Teretek® Used to Reinforce Ground of Victorian Villa

PROJECT PROFILE
UK21-248

mainmark

INDUSTRY
Residential

STRUCTURE
Three-storey semi-detached, Victorian brick house

PROBLEM
Differential settlements

LOCATION
Greater Manchester, UK

DURATION / YEAR
1 day / 2020

TECHNOLOGY
Teretek®

BUSINESS UNIT
Mainmark UK

Summary

A semi-detached, three-storey, Victorian villa in Prestwich, Greater Manchester had been gradually experiencing differential settlement, for over 30 years. The owner was concerned that if left untreated, the visible cracking that had appeared would worsen and was planning ahead in case they decided to sell the property. They wanted to carry out remedial work now, to prevent any future movement and show prospective buyers that the issues had been remediated.

The homeowner had researched alternative options and already approached another well-known contractor who had taken time to respond. The client required a company that could respond quickly and work with them to help resolve the issues. Following an initial phone briefing with the client, Mainmark offered a budget price by email, subject to a site visit, that provided as much information as possible, so that the client understood the process and how Mainmark would approach the work.

Mainmark's subsequent site inspection indicated that wall settlement was up to 20mm in some places, and the total length of the foundations that needed treatment was approximately 8 lineal metres. This included the front right-hand side of the porch footings, the length of the exterior hall wall and the front elevation of the living room.

Work on replacing the original clay drains adjacent to the treatment area had already taken place prior to the inspection and a new drainage system had been installed. The main section of the house was also supported over a cellar, whilst the hall was constructed over concrete strip footings.

Objectives

The homeowner's primary goal was to support the structure and improve the load bearing capacity of the ground to help protect against future movement.

Solution

Mainmark was required to undertake full ground stability pre-tests and a level survey. The ground treatment plan was designed to increase the bearing capacity of the ground under the foundations where movement had occurred in the past.

To do this, Mainmark undertook DCP (Dynamic Cone Penetrometer) testing at the site with the pre injection test demonstrating poorly compacted subgrade to 1.5m below ground level. Following the resin injection process, a post injection test was carried out which demonstrated a significant ground strength improvement.

To rectify the issues, Mainmark's proprietary non-invasive Teretek® resin was injected in six locations from 1.5m to 2.5ms down at each location to fill any voids and reinforce the weak ground. To help ensure even distribution, injection took place at each point until laser measurements indicated a positive lift of between 2 and 4mm along the length of the treated areas. A drainage engineer was also present and carried out CCTV drain surveillance whilst the resin injection process took place to ensure no resin entered into any cracks or joints in the drains during the injection process.

The ground strength post-test carried out by Mainmark showed a marked improvement and the project was completed within just one day. Mainmark delivered the important ground improvement as a priority and was also able to raise the structure by 4mm which generated noticeable crack closure. After completing the works, all injection holes were grouted and the drains were checked and declared clear as required. The project was completed on time and in budget, faster than alternative solutions could have provided.

Homeowner, Vincent Holt said: *"My three storey Victorian property had suffered some historic movement in one corner of the house. I had put off for years having any work carried out on it as I assumed it would involve significant underpinning with concrete, consume large amounts of cash I didn't have and be 2 weeks of major disruption. Then I heard about the resin injection process and called a couple of companies to get a survey and quotation.*

Mainmark stood out head and shoulder over the rest because of how friendly and responsive they were. The inspection was carried out efficiently and my questions were quickly answered. Within 2 weeks of accepting the quotation I had a team on site, working professionally to reinforce the soil and improve ground strength under the foundations. They closed up the cracks and carried out pre and post ground stability tests and showed me the resultant improvements. The delivery team were a credit to Mainmark; they were polite, had many years of experience between them and knew exactly where to inject to get the best results. I would highly recommend Mainmark to anyone wondering who to hire for this work."

Corner of house re-levelled

Step crack closed up and repaired