

Bilston Academy, Bilston, Wolverhampton—Mine Workings Stabilisation

Client: Wolverhampton MBC

Designer: Johnson Poole & Bloomer (JPB)

Value: £1.2m

Date: Mineworkings treatment was carried out in 3 phases during the academy re-construction;

- October 2009 – March 2010, September 2010 – March 2011, February 2013 – March 2013

The site is in an area of known intensive mining with records of several coal seams having been worked on the site, in particular the Thick Coal, Heathen Coal, Stinking Coal, & New Mine Coals. Working under the Wolverhampton Metropolitan Borough Council Term Contract for Mineshaft & Ground Stabilisation the project was carried out to locate and treat all mineshafts on the site and also to investigate and treat shallow mine workings prior to construction of the new academy buildings.

It was anticipated that a number of potentially deep unrecorded mineshafts may be present on the site and in order to ensure that all shafts were located and treated, whether recorded or unrecorded, a 1m centred probing grid was carried out across the whole site;

- 14,100 nr probe holes were completed (28,033 m drilled).

The probing investigation proved the location of 4 known recorded shafts but also located 29 unrecorded mineshafts between 20m and 80m deep.

- 33nr mineshafts treated
- Shafts were drilled 3 times to full depth and stage grouted
- 91nr treatment boreholes in total (2,826 m of drilling)
- 2,900 Tonnes of grout @ 10:1 PFA:OPC used in the shaft treatment
- Shaft treatment was carried out from fully designed steel drilling platforms with drilling personnel protected with harnesses and fall arrestors in case of shaft collapse

Due to the depth of fill on the site of up to 10m grout caps were constructed over the shafts in the deep fills.

- 33nr grouted caps completed
- 1101 boreholes drilled (9,741.50 m drilled)
- 770 Tonnes of grout @ 5:1 PFA:OPC

17 investigation holes were initially drilled to provide better information on workings, migrated broken ground, seam depth and dip. Information from these boreholes was used by the Engineer to confirm the shallow mine workings stabilisation design for the building footprints. This involved treatment between 26 and 32m depth carried out on a primary 6.0m grid with secondary centre holes giving an effective 4.25m treatment grid.

- 1190nr boreholes drilled (34,200 m of drilling)
- 8080 Tonnes of grout injected at 10:1 PFA:OPC

Up to 7 rigs were resourced to site during the work with probing and treatment work being carried out concurrently. Water flush was used for all drilling in line with Coal Authority & HSE guidance on Managing the Risk of Hazardous Gases When Drilling.

