

# MASONRY & ALFRESCO PAVING

A quick reference guide to laying pavers



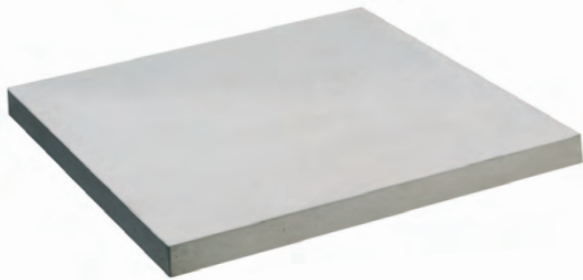
**London**  
200mm x 100mm x 60mm  
200mm x 100mm x 80mm



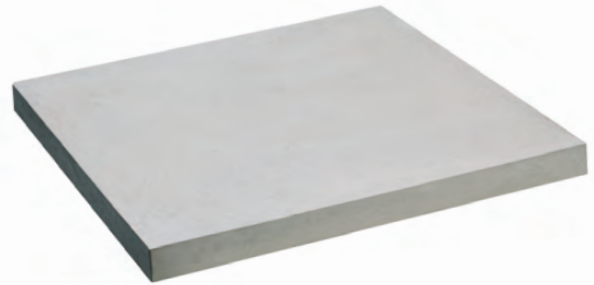
**Lifestyle Flagstone**  
450mm x 450mm x 50mm



**Cobblestone**  
230mm x 190mm x 45mm  
230mm x 190mm x 60mm



**Alfresco Textured Paver**



**Alfresco Smooth Paver**



**Alfresco Textured Bullnose Paver**



**Alfresco Smooth Bullnose Paver**

Sizes listed above are nominal.

# MASONRY PAVING

## Choosing the right paver for your situation

### Pathways & Patios

London, Cobblestone and Lifestyle Flagstones.

### Residential Driveways

London and Cobblestone Pavers only.

Note: Patio and Lifestyle Flagstones are not suitable for vehicular traffic.

## Terminology

**Subgrade:** The natural soil that is exposed at the excavated level.

**Basecourse:** The layer of compacted granular material placed on top of the natural soil.

**Bedding Sand:** The sand layer (nominally 30mm thick) that the pavers are bedded on.

**Jointing Sand:** The sand that is placed in the vertical joints between the pavers.

**NZ Standard:** Reference NZS 3116:2002 Concrete segmental paving.

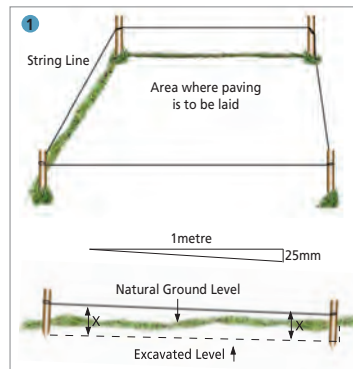
## Installation/Laying Guide

### 1. Setting Out & Drainage

Set a string line to a height to correspond to the finished level of the pavers, making due allowance for the various depths of the basecourse, bedding sand and paver thickness.

The top surface of the paving needs to have slope or fall so that rainwater runs off and does not pond on the surface. Allow for a fall of at least 25mm per 1.0 metre and ensure any paved area falls away from buildings. Also, a paved area must have a sufficient number of drainage collection points i.e. (channels, kerbs and cesspit sumps) to collect the rainwater and discharge it to a suitable stormwater disposal system.

$X = \text{Depth of excavation} = \text{thickness of paver} + 30\text{mm bedding sand} + \text{thickness of basecourse}$ .



### 2. Excavation & Subgrade

All organic material e.g. (vegetation, topsoil etc) should be removed and the soil excavated down to a depth allowing for the thickness of basecourse, bedding layer and pavers. At this level, otherwise known as the subgrade, the soil needs to be assessed for strength. It is important that the subgrade is of uniform strength, so any soft, loose material or existing fill areas will need to be undercut, removed and replaced with dense compacted material.

Measure down from the string lines using a tape measure to check the correct level of the subgrade has been reached. The subgrade will need to be shaped and trimmed fairly accurately and it is desirable that the subgrade slopes to prevent ponding of water at that level. If the soil is wet, then a drain may be needed that is piped to a suitable discharge point.

