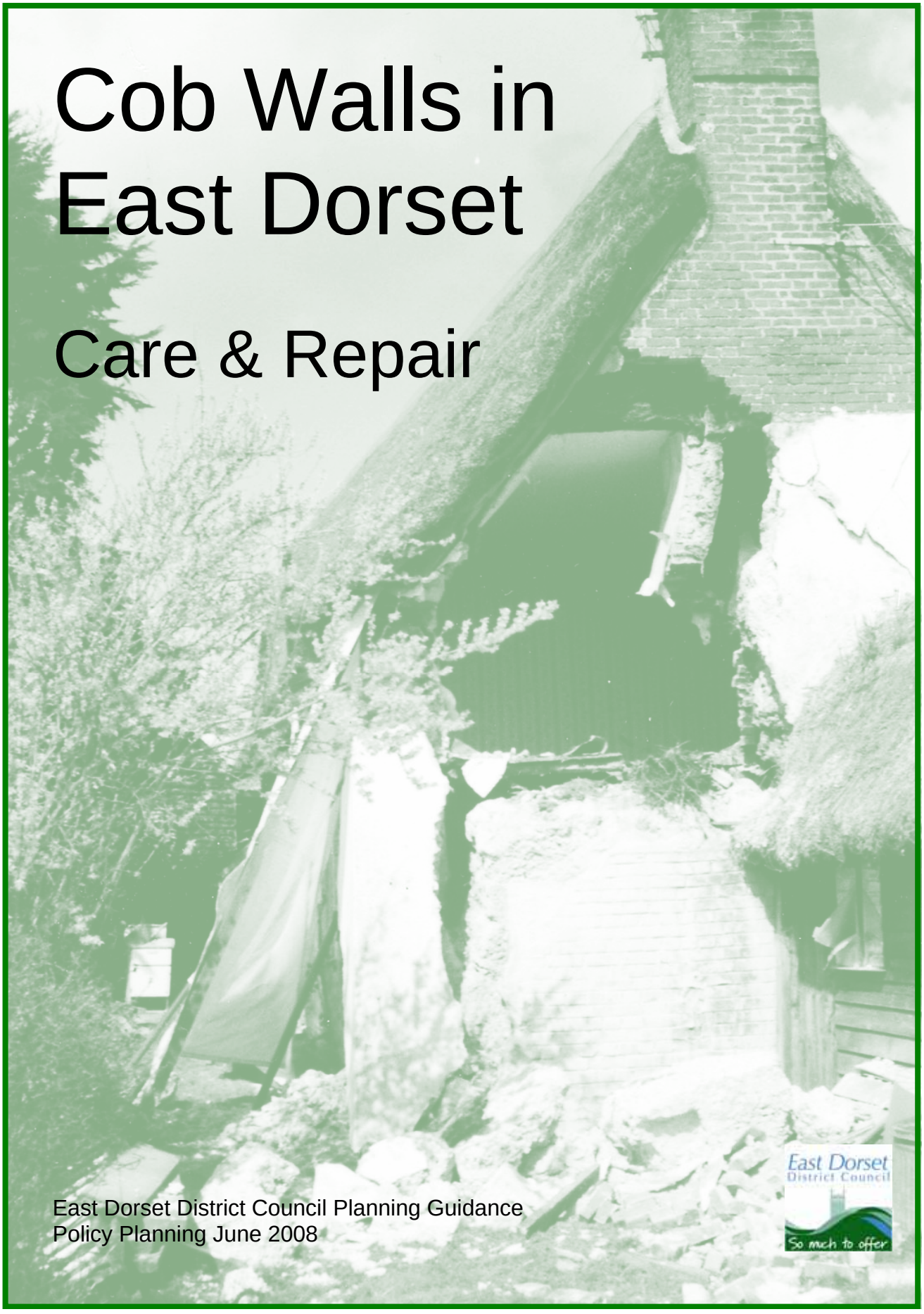
Cob Walls in East Dorset

Care & Repair



East Dorset District Council Planning Guidance
Policy Planning June 2008

Foreword

Thatched cob barn in Corfe Mullen.

There are over 60 listed cob buildings in East Dorset, but many more 'curtilage' buildings, unlisted buildings and cob walls. From time to time the Council receives requests from owners of cob structures seeking advice on how to look after them. This booklet summarises the main causes of cob failure and common techniques of repair. Importantly, it lists where local specialist expertise can be sought.

Some cracks in cob walls may not be as hazardous as they appear. Conversely, even a small crack could be indicative of a potentially serious failure. In this brief introduction to the world of cob it can be dangerous to generalize; each case needs to be assessed individually. But an understanding of the material and an appreciation of the basic principles of care and repair enables the owner to make informed choices on the best course of action and can help to avoid costly mistakes.

Cob Walling

Cob walls, as load-bearing structures and free-standing boundary walls still make a significant contribution to the character and identity of East Dorset. Together with thatch, they blend into the folds of the open countryside and create distinctive picturesque groups in villages. Cob is an 'earth material', dug locally from the ground and mixed with other natural additives. Unlike brick, it is not fired in a kiln, but simply left to dry out once it has been made into walls. It is applied in thick layers, or 'lifts', of up to 600mm in height.

