



Case study 7:

abandoned mineshafts located and filled



KEY FACTS

- ▶ Up to five mineshafts potentially present within the development site
- ▶ Previous investigations had been unsuccessful, and the area could not be developed as the shafts had not been located
- ▶ GRM located four out of five shafts
- ▶ The four shafts were successfully located, filled and capped
- ▶ Investigation revealed indisputably that the fifth shaft was an old well

The challenge

GRM's client proposed to develop the site of a former steel works with light residential structures and associated infrastructure. However, Coal Authority records showed the possible presence of up to five mineshafts, as well as coal workings within five seams of coal at 60m to 160m depth. The shafts and coal workings were a major cause for concern with regard to surface instability that could potentially cause problems for the development.

Although previous probe drilling exercises to locate the shafts had been unsuccessful, there was still good reason to suspect their presence. GRM's task was to prove unequivocally whether they existed and if so, their exact locations and to treat them to remove the risk they posed.

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The solution

Relevant abandonment mine plans were reviewed and approximate locations of four of the five shafts determined. The fifth shaft was not shown on the abandonment plans, and was believed to be recorded based on Ordnance Survey mapping.



A probe drilling scheme was carried out to locate the mine entries. By combining all the relevant plans and information from various sources including Coal Authority mining reports, OS mapping, abandonment plans and previous site investigations, GRM were able to identify 13 possible locations within the development area.

At each possible location, probe holes were drilled and progressed to rockhead over a 10m x 10m area, the spacing of the grid having been determined by the anticipated shaft diameters.

Four of the five mineshafts were located, but the fifth shaft remained undiscovered. The spacing of the grid was reduced, but still no evidence was revealed. As this shaft was marked on an OS map and not on the abandonment records, and since it was in the area of an old sand pit, it was conjectured that it was actually an old well. This theory was proved during demolition when a well was located in the approximate area of the 'shaft'. GRM were able to inform the Coal Authority that the fifth shaft had been erroneously recorded and it was consequently removed from their records.

The four mineshafts that remained and posed a threat to the development were successfully drilled and grouted throughout their entire length. Boreholes were drilled to check that all the shafts had been successfully filled prior to the shafts being capped.

All works were carried out under the supervision of an experienced GRM engineer.

The coal seams that were reported were also proven by probe drilling not to lie within influencing distance of the ground surface and no further investigation or grouting was deemed necessary.

Conclusion

Previous attempts to develop this site had failed, as the locations of the five possible mineshafts could not be determined. GRM's thorough investigation and meticulous attention to detail enabled them to locate four of the five shafts, and prove beyond doubt that the fifth shaft did not exist.



The located shafts were successfully filled and capped, and all risk to the development was completely removed - allowing the client to proceed with the project as planned.

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