



Geotechnical Division Case Study Charlestown Slope Stabilisation

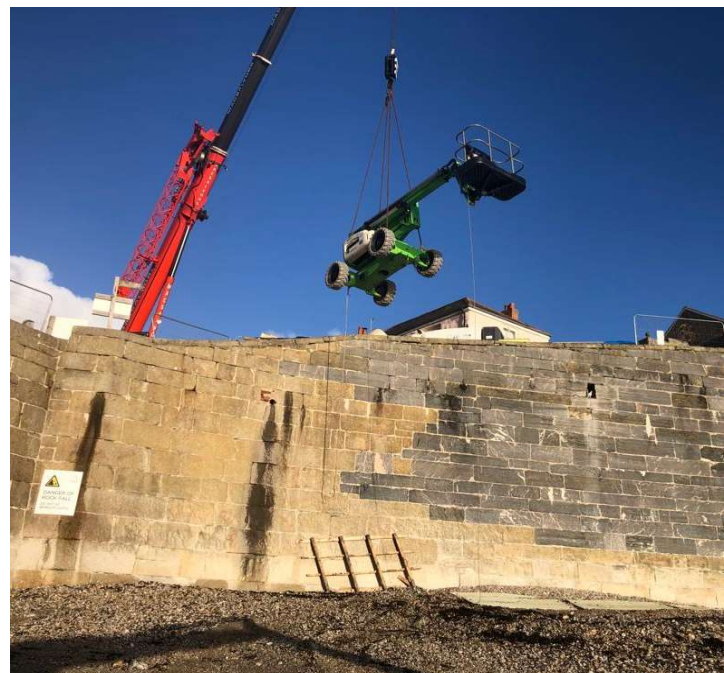
Stabilisation of the Sea Cliff below the Southwest Coastal Path at Charlestown Harbour using an anchored sprayed concrete facing.

In October 2021 Griffith's were employed by Cormac Solutions Ltd. (CSL), part of the Corserv Group of companies owned and operated by Cornwall Council, as a specialist Contractor to undertake Rock Stabilisation works at Charlestown Harbour.

The South West Coastal Path (SWCP) runs through Charlestown and out towards Par to the East where the footpath runs along the crest of the sea cliffs. The failure of the sea wall and subsequent coastal erosion during storm events had undermined the SWCP, resulting in the temporary narrowing of the path. Cornwall Council were concerned that further erosion would see the complete loss of the path and a risk to the residential buildings at the crest.

A design was procured by CSL which required the installation of 15No. soil nails to stabilise the upper section of the cliff and 53No. rock pins to hold the reinforced sprayed concrete facing. Weepholes were installed as required by the Designer.

To complete the works on the rock face access to the beach was required. Due to the distance of travel to bring a barge with an excavator, drilling rig, MEWP and all materials it was considered impractical. A barge would also limit the ability to safely clear the beach in the event of a storm. Griffith's therefore chose to undertake a contract lift to bring plant and materials on and off the beach at the appropriate point in the construction sequence.



Pictured above: Lifting a MEWP onto Charlestown Beach for the application of Sprayed Concrete.

Charlestown Harbour is part of the UNESCO world heritage site of Cornwall and West Devon Mining Landscape; the Harbour is a listed structure which had to be considered when developing Temporary Works for the use of the crane.

The road was temporarily closed with the agreement of the Harbour and Residents, and a 100tn crane was used to lift plant, equipment and materials onto the beach. A temporary works platform for the 9tn Long Reach Excavator was created with bulk bags and locally sourced site won material to form a temporary sea defence above the Mean High-Water Springs (MHWS).

Soil Nails, Rock Pins and weepholes were installed across the face in line with the Designers requirements. A double layer of A393 Stainless Steel reinforcement mesh was installed, secured to the face and effectively profiled to minimise the rebound of the concrete.

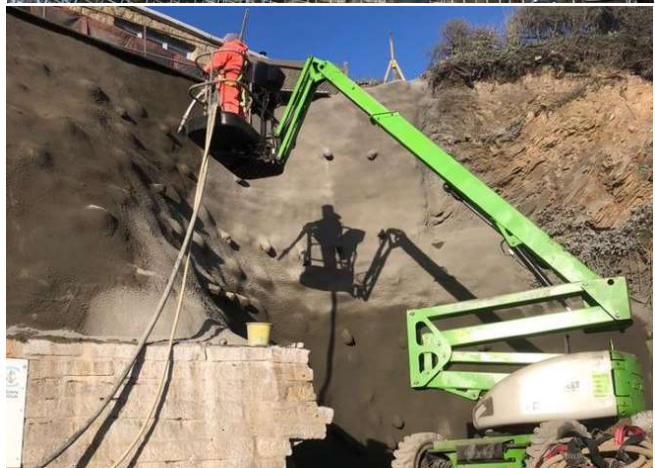
Griffith's were able to react to several design changes as a result of emerging conditions, and to facilitate a more effective design.

As part of the Designer requirements the area to be stabilised doubled during the setting out process, necessitating the installation of additional nails and mesh. Griffith's worked with our suppliers to expedite the deliver of materials to ensure minimal impact on the construction programme.

Griffith's were able to suggest suitable alternatives to materials to allow the sprayed concrete facing to meet the designer requirements whilst utilising materials that were locally available. This protected the Principal Contractor and the Client from the additional costs of importing materials.

Working in a coastal environment it was important to manage works to ensure no adverse impact on the local environment. Work was planned and undertaken so as to remain at all times above the MHWS.

Works at Charlestown were completed to the satisfaction of Cornwall Council, Charlestown Harbour and the local residents, despite a number of design and construction challenges based on emerging conditions.



Pictured above: Completed stabilisation works.

Pictured above:
Fig 1. Installing soil nails and rock pins with long reach excavator.
Fig. 2 & 3: Installation of A393 mesh with weepholes secured to soil nails and rock pins
Fig. 4: Application of Gunite sprayed concrete from MEWP

Project details at a glance

Client: Cormac Solutions Ltd.
Location: Charlestown Harbour
Completed: January 2022
Value: £320,000
Contract: NEC3 Option A