

Case Study

High Energy Impact Compaction Improves Subgrade Uniformity

Market Sector

DEFENCE INFRASTRUCTURE



Application

UNCONTROLLED FILL



Project Phase

EARLY WORKS



LANDPAC

INTELLIGENT GROUND ENGINEERING SOLUTIONS

Amberley Airbase, Queensland

Equipment Used

Landpac deployed a 5-Sided Heavy Impact Compactor for the Amberley Airbase Temporary Stockpile Facility project. The compactor was fitted with Landpac's monitoring technologies:

- Continuous Induced Settlement (CIS) system, using Differential GPS to track settlement per pass.
- Continuous Impact Response (CIR) system, providing real-time plots of relative soil response and subgrade stiffness.

Project and Geological Review

Enviropacific engaged Landpac to undertake High Energy Impact Compaction (HEIC) for the proposed Temporary Stockpile Facility at Amberley Airbase, QLD.

- **Site area:** Divided into 6 compaction zones.
- **Duration:** Mobilisation commenced on 15 December 2017, with works running through to 19 January 2018.
- **Scope:** Existing uncontrolled fills were compacted to improve subgrade conditions.

The site was systematically compacted using 40 passes per zone, with induced settlement and CIR monitoring guiding the process.

Results

- **Compaction Passes:**

Each of the 6 zones received 40 passes. One zone with lower soil response (linked to over-wet subgrade) received an additional 10 passes after drier weather conditions improved the material response.

- **Induced Settlement Monitoring:**

Average induced settlements were recorded across all zones, confirming sufficient compaction effort and identifying areas with residual settlement potential.

- **Soil Response Monitoring (CIR):**

Final CIR plots indicated a more uniform subgrade across the site, with only minor localised weaker areas. The zone with very low response showed significant improvement after the additional passes.

- **Geotechnical Testing:**

Independent testing was undertaken by Laing O'Rourke's appointed engineers to determine subgrade design parameters following Landpac's compaction and monitoring works.

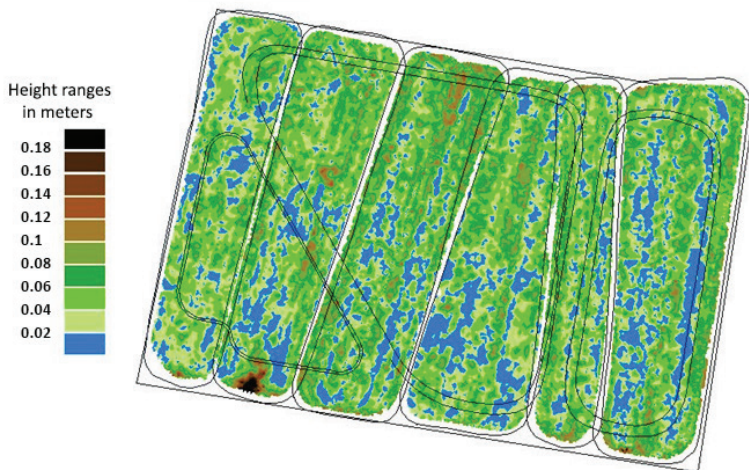


Summary

The Amberley Airbase Temporary Stockpile Facility demonstrated the benefits of High Energy Impact Compaction for managing uncontrolled fills in defence infrastructure projects. The HEIC approach provided a cost-effective ground improvement method, minimised the need for removal and replacement of unsuitable material, and ensured a more uniform subgrade response.

Average settlement of 40.5mm achieved

CIS Plot (Total Settlement)



Key Outcomes

- ✓ Improved subgrade uniformity
- ✓ Real-time monitoring with CIS and CIR
- ✓ Identified and treated localised weak areas
- ✓ Time and cost savings compared to conventional remediation

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