The characteristics of cob are therefore quite different from modern building materials. Neglect and inappropriate repairs have caused a significant number of cob structures to fail, with the result that there are far fewer examples of cob today. The purpose of this booklet is to introduce these characteristics; outline some of the reasons why cob walls fail; and to point in the direction to where further advice and practical help can be found.

Initial signs indicating that things are not what they should be.

Properly looked after, there is no reason why the life of cob walls should not be prolonged indefinitely. The oldest example in Dorset, in Briantspuddle, dates from the late 15th century. In Devon, the county with the highest number of cob buildings, there are many much older than this.

Listed cob cottage dated 1667 in Woodlands

Most cob buildings in East Dorset date from the 18th century, although there are a few earlier examples and some as late as the mid 19th century. Originally, most of these had thatched roofs, but many have since been re-roofed in slate or tiles. Others have been faced with brick, once bricks became easily available and fashionable. This can make the identification of these cob buildings difficult.

18th/19th C rendered cob cottages in Hinton Martell.

In East Dorset there are two main types of cob material. In the chalk area to the north and west, some cob is almost pure chalk and some is clay with chalk aggregate. Outside the chalk areas, to the south and east, the cob comprises a mixture of clay,

sand and gravel. Whatever the mix it also includes straw to reinforce the material. In heathland areas, where the cob is often of amore sandy nature, heather is often found as a binder. Chalk is sometimes mixed in to add further strength.

17th C, chalk cob cottages in Pentridge.

In some areas, for example, the river valleys, there are examples of both chalk-based cob and clay-based cob. So, when carrying out repairs it is important to establish which is which and to determine the cause of failure.

Chalk cob over a high brick plinth. Note failing cement render.

Full gables in cob are rare as they are structurally weak. Half or quarter hips are a characteristic feature of cob cottages. As the walls depend on their mass for their stability, window openings are few and small in size and walls are thick. The very early ones were often 750mm thick, but commonly those of the 18th Century are around 600mm. Later walls, including some agricultural buildings, may be as little as 450mm.

Corners of buildings tend to be rounded. Traditionally, the walls are faced with smooth lime-based render (lime and river sand with animal hair added) for weather protection and lime-washed or painted off-white. Coloured walls are not characteristic of East Dorset.

19th c plastered cob cottage.

Cob walls may be constructed directly off the ground without foundations, or built off a plinth or an underpin of brick or rubble-stone. It is not unusual for such plinths to be rendered and painted black.

It is possible that some cob walls without plinths survive, but often the absence of a plinth is due to rising ground levels around the building. On the other hand some visible plinths can occasionally be misleading, as they may have been formed in later years to face-up eroded cob. This is particularly the case with brick plinths.

Cob implement shed on a plinth of brick over green sandstone and flint. Such buildings are becoming increasingly rare.

Causes of cob wall failure

Cob walls are particularly susceptible to excessive damp conditions, neglect, or inappropriate repairs. Their structural stability can be easily undermined, so it is important to appreciate a few basic principles:

- Inadequate weather protection at the top of a wall will allow rain-water to penetrate the wall causing rapid erosion and de-stabilisation. Chalk cob walls tend to be less forgiving of excess moisture. The material can turn into a plastic consistency quicker than clay cob.

- The build-up of ground levels over time can prevent masonry plinths from drying out and cause the base of the wall to become saturated, thus weakening the wall at the point of its greatest load. Uneven ground levels on either side of the wall compound the risks.

- Cement renders and modern impervious paints are two of the main causes for wall collapses. Cement render is too dense and heavy for the softer earth wall and frequently become detached from it. Hair-line cracks caused by normal daily thermal expansion and contraction of the hard material allow rainwater to penetrate between the render and cob. Water sinks to the bottom within the cavity and into the wall at the bottom, changing the consistency of the cob. Wall slumps are without warning and are dramatic, especially if you happen to be in the building at the time.

- Vegetation against the wall may prevent drying out and allow mosses and algae to develop. Frost action will cause the saturated material to expand.

- Hard paving at the base of cob walls can cause water to puddle or splash onto the wall, making the lower section of the wall damp. Splash-back from passing vehicles will have a similar effect.

- Over a period of time, vibration caused by heavy vehicles can cause walls to crack. Cob walls are also particularly susceptible to impact damage, as the material has little intrinsic cohesion.

- The structural stability of cob relies on its mass, hence the thick walls and small openings. Increasing the number and/or size of windows or door openings can cause weaknesses as the mass and integrity of the cob wall are weakened. Cob walls are also vulnerable to structural defects within the building, especially the roof. For instance, defective timbers in the roof structure can cause the walls to lean outwards or develop major cracks. Inherently weak roof structures are a common feature of original one-and-a-half storey cob buildings.

- Leaking pipes can cause localised saturation, sometimes undetected until the problem becomes critical.

Erosion of cob made worse by crude attempts to patch up. Free-standing cob walls are particularly susceptible to neglect.

- Infilling of inflexible materials, such as brick and concrete blocks, introduces differential thermal expansion and evaporation which can cause cracking between the different materials. Inserting impermeable material into cob can impede evaporation and result in a build-up of moisture at the interface between the two materials.

