

Case Analysis

Brickworks Market Place, Torrensville, Adelaide

Market Sector

RETAIL



Application

IN-SITU COMPACTION



Project Phase

CONSTRUCTION PHASE



LANDPAC

INTELLIGENT GROUND ENGINEERING SOLUTIONS

Site Description

Following closure of the former brickworks and quarry manufacturing site in 1979, the area was backfilled with a variety of materials, including demolition debris, industrial waste, and quarry by-products. Fill depths across the site varied significantly, reaching up to approximately 11.5 m, with localised areas extending to a maximum depth of approximately 15 m.

With the exception of the Dan Murphy's building, most of the structures were founded on fill materials ranging between 0.5 m and 5 m in depth, with localised areas near the southern portion of the Woolworths building where fill depths extended to approximately 10 m.

The fill depth map on the next page illustrates the existing fill depths across the site prior to any ground improvement works being undertaken. In addition, the figure identifies the zones where vibration monitoring was required, particularly in proximity to Torrensville's historic kiln and landmark chimney, both of which were preserved and restored during the development works.

UPDATE INFO NEEDED BELOW

Client: Fabcot

**Principal Contractor: Badge
Constructions**

**Ground Improvement Contractor:
Landpac**

CONTINUED →

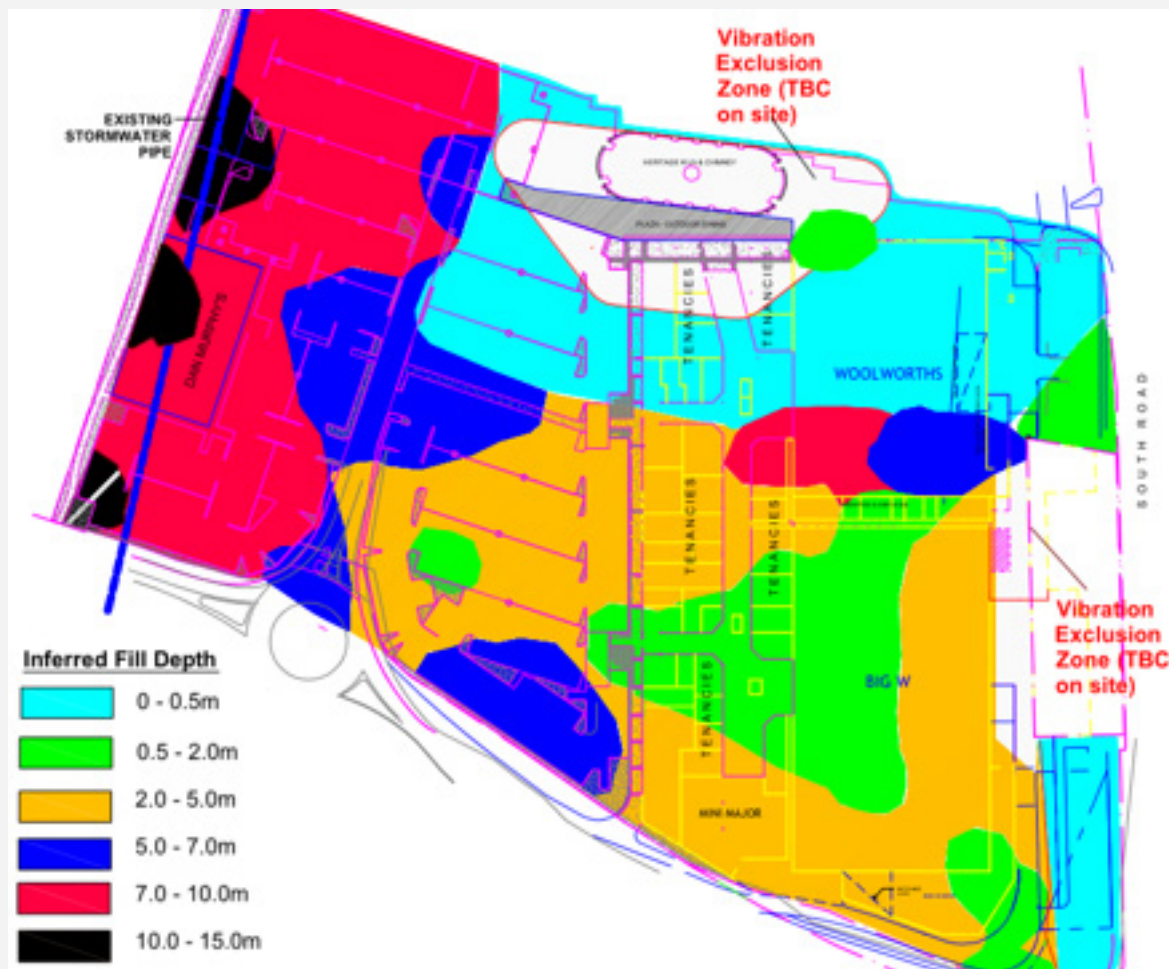
Geological Review

The project utilised deep impact compaction to densify heterogeneous in-situ fill materials, creating a stable foundation without the prohibitive costs of excavation and replacement. By employing Landpac's 175kJ high-energy impact roller, the team successfully mitigated risks associated with site voiding and achieved the required <15mm differential settlement specification.

Key Technical Achievements

- **Sustainable Execution:** Eliminated the need for mass soil export/import by improving existing sub-grade in-situ.
- **High-Energy Efficiency:** Utilised Australia's largest impact compactor (175kJ/15t module) to ensure depth of influence.
- **Performance Reliability:** Guaranteed structural integrity for the subsequent 0.7m fill layers through rigorous compaction control.

