

# RESTEK

## Fearon Hall Loughborough

### Underpinning/ Ground Stabilisation

#### The Problem

The original hall was constructed in 1890 and the front section including the current main entrance, staircase and side rooms were added in 1910.

Structurally the original hall showed no signs of distress or undue movement, however the newer front section had a significant problem in the North East corner with settlement and cracking.

We believe that about 30 years ago the high-level tie rods in the Paget Room were added and the masonry movement joint to the side elevation introduced.

Given the visible opening up of the movement joint and recent nature of the cracking within the Paget Room it is clear that the measures taken had not addressed the cause of the settlement and that ongoing movement is occurring.



The structural underpinning that was required at Fearon Hall meant we had to carry out resin injections to the North and East external walls and to all four walls of the basement.

To start we marked out all the areas that were to receive the resin injection and removed all the dirt, dust laitance and contamination with suitable separating effect from the areas that would receive the resin.

We then started a drilling pattern and installed a combination of high pressure bore packers, surface packers, mechanically fix and bind with bonding adhesive.

The injection consolidates the ground beneath the foundation approximately 4-5 metres below ground level.

The consolidation generated a safe ground bearing pressure at the underside of the foundation.

We found that the areas requiring structural repair could be repaired by helical stitching. The stitching bars and anchors provided a permanent solution for the masonry repairs and crack reinforcement.

We used this method as our stainless-steel brick ties and anchors have a tensile strength within the 1050-1200N/mm<sup>2</sup> band and a spiral twist that permits a degree of torsional yield within its elastic limits. Anchored across the fractures, the helical stitching ties progressively accumulated building loads and disperses them back into the structure to strengthen cracked walls.



As the images show there was also a lot of damage to the inside of the Fearon Hall due to the movement of the building.

Internally, the first-floor pageant room had a lot of cracking. We solved the cracks by raking out and filling the cracks with an epoxy repair mortar. We then as an addition plastered the walls before redecorating them with emulsion back to their original colour scheme.

Internally the basement also needed a new concrete floor, before commencement we needed to remove the brick paved floor that lay there originally.