

TMS Maritime is a leading UK specialist in marine civil engineering, ancillary floating plant and diving services

Client: Fort Bovisand Developments

Dec 2020 - Jan 2021

Project: Cliff Stabilisation

Value: £478,000

Employed by Fort Bovisand Developments Ltd, TMS worked closely with the scheme designer, Red Rock Geoscience, to successfully complete the vital stabilisation works to the cliff face approaching Fort Bovisand, a former casemated gun battery constructed in the 1860s for the protection of Plymouth Sound. The work, which was completed in challenging weather states during December and January, and under demanding physical conditions, was delivered to ensure the stability of the main access road and nearby coastal cottages. Tidal abrasion and repeated hydraulic action had caused the weak mudstone cliff face to be significantly undercut, leading to localised, minor collapses. These collapses had gradually crept landwards, presenting a serious threat to the access road and to the coastal cottages behind.

Due to the rocky foreshore, it was impossible to deliver materials or plant by sea. All works were therefore completed from above, using a combination of roped access techniques and heavy craneage to stabilise the cliffs. This required careful co-ordination with Red Rock Geoscience to ensure that the cliffs were sufficiently stable - in temporary state - to withstand the imposed crane loadings.



Three distinct gullies were repaired using various techniques. Firstly, a total of 1600t of rock armour made up of 3 to 4 tonne blocks was lowered by 120t crane into position, guided by roped-access technicians. The second gully, which had been stabilised historically by the construction of a masonry wall at beach level, required repairs. Primarily, reparations consisted of underpinning and re-pointing. Underpinning could only be completed by crane-lifting an excavator down onto the foreshore during each low tide, together with the required concrete. The re-pointing was completed by roped access. Finally, once the wall had been stabilised, a sink hole that had developed above it was then filled with 1100t of 6G stone.



In the final gully, a fissure and blowhole above it were plugged and sealed using specialist marine mortar and marine-grade concrete. This was again completed using roped access techniques. As a final measure, a 3D scan was completed in order to produce a georeferenced point cloud survey and geospatial model, to provide a baseline against which future movement of the cliff can be monitored.