

BUILDING DAMAGE

SUBSIDENCE (& HEAVE)!

Subsidence; is the downward movement of the site on which a building stands – where the movement is unconnected with the weight of the building.

Heave; is the opposite effect of subsidence, that is to say when the site upon which the building stands moves upwards.

www.subsidenceforum.org.uk

By the time an owner recognises (usually by seeing cracks or feeling a sloping floor) that a building is at risk from ground movements, some damage will have already taken place. It then becomes a question of: does it just need a quick repair? ... Or does the insurance company need to be contacted to sort out the cause and prevent more damage? Although most buildings experience minor movement over time, cracks over 5mm that do not close or continue to open wider (i.e. active cracks) indicate a more serious problem.

Properties with visible damage are often not mortgageable, and may even have a value of zero placed on them by valuation surveyors (with a recommendation that the owner must call in qualified specialists to assess and undertake repairs). This is all well and good if the property carries insurance and the owner can be patient to resolve the issues. It's more likely that problem properties are sold off quick (as cash purchases) possibly for sale at 50% of their real worth at auction or via a sourcer to an investor. These properties can offer great potential for a careful investor, however a little knowledge and due diligence is vital.

WHAT CAUSES SUBSIDENCE AND/OR HEAVE?

Damage to a foundation by subsidence and/or heave is usually a result of changes in soil volume and/or the amount of water present in the ground. Soils with a high clay content contain very small particles (<0.002mm across) and can absorb water and swell, but also lose moisture content and shrink. Hence, some clay soils are more susceptible to shrinkage and swelling than others. It's also worth noting that the depth to which this type of ground movement occurs is usually restricted to the upper 1.5m-2m of the soil. Trees are the main cause and are responsible for some 60% of subsidence, while soil shrinkage in general accounts for about 75% of subsidence claims.

Conversely, if a clay-type soil becomes wet and rehydrates it can swell or heave. This can occur seasonally or over time, if for example a sewer leaks or a tree is 'removed' without too much thought. This process can take many years but damage from 'heave' is often regarded as more severe than damage from subsidence. Leaking drains and pipes are the second highest cause of property damage accounting for about 15-20% of subsidence or heave incidents.

Although there is usually no apparent volume change with sandy, gravelly soils or on rock, subsidence can result with a loss of physical support. Examples of this include a mining collapse, or strong floods washing away fine soil particles from gravels, or when chalk/limestone rocks dissolve away, or even when organic rich peaty soils dry out and shrink.

It is notable that construction on landfill and mistakes by builders are the largest cause of failure in newly built property, which is commonly considered to be 'settlement'.



Mark Doyle

Mark is a Chartered Engineer who moved into property full time following a serious rugby injury in 1996. Landlords and investors since 1991, he and his wife Claire have well over 20 years of experience in buy-to-lets (BTLs), Houses in Multiple Occupation (HMO's), developments and conversions into flats and houses. They typically work on properties in very poor condition.

**SUBSIDENCE
AFFECTS AS MANY
PROPERTIES IN THE UK
ON AN ANNUAL BASIS
AS FLOODING!**



Photo 1: Subsidence cracks (widest lower down) right through property, from sagging, Lincolnshire

IS SUBSIDENCE DIFFERENT TO SETTLEMENT?

Various definitions exist of subsidence and settlement; however it is generally accepted that;

- **Settlement is the downward movement as a result of the soil being compressed by the weight of the building within ten years of construction. This is usually considered to be the result of either poor design or poor construction and somebody usually ends up being sued for damages.**
- **Subsidence is the downward movement of the ground itself, irrespective of the weight of the building.**

WHAT IS THE PROBLEM?

Damage to a structure usually occurs with unevenly distributed volume changes in the surrounding soil. For example, even a small localised 3% volume change in the soil can cause subsidence, and as little as 10mm ground movement can lead to damage in buildings, floors, walls, basements, drains, manholes, cesspits, etc.; some of this damage can be very serious.

Although simplistic, to aid understanding of subsidence, cracks are usually caused by the building either tilting or arching or sagging.

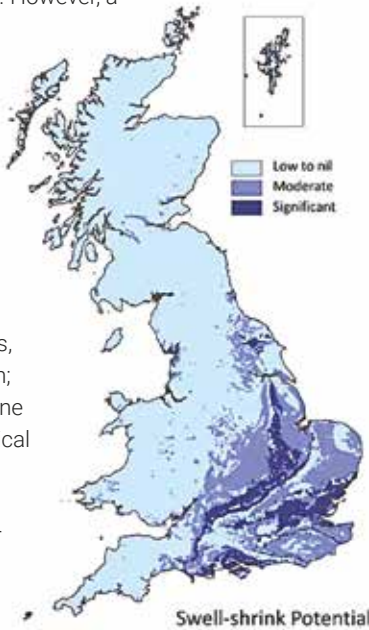


Photo 2: Heave vertical crack (widest higher up) Convex upward bending from 'tilt'. Cheshire

