

Advice for Local Authorities on what action to take when a sinkhole appears

In the event of a sinkhole appearing, in the immediate aftermath the following action should be considered:

- ensure area and a safety perimeter are cordoned off to keep people away;
- notify the landowner and/ or emergency services as appropriate;
- where services pipes, e.g. gas or water are left suspended, contact infrastructure managers e.g. www2.nationalgrid.com/uk/safety/ and www.unitedutilities.com/emergencies.aspx
- where infrastructure e.g. Transport, ICT are within 50m, contact infrastructure managers e.g. Network Rail, Highways Agency, Local Authority transport departments, BT
- manage any triggering processes, e.g. leaking drains to minimise the potential for ongoing subsidence;
- contact the Council-Building Control to find out any history of sinkholes in the area, and request a list of consulting engineers for advice on the correct stabilization procedures;
- inform the British Geological Survey for their records on these events <https://britishgeologicalsurvey.crowdmap.com/reports>.

If the concern is about whether a sinkhole is developing on a specific property the following action should be taken:

- monitor any suspect depressions;
- check that there are no obvious potential triggering mechanisms, e.g. leaking pipes, downfall pipes from roofs;
- check for any associated cracks in adjacent buildings; and
- seek guidance from the Council- Building Control as indicated above.

For further information on sinkholes consult:

- General: www.bgs.ac.uk/science/landUseAndDevelopment/shallow_geohazards/SinkHoles.html
- Specific home owner advice: www.bgs.ac.uk/services/services_for_you/homeowners/home.html

In filling in the sinkhole, the following should be considered:

- A **full ground assessment undertaken by a chartered geotechnical engineer or engineering geologist** prior to filling.
- Determination of the **size and scale** of the sinkhole to enable the right solution to be designed for backfilling and the impact on the ground (e.g. groundwater).
- Different solutions depending on whether the sinkhole is formed naturally or from a man-made influences (e.g. mining).
- Properties of the backfill material needed to provide strength and/or flow to fill cavities.
- Presence of local infrastructure and monitoring of the solution during and after backfill.
- The backfill solution does not result in temporary bridging of the sinkhole that could be reactivated.
- Typical backfill materials can be granular material or bulk grouts or even foam grouts, but this is **very** dependent on the local conditions found at the site of the sinkhole.
- In rural locations many sinkholes are backfilled with refuse and could be a source of ground contamination.

A good example of a project that has undertaken grouting is at:

www.rwe.com/web/cms/mediablob/en/217886/data/0/3/PFA-used-to-infill-disused-mine-workings-in-the-West-Midlands.pdf;

and an example of grouting techniques can be found in:

www.keller.co.uk/services/grouting.aspx