

Whisper Bay, Airlie Beach, QLD – Dynamic Compaction of uncontrolled fill



Dynamic Compaction (DC) comprises imparting high impact energy to the soils, thereby effectively over-consolidating the soils and maximising their bearing capacity.

**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

A disused and backfilled stone quarry on the waterfront of Airlie Beach was chosen as the site for residential development. The uncontrolled and variable nature of the backfill provided challenges to the developer and builder, which were overcome by Dynamic Compaction treatment.

Soil Conditions

The area consisted of highly variable, un-compacted fills ranging from 1m to greater than 8m in depth. The Fill was predominantly comprised of cobbles and boulders, ranging from 0.1 to 1.0m in size, interspersed with sands and clay and occasional timber and waste.

Solution

To enable the conventional construction of the proposed 3-storey apartment buildings on shallow foundations, Keller proposed the use of Dynamic Compaction as the appropriate soil improvement system offering significant cost savings as well as program advantages on other solutions, including removal and re-compaction and piling.

The challenge was further complicated in that the buildings straddled the interface edge of the old quarry, with buildings founded partially on rock and on the dynamically compacted fills in the quarry. Post construction settlement targets were aimed at 15mm post construction with a guaranteed maximum of 30mm provided.

Construction

Using a range of pounders weighing between 12 and 27 tonne, in excess of 15,000m² was treated in a 6 week period. The treatment was carried out to provide full support over the entire site to allow the construction of buildings without the need for suspended floor slabs and to ensure serviceability of roads, services and pavements.

In areas where highly loaded structural columns or lift shafts occurred, dynamically driven stone columns were constructed to provide support for the structures.

Performance

The measured performance of the works six months following opening of the new lines has exceeded expectations in terms of lateral stability and settlement performance.

Project Manager:
Incoll Management Pty. Ltd.

Principle Contractor:
Hutchinson Builders Pty. Ltd.

Geotechnical Consultants:
Pells Sullivan Meynink Pty Ltd

Specialist Geotechnical Constructor:
Keller Ground Engineering Pty Ltd