### 3. Basecourse

The thickness of basecourse that is required will depend on both the strength of the subgrade soil and the type of loading anticipated on the pavers. Generally 100mm to 150mm thick for residential driveways, and 50mm to 75mm thick for patios and pathways. Note: These thicknesses refer to the final compacted depth of basecourse, and are a guide only. For more comprehensive recommendations, refer NZS 3116:2002 Table 2.

The basecourse shall be a well-graded, granular material with hard durable particles; free from organic material. GAP20 is a suitable material. Spread, shape and thoroughly compact the basecourse to a uniform dense condition using a vibrating plate compactor.

It is VERY important to get the top surface of the basecourse to the right height and within tight tolerances for levels and falls etc. (Suggest +0 to -10mm). Do not rely on the bedding sand to compensate for any out of tolerance basecourse levels as the bedding layer will compact unevenly and in time will result in an uneven paved top surface.



**4. Bedding Sand**

The bedding sand shall be a well-graded, granular material with hard durable particles, free from organic material.

Lay screed rails on the compacted basecourse approximately 1.0m apart. Loosely spread the bedding sand over the area and screed off across the screed rails. It is important to lay bedding sand with uniform thickness/density/looseness and consistent moisture content.

Remove the rails, fill in and trowel smooth the gaps left behind.

**5. Laying Pavers**

Once you have selected a laying pattern, start placing the pavers from a corner or along a straight edge or at the bottom of a slope and lay upslope. It is VERY important to place the pavers leaving a 2mm to 4mm gap between them. If the pavers are laid touching each other, spalling of the edge of the paver and/or cracking may occur if excessive movement of the basecourse occurs, especially in vehicle trafficked areas.

By working on top of the already laid pavers you can avoid walking on the screeded bedding sand. Check for line and level at regular intervals visually or using a string line.

Cutting pavers for the infills is best left to last and can be done with a bolster & hammer, block splitter or diamond/carborundum drop saw. Make sure protective glasses, earmuffs and gloves are worn.



Laying



Cutting

**5** For Driveways the Herringbone Pattern should be used.

NOTE: Half blocks are put in place last.

**Herringbone**                      **Basket Weave**                      **Stretcher**

**6. Edge Restraints**

Edge restraints must be provided at the perimeter of the paved area to confine the paving and prevent outward migration of pavers. Interlocking border block, kerbs, kerb and channel, paver on edge and concrete haunching are some of the common means of providing edge restraints.

Edge restraints should extend at least 50mm below the bedding sand and with the exception of haunching, should be constructed prior to laying the pavers.



Haunching

**6** 'Haunching' Cross-section

**6** Kerb Cross-section

## 7. Joint Sand & Compaction of Pavers

Sweep DRY jointing sand into all joints between pavers. The pavers themselves must be absolutely dry otherwise the sand will not fully make its way to the bottom of the joint.

Cemix Joint Sand or stabilised jointing sand products such as Cemix Pavetight Sand are suitable joint filling materials. Note: For stabilised jointing sand products it is important to carefully follow the manufacturers clean-up instructions otherwise discolouration marks may result on the surface of the pavers.

Once the joints are full, and the haunching has set, cured and gained sufficient strength, compact the pavers using a suitable vibrating plate compactor. A vibrating plate compactor must NOT be used on larger pavers instead use a rubber mallet on these pavers.

During compaction, keep topping up the joints with sand as it settles until all joints are completely full. This procedure initially "locks up" the pavers. Sweep off any excess sand. At a later stage, once the pavers have had traffic on them, it may be necessary to return to the job to top up and completely fill the joints with sand.



## 8. Follow up Maintenance & Sealing

Routine cleaning and maintenance of the paved surface is recommended. Periodic cleaning and removal of organic materials such as moss, mould & algae etc using proprietary chlorine bleach-based cleaning products and physical brushing with detergent flushed off with water is suggested to maintain the appearance of the product.

If staining or marking of the pavers is likely e.g. leaves, berries, BBQ spills, then sealing your paved area should be considered. You can get specialist advice from sealant suppliers. Because it is difficult to remove stains, sealing should be carried out as soon as possible following installation.

The use of acid or waterblasting alters the top surface of paving and can change its appearance. Seek expert advice and/or carry out a small test on an inconspicuous area before undertaking cleaning or maintenance over the entire area of paving.

## Material Quantities

### Excavation

Excavation Quantity (m<sup>3</sup>) = Area (m<sup>2</sup>) x Depth (m) x 1.5 (bulking factor for clay type soils).