- Rodent damage. Rat tunnels and nesting chambers within the core of the wall can cause the wall to fail. These are most frequently found in existing or converted grain storage/threshing barns; in fact, anywhere where food is, or has been, stored.

- Damage and cracking of cob can also be caused by differential movement due to subsidence, lack of good foundations, erosion or softening of the supporting soil, defective rainwater goods and inadequate disposal of surface water.

How to care for cob walls

1. Ensure that cob walls are not damaged by water. All walls, whether free-standing or as part of a building, must be given a 'good hat' and a 'good pair of boots'. Wall capping should have a generous overhang to give adequate protection for the wall. Plain tiles or thatch are local traditional forms of capping. At the base of the wall, brick or stone plinths should be kept clear of soil or vegetation to allow them to dry out after wet conditions. Resist applying chemical damp proofing into cob. Provided the render allows the cob to dry out, moisture will not rise up the wall.

2. Never apply cement render or impervious paint to cob walls. If the existing walls have lime render that are in need of repair, use lime putty render and finish with lime-wash or mineral paint. Cement renders are a different matter altogether, and the right course of action less clear-cut. If the wall sounds hollow and there are visible cracks, there is often little choice but to remove the render before more damage ensues. But if the render is stuck resolutely to the cob (usually by means of chicken wire nailed to the wall) it could do more damage trying to remove it.

   When removing defective render it is advisable to take a 'softly-softly' approach: remove a small amount at high level first; then a further amount lower down and then lower down again. This enables an assessment to be made of the dampness within the cob, which will tend to increase towards the bottom. If you encounter serious dampness, seek professional help straight away.

3. Consider replacing hard paving at the base of the wall with gravel and a shallow French drain. Ensure that it is located at a safe structural distance from the wall. Ill-considered work can however undermine or weaken the base of the wall.

4. Use lime plasters on the internal face of wall and decorate with mineral paint (such as Keim paints) or distemper, not with emulsion or vinyl wallpaper, so as to allow the walls to 'breathe'.

5. Avoid painting plinths with bitumen as this can impede the evaporation of moisture. It is also important that stone or brick plinths should be pointed with lime mortar, with no traces of cement.

6. Repair holes in cob using cob blocks, keyed into the cob wall using a saw and bonded with cob slurry, adding lime if required. As a general rule, the new material should match as far as practical the consistency of the old wall. This work should be undertaken by specialist contractors.

7. Removing the render will expose the cob wall. This may contain many cracks of different sizes. This is not unusual; it is often the result of shrinkage caused by the drying out process many years previously. Your specialist advisor will propose the most appropriate treatment before re-rendering afterwards.

Caution

If the wall has significant cracks or is bulging or is leaning it is important to ascertain the causes of such failures and rectify these to prevent further structural movement. For any structural work to a cob building, or the removal of large areas of render, you should seek advice from a structural engineer, surveyor or architect with expertise in cob structures (see below).

If the wall or cob building is listed any works that may affect its character will require listed building consent. Consult the Council's Design and Conservation team before carrying out any works.
(tel: 01202 886201
or e-mail: planning@eastdorset.gov.uk).

Historic building grants and/or loans may be available to help defray the cost of conservation work.

18th C plastered cob cottage in Pamphill.

New Works and extensions

When considering extensions to cob buildings, it is important to form a non-rigid junction that will allow the original building to move independently of the new rigid extension.

Where to get local specialist help

Architects and Surveyors

Laurence Keefe
tel: 01258 489009

Eric Lewis RICS
tel: 01202 886587

Robert Nother RIBA
tel: 01202 673149

Christopher Pacey FRICS
tel: 01258 840917

Carole Ryan RICS
tel: 01929 400811

Jonathan White RICS
tel: 01202 841555

Structural Engineers

Laurie Harvey
tel: 01202 880857

Bryan Hoile
tel: 01202 841476

Suppliers

Bursledon Brickworks,
Coal Park Lane, Swanwick, Southampton
tel: 01489 576248

Dorset Centre for Rural Skills,
West Farm Barn, Farrington, Blandford,
Dorset DT11 8RA tel: 01747 811099

The Lime Centre, Long Barn,
Morestead, Winchester
tel: 01962 713636

Rose of Jericho
Westhill Barn, Evershot,
Dorchester DT2 0LP
tel: 01935 83676

Further Reading

Clay and Cob Buildings, Shire Publications ISBN 0-7478-0579-2

Conservation of Clay & Chalk Buildings, Gordon T Pearson, Donhead Publishing, 1992, ISBN 1 873394 00 4.

Devon Earth Building Association (DEBA) publications and newsletters
http://www.devonearthbuilding.com/

Earth Buildings, methods and materials, repair and conservation, Lawrence Keefe, Taylor and Francis, 2005, ISBN 0-415-32322-2

Society for the Protection of Ancient Buildings (SPAB) Information Sheets
37 Spital Square
LONDON
E1 6DY
tel: 020 7377 1644
www.spab.org.uk

Here the brick and cob have parted company and the wall is bowing out.

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