

# Teretek® Strengthens Foundations in Grade II Listed Building



## INDUSTRY

Commercial

## STRUCTURE

Grade II listed building

## PROBLEM

Weak ground

## LOCATION

Bristol, UK

## DURATION / YEAR

5 days, June 2019

## TECHNOLOGY

Teretek®

## BUSINESS UNIT

Mainmark UK

## JOB NUMBER

UK19-141

## Summary

A Grade II listed building in Bristol was being refurbished into new living accommodation, comprising of ground floor and first floor apartments. The building had previously shown signs of subsidence and so the refurbishment required the foundations to be underpinned, in order to support the additional load of 250kN/m<sup>2</sup> which would be placed onto them through the construction of the apartments.

Before any ground improvement work took place, site investigations were undertaken in order to determine the ground conditions beneath the site. The site investigations revealed that the existing foundations were sitting on loose made sand, extending to a depth of 3m below ground level. At this depth, the soil was strong enough to take the load. As a result, the ground improvement works had to be undertaken at this level.

The building also had scaffolding around it, meaning that a traditional invasive solution such as concrete underpinning would have been impossible due to access issues. In addition to this, ground remediation would need to go to a depth of 3m, which would have been very difficult to undertake using traditional methods, due to the logistics of the site. A traditional underpinning solution would also have meant a lengthy process and project duration. Mainmark's non-invasive alternative was the perfect solution and it was chosen because it would allow the work to be carried out easily and with minimal disruption.

## Objectives

The key objective was to provide ground improvement on the treated soils, in order to strengthen the foundations and achieve a specific allowable bearing capacity of 250kN/m<sup>2</sup>. This would allow the foundations to support the additional load from the construction of the apartments.

## Teretek® Strengthens Foundations in Grade II Listed Building continued

### Solution

Due to the sandy and gravel made-ground conditions and to the limited site access, Mainmark's proprietary resin injection solution, Teretek®, was the most suitable method to provide the ground improvement. Using Teretek provided Mainmark with the flexibility to work within the site's tight physical constraints - around the scaffolding - without causing business disruption. Mainmark's Teretek solution also allowed the work to be completed much quicker than originally anticipated by the client.

Teretek is a non-invasive resin injection solution that can both strengthen ground bearing capacity and also re-level structures, in a process that is likened to keyhole surgery. On entering the ground, the polymer resin solution mixes together and quickly expands, strengthening soil and re-levelling buildings quickly and efficiently.

To verify the improvement of the treated soils after the Teretek had been used, Mainmark completed both pre and post project dynamic cone penetrometer testing which measures the strength of soil. Using the results from this testing, Mainmark was able to confirm that the treated soils had been strengthened enough to safely accommodate the specified bearing pressures on the foundations.

Whereas traditional concrete underpinning would have taken many more weeks, Mainmark's adaptable methods meant that the works were completed in just five days, within the client's specified time frame and also within the stated budget. Despite the heavy loading requirements and extremely weak grounds beneath the building, Mainmark achieved excellent improvement of the soils. The client was impressed with the results of the ground improvement works.



Teretek® material being injected into the work site despite scaffolding placed around the area