

South Cliff Stabilisation Scheme

Scarborough Spa

Scarborough Spa is a Grade II listed building in South Bay, Scarborough, North Yorkshire, which is used as an events and entertainment venue. Work was needed to stabilise the cliffs behind Spa to prevent any future collapse.



The project

Scarborough Spa is situated on the seafront of the South Cliff, which was unstable. Working with Balfour Beatty, Keller helped provide a solution to stabilise the cliff face and protect the iconic building from potential damage and future ground movement. Keller proposed installing piles to provide support by tying into the underlying competent rock and restrain the lateral forces which were causing the instability.

The challenge

To dissipate the loads, a detailed moment analysis was performed by the project engineers which determined a lateral load of 1500kNm at peak. Each pile required a minimum rock socket or penetration into the underlying rock which varied in depths from 20 to 35m. This needed to be installed in restricted access and working room conditions while still maintaining safe working practice, ongoing site operations and interaction with other works.

The solution

The final solution decided upon was the installation of 205No 406/340mm diameter piles to depths of up to 35m reinforced with 304mm diameter OD x 22m wall bespoke milled steel tube in sections with fully tested and certified joints to allow the bending moment to achieve the necessary restraint for the lateral forces to be achieved. The work was carried out between November 2018 and May 2019.

Project facts

Owner(s)

Environment Agency
Scarborough Borough Council

Keller business unit(s)

Keller UK

Main contractor(s)

Balfour Beatty

Solutions

Slope stabilisation

Markets

Infrastructure

Techniques

Bored piles
CFA piles
Restricted access piles

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