Fill depths across the site



120,000m³ of imported fill

Project Details

Landpac was engaged as a specialist ground improvement sub-contractor by BADGE Construction (SA) Pty Ltd on the Woolworths Brickworks Marketplace development in Adelaide that consists of Big W and Woolworths Supermarkets and other retail outlet on a 4.7 ha site.

The site was formerly used as a brick manufacturing plant and quarry. The production of bricks ceased in 1979 and the site was filled with a variety of materials resulting in highly variable subsurface conditions.

Approximately 120,000m3 of fill was imported to achieve final design levels. As a more cost effective and quicker alternative, the fill was placed in 0.7m thick layers and compacted with HEIC.

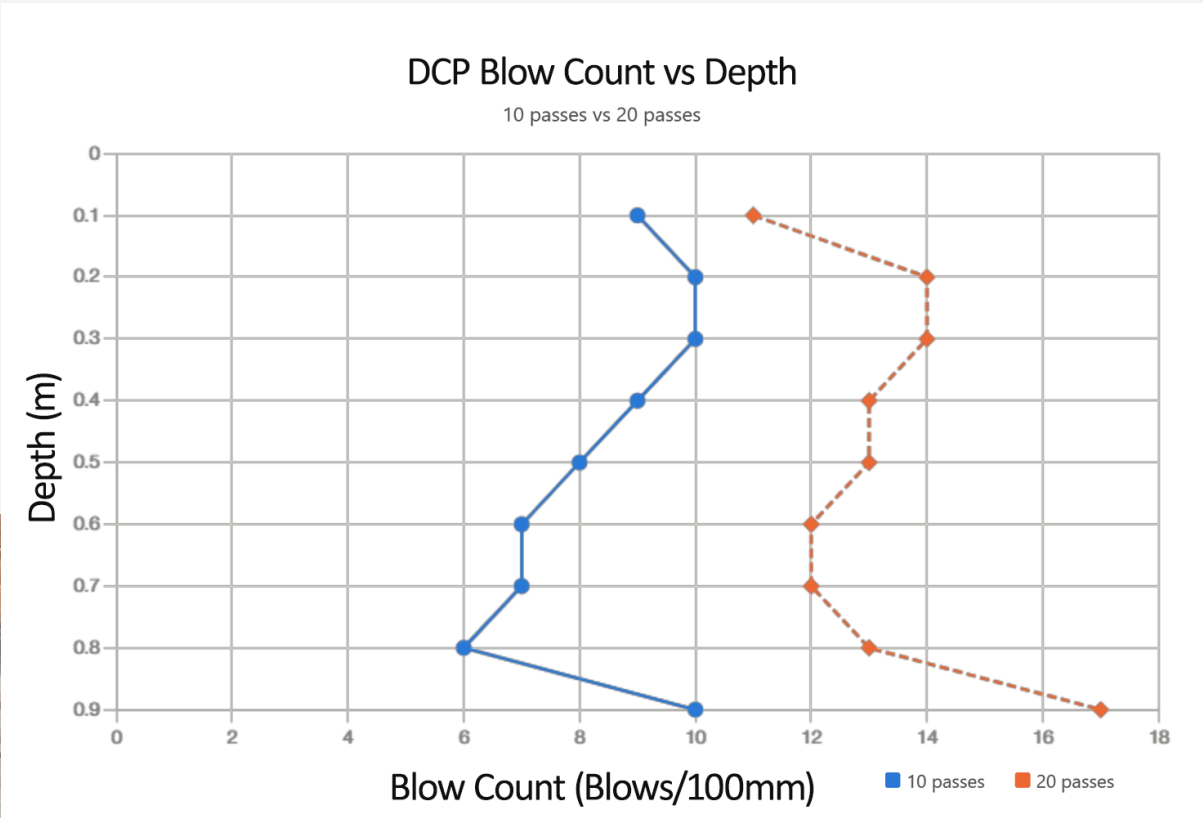
The HEIC process was validated using Dynamic Cone Penetration (DCP) in the layer work materials. While NDTs provided data at specific depths (98%SMDD), the DCP tests offered a more granular look at the strength throughout the entire 1m profile.

This dual-testing approach enabled a robust correlation between density and strength, ensuring the works met all modulus-based performance standards. PLT's were done at random intervals to confirm the modulus based correlations.



NOTE: Traditional 300mm lifts often create a "smooth" interface between layers, which can act as a shear plane. The high amplitude of HEIC "knits" the 0.7m layers together. The energy wave breaks the surface of the previous lift, creating a vertical continuity of stiffness that eliminates lamination risk.

Layer 1, 10 Passes vs 20 Passes DCP averages



Summary

In-situ compaction was carried out using HEIC to densify the existing ground and provide a stable, load-bearing platform, allowing the subsequent placement and compaction of 0.7 m engineered fill layers. Each successive layer benefited from the anvil or compounding effect created by the previously compacted layers, enabling more efficient densification with each impact. This process significantly reduced variability and mitigated the risk of differential settlement.

In contrast, conventional excavation and re-compaction of up to 10 m of layered fill would have posed significant risks, including longer programme durations, constructability challenges, increased variability in material properties, and more demanding particle size and moisture control requirements. The presence of asbestos in some locations, which was left in-situ, further increased the cost and complexity of traditional methods, highlighting an additional economic advantage of using HEIC.

A bearing capacity of 250kPa for the foundations was achieved. Geotechnical testing and verification of the sub-grade design parameters were provided by Douglas Partners Pty Ltd. Landpac (Australia) provides impact compaction services throughout Australia and to the Asia Pacific region.

**Avg 57% Strength
increase across
the site**



Summary

- ✓ Time and cost savings through thick lift compaction
- ✓ No strict particle size grading required
- ✓ Reduced environmental impacts
- ✓ Reduction in water requirements
- ✓ Time and Cost Savings.

Get in touch

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