

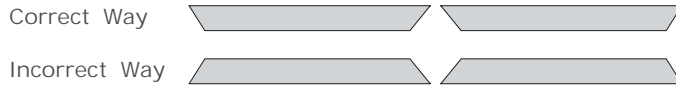
Installation Guide....

Strata flagstones are ideal for patios, paths and courtyards and we have provided this installation guidance to help ensure you get many years of trouble-free service. Installation tips such as this can never be comprehensive for every project and we urge you to seek professional on-site advice for any specific issues not covered in this brief guide.

Which way up?

There seems to be some confusion about the way you lay natural stone.

Please see the diagram as detailed below...



Getting ready to lay your patio

You will need:

- Spade and/or shovel
- Wheelbarrow
- Lump hammer
- Rubber mallet
- Brick and/or pointing trowel
- Spirit level
- Sweeping brush
- String lines
- Wooden pegs or steel pins for
- Fastening line
- 2.4 - 3.6m long timber straightedge
- Cement mixer
- Protective gloves
- Protective eyewear

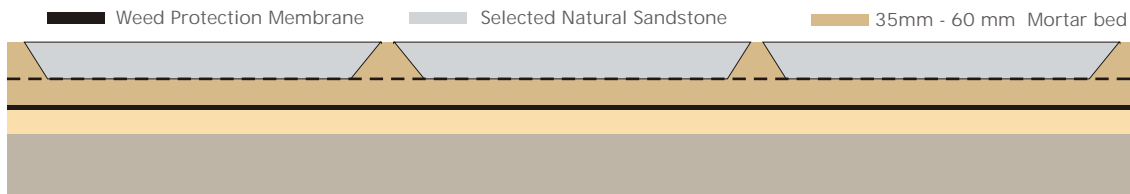
Drainage

Flagstones need to be laid to falls to ensure that any water on the surface will drain away properly. We recommend a fall of 1:60, which is equivalent to 17mm per linear meter. This is sufficient to drain the paving without it being noticeably sloped.

Preparation

The area to be paved needs to be cleared of all vegetation and topsoil, to a depth of at least 65mm. Remember: paving should always be laid at least 150mm lower than the Damp Proof Course (DPC) of any adjacent building.

Use taut string lines as guides to both alignment and surface level. These can be fastened to pegs knocked into the ground or nails fixed into masonry. Use string lines at the edges of the pavement and then use a long timber straightedge to span from the flags to the string lines to check for level.



Mixing Mortar

The flags need to be laid onto a full mortar bed. This means the bed underneath each piece extends beneath the entire flagstone, with no gaps or voids. Some less experienced installers lay flags onto 'spots' or 'dabs' of mortar, which we cannot recommend as these spots do not offer full support to the flags and often cause problems in the months ahead.

The mortar should be a mix of 4 parts sharp sand with one part cement, mixed to a consistency that is moist but not overly wet. Wet mortar can be messy. Light coloured flagstones, and those formed from granite are often prone to discolouration when laid onto mortars made using strongly-coloured sand, such as the orangey sands common in SE England. For these flagstones, we recommend that the laying mortar should be prepared using 6 parts neutral coloured sand (often sold as "Silver Sand") and 1 part white cement. This will minimise any risk of discolouration whilst ensuring your new paving is properly bedded and fully supported.

The mortar bed should be 35mm to 60mm thick. Where the mortar would be thicker than this, or where levels need to be built-up, this should be done using crushed stone such as Type 1 which is readily available at most Builders Merchants. Aim to have a reasonably consistent bed thickness throughout.

It's best to use a powered mixer to prepare the mortar. These can be hired locally for around £30 per week, if necessary. They make light work of the mixing and allow you to save your energy for laying the flags, rather than mixing sand and cement. Mix only as much bedding mortar as will be used in 30-60 minutes. Mortar starts to harden as soon as it is mixed and, in warm weather, it may become 'stiff' and unworkable in as little as 20 minutes.

Be sure to wear protective eyewear and gloves when mixing mortar. Cement is strongly alkaline when wet, so dust or mortar splashes can damage your eyes and your skin. Wear long sleeved clothing and wash any splashes with clean water immediately. You should wear protective gloves at all times, as they will help protect your hands from abrasion while handling tools and flagstones.

Installation Guide....

Laying your patio....

