



Carmylie slab sealed with linseed oil; note lime pointing to wide joint on upper side

Washing When carrying out regular cleaning on stone floors water use should be minimal and carefully controlled. On some tenement stairs, excessive use of water can result in moisture build up in the fabric of the landings and adjacent floors. This leads to progressive saturation of the structure underneath the slabs, resulting in timber decay and damp issues.

Damage Should pointing break up, corners break off or slabs crack, it is important to identify the cause; for example was it wear and tear, impact, or something failing underneath. Wear and tear can be repaired as described above, but other events should be investigated in greater depth, and may involve lifting the slab and re-bedding.



Historic impact damage showing subsequent repair

Further reading

Jackson & Day, *Period House*, Harper Collins 2005
Care and Repair of Georgian Houses

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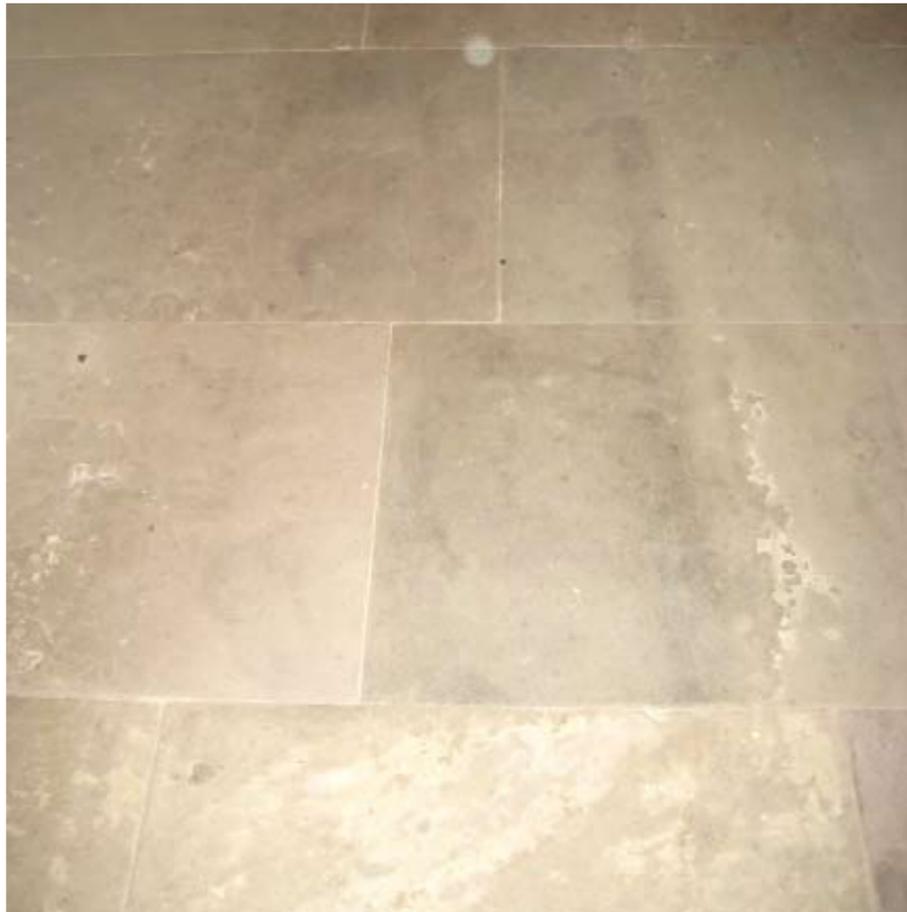
INFORM
INFORMATION FOR TRADITIONAL BUILDING OWNERS

**Stone
Floors**

Stone Floors

Stone floors have been an important feature in traditional Scottish buildings for centuries and contribute much to the feel of a period building. They are extremely hard wearing and durable, and require little maintenance. This INFORM guide will outline:

- **Dating, structure, and how they were put together**
- **Reinstatement and repair**
- **Cleaning and ongoing maintenance**



Materials and dating

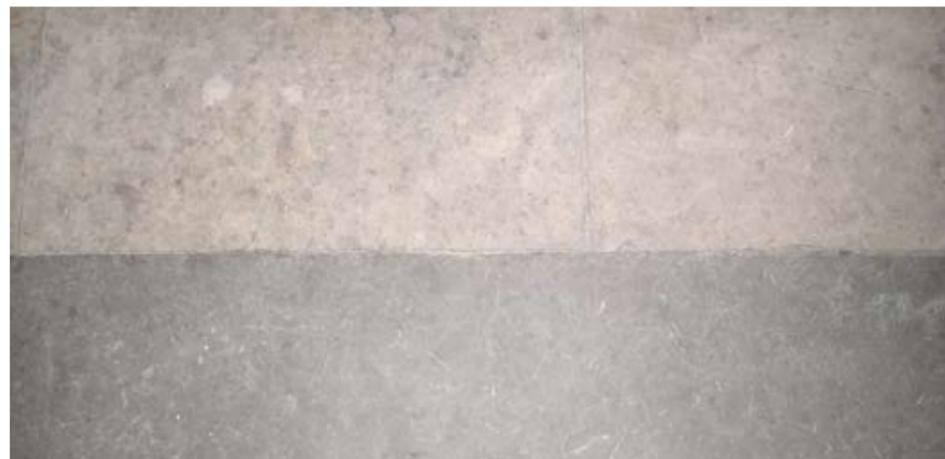
Stone or flagstone floors have been used in a variety of contexts in Scotland since the earliest times, and many medieval examples survive in situ. The essential techniques of laying a floor have not changed substantially, although later floors, from the 18th C onwards, tended to have tighter joints. Layered, easily split stone, often machine cut, became widely available in Scotland with the advent of railways in the mid 19th C. The presence of a stone floor does not indicate any special antiquity; kitchens and halls continued to be flagged until the early part of the 20th C, in tenements and status buildings alike.

