



# ASUC recommended minimum site investigation for typical domestic 1, 2 and 3 storey buildings

A survey of ASUC members has revealed the following statistics:-

- 74% of all underpinning projects increase in value
- The average increase is 27%
- Smaller projects suffered larger proportional increases and this correlated strongly with less adequate site investigations

The purpose of these recommendations is to reduce the overall costs to insurers by recommending a bare minimum standard of investigation whilst accepting that “full” site investigations are rarely carried out and in the majority of cases would not be economically justifiable. If these recommendations are implemented, insurers will enjoy a reduction in overall costs. However, a minimum investigation (and for that matter a “full” investigation) cannot foresee all problems and while increases will be reduced from present levels, some increased costs must still be anticipated.

Our recommendations are very much minimum requirements and should only be carried out by an expert who is well versed with subsidence problems and who has a good knowledge of the area in which the problem is located.

**The purpose of the investigation is to:**

1. Identify the extent of subsidence/heave
2. Identify the cause of subsidence/heave
3. Identify the foundation ground and water conditions in the areas of subsidence and / or heave
4. Identify some underpinning scheme options
5. Identify a suitable bearing stratum including ground and water conditions within which the underpinning system will be constructed.

Only when the specifier has answered the above questions will the risk of cost over-run's be reduced.

**Our recommendations are as follows:-**

**STAGE 1**

**Walk around survey**

Identify extent of distressed areas and question whether heave or subsidence?

Identify drainage, basements, trees and any topographical or constructional features which may be responsible for the problem. Contact those who have local knowledge, eg the Local Authority. Remember the property itself is a full scale test model and an enormous amount of information can be gained at this stage.

**Construct Trial Pits**

One number trial pit per 8m of external or internal wall exhibiting signs of distress. (The number of pits being rounded up, i.e. 1 pit for 5m, 2 pits for 9m). In addition, excavate one control pit to an area without distress.

Pits should expose the foundation profile, the underside of foundations and should extend a minimum of 0.5m below underside of foundations. *Reporting to include comments on quality and type of concrete, brickwork, mortar and any damage. Report on soils together with ground water strikes, flows and standing levels. To internal walls*

*include slab/concrete thickness, reinforcement and the depth below any suspended flooring.*

All Pits should be extended with a hand auger wherever possible.

### **If relevant, test drainage**

### **Soil Testing**

In clay soils take pocket penetrometer readings at 0.5m intervals together with samples for moisture content tests. If shrinkage/swelling is suspected instruct Atterberg Limit tests from a sample immediately below footings and at least one further representative sample. Instruct further Atterberg Limit tests with a change in clay lithology.

### **Study geological drift map and link with findings of excavations**

Can questions 1 to 5 above be answered? If yes go to Stage 3, if no go to Stage 2.

### **STAGE 2**

Continue or recommence investigation work until the information from (1) to (5) above has been obtained. This may involve extending the trial excavations, constructing bore holes, carrying out further testing, dynamic probing, structural monitoring or other means. For example, if a piled scheme appears to be a preferable option, then carry out sufficient investigation to allow a reasonable estimate of pile lengths.

### **STAGE 3**

Once sufficient information is obtained to answer questions 1 to 5

#### **either**

- a) invite tenders on the basis of a design/specification you have produced including the site investigation information

#### **or**

- b) invite design and construction packages on the basis of the site investigation and a stated extent of underpinning work.

### **Points of caution**

1. In areas where the expert knows his/her area, borehole construction to the pile depths may not be required. It should, however, be borne in mind that even in areas known to the expert, ground conditions can vary enormously.
2. Do not terminate boreholes simply because they are obstructed – learn the cause of the obstruction and underlying soils.
3. Always note ground water levels and inflow wherever possible.
4. Always provide full geological descriptions of all soils encountered in accordance with BS5930.
5. Remember the above are very much "minimum recommendations" and while the BRE, NHBC and Codes of practice are rarely followed, we recommend that they are consulted and the scope of these minimum recommendations expanded as may be appropriate for more complex and larger projects.

***ASUC TIP: Ask your SI Contractor to provide package deal prices  
- this should reduce costs.***