Cutting

If your patio involves a lot of cutting we would advise that you hire a powered cutting tool with a diamond tipped blade (any hire shop will advise you of the machine and blade you will need if you advise them of what you are intending to cut). Please take care and also make sure that your hire shop issues you full instructions and relevant safety equipment, including goggles.

Selection

We recommend that whenever laying natural stone you should mix your paving from 3-4 different packs (where possible) as you lay your patio. This will allow the colours to blend and help to improve any shade variations that may occur between packs, giving your patio a more natural look.

Laying the flags

Using a brick or pointing trowel, spread the mortar over an area approximately 100mm longer and wider than the flag to be laid. Ripple the surface of the bed with the point of the trowel so that there will be some 'give' once the flag is placed onto the mortar.

Lift the flag into position and carefully lower it onto the bed. With larger flags (600x600mm or larger) it is best to have an assistant helping to lift and lower the flag. Once in position, the flag should be 5-10mm high, and should then be tapped down to the correct level using the rubber mallet.

Don't hit the flagstone at the corners or in the exact centre. This can break the flagstone and, even if it doesn't, it usually results in uneven laying. Aim for the points that are located roughly halfway between the centre and the corners, and use a succession of light but firm taps rather than heavy blows. Tap down one edge once or twice and then tap the opposite edge, alternating as required until the flag is at the correct level.

If the flag is not going down on the bed, you may need to lift it out and remove some of the bedding mortar. Take care not to allow the bedding mortar to stain the flagstone edges when lifting it from the bed. Similarly, if the flag goes down too far, you may need to add mortar to the bed to achieve the correct level.

Use the spirit level and/or the straightedge to check the flag is falling in the right direction and is at the correct level. Be certain that the flag is correct before moving on to prepare a bed for the next flag. Remember to allow for jointing. Many flagstones are laid with a 10-15mm wide joint that can be filled with mortar or a resin-based jointing material once the bed mortar has hardened (usually 24-48 hours). With some random layouts, you may find that some joints need to be 8-12mm wide while others are more like 15-18mm wide. This is nothing to worry about, but should be borne in mind when laying the flags. You may find that you need to adjust the width of some joints as the laying proceeds.

There should be no significant 'lips' between adjacent flagstones. They should be roughly (\pm 2mm) level with each other. At free edges of the paving (ie: where the flagstones would lie against grass or flower beds, etc.) you may wish to bring the mortar bedding up the edge of the flagstones to prevent them moving sideways.

Jointing

Traditionally, flagstones were pointed with a cement mortar. This would be made using a 3:1 mix of building sand (softer and less coarse than the sand used for the bed mortar) with cement, but as mentioned previously, when working with light-coloured sandstones and granites, it's often better to use silver sand with white cement.

The jointing mortar is mixed to a stiffer consistency than bed mortar, and then pushed into the joint from the blade of a trowel using a small pointing trowel, packing it into the joint before smoothing off with the pointing trowel or a special 'pointing iron' that gives a flat or semi-round profile. This takes a great deal of care to ensure the mortar does not stain the edges of the flagstones and it can be very time-consuming for those not familiar with it.

Nowadays, many contractors use resin-based or polymeric mortars to joint flagstones. These are simply brushed into the joints, and any surplus swept off the surface. The resin is completely transparent, so cannot permanently stain the flagstones. Occasionally, a slightly shiny film or residue may be left behind on the flagstone surface, but this should weather away in a few days. These resin or polymeric mortars are more expensive than a sand/cement mortar, but they are very easy to use, very quick, and they avoid any risk of staining, even with light-coloured and/or granite flagstones, so may be worth considering.

Colour Enhancers and Sealants

Some homeowners prefer the look of their paving when it is damp or wet, as the moisture tends to bring out the natural colour of the stone. This effect can be achieved permanently by using a good quality colour enhancer. It's worth noting that different types of stone look better with different colour enhancers, so try to choose a product that is specific to your material rather than a 'jack-of-all-trades'. Always test the colour enhancer on a surplus flagstone or sett or in a discreet corner before applying it to the whole pavement. Allow it to dry and leave it for a few days as the character can often change as the product cures.

While colour enhancer can improve the looks of the stone, sealants can both enhance the colour and protect the paving from accidental staining or colonisation by algae and lichens. There is a great deal of variety with sealants, both in terms of the type of chemicals used to manufacture them, and in their finished appearance.