**Note I** - In determining the Area (m<sup>2</sup>), add say an extra 0.15m width to the proposed paving dimensions where applicable to allow for additional excavation required for edge restraints such as haunching and kerbs.

### Basecourse (GAP20)

Basecourse Quantity (m<sup>3</sup>) = Area (m<sup>2</sup>) x Nominated Basecourse Depth (m) x 1.25 (compaction factor).

**Note II** - In determining the Area (m<sup>2</sup>), add say an extra 0.15m width to the finished paving dimensions where applicable to allow for additional basecourse required beneath edge restraints.

**Note III** - The basecourse quantity determined above is the "loose measure" quantity, which means the quantity of basecourse required to be delivered to the job site is in a loose state. This material will reduce down in volume when compacted by up to 25%.

### Bedding Sand

Bedding Sand Quantity (m<sup>3</sup>) = Area (m<sup>2</sup>) x Nominated Bedding Sand Depth (m).

**Note IV** - In determining the Area (m<sup>2</sup>), add an extra 0.15m width to the finished paving dimensions where applicable to allow for overscreeding of the bedding sand.

**Paving:** Length (m) x Breadth (m) = square metres of paving (m<sup>2</sup>)

Number of Paving Units Required = Area (m<sup>2</sup>) x Number of units per square metre (see table below).

**Note V** - Add 3% extra to the number of paving units determined above to allow for wastage, cutting, curves etc

Number of units per square metre:	
Cobblestone Paver = 23/ m <sup>2</sup>	London Paver = 50/ m <sup>2</sup>
Lifestyle Flagstone = 5/ m <sup>2</sup>	

**Jointing Sand:** 1 bag (40kg) will do +/- 20m<sup>2</sup> of paving depending on the joint spacing.

### Edge Restraints

Determined by the specific requirements of your project. Allow concrete for haunching pavers (as a rule of thumb: 1 barrow of concrete will cover 5 metres of edging).

### Drainage

Determined by the specific requirements of your project. Allow for excavation, length of perforated drainage pipe, filter cloth and drainage aggregate.

Joint Filling Material (Plastering Sand, Cemix Joint Sand or Cemix Pavetight Sand).

Joint Filling Sand Quantity (m<sup>3</sup>) = One 40kg bag of sand will do between 12m<sup>2</sup> to 20m<sup>2</sup> of paving depending on size of paver used, joint width spacing (between 2mm to 4mm recommended) and paver thickness (50mm or 60mm).

## Checklist of Tools you will require

- Tape Measure
- String Line
- Spade
- Yard Broom
- Barrow
- Float
- Spirit Level
- Screeding Rails 30mm diameter x 2-3m long
- Screeding Board 100 x 25mm x 1.8m long
- Hire a vibrating plate compactor (75kg)
- Block Splitter/Drop Saw



## General

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### Colour Variation

When laying more than one pallet make sure to "mix & match" from different alternating pallets. If you require extra paving make sure to ask for the same batch number to minimise colour variation.

### Level

Keep the finished level of the paving below the damp proof course of your house in accordance with your local council requirements.

### Haunching

Concrete haunching requires a setting (curing) period of 2-3 days before any traffic should be allowed on the paving. Avoid driving vehicles over the edge of the paving.

### Colour

It is best to use darker colours in driveways as tyre marks and oil stains will not be as visible. Sealing of your paving helps to prevent the absorption of oils and aids cleaning when necessary.

### Minimising Joint Sand Loss

If the loss of joint sand is a likely or continuing, either sealing the joints or the use of a stabilised jointing sand should be considered.

### Efflorescence

Efflorescence is a natural and unpredictable phenomenon that occurs with concrete and masonry products as a result of excess lime leaching from the cement and depositing on the surface of the product. It can appear as whitening and is more visible on coloured pavers. There are some things you can do to minimise efflorescence such as keep paving covered and dry before laying and provide good drainage to the subgrade and basecourse.

### Sealing

Seek expert advice on sealing from companies that supply sealing products.

**For more comprehensive paving installation information please visit [www.cca.org.nz](http://www.cca.org.nz). To obtain a copy of the New Zealand Standard relating to paving, NZS 3116:2002 Concrete Segmental Paving, visit [www.standards.co.nz](http://www.standards.co.nz) (charges will apply).**

# WETCAST PAVING

## Choosing the right paver for your situation

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Alfresco Pavers are suitable for use in patios, courtyards, pool surrounds, paths, steps and decks or any area subject to pedestrian loads only.

