

Client: Eastlink Projects Pty Ltd

Consulting engineers: Weathered Howe Pty Ltd

Main contractor: Austress Freyssinet Pty Ltd

Specialised contractor: Menard Soltraitement

Earthworks: Lund Constructions