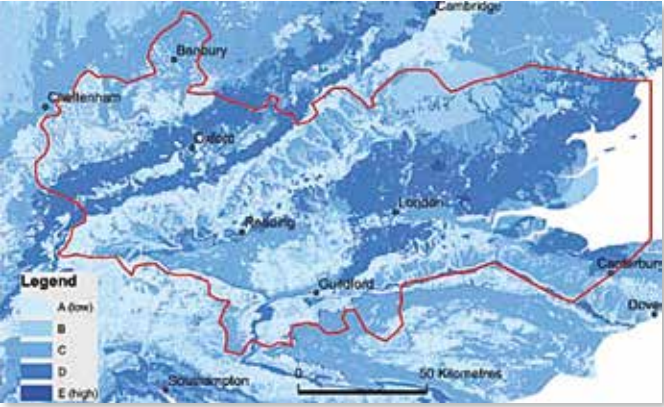
These subsidence cracks can usually be seen from the inside and outside, and are diagonal and taper through a building extending right through the damp course (see photo 1). Heave cracks are more typically associated with a small area of uplift causing a 'tilt' type effect and have a tendency to be more vertical and are usually wider higher up the building (see photo 2). However, a building can show both of these patterns of movement.

WHO IS AT RISK?

To generalise, buildings most at risk from subsidence and heave damage are those usually sited on the youngest clay soils (with the greatest swell/shrink potential) across England and Wales, in particular the south east of Britain; roughly south of the Bristol to Hull line (see Map 1, from the British Geological Survey). Of most concern are older smaller domestic pre-1965 properties, with 'shallow footings' or property with no foundation at all.



Map 1: Distribution of Clay Soils in the UK - www.bgs.ac.uk



Map 2: Thames Valley Detail showing Low to High Swell-Shrink Potential Clay soils. www.bgs.ac.uk

WHAT DOES THE INSURANCE INDUSTRY THINK?

To the finance industry, 'subsidence or heave' is not something they are particularly comfortable with. It's difficult to measure and quantify, notoriously unpredictable and expensive to sort out. Experts, each providing analysis and a study on a single claim can include an Arboriculturalist, Building Consultant, Geotechnical Engineer, Hydrologist, Loss Adjustor, RICS Surveyor, Structural Engineer, and possibly even an Adjudicator and the Ombudsman and the claim may well take years to sort out!

Usually **'where there's blame there's a claim'**, however subsidence and heave can be difficult to decipher. As an example: if while refurbishing or during construction works building damage was observed, could the ground movement be attributed to an extreme weather event? Hence, is it an 'act of God' and does **'Force Majeure'** apply, thereby removing any contractual obligation and a potential claim?

****A note on Force Majeure: originally a French term, which is clearly defined in France, but sadly there is no clear definition in British common law (unless it is specifically defined in the contract for a defined piece of work itself!). The term is commonly used to avoid blame in commercial agreements and in construction industry standard contracts; such as the JCT, NEC and ICE contracts standard form and may or may not include: unforeseen changes in legislation, wars, fires, adverse weather, civil unrest, strikes, natural disasters, epidemics, etc. Always read your contracts and check you are happy with not only the items listed but also any obvious omissions or you may not be covered for damage during the works!***

Not surprisingly, insurance company underwriters will initially use a postcode to identify and categorise insurance risk. However, sufficient detail may well be in the database available to put in place a variable but still higher excess from one end of a road to the other (i.e. from £1,000 up to say £5,000)! In the south east alone, some one in fifty houses have now recorded issues over the last thirty years and the Association of British Insurers (ABI) reports that some 350,000 buildings have been treated for subsidence and or heave damage. Subsidence and heave insurance claims now cost around £500 million a year in the UK! The ABI also believes that as many as one in five homes in England and Wales may be damaged by 2050 and the bill for

“ If something looks ‘too good to be true’, or ‘why hasn’t it sold yet’ or ‘the sale has fallen through and it’s now going to auction’, it’s important to stop and ask...why? ”

subsidence and heave claims could rise to £1.2bn a year (originally calculated at 2004 prices!).

The worst years recorded for the insurance industry were 1976, 1989, 1995, and 2003 (as a result of hot dry weather between June and September), and now every insurance policy is very carefully worded (check yours!). The Met office has also stated that 2014 was the warmest year and the fourth wettest on record for the UK; and the impact of this on ground movement and property damage claims still remains to be seen!

WHAT CAN I DO?

Firstly, if you already own a building and you think you have a problem, get some qualified advice quickly (ask for a fixed price appraisal of the problem). It's also worth seeing what your insurance document states your level of cover is. There's a good chance that other people in your area will have already had issues, so can you think of someone local that knows what's going on, a nosy neighbour perhaps?

If on the other hand you are looking to buy a building and you think there may be some structural damage, you need a structural appraisal, again from a qualified specialist. Depending on the feedback you receive, you are in a better position to make a qualified decision, and you could always 'caveat' an offer to proceed subject to additional study.

DUE DILIGENCE!

As an investor, making calculated decisions is normal, but the watch words here are 'due diligence'!

If something looks 'too good to be true', or 'why hasn't it sold yet' or 'the sale has fallen through and it's now going to auction', it's important to stop and ask...why? This is also the main reason to view a property prior to purchase and ask yourself what 'clues' can you see; perhaps a large tree or shrub, a footpath that seems to be slipping down a slope, a tight fitting door, a floor that slopes into a corner and so on. With increasing global warming driving more extreme weather events, it's predictable that property damage like this will increase from ground movement.

CONTACT DETAILS

Mark is always happy to chat with someone who has a building with a stability or ground stabilisation problem and can be contacted by emailing mark@cheshlancs.co.uk or by visiting www.cheshlancs.co.uk.