HOMEOWNERS' GUIDE TO ACSW GROUND STABILITY INVESTIGATIONS

Guidance Note SSGN028

Purpose of this Guidance Note

Advanced Continuous Surface Wave (ACSW) testing is a new way of investigating the stability of the ground beneath or around a property without the need for drilling boreholes. The purpose of this guidance note is to provide information to homeowners who may be thinking of asking for an ACSW investigation or who have received an ACSW ground stability report. The guide briefly explains how ACSW testing is carried out and the information which an ACSW investigation provides. It also sets out some of the limitations to ACSW data and some of the specialist advice that might be needed to review the findings the investigation.

More information on ACSW testing is available on the SoilSafe website, www.soilsafe.co.uk , and we will be happy to talk to you to explain further, but you may need to seek separate specialist advice from a geotechnical engineer to decide if this is the most appropriate form of investigation. *A list of geotechnical consultants is provided by the Association of Geotechnical and Geoenvironmental Specialists at www.ags.org.uk* .

Please remember you should always speak to a chartered building surveyor first if you are worried about the condition of your property – see the RICS website www.rics.org for more details. **Your solicitor will be able to help if you have concerns about possible issues with the stability of the ground, the effect on the value of your property or your responsibilities to your neighbours.**

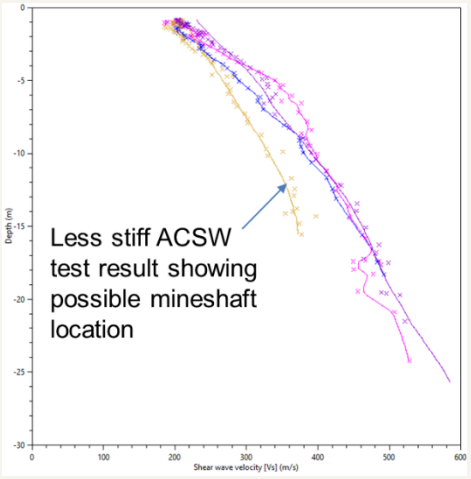
What is ACSW Testing?

Advanced Continuous Surface Wave (ACSW) testing uses surface vibrations ('surface waves') to build up a profile of the stiffness of the ground. The vibrations are generated by a 'shaker' and measured by 6 vibration-detecting 'geophones'. Each test measures the stiffness of the ground over a 3m length and can normally provide a profile to around 10m depth below ground level. There is no digging or drilling involved, and testing can even be carried on solid floors inside buildings (as long as the floor rests directly on the ground beneath).

Where there is a possible problem with the stability of the ground, ACSW testing is carried out at number of locations around the property to investigate

the stiffness of the ground – areas of lower stiffness can suggest possible problems with the ground that might affect the property.

What kind of information on ground stability can ACSW testing provide?



The stiffness of the ground affects how much it moves under the weight of buildings. Soft ground (like soft clays, loose sand or peat) will compress much more than stiff ground (such as stiff clays, dense sand or solid rock). If there are differences in ground stiffness beneath a property, then parts of the building may gradually settle at different rates causing cracking and other damage to the building. ACSW testing can pick up these kinds of differences in the stiffness of the ground.

Where ground has been disturbed (for example after mining or quarrying or where there are natural sinkholes) this can result in less stiff material being present and ACSW can identify this by comparing results with tests on undisturbed ground.

Where there are underground voids then this affects the quality of the ACSW data since the vibrations cannot easily travel through the ground. Locations of tests with very poor-quality data can therefore highlight possible mineshafts, sinkholes or other buried features.

However, ACSW can only provide information for the locations tested and up to a depth of about 10m below ground level. There may be some locations where it isn't possible to test or there may be features below the depth of the test. Very small features, less than about 3m long and 1m high, may also not be detected by ACSW. *ACSW cannot provide information on subsidence due to shrinkable clays or trees – you should speak to a building surveyor about this.*

A ground stability report or building surveyor's report is needed to make sure that ACSW is the right technique for the investigation and to pick the test locations. Testing needs to be carried out right on top of features that might be a concern – for example possible mineshafts - so as much information as possible on location of any of these features is needed.

