



# Better Exteriors.

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## SPLIT STONE INSTALLATION GUIDE

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### **Installations Tips**

Please note these tips are guides only and should be used in addition to the relevant Australian Standards for trade practices. Note that installation may vary from site to site with varying conditions experienced on that site (i.e. Soil conditions, pool surrounds, driveways, wet areas etc.). The contractor and specifier should decide if these suggestions are suitable for their application or require further adjustment. A site sample of the proposed method of installation should be completed to ensure that this method is appropriate for the site conditions. These tips are given in good faith and to the best of our knowledge and experience at the time of printing. In no way do these tips replace the services of professional contractors and/or consultants.

### **Material Considerations**

Natural stone wears the markings of thousands of years of formation, through extreme weather and climate conditions with sands, oxides and minerals from the earth and the sea. Materials vary in appearance from original sample and from piece to piece upon installation. As with any natural material, no two pieces of natural stone will be exactly alike. Colour, as well as percentage, size and shape of markings, will vary. Variation is not a material flaw. It's not that we accept imperfections, the imperfection is the point. Our goal is to minimize surprises and help set realistic expectations with specifiers, contractors and end users. Prior to ordering, ensure that consideration has been made to understand what variation you might expect when this material is delivered and installed.

We suggest blending tiles from all pallets delivered whilst laying.

Some typical installation methods are:

### **Foundations/Substrates**

For an area to be successfully tiled, the substrate or foundation preparation is very important and is the first element to influence the end quality of the flooring. This is because the sub base or 'laying support' carries out a number of functions in protecting the surface layer of the Stone. For these stones we recommend the following:

Pedestrian traffic only: reinforced concrete 75mm thick

Vehicle Traffic: Reinforced (F72 mesh) concrete base 100mm thick min. 25MPA

\*\* Engineer's advice should be sought in the design of all concrete. Contractors should also consider drainage and/or waterproofing issues to minimise the risk of rising humidity, which can bring salts contained in the soil or in the bedding layers to the surface.

### **Slope**

When dealing with outdoor stone flooring, special attention must be paid during planning in order to respond adequately to rainwater run-off. This is done by dividing the floor field into different drainage surfaces if necessary and giving them effective slope and perfect levelness. This will avoid trapping water and moisture on the floor surface since they cause undesirable and unsightly effects due to rings, saltpetre efflorescence and dirt build up. The following slopes are recommended:

Small flooring surfaces: gradient > 1%

Large flooring surfaces: gradient > 2%

### **Control Joints**

Control joints are recommended for the substrate (concrete sub base). The joints in the concrete base should be continued through the mortar bed and grout joint. Control joints help absorb variations in the flooring caused by temperature swings and other movement in the sub grade, concrete base, mortar or actual tile itself. In addition to structural concrete joints, tiled surfaces should also include appropriate control joints every 20m<sup>2</sup> that penetrate through tile and the bedding mix, but not through the concrete substrate. Generally, the overall floor field is divided into compartments where technical expansion joints are set out in a crosswise and/or longitudinal direction (minimum 5mm joints every five meters).

Use of control joints will greatly reduce the chance of unsightly surface cracks appearing.

### **Storage**

Ideally store crates indoors away from direct sunlight and rain and on a level surface. Do not stack crates on top of one another.

### **Waterproofing/Membranes**

Drainage design and waterproofing should be considered prior to installation as part of a broader 'moisture management plan'. To assist in dealing with efflorescence and other moisture related issues, we recommend coating the substrate (ideally the bedding screed) with a waterproofing compound/membrane prior to tile installation. Examples are Mapelastic Smart.

### **Pre-Sealing Prior to Laying**

Pre-sealing prior to laying should be considered depending on the stone selected and the environment it is to be installed in. When pre sealing ensure that the product used is appropriate to work in conjunction with the selected tile adhesive.

### **Pools and Wet Areas**

In certain environments it may be appropriate to dip seal (on all six sides of the stone tile) with a consolidator sealer such as Chemforce Fortifier Plus or Dry Treat 40SK. This would be highly recommended for pool coping and for other wet areas such as kitchens and bathrooms.

## **Weather Consideration**

Avoid laying stone in extreme weather conditions, or if rain is expected.

Laying stone on very hot days (above 30C degrees) can cause delamination issues between stone and adhesive or mortar bedding layer.

## **Selection of Bedding Technique**

Cobblestones are typically supplied with a variable thickness greater than standard stone tiles and therefore often need to be installed using a wet mortar bed. For cobblestones where the variation in thickness is greater than 2mm +/-, we recommend using a 'Classic Wet Mortar Bedding Technique'. For cobblestones where the variation is within the standard range of 2mm +/-, we recommend using a 'Synthetic Adhesive Bedding Technique'.

## **Classic Wet Mortar Bedding Technique**

It is recommended that the concrete slab to which the mortar is going to be applied, be free and clear of all dust and debris. It is vital to ensure that the surface is clean, to enable a good bond to take place between the mortar and the concrete base.