## Terminology

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**Subgrade:** The in-situ soil at the base of the excavation, on which either a concrete base or compacted aggregate base is placed e.g. (silt, clay, sand, gravel etc).

**Concrete base:** A concrete slab over which a mortar bed and tiles or pavers are laid.

**Aggregate base:** A layer of compacted basecourse material over which a mortar bed and pavers are laid.

**Mortar bed:** A bed of sand and cement mortar on which the tiles or pavers are laid.

**NZ Standards:** There are currently no New Zealand standards covering the installation of Alfresco Pavers.

## Installation/Laying Guide

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### 1. Setting Out & Drainage

Set a string line to a height to correspond to the finished level of the tiles or pavers, making due allowance for the various depths of the concrete or aggregate base, mortar bed and tile or pavers.

The top surface of the paving or tiles needs to have slope or fall so that rainwater runs off and does not pond or collect on the surface. Allow for a fall of at least 10mm per metre (1 in 100) and ensure any paved area falls away from buildings. Also, a tiled or paved area must have a sufficient number of drainage collection points such as channels, kerbs and rainwater sumps to collect rainwater and direct it to a suitable stormwater disposal system.

### 2. Excavation & Subgrade

All organic material e.g. (vegetation, topsoil etc) should be removed and the soil excavated down to a depth allowing for the thickness of the concrete or aggregate base, mortar bed and pavers. At this level, otherwise known as the subgrade, the soil needs to be assessed for strength. It is important that the subgrade is of uniform strength, so if any soft, loose or fill areas exist, the fill will need to be excavated, removed and replaced with dense compacted, granular material.

Measure down from the string lines using a tape measure to check the correct level of the subgrade has been reached. The subgrade will need to be shaped and trimmed fairly accurately and it is desirable that the subgrade has fall to prevent ponding of water at that level. If the soil is wet, then a perforated drain may be needed that is directed to a suitable discharge point.

### 3. Base Preparation

#### Concrete Base

The concrete base is typically a minimum of 75mm thick for residential applications. For residential applications it should contain shrinkage and crack control reinforcing e.g. (mesh), or control joints e.g. (sawcuts or construction joints) depending on the size, shape and complexity of the area.

The control joints (saw cuts) in the slab should be mirrored in the flagstone layout to prevent cracking through the flagstone units themselves (See figure 1).

#### Aggregate Base

The thickness of aggregate base will depend on the strength of the subgrade soil and the type of loading anticipated on the pavers. Generally 100mm thickness is sufficient for courtyard areas, paths and patios. Note: The dimensions on the following page refer to the final compacted depth of aggregate base, and are a guide only.

Using an aggregate base, instead of a concrete base, has the disadvantage that if ground movement occurs, the paving is less resistant to movement and consequently the grouted joints may be more susceptible to cracking.

The aggregate base shall consist of a well-graded, granular material with hard durable particles; free from organic material. AP20 aggregate is a suitable material. Spread, shape and thoroughly compact the aggregate base to a uniform dense condition using a vibrating plate compactor.