It's vitally important to appreciate that sealants should only ever be applied to paving that is bone dry. The presence of any moisture on the pavement surface or within the jointing can seriously affect the way in which the sealant cures, and in some cases, will result in an unattractive milky-white discoloration which can only be corrected by chemically stripping the sealant. Consequently, sealing should only be undertaken during the warmer, drier summer months. If the paving was laid during winter or spring, it may be a good idea to have it cleaned prior to sealing, but be sure to allow at least two days for it to thoroughly dry before applying the sealant in accordance with the Manufacturer's instructions.

Strata Stones cannot accept any responsibility for any mortar staining, cutting or problems during the laying of their sandstone and limestone.

General Information

All you need to know...

Maintenance and Cleaning of Strata Stones Paving
All paving benefits from simple maintenance and cleaning. Detritus will accumulate on the surface and weeds may settle into this and start to grow. Weeds do NOT grow through properly-laid paving: they grow onto poorly maintained paving.

Sweeping

Regular sweeping with a broom will remove most of the usual litter and garden debris that finds its way onto all pavements. Occasionally, it can be beneficial to hose down the paving, adding a dash of basic detergent if required to help remove any surface stains. For sensitive paving such as limestone's, many cleaning specialists prefer to use a mild baby shampoo in place of standard detergent as they believe this runs less risk of damaging the natural colouring of the stone. Scrubbing with soapy water and a stiff brush will help shift any awkward stains, but don't be tempted to use anything overly abrasive, such as steel wool or wire brushes as these can leave marks on the surface of your paving.

Power Washers

Power washers can help clean heavily soiled paving but they should be used sparingly and with great care. They can damage the surface of the stone and/or the jointing if not handled correctly. If a power washer is to be used, we would strongly recommend the use of a 'rotary cleaning head' rather than the more usual 'lance' as these are less damaging to the paving while still being very effective against dirt. When power washing is used, it should be limited to one, and a maximum of two sessions per year. Patios and driveways that are power washed on a regular weekly or fortnightly basis tend to develop structural problems such as failed jointing, settlement and excessive surface wear of the paving.

Awkward Stains

For heavy staining, such as oil drips, autumnal fruits, bird droppings, etc., if basic cleaning using hot, soapy water does not work, we would recommend that you seek specialist advice from a surface cleaning professional. Many of the 'patio cleaners' sold in DIY store or Builders' Merchants are based on strong acids that can irreparably damage certain types of stone or adversely affect the natural colouring. Always test any cleaning product on a surplus flagstone or sett or in a discreet corner before applying it to the paving.

Efflorescence

Efflorescence is a problem more commonly associated with concrete paving, as the characteristic white powdery deposit originates in the calcium carbonate of the concrete, but it can also affect natural stone paving when it is laid on mortar or concrete. While the appearance of efflorescence can detract from the looks of a new pavement, it is important to understand that,

no matter how bad it may seem, it is temporary, that it will pass with time, and that it is not actually damaging the stone.

There are efflorescence removers that can be used to wash away the worst of any deposit, but they are removers, not cures, and it is quite likely that a new deposit will appear within a few days, although it may not be as heavy as the original deposit. Simple washing with warm soapy water will usually achieve the same, and at a much lower cost!

Strata Stones Sizing/Dimension Policy

All dimensions given are nominal and subject to manufacturing tolerances. The quoted dimensions of our paving ranges are those normally attained when the slabs are arranged correctly spaced.

Product Colour Variation

Tonal and colour variations are evident in all Strata products and whilst the colours reproduced in this brochure are as accurate as photographic and printing processes allow, it is essential that your choice is made from actual materials at your local stockist. This is particularly important when choosing Natural Stone products where considerable variation occurs.

When using several packs, products from all the packs should be blended throughout the project to produce an acceptable overall natural appearance.

HEALTH AND SAFETY

Manual Handling

Most of our products are heavy. Some are very heavy. Appropriate handling precautions include wearing protective gloves and footwear and obtaining assistance when moving items weighing over 20kg.

Note

In the unfortunate but unlikely event of products reaching you in less than satisfactory condition, please notify the retailer immediately.

Warranties

In an unlikely event of our products reaching you in a less than satisfactory condition, please notify your supplier within 2 hrs from time of delivery, they will be happy to assist you and advise you of replacements etc.

Please note that if any products are knowingly laid with any defects apparent prior to laying then we reserve the right not to replace the product and will not accept any responsibility for costs incurred for relaying or rectifying the problem.

Other Information

If you should have any further questions, concerns or want to learn about any common problems found when a product has been incorrectly fitted or sealed, please visit www.pavingexpert.com