

JOG and LPDG used to Re-level a Commercial Building

INDUSTRY

Commercial

STRUCTURE

Factory and warehouse

PROBLEM

Floor subsidence

LOCATION

Sheffield, UK

DURATION / YEAR

42 days / 2016

TECHNOLOGY

JOG Computer-Controlled Grouting and Low Pressure Deep Grouting

BUSINESS UNIT

Mainmark UK



Summary

A sizeable section of a large commercial building had suffered differential settlement of up to 156mm. Staff facilities and amenities areas, as well as offices above, suffered during this settlement with cracks opening and floors sloping severely. The building had been founded on compacted fill placed at the conclusion of open-cast coal mining.

Objectives

The project comprised of two main parts:

1. To re-level the large section which had subsided.
2. Treat the ground down at depth by filling any potential voids to minimise the likelihood of further settlement.

The two tasks were to be completed as soon as possible, avoiding impact on the complex building and its occupants.

All the works had to be carried out while the production and operation remained active as business interruption was not an option.

Solution

JOG Computer-Controlled Grouting (JOG) re-levelling system was first utilised to level correct the building. The precise computerised control of the system allowed complete level correction without disturbance to the surrounding areas.

During the second phase, Low Pressure Deep Grout (LPDG), was utilised to fill voids at depth without fracturing the cohesive soils of the compacted fill material.

Injection rods were inserted in sections at 112 locations down to 6m. Grouting took place at 1m intervals in a bottom up process. The grout was introduced at low designed pressures allowing voids to be filled without fracturing the soils or creating uplift.

The structure was re-levelled and voids filled successfully, returning the building to design levels while the building remained occupied.



To allow real time lift data a robotic survey station was established adjacent to the building collecting level data from the many survey prisms set up on the building exterior.