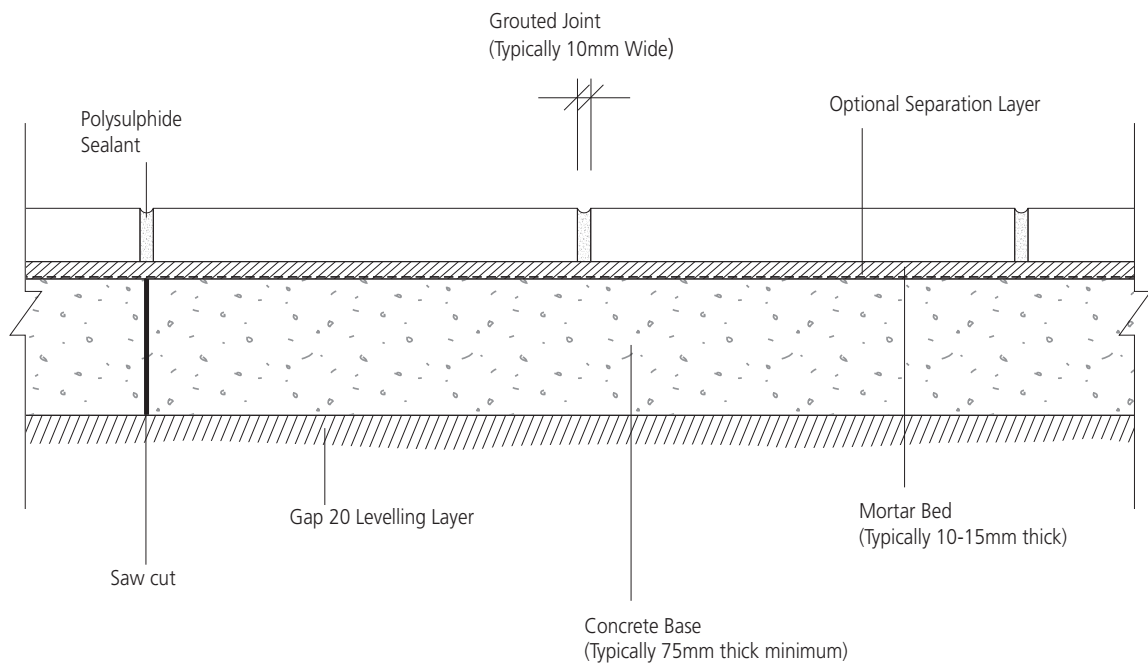
It is VERY important to get the top surface of the aggregate base to the right height and within tight tolerances for level and falls etc. i.e. (suggest +0 to -5mm). Do not rely on the mortar bed to compensate for any top of aggregate levels that are out of tolerance.

Prior to commencing laying the pavers, a thin layer of granular fines can be spread and compacted to fill in any open-textured areas and assist with final levels of the top surface of the aggregate base.

#### 4. Mortar Bed

A proprietary bagged product may be used or mortar mixed on site comprising 1 part cement to 5 parts sand. Various proprietary additives are available to enhance the workability and properties of mortar materials.

Figure 1: Typical X-Section on a concrete base 1:50



#### Laying on an Aggregate Base

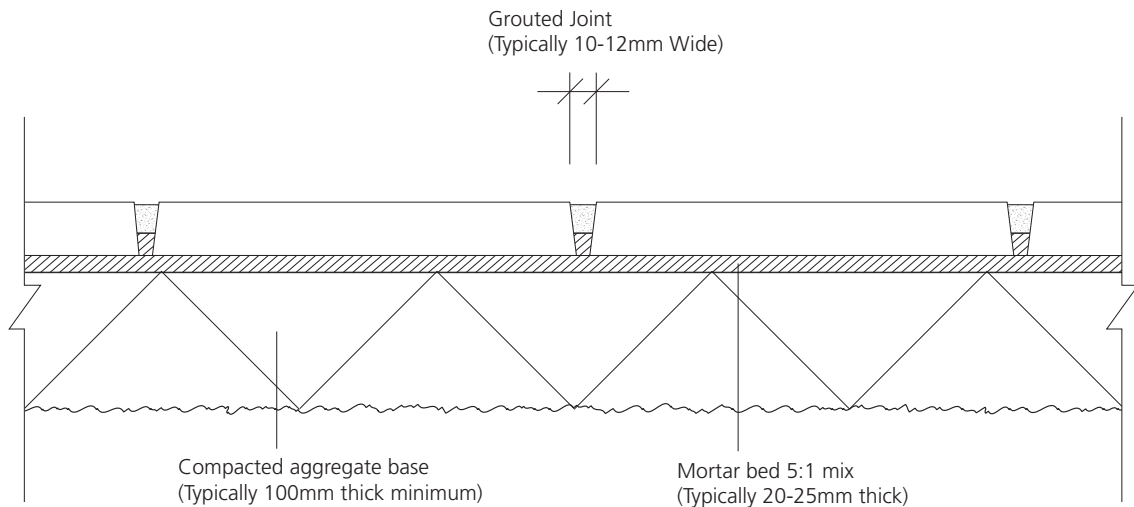
Laying on an aggregate base on a sand-cement mortar bed is the more common method of installing Alfresco Pavers.

Once you have selected a laying pattern, start placing the pavers from a corner or along a straight edge such as the face of a building or foundation. The coverage of mortar should be such that it gives maximum support beneath each paver. Spot mortar is not recommended. It is best that mortar be placed individually for each paver rather than screeded in sections. Mortar should be trowelled all around the edges of the paver so that when laid, the gap between the pavers becomes partially filled.

