

A useful guide to installing  
paving blocks, flagstones,  
porcelain and garden walling

# Guidance + Advice

August 2020

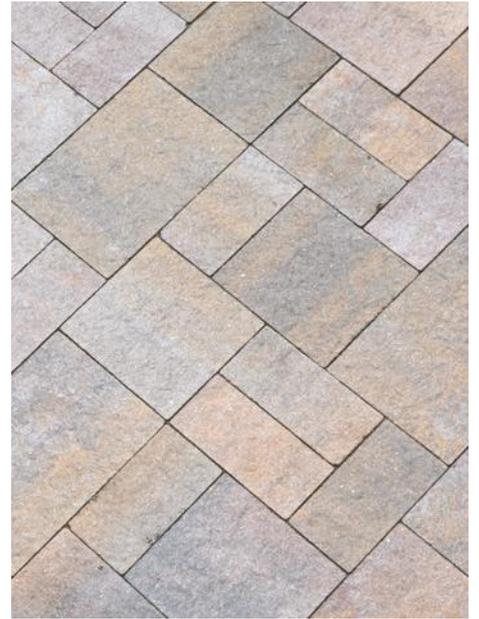


## Contents

Laying Patterns .....	04
Paving + Flags How-to-lay Guidance .....	12
Types of Joints .....	16
Flexible Bedding Layer Materials .....	17
Bound/Solid Installation Materials .....	17
How to-install Estarano Porcelain .....	18
How-to-build Walling .....	24
How-to-build Kamden .....	26
Concept Designs for Kamden .....	28
Aftercare Guidance .....	30
Aftercare Products .....	32
Jointing Products .....	33
Advice + Guidance .....	34
Finding an Installer .....	35

We've compiled some helpful advice and guidance to cover a range of topics. Get in touch with us if you have any hard landscaping questions.

# help and advice



BE INSPIRED BY OUR  
laying  
patterns  
SELECTION

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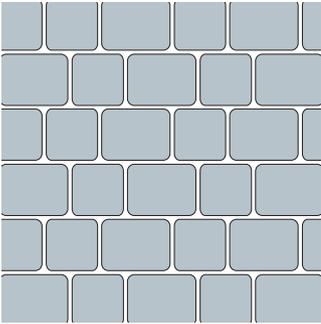
make it yours



# Laying Patterns

There are many ways to lay flagstones and paving and your choice of laying pattern depends on the size and shape of the stones you are planning to use - as well as your personal taste.

## Country Cobble® | Plaza | River Stone paving



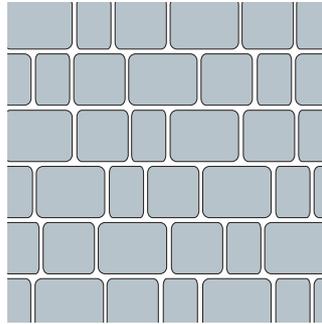
### Random Coursed (2 sizes)

Uses 200x150mm + 150x150mm.

Ratio per m<sup>2</sup>:

57% 200x150, 43% 150x150.

*Not suitable for: River Stone*

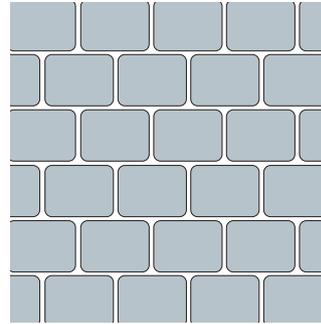


### Random Coursed (3 sizes)

Uses 200x150 + 150x150 + 100x150mm.

Ratio per m<sup>2</sup>: 44% 200x150, 34% 150x150, 22% 100x150.

*Not suitable for: River Stone or Plaza*

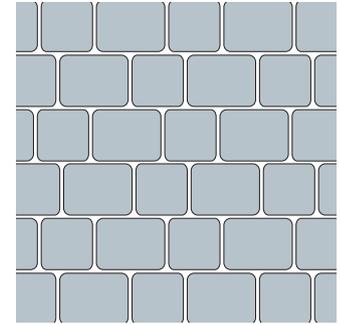


### Stretcher Bond (1 size)

Uses 200x150 or 300x150mm.

