

Project Report

ENGINEER	DESIGNER	CLIENT
Beckett Rankine	Beckett Rankine	Newhaven Port Authority
SUBCONTRACTOR	CONTRACTOR	INSTALLER
Anchor Systems (Intl) Ltd	Jackson Civil Engineering	Jackson Civil Engineering

Requirement

Newhaven Port, located at the mouth of the River Ouse, was facing ongoing coastal erosion that had compromised the structural integrity of the sea embankment. The primary goal was to deliver a permanent slope stabilisation solution that would secure newly placed articulated concrete mattresses (Dycel 221) used for erosion protection.

Due to tidal working windows and a steep, challenging slope, the project required a reliable anchoring system capable of handling both buoyant uplift and variable ground conditions. Anchor Systems was contracted to provide and test a robust ground anchor solution that would form the structural backbone of the revetment installation.

Testing

To ensure site-specific suitability, eight on-site load tests were carried out at varying depths and orientations. Ground conditions varied significantly between the toe and crest of the slope, necessitating anchor depths ranging from 5.8 to 13.5 metres. Key test highlights:

- Anchor Type: Vulcan Earth Anchor (AS200)
- Inclination Angles: 45° and 90°
- Maximum Load Achieved: Up to 250kN
- Testing Standard: All anchors tested to soil mechanics failure

Each anchor test was logged with bar extension, plate loss, and achieved capacity, validating both design assumptions and anchor layout. These tests highlighted changes in soil strength between the toe and crest zones, leading to the deployment of varied anchor depths and orientations across the embankment.

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Slope Stabilisation

Newhaven Port, East Sussex

Solution

The final solution used 166 x Vulcan Earth Anchors (AS200) driven to depths between 8 and 10 metres, installed on a 3m grid layout as specified in Beckett Rankine's revetment drawings. All components—bars, plates, and fixings—were fully galvanised to meet the extended design life requirements in a harsh marine environment.

Anchors were embedded through both the crest and toe mass concrete beams, tying directly into the articulated concrete revetment mats using extra cable loops fixed to 20mm reinforcement bars spaced at 200mm intervals. The system was installed using machine-mounted equipment, with anchor positions precisely aligned to match the Dycel mat layout. Geotextile membranes were laid under the mats and beams without puncturing, ensuring soil retention and preventing undermining.

This project not only delivered effective slope stabilisation and coastal erosion control but also demonstrated the performance and versatility of Anchor Systems' ground anchor technology in a complex, multi-partner marine environment.

