

Project Report

Banff Bridge Scour Works

CONTRACTOR
STORY Contracting

DESIGNER
AMEY

Requirement

Banff Bridge on the A98 in Aberdeenshire required remedial works to address scour affecting the bridge foundations within the tidal river environment. Scour occurs when flowing water removes sediment from around structural foundations, potentially compromising long-term stability.

To protect the bridge, a scour protection system was designed using rock mattress units installed across the riverbed. These mattress systems needed to be securely fixed to prevent movement caused by water flow, tidal forces and storm conditions.

The anchoring solution therefore needed to:

- Provide reliable ground anchor restraint for rock mattress units
- Perform in a tidal saltwater environment with high corrosion resistance
- Meet defined load requirements to ensure long-term erosion control and scour protection
- Be installed within varying ground conditions including sand with buried rock fragments

Importantly, the anchors were required to be installed into the natural riverbed, rather than areas of exposed concrete, ensuring effective load transfer within the in-situ ground conditions.

Testing

Prior to construction, a series of on-site validation tests were undertaken to confirm the performance of the selected Vulcan Earth Anchor ground anchor system within the site's ground conditions.

A total of 12 test anchors were installed along the shoreline to verify achievable loads and installation depths. Testing confirmed:

- Achieved loads between 30 kN and 50 kN
- Installation depths between 1800 mm and 2770 mm
- Performance exceeding the project's 12 kN design load requirement

Testing was carried out using a 20-ton hydraulic ram to confirm the anchor load capacity before installation commenced.

Ground conditions consisted primarily of sand with buried rock fragments, resulting in varying densities across anchor locations. To reduce the risk of installation refusal, a drill mast was used to percussion drive a rod to depth prior to anchor installation.



Solution

Anchor Systems supplied a fully stainless steel AS-10 bar and wire Vulcan Earth Anchor system, designed to meet the project's structural and environmental requirements.

The system utilised grade 316 stainless steel components to provide corrosion resistance within the tidal saltwater environment, ensuring long-term durability for the erosion control works.

The bar and wire configuration was selected as a cost-effective solution that still allowed the anchor system to be securely locked off using a plate, washer and threaded nut detail at the surface. This enabled the rock mattress units to be firmly restrained against uplift and movement caused by river flow and tidal forces.

Installation was completed using machine-mounted equipment within sheet-piled areas installed to allow temporary dewatering during construction. Works are being carried out in two phases either side of the bridge within the tidal riverway.

Through pre-construction testing and the use of corrosion-resistant materials, the Vulcan Earth Anchor system provides a reliable ground anchor solution for riverbed stabilisation and erosion control, helping protect the foundations of Banff Bridge for the long term.



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