



General Information

On delivery, the product should be inspected. If there are **any** issues, please report them immediately and do not commence installation.

Before installation commences a certain amount of sorting of the product may be required to ensure consistency of colour, texture and dimensional tolerance.

Natural stone products are unique and you can expect colour and veining variances between each unit.



Health and Safety Information

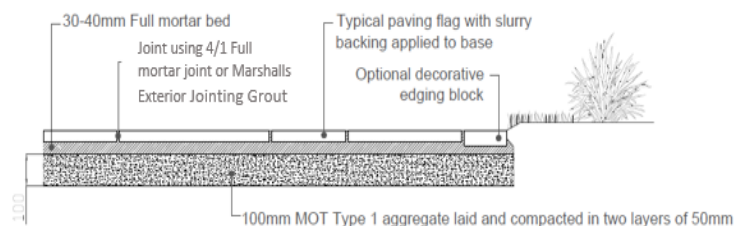
Safe working practices should be employed at all times during the construction process and all necessary Personal Protective Equipment (PPE) should be worn.



Pavement Design

For most domestic applications, a sub-base of a minimum of 100mm should prove to be sufficient. However, the paving design must be based upon the prevalent ground conditions, type and frequency of anticipated loads.

Consideration should be given for the inclusion of movement joints, at 6m centres, if the area is subjected to prolonged periods of direct sunlight, the area is a large open expanse of paving or the selected colour of paving is the dark option.

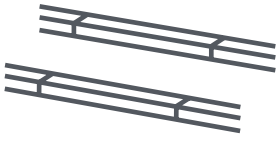


1 Typical section through a patio constructed in accordance with Marshalls Register Installation Procedures
D01 Scale 1:20 @ A3



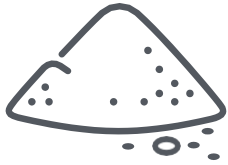
Excavation

To allow the new paving to be installed correctly, a certain amount of excavation may be required. The depth of this excavation will depend upon the thickness of the required sub-base plus the sand and/or mortar, and the paving flag thickness. An extremely important factor to consider when working out the depth of excavation is that the finished surface level of the paving, when being laid up to an existing structure, must be a minimum of 150mm below the DPC to prevent problems with rising damp in the structure.



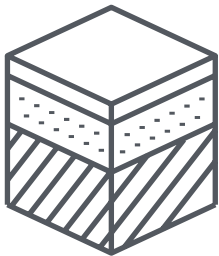
Edge Restraints

Edge restraints should be sufficiently robust to resist the lateral displacement from imposed loadings placed upon the pavement and are installed prior to the installation of the sub-base. The restraint must provide a consistent vertical face to a level below the laying course material.



Sub-base - Material Selection

Granular sub-base material should be well graded (40mm to dust) Type 1 quality material. Inferior quality material may be liable to failure under loading and be susceptible to frost or moisture movement. Recycled materials such as crushed masonry or concrete can be considered, provided it is well graded and compacts to give a close textured finish. Materials containing organic matter should not be used.



Sub-base - Construction

Sub-base material should be placed in layers not exceeding 75mm in thickness or twice the nominal maximum aggregate size. Each layer should be fully compacted before the next layer is placed. Sub-base tolerance to be +5 -10mm from specified levels. The surface should be clean and suitably close textured to prevent migration of finer material through the construction.

A minimum longitudinal fall of 1.25% (1 in 80) and cross-fall of 2.5% (1 in 40) should be incorporated in the sub-layer construction to provide adequate surface water runoff from the wearing course.

Tolerances

All products are manufactured with small variations in size. Bedding onto mortar allows variations in thickness to be accommodated during installation.

Rigidly Laid Paving - Material Selection

Paving units should be cleaned by washing the units with a sponge and clean water. This is to remove any dust, loose material, packaging or production aids. To avoid damaging the units, stack the units on timber battens with spacers between them.

Note: The units should be laid with the smooth surface down.

The backs of the units should be primed using Marshalls Paving Primer prior to placement upon the bedding mortar. This assists bonding and helps to prevent potential marks and moisture draw through appearing on the surface of the paving units. It is also a very useful technique for ensuring elements, such as wall copings, caps and step treads, adhere and do not become loose.

Flags should be supported on a full 'wet' workable mix mortar bed of 1-part cement to 3 or 4 parts sharp sand. The mortar bedding should be laid to give a thickness between 30mm and 40mm (which reduces to approximately 25mm after tamping down the paving); however, some adjustment may be necessary to ensure that the units are fully supported and do not rock or move. A bonding agent can be added to the mortar to assist bonding.

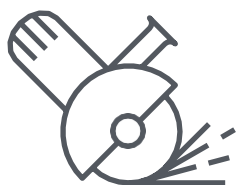
Keep checking levels and gradient across the units. String lines can be helpful to define levels and lines within the laying pattern to maintain the correct joint width. Spacing packers e.g. window packers are useful for use as temporary spacers.

For most paving units, where a minimum of 10mm joint and maximum 22mm thick paving unit, a damp mortar mix of 1-part cement to 4-parts building sand can be used to joint the paving units. Alternatively, we would recommend using Marshalls Exterior Jointing Grout (This product should only be used by experienced installers and is not for DIY application). Further information on how to install Marshalls Exterior Jointing Grout can be found on our website.

If using the mortar mix to joint paving units, please be aware that if any mortar gets onto the surface of the units, it should be cleaned off immediately using a damp sponge and frequently rinsed in clean water.

Under no circumstances should dry or semi dry sand/cement mixes be brushed into the joints. This practice leads to staining of the paving and does not constitute a true rigid joint.

Butt jointing is not recommended for any of these paving products.



Cutting

Cutting may be carried out using a water and dust suppressed diamond tipped power saw. It must however be noted that the aesthetic finish achieved will depend greatly upon the choice of cutting mechanism and level of skill. Specific equipment or blade types should be used when cutting natural stone units as those designed for cutting concrete only may blunt easily. If more than 25% of a flag or slab requires cutting then the remaining piece should be cut from the internal corner of the cut to the external corner of the flag or slab, at an angle of preferably 45°.



Inclement Weather

Laying operations should be discontinued (and any open work face covered) if weather conditions are such that the performance of the paving may be jeopardised. Laying operations should not be undertaken when the temperature is below 3°C on a falling thermometer and below 1°C on a rising thermometer. All unfinished areas and stockpiles of materials should be covered in the advent of inclement weather to prevent saturation.



For more information

Please contact Marshalls Group Technical Services on **0370 411 2233** or email grouptechnicalservices@marshalls.co.uk