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What should I do with an ACSW investigation report?

As well as the detailed technical results of testing, the ACSW ground stability investigation report includes a non-technical summary giving as much simple-to- understand information as possible on the stability of the ground from the testing completed.

Depending on the results, you may need to get more advice from a geotechnical engineer to decide if any further investigations are required. If you have a building surveyor, you should pass the report on to them. An ACSW investigation report cannot tell you about every risk to your property. A geotechnical engineer or building surveyor will be able to help advise you if there is anything else you need to consider. If you are selling your property, you should make sure your solicitor has a copy of the ACSW investigation report; they may need to provide it to any purchasers.

Frequently asked questions on ACSW

What do I need to do before testing?

We will discuss arrangements with you before we arrive, but please make sure that there is somewhere for the test vehicle to park and that any areas to be tested are clear. A cleared, level area about 1m x 6m is needed for each test, plus a clear walkway to wheel equipment into position. Inside properties it may be necessary to roll back carpets to expose the floor. Please make sure any fragile or valuable items are moved out of the way. We will not be able to test where we cannot safely get our equipment into position. To minimise noise, we may ask to use your electricity supply to operate the equipment rather than our portable generator.

Can I stay in my property during the testing?

Yes, as long as you can make sure you keep clear of the testing area and are not at risk of tripping over any of the cables. Please make sure any children or animals are kept safe and away from the test area during the testing – they could be worried by the noise. Each test takes only around 20 minutes, and we will normally complete testing over a single day (around 12 tests).

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Will the testing cause any damage?

Apart from a slight depression in soft ground there will be no damage from testing operations. We will not test on any very delicate surfaces that could be damaged; please let us know.

On sites with very unstable ground there is always the very small risk that ground could collapse spontaneously, for example after heavy rain. However, ACSW does not involve penetrating the ground and the level of vibration from the 'shaker' is only about the same as a washing machine, so it is much lower risk than the drilling of boreholes.

Should I let my neighbours know about the testing?

There is some noise and vibration from ACSW testing (similar to a washing machine on spin) and explaining what is going on to neighbours may prevent any concerns they have. It is much better to speak to your neighbours rather than allowing them to worry.

How quickly will I get the results from testing?

We can give initial feedback on site and normally provide our full report within 2 weeks of completing testing.

Can ACSW prove there is not a problem with my property?

An ACSW test can reduce the level of risk to your property, for example by showing that ground conditions at all test locations show similar stiff ground. Unfortunately, no investigations, even by drilling boreholes, can ever prove absolutely that there are no stability problems because they cannot test all of the ground beneath the property. It is always possible that there are nearby areas which have not been investigated, including on your neighbours' land, which could affect your property.

What happens if the testing indicates that there might be a problem with the ground?

This depends on the nature of the possible ground instability. You will need to get further advice from a geotechnical engineer or building surveyor, but we would discuss this further with you. In some cases, a borehole investigation may be required.

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Important Information

Before buying any property, you should always seek proper advice on the risk from ground instability. A ground stability search report will tell you if there are risks you should investigate, and a building survey will check for any damage to the property. Check that your insurance will cover risks from ground movement. Your solicitor can provide more advice.

If you own a property, remember that even on sites with a history of ground instability risks of injury from ground movement are extremely low provided that you take sensible precautions. *Always get professional advice if you see any signs of possible damage to your property which might be caused by ground movement (such as cracking or unexpected difficulty opening doors or windows) or where unexplained holes or depressions occur in the ground.* Often these may not be serious problems but it its always better to be safe. If you are worried about anyone's safety, make sure everyone leaves the area immediately and dial 999.

For more information visit our website, email info@soilsafe.co.uk or call us on 0800 774 7414.