Mortar Compound

Recommended mix is:

3 parts blended coarse wash sand (as per Aust. Standards)

1 part Grey Portland cement (type GP cement)

1 part clean water

Note: additional water can be added to achieve the desired consistency

Bonding agent: This will help with the workability, adhesion and strength.

This can be mixed with a paddle mixer or in a barrel cement mixer. It should be mixed until free of all lumps and all material is completely blended together.

## **Bonding Slurry Compound**

Cement and water mixed into a workable paste or;

Cement and bonding agent (SBR based) mixed into a workable paste

## **Laying Method**

General tips in working with Wet mortar are as follows:

1. Clean and dampen the concrete on which the stones are to be laid.
2. Apply the bonding slurry compound slurry to the concrete where the mortar is to be placed in an even coat (1-2mm thick)
3. Place the mortar mix on the concrete and the paste on which the stone is to be laid. The mortar bed should be 25mm thick with no voids and evenly spread.
4. Remove all loose material from the back of the stone before laying.

5. Apply the bonding slurry compound to the back of the stone in an even coating (1-2mm thick).
6. Place the stone into position gently tapping down with a rubber mallet (white rubber mallet is recommended to avoid marking the product). It is important to ensure that there are no air voids under the product as this may cause the adhesion of the stone to fail or the product may not be fully supported.
7. Tap the stone down to the desired level.
8. Consistent open joints should be allowed for at 7-10mm spacing.
9. Trowel fill any voids around the product and remove any excess mortar and discard it.
10. Remove all excess material from the surface of the stone using a clean sponge with clean water. It is important to work as cleanly as possible to avoid marking the product.
11. Do not spread too much mortar as it may begin to dry before you have laid the stone. Work in small controlled areas.

### **Synthetic Adhesive Bedding Technique**

Research and development of adhesives are continually improving. There are many reputable companies with a wide range of products available. Examples are Mapei. It is essential to follow manufactures instructions.

In certain environments, fast setting tile adhesives (such as Granirapid by Mapei) should be used.

### **Laying**

General tips in working with adhesives are as follows:

1. Prepare a sub floor (screed) that is perfectly flat to make it easy to keep the stone elements level with each other, since only a thin (5-10mm) layer of adhesive is used (therefore offering very little laying tolerances).
2. Clean the laying surface (remove debris, dust oil etc), once the screed is completely dry.
3. Prepare a uniform layer of adhesive using a notch trowel 8-10mm thick, and back butter the base of the cobblestones as well.
4. Lay stone elements so the timing corresponds to the drying time required for the adhesive used, without letting the glue create a film due to prolonged exposure to air. The stone pieces are then compacted evenly on the adhesive with a rubber mallet to ensure consistent contact with the glue. Consistent open joints should be allowed for at 7-10mm spacing

For site specific requirements we suggest you contact Mapei.

For all laying techniques, we recommend that after an area is laid it should not be loaded for a period of time to enable the bedding layer to strengthen.

Pedestrian traffic: 2 days

Vehicle Traffic: 2-3 weeks.

## **Cutting**

Ideally it is recommended that cutting be done using a bench saw with a wet diamond blade. The stone should be washed immediately after it is cut to avoid cutting paste drying and staining the surface of the product.

Crystalline silica (or silica dust) is a common mineral found in soil, sand and stone. It is also used in the construction of materials such as bricks, tiles, concrete and artificial stone. Silica exposure can cause a range of health issues, so protective equipment should be worn whilst using power tools to cut, grind and drill such products. Appropriate safety guidelines relating to silica exposure should be adhered to on the work-site.

## **Grouting Compound**

It is recommended to use a high-grade pre-bagged grouting compound that is suitable for the application.

## **Grouting Methods**

1. Dampen grout joints and stone with a sponge
2. Place grout into joints, ensuring no voids, to the full depth of the paving stones
3. Remove any excess grout with a trowel
4. Sponge clean the paving surface with water, ensuring all excess grout has been removed.

## **Cleaning**

Stone should be cleaned when grouting material has set.

Cleaning will enable any grouting residue to be removed.

1. Sweep excess dirt from surface.
2. Use a pH neutral cleaner and apply to surface in liberal quantities and in manageable sections.
3. Gently agitate the surface with a stiff broom and/or nylon pad (such as Doodlebug by 3M).
4. Remove residue from surface with a wet-vac or squeegee.

It is important that no acidic cleaners are used.

Using a cleaning and sealing professional may be appropriate to achieve best results.

## **Sealing**

Sealing is an essential step in protecting the beauty and ensuring the longevity of any stone. We always recommend using a cleaning and sealing professional after the stone has been installed. Please call us for a list of recommended professionals. Research and development of sealing products are continually improving. There are many reputable companies with a wide range of products available. We recommend using high quality penetrating sealers such as Chemforce Stain Protector or Dry Treat Stain Proof.

**Acceptable Characteristics**

Stone tiles are made from naturally occurring materials and a variation in colour and/or surface finish may occur. It is the responsibility of the user to inspect tiles prior to laying. Minor marks and small chipping are not structural and therefore not considered defects. Any tile with excessive chipping or variation in thickness and dimension prior to laying, may be subject to a warranty claim