

4. **Structure** - Looking at the signs and causes of structural related defects and warning of the things that both potential buyers and owners/occupiers should be wary of and recommending a suitable course of action in the event of a failure or concern being identified. Indicating areas where structural failures have commonly occurred and giving examples of the types of defects involved.

The Property Doctor

...when is a crack more than just a crack?

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All too often we see cracks in buildings. It is not an unusual sight; after all, unless the material involved is elastic then cracking is the inevitable result of external forces, including temperature, over-loading, mechanical impact (being hit by a vehicle) or uneven support. As in 'Lego' the builder links blocks in a certain way to ensure that they bond together to form a solid structure, otherwise you may end up playing 'Jenga' - it all falls down!

But when is a crack more than just a crack? Well this assessment requires an understanding of the principles of design relevant to the property in question. You need to establish if the movement is intentional. Sometimes cracks are allowed to happen at a particular location to avoid them occurring somewhere else. Sometimes cracks are a necessary part of the curing or shrinkage process. But how do you identify a crack that is not intentional? Well to the untrained eye it's not that easy, but sometimes it can be obvious. Say for instance, bricks or stones are cracking as well as the pointing, or a sill, beam or lintel becomes affected by cracking, well in these instances it is likely that something has gone wrong. The relevance of each crack requires a better understanding of the type of structure.

In simple terms there are three common types of structure, traditional (brick and stone), non-traditional (concrete, metal, or panel etc.) and timber framed (as its name suggests). Once you are aware of the type of structure you are dealing with you are a step nearer to understanding the potential effect that any crack or movement might have on that structure. Although many possibilities exist, it is fair to say that traditional properties are most susceptible to certain structural problems e.g. foundation defects, rot due to dampness or poor maintenance, deterioration of external fabric through weathering, overloading of the structure or unauthorised and poorly undertaken alterations. A traditional building, just like Lego, relies on all of its elements working together to remain stable. If the roof or floor rots then the walls may move outwards. If the foundations fail the building can settle. If the stonework erodes to a point where it becomes unstable then cracking and loss of support can occur. If alterations are poorly carried out they can affect the original structure.

Many more non-traditional buildings have been constructed since the Second World War, the primary benefit being quicker build-times. Many were intended as temporary dwellings (pre-fabs). Most were constructed using building materials that have in the intervening period suffered from the effects of weathering and atmospheric pollutants. Because of their reliance on poorly specified materials some have deteriorated badly. Corrosion is one of the primary problems causing panel movement and failure of reinforced concrete. Great care is required in dealing with this type of property.

As for timber framed buildings; the principal issues tend to revolve around the quality of construction at day one. By its very nature, a timber frame is a highly engineered panelled construction that relies upon accurate erection to achieve its designed status. Allowances are

made in the construction for the frame to shrink in the first year or so after construction. The external cladding, be it rendered brick, block or stone around a timber frame is not of any structural consequence. This masonry cladding does not hold the roof up and is merely an aesthetic weatherproof enclosure. Often this external cladding becomes affected by cracking due to poor workmanship and sometimes in extreme cases even falls away from the building due to a lack of ties holding the cladding in position.

Another important area to mention is foundations. Generally, the ability of the ground to support the weight of the house is dependant on the foundation being properly designed. This means that the load is transferred to a suitable level beneath the ground. Even if the foundation is properly designed, over time external elements can affect its ability to do its job. These can include tree roots, underground water courses, defective drains and areas of poor ground support caused by unknown mine workings. Sometimes the foundations themselves are just not constructed properly. In older properties there may be little or no foundation. As a result nearby roadways and increased traffic flows can result in vibration related problems.

To summarise, a crack does not always mean that you have a structural problem. It is important that if you are concerned that you take advice, as cracking can mean that something may be on the move. Do not delay, as issues surrounding the stability of your home can more often be dealt with in a manner that will minimise costs, if dealt with quickly.

If you have any queries, or need to consult the Property Doctor please contact either Colin Bruce or Brian Shaw on 01383 824450 or by mobile (24 hours) on 07900 913975, Bruce Shaw Property Consultants Limited, 6 Forth Reach, Dalgety Bay, Fife KY11 9FF or visit us on-line at www.bruce-shaw.co.uk