Structure

The substrate of a stone floor obviously varies depending on its location within the building - on the ground floor in corridors or service areas, or in upper floors such as kitchens and halls of tenements. On ground floors the base can vary from simple earth or stone debris, to more sophisticated bases of rubble and ash, used to prevent the passage of moisture from the ground below. On earlier upper floors, such as the first floor of a tower house slabs were laid directly on

the masonry of the supporting vault, there being no damp issues to consider. The slabs laid on upper floors of flats and tenements are supported on the timber joists, normally on a bed of mortar or sometimes ash, approx 30mm above the joists themselves.

The stone used varied with location. The best local stone for the purpose was selected, varying from sandstone to slate. With the advent of railways and the better distribution they gave, wide variety of slab can be found, for instance: sandstone (light brown when clean), carmylie slab from Angus (green/brown) to the darker harder flagstone/sandstones from Caithness and sometime slate from elsewhere. Finer harder stone or slate allowed narrower joints, but in all cases the joints would be 3-5mm or so, except in early floors where they could be up to 5-17mm. In all cases the joints are pointed with a lime mortar, normally putty or with fine sand added for the wider joints. Slabs were always laid in lines, although the next row may vary slightly in width; this allowed the best use of differing widths from the quarry.



Differing types of slab used. The lower section is a hearth stone

Reinstatement, cleaning and repair

Recent trends have favoured the uncovering and display of stone floors. Although some of the work can be time consuming and getting tradesmen for this can be problematic, the process is reasonably straightforward. Once the old covering is removed (carpet, lino or such like) an assessment can be made of what can be done. Underneath will be residues of adhesive and screed that were put down as part of the preparation work for the old covering. This can range from impact adhesive, self-levelling screed compound, cement and a variety of materials of varying hardness. Their removal will mainly be a mechanical process, which can be assisted by steam from a wallpaper stripper. With some screeds, and early glue used as a base for old linoleum, soaking with water can act as a softener, especially if the water is held in an old towel, permitting long term wetting without a flood risk.. Hard materials may require a metal scraper, but be careful of splitting off layers of stone, especially on stone with a laminar structure such as Carmylie or a softer slate. Some detergent may be added to the water, but strong chemicals should be used with caution, especially in a domestic context. When all fixing or glue material has been removed, it may be appropriate to smooth out the surface and soften any hard edges from cracks or splits. Rubbing with a soft brick or a piece of sandstone with water helps clean and even up the surface.

Machine sanding Some companies offer to sand the floors with a modified timber floor sander. While effective in removing the previous layers, controlling the depth of the grinding is difficult, and much of the wear patterns built up over the past are lost from corners and edges, giving a flat plain look.

A cleaned floor at this stage, once dry, will be a light grey or dull buff, depending on previous levels of dirt and use.

Repairs and repointing Repairs and replacement of badly broken or missing pieces should be done by a stonemason, who can cut new or reclaimed slab to the required size. Avoid replacing whole slabs unless absolutely necessary, and ensure new joints do not line up to those of their neighbour. New material should match the existing by type (ie sandstone, slate etc) ahead of colour, which will change with the type of sealant applied.

Repointing of joints and making good any cracks or splits should be done at this stage, using a lime mortar, usually as putty but with added sand in the case of wider joints.

Sealants Once these repairs have cured and dried the floor can be left as cleaned, although the use of a sealant may be considered. Sealing can be done with natural waxes or oils although there are modern products available. Generally, if a light colour is required, a wax is the best way to achieve this. If a darker more rustic finish is wanted, linseed oil, (the traditional finish) is recommended. This soaks into the matrix of the stone giving a good cleaning surface and, as it sets nearly hard, it consolidates loose elements, especially delaminating surfaces. Normally 2 applications of oil are required, with excess material wiped off between coats. In warm weather a layer will cure/dry in 2-3 days; in the winter this could take longer. Foot traffic during this time should be restricted where possible. The applied oil will also soak into the mortar, toning down the colour and giving it extra strength. Modern surface treatments for floors include silicone and acrylic based sealants; while these are likely to be effective in preventing stains, the surface finish is quite different from an oiled and waxed floor.



Repaired slab showing grinder marks and cement patching

Inspections and access Occasionally, as part of a property survey, or when work is planned, there may be a requirement to lift the slabs to assess the condition of the joists. A stonemason should do this, although some joiners are familiar with stone floors. Care should be taken when lifting a slab not to break off the arrises or edges - a sturdy wire with a right angle should be inserted into the joint, rotated and the slab thus carefully lifted.

Ongoing maintenance

Waxing Once a floor has been re-pointed and sealed, there should not be a heavy burden of maintenance; such a floor will resist most staining and splashes, but will go opaque on prolonged exposure to water. The smooth surface can be easily brushed and wiped as required. With regard to ongoing care, occasional waxing with a beeswax based floor polish is appropriate, but it is important to remember that after such waxing, getting further coats of linseed oil to spread may be difficult.