Work on top of the aggregate base and check for line and level at regular intervals either visually or using a string or chalk line.

Cutting pavers for infills is best left to last and done with a diamond/carborundum drop saw. Make sure protective glasses, earmuffs and gloves are worn. To avoid staining it is important that the cut pavers are washed with clean water immediately after the first cut has been made.

Figure 2: Typical X-Section on an aggregate base 1:50



## 5. Grouting of Joints

After laying the pavers, the joints are filled using a sand-cement grout. Pigments or oxides can be added to the grout to compliment the colour of the pavers. Grouting can occur when the mortar bed has set adequately and the newly laid pavers can be walked on without dislodging them.


The most common method of grouting is the Semi-Dry Mix grouting method whereby the joints are first prepared with a proprietary bonding agent. Then a semi-dry mix of 3 parts sand to 1 part cement is placed in the joints, a fine sharp sand is recommended, then pointed to fully fill and compact the grout and finished as required. Any spillage of the grout on the pavers needs to be cleaned off immediately with a wet sponge to avoid staining.

Under some weather conditions e.g. (hot and windy, high evaporation) the grouted joints must be protected from drying too rapidly e.g. (by lightly spray-wetting and/or wet covering) in order to minimize the potential for grout cracking. If the pavers are too dry and have not been moistened after grouting, moisture may be drawn out of the grout into the pavers, leading to cracking of the grout.

## 6. Follow up Maintenance & Sealing

Routine cleaning and maintenance of tiles or pavers is recommended. Periodic cleaning and removal of organic materials such as moss, mould & algae etc using proprietary chlorine bleach-based cleaning products and physical brushing with detergent flushed off with water is suggested to maintain the appearance of the product.

If using pavers around pools, in barbeque areas or in areas where staining or marking is likely from tree berries or leaf tannis, you might consider sealing your paved area. Pavers need to be cleaned with a mild acid wash (Spirit of Salts), 20 parts water to 1 part acid prior to sealing. Following the acid wash, the pavers need to be completely clean and dry before applying sealer. You can get specialist advice from chemical and sealer suppliers on the correct product to use. Because it is difficult to remove stains after the event, sealing should be carried out as soon as possible after installation.



The use of acid or water blasting alters the top surface of pavers and can change its appearance. Seek expert advice and/or carry out a small test on an inconspicuous area before undertaking cleaning or maintenance over the entire area.

The purpose of sealing is to enhance the colour of the pavers, protect the surface and to ease cleaning and maintenance. The pavers do require ongoing resealing. How often depends on site-specific conditions such as exposure to sunlight, amount of wear to the surface (e.g. foot traffic) and the quality of the sealer.

There are a number of different sealer products and suppliers in the marketplace. As the conditions present on every site are unique, and Viblock are not experts in the field of sealers, we recommend that customers speak to various sealer suppliers and make an informed choice.

The success of any sealed job is dependent on many factors e.g. (weather and temperature on the day, dryness of tiles, use of the right tools, following the supplier's instructions for applying the sealer). We therefore recommend employing qualified and experienced applicators.

When sealing Pavers it is important to seek expert advice from your sealer supplier about achieving the degree of slip resistance you want for the surface finish in your particular situation.

## Material Quantities

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**Paving:** Length (m) x Breadth (m) = Area in square meters (m<sup>2</sup>)

**Basecourse:** Square metres (m<sup>2</sup>) x thickness (m) = cubic metres of sand

## Checklist of Tools you will require

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- Tape Measure
- String Line
- Spade
- Yard Broom
- Barrow
- Float
- Spirit Level
- Block Splitter/Drop Saw
- Pointing tools
- Compactor
- Cleaning sponge

## General

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### Dimensional Tolerance

Alfresco Pavers are hand made products and as such are subject to dimensional variation particularly in the thickness of the product. Any difference in thickness may be taken up in the mortar bed.

### Colour Variation

When laying more than one pallet of product, make sure to "mix & match" from alternating pallets.

### Efflorescence

Efflorescence is a natural and unpredictable phenomenon that occurs with concrete and masonry products as a result of excess lime leaching from the cement used to make the products and depositing on the surface. It can appear as whitening, giving the appearance of "fading" and is more visible on coloured tiles or pavers. To minimise efflorescence, we suggest keeping tiles and paving covered and dry before laying and provide good drainage to the subgrade and basecourse. For more detailed explanation, refer to the Specification Sheet entitled 'Efflorescence'.