



Guide Sheet for Building with Cob

Determining the state of the cob:

To the uninitiated, cob buildings requiring repair can appear to be a daunting prospect. It's important to remember that cob can often show cracks and defects because old buildings gradually move on shallow foundations. Recent movement is of more concern than an old defect.

If the cracks are located around doors and windows the damage is likely to have arisen from changing stress loadings or rotten timber lintels. Movement in an elevation wall is often revealed by bulges along its length, internal gaps with partition walls, floor joists becoming visible. Movement in a gable wall can be a problem if the crack widens significantly as it goes up the wall.

Much of the damage caused to cob is through the inappropriate use of modern cement renders, plasters, masonry paints and emulsions, which all conspire to trap moisture in the wall and once cob is damp it can lead to structural problems. When the moisture level in cob exceeds 12% then the strength of the cob drops dramatically. However, don't be misled by damp-proofing firms using surface moisture meters. Condensation and hygroscopic (water seeking) salts can both give high meter readings for basically dry walls. The moisture needs to be measured in the centre of the wall by taking a core reading. New concrete floors with damp proof membranes can also cause damp to be concentrated in the walls.

Repairing cob depends on the size of the problem. Non-structural cracks can be repaired with cob bricks, larger cracks or defects with cob blocks. Rebuilding and repairing cob structures with cob blocks offer many advantages over masonry and aerated blocks:

- They will match the existing structure for porosity and density, allowing moisture to move in a similar way.
- They won't introduce hot or cold spots where differential thermal movement can cause renders and plasters to crack.
- They have a similar compressive strength to the original cob and can therefore accommodate general movement better without detaching from the original structure.
- They allow recycling of material with savings in energy consumption.
- Cob blocks and bricks are ready dried and won't shrink away from adjoining surfaces.

As with any work on older properties, before starting any work check whether need planning permission and listed building consent. Once this has been dealt with, work may begin.

• Preparation

When using cob blocks and cob bricks for repair, it's important to ensure that they are bedded on flat surfaces as far as possible. If building a cob wall from new, first build a stone lintel for the cob to sit on- this forms the actual foundation of the wall.

Damaged and unsound cob in adjoining surfaces must be pared- differing methods have been suggested of getting a mechanical fixing to the adjoining surfaces. As well as chasing the blocks into adjoining cob, stainless steel helifix bars can be driven into the existing cob and bedded in the joints of the repair.

Heritage cob & Lime
Coates Road, Bideford Business Park
East-the-Water, Bideford. EX39 4GD

Email: mail@heritagecobandlime.com

www.heritagecobandlime.com

Tel: 01237 477431

Vat No: 106281050

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Any lintels that are unsound should either be repaired or built anew, using stone and lime mortar for bedding joints.

- **Damping**

It's important to control suction from the cob. Both the surfaces of adjoining cob and the cob blocks and bricks must be dampened with a light spray before use.

- **Bedding mortars**

The aim of the bedding mortar is to spread the load evenly onto the block and it should be kept to a minimum thickness. The mortar can be a weak mix of earth/lime/sand mix of varying proportions dependent on whether the cob blocks are to be exposed and weathered to match or rendered or plastered. In the latter case a 4/1 mix of coarse sand/lime putty will be suitable. These mixes are intended to be of similar strength and porosity as the blocks.

- **Quantities**

For 1 square metre of wall, 225mm thick - 20 blocks of size 18" x 9" x 4"

For 1 cubic metre of wall, - 80 blocks of size 18" x 9" x 4"

1 tonne of ready mixed 4/1 lime mortar will lay around 160 cob blocks, depending on the shape of the repair and the thickness of the bedding joints

It's also possible to put up shuttering and tamp down a drier mix of cob, but this method is generally slower as only a couple of feet can be rebuilt at a time, as each layer must have enough time to dry.

Larger problems may need to be tackled differently. The need for buttresses, tie-bars and underpinning is best discussed with an expert familiar with cob.

- **Safety**

Limes are caustic. Ensure you always wear eye protection and protective gloves and clothing and follow the safety instructions on the labels.

Be aware when repairing damaged cob buildings that if its condition has deteriorated, then the cob may fail. Keep a watch on any cracks or bulges that start to appear. This indicates that the cob is in danger of failing at any moment. Failing cob can often be heard to 'tingle', the sound is similar to dripping water. If you see or hear any of these factors, then evacuate the site immediately.

Do not work on your own when repairing damaged cob buildings. Always have one person 'spotting' or watching for any cracks or movement.

Our advice and information are given in good faith. It's important that users satisfy themselves that they've chosen an appropriate product and have a suitably skilled workforce to undertake the work.

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