

5. **External Fabric** - Discussing the principle types of materials involved and identifying the main causes of physical deterioration (water, atmospheric pollutants, wind etc.) and also those areas of the construction that might be potentially concealing a problem for various reasons..

The Property Doctor

...remember the three little pigs?

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...They built their houses out of straw, sticks and bricks. When the big bad wolf huffed and puffed even the brick built house came under pressure. Today we use materials appropriate to withstand our Scottish climate, a fairly aggressive environment when the temperature, wind and rainfall levels are taken into account. Many of you will have noticed the considerable difference between materials used locally and those that are seen when we visit other countries on holiday. This is no accident. If we were to build a Spanish villa or 'lightweight' American house in Scotland it would probably deteriorate very rapidly.

But how do we decide what to build a house of? Well the main criteria is the availability of the raw material, as this affects price. Historically that meant that the primary building material for external walls was stone. Normally this came from the local quarry unless the house was very grand, in which case the material might have been transported somewhat further. Later we saw the introduction of bricks made from clay, again quarried on a relatively local basis. Today with improved technology and transportation the choice is greater but still restricted by climate.

Over time data relating to rainfall, wind-speed and temperature have been collated to assist building designers appreciate what to expect in relation to specific locations. This information is used to ensure the building envelope is able to withstand the exposure requirements. In choosing the walling material it is important to consider a building will last 60+ years.

The effects of long term weathering are best appreciated by looking at deterioration of older buildings. You may have seen stonework on buildings that has eroded to the point it has required replacement with new stones. This is a result of stone being cut out of the ground and placed into a building in such a location that its ultimate deterioration is accelerated massively and occurs for various reasons. For instance, surface erosion can occur through constant wind action combined with persistent wetting and drying of the outer surface of the stone as can most often be seen at chimney level. Delamination (as its name suggests, the removal of layers) on the other hand can arise out of incorrect installation of stones and results in damage to isolated units. It is important for anyone who owns a stone building to consider very carefully how they maintain that stonework and its pointing. All too often unsympathetic repairs including the use of cement based pointing contribute to the accelerated deterioration of the wall. Under no circumstances should anyone re-point a stone wall using cement based mortar unless they have taken professional advice. Cement mortar can cause irreparable damage to most stones other than granite which is far stronger than the sandstone materials we see used in this part of the country. This damage is caused by changing the patterns of moisture evaporation on the external surface of the stone.

As for brickwork, similar deterioration can occur due to persistent wetting and drying actions resulting in frost shattering or delamination of the outer face of the material. Again the strength of mortar for re-pointing should always be carefully considered, particularly if the brick is pre 1940's. As with sandstone materials, early bricks can be weak and could become damaged by

using cement based mortar. Brickwork can also be affected by naturally occurring imperfections in the clay that cause the surface to fail locally. Another thing that is becoming more prevalent is the corrosion of metal wall ties that hold cavity walls together. Most brick houses of the last 60 years are formed using two walls separated by a cavity in the middle. The metal ties that hold these walls together may ultimately corrode causing a pattern of horizontal cracking at regular intervals throughout the height of a buildings elevation.

Render was traditionally applied to external walls to protect poor quality masonry against weathering. Today it is used extensively throughout Scotland and is rightly perceived as a traditional material. Render like every other material exposed to constant weathering will deteriorate. Preparation and detailing are everything. If the detailing is wrong then it does not matter if the material is well applied, it will fail. Render, correctly chosen, requires accurate mixing and application to stay on the wall. Render failures are common and we are often called to advise why.

Contemporary materials require strict following of manufacturer's guidance to ensure the material does its job; such systems can rely to some degree upon sealants for their ultimate weather-tightness. These sealants also require careful choice, preparation and application to avoid failure.

Maintenance of your walls will be covered in a later article. However, it is important that your gutters and any overhangs are regularly clean and well maintained, as the result of not doing so will probably be discolouration, followed by erosion and ultimately rot, particularly in older solid wall properties.

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.