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A typical installation consists of a build-up of three layers:

- Principal insulating layer – a layer of expanded clay aggregate laid loose, normally over a breathable membrane to prevent the ingress of subsoil particles.
- Insulating lime concrete slab – a layer of insulating aggregate, normally also expanded clay, with hydraulic lime binder.
- Screed - a screed made with a suitable blend of hydraulic lime with a fine aggregate. This layer can be replaced or finished with re-used tiles or stones in order to reinstate a historic floor finish.



**07** A hydraulic lime floor being laid  
© The Limecrete Company

A typical installation of an insulating lime concrete floor involves the excavation of the ground to the required depth, then levelling and compaction of the ground before installation of the breathable membrane. This need for substantial excavation is the principal disadvantage of this system. Any floor finishes laid on a lime concrete floor should be permeable to retain the movement of moisture vapour through the floor.

Insulating lime concrete floors are generally purpose-designed for each individual situation. The depth of each layer will depend on:

- Floor area and shape
- Substrate type
- Groundwater pressure
- Intended use
- The thermal insulation value required
- Whether under-floor heating is required
- Wall thickness and construction

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## AMOUNTS OF INSULATION

The Approved Document that accompanies Part L of the Building Regulations for existing dwellings AD LIB (2010), calls for floors to be insulated to achieve a U-value of 0.22 W/m<sup>2</sup>K.

### U-VALUES

U-values measure how quickly energy will pass through one square metre of a barrier when the air temperatures on either side differ by one degree.

U-values are expressed in units of Watts per square metre per degree of temperature difference (W/m<sup>2</sup>K).

In many cases existing un-insulated floor U-values are already relatively good when compared with wall and roof U-values.

The target U-value of 0.22W m<sup>2</sup>/K is appropriate subject to other technical constraints, for example depth of footing and adjoining floor levels. A 220mm layer of lightweight expanded clay aggregate loose fill will generally achieve a U-value of 0.45W/ m<sup>2</sup>K on its own.

The size and shape of the floor (perimeter/area ratio) will, however, affect the overall U-value performance, and thus the depth of insulation required. Individual calculations will need to be prepared for each particular situation.

## 05 Further information

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The Conservation Department promotes standards, provides specialist technical services and strategic leadership on all aspects of the repair, maintenance and management of the historic environment and its landscape.

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