

# JOG and Teretek® used to raise and re-level a 3,700m<sup>2</sup> warehouse



## INDUSTRY

Industrial

## STRUCTURE

Warehouse

## PROBLEM

Subsidence

## LOCATION

Pontefract, Yorkshire, UK

## DURATION / YEAR

12 weeks / Oct-Dec 2019

## TECHNOLOGY

JOG Computer-Controlled Grouting and Teretek®

## BUSINESS UNIT

Mainmark UK

## Summary

Ultima Furniture, a high quality, bespoke kitchen manufacturer, recently purchased a large 3,700m<sup>2</sup> warehouse in Pontefract. Previously, the building was used by a manufacturer of conveyor belts and was built on 20m of made ground in an area that had a history of mining activity. The facility was experiencing subsidence and had visible signs such as concave dishing (bowl-like shapes) appearing throughout the concrete floor, a large crack in the brickwork and buckles in the external cladding. The roof drainage was also compromised as the building tilted severely towards the rear.

During the preceding 10-15 years, the building had subsided by 353mm below its original level, making it unsafe for workers. As a result, Ultima required a cost effective, time-efficient solution that would allow the facility to continue to be used safely.

Alf Ellis, owner of Ultima Furniture, was considering several options with the two main solutions being: demolition and rebuild; or ground remediation to re-level the building and help arrest the subsidence. Demolishing and rebuilding the warehouse would be time-consuming, costly and therefore unfavourable.

Ultima decided to address the subsidence using Mainmark's non-invasive, innovative technologies; JOG Computer-Controlled Grouting and Teretek® resin injection as this bespoke combination would allow for the desired outcome with minimal intrusion to the building. This method also allowed a portion of the building to be used by Ultima Furniture during the lifting process.

## Objectives

The primary objective was to restore the warehouse as close to the original level as possible. The warehouse required a considerable lift of up to 325mm in the worst affected area, with a timeline of just 12 weeks, making this Mainmark's largest project in the UK to date and one of the largest re-level projects globally.

## JOG and Teretek® used to raise and re-level a 3,700m<sup>2</sup> warehouse continued



*Large crack in floor between concrete slabs*

### Solution

The warehouse consisted of two structures side-by-side which created a large 3,700m<sup>2</sup> open plan space on the inside. One end of the building housed an office and staff amenities area, pallets and packaging. The actual treatment zone was 3,000m<sup>2</sup> across two thirds of the two structures, with the most significant subsidence occurring gradually towards the rear of the building.



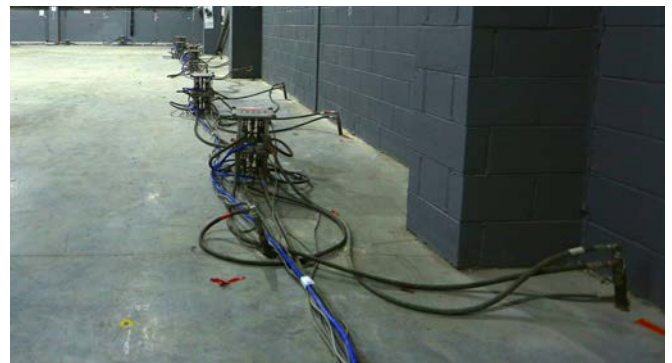
*Rear corner of site experienced significant subsidence*

To facilitate an even, controlled lift of the building, Mainmark simultaneously used two of its advanced solutions, JOG Computer-Controlled Grouting and Teretek resin injection. JOG Computer-Controlled Grouting was used for the main lift of the perimeter and central spine pad foundations, while Teretek was used for re-levelling and void filling under the floor.

The compact, modular nature of Mainmark's equipment was also essential to the success of the

project as - a bit like Lego - it can be broken up, moved around, or put all in one area; allowing flexibility for site specific requirements. Therefore, Ultima was still able to access stock and take deliveries while Mainmark carried out the remediation works.

The project began with the installation of project specific JOG equipment, with two injectors at each pad location, allowing adequate coverage and control during the re-levelling process. A dedicated area was nominated for the pumping equipment as well as the computer control station.



*JOG Androids strategically placed to give adequate coverage and control*

The Teretek resin mobile rig units were located both inside and outside the facility, which allowed coverage of the entire treatment area.

Two Trimble S8 stations were deployed together with 36 wall-mounted prisms and 14 floor-specific prisms to monitor and record level data during the re-levelling process. The S8 stations recorded level-data from each prism strategically placed around the warehouse. One station monitored the wall-mounted prisms along the perimeter and centre of the building, while the second station monitored the floor prisms. The stations sent the captured data to a computer in real-time, showing lift over time for each prism.

Deploying the two stations on site allowed increased efficiency as continuous monitoring of the building streamlined the gradual lifting process, enabling immediate adjustments to both the JOG and Teretek lifting processes.

## JOG and Teretek® used to raise and re-level a 3,700m<sup>2</sup> warehouse continued



*Trimble stations monitor and record level data during re-levelling*

The millimetre precise control offered by Mainmark's JOG Computer-Controlled Grouting and Teretek resin injection technology enabled the substantial lift of the warehouse's foundation and floors while helping to ensure the integrity of the building was kept intact throughout the re-levelling process. The project was completed in a time-efficient and cost-effective manner, well within agreed budgets and timeframes, achieving a maximum lift of 325mm.

Mainmark's award-winning ground engineering solutions offer cutting-edge benefits to commercial properties. The speed and non-invasive qualities of solutions such as Teretek and JOG Computer-Controlled Grouting can help raise, re-level and re-support a building, saving companies time and money.

Simon Clayton Human Resources Manager at Ultima said: *"The subsidence to our 40,000 sq. ft. warehouse facility posed a safety risk and impacted our storage capabilities."*

*"We knew repairs needed to be undertaken before we bought the warehouse and so competitive pricing was favoured, but more importantly, we wanted to ensure the work was completed to a high standard. We emphasised that the work needed to be completed quickly and correctly in order for the space to be used by Christmas."*

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*"Ultima is a technology focused business and automation is at the heart of our production. Mainmark's advanced technology was a great option for us as it aligned with our culture and we were keen to see it in action."*



*Mainmark's advanced JOG computer technology*

*"The Mainmark team took the time to explain the process, answered all my questions and outlined the space they would need to undertake the project. Nothing was too much trouble and there was no disruption to our business as we were still able to store products in the warehouse while work was underway."*



*Small equipment footprint allowed business to continue with minimal disruption*

*"Before choosing Mainmark, we researched their solution and assessed the reviews. I'm glad we chose to work with them, I would absolutely recommend Mainmark and the result was perfect. Once the lifting process was complete we were able to fully move in straight away, it's exactly what we wanted and nothing was too much trouble."*