Ratio per m<sup>2</sup>:

100% 200x150.



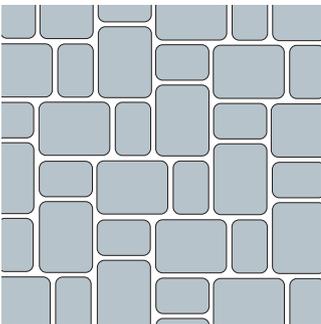
### Stretcher Bond (2 sizes)

Uses 200x150mm + 150x150mm.

Ratio per m<sup>2</sup>:

57% 200x150, 43% 150x150.

*Not suitable for: River Stone*



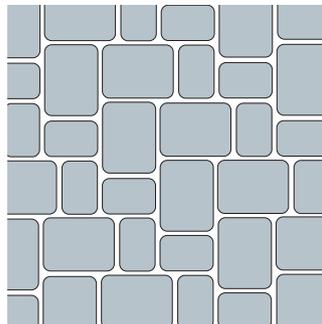
### Courtyard Pattern A (2 sizes)

Uses 200x150mm + 100x150mm.

Ratio per m<sup>2</sup>:

67% 200x150, 33% 100x150.

*Not suitable for: River Stone or Plaza*



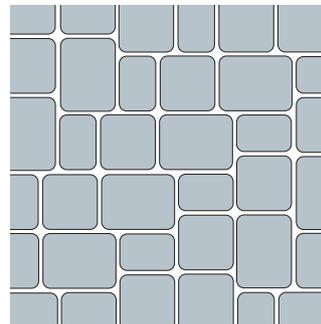
### Courtyard Pattern B (2 sizes)

Uses 200x150mm + 100x150mm.

Ratio per m<sup>2</sup>:

67% 200x150, 33% 100x150.

*Not suitable for: River Stone or Plaza*

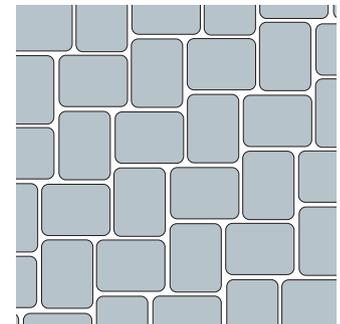


### Courtyard Pattern C (3 sizes)

Uses 200x150mm + 150x150mm + 100x150mm.

Ratio per m<sup>2</sup>: 44% 200x150, 34% 150x150, 22% 100x150.

*Not suitable for: River Stone or Plaza*

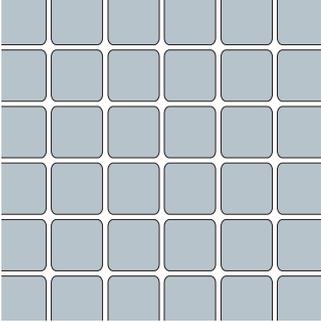


### 90° Herringbone (1 size)

Uses 200x150mm.

Ratio per m<sup>2</sup>:

100% 200x150.



### Stack Bond (1 size)

Uses 150x150mm.

Ratio per m<sup>2</sup>: 100% 150x150.

*Not suitable for: River Stone*

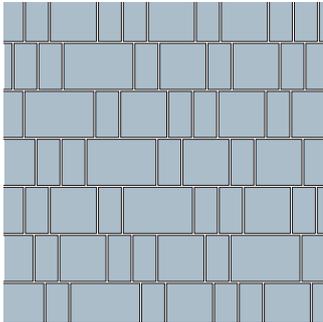
For more in-depth  
information and videos  
on laying patterns visit  
our website:  
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Stretcher Bond (1 size)  
COUNTRY COBBLE® / Corrib

**Top Tip...** When laying 3's mixed sizes please ensure you alternate between bales for each layer to ensure an evenly distributed colour blend. ie. They should not be laid layer-by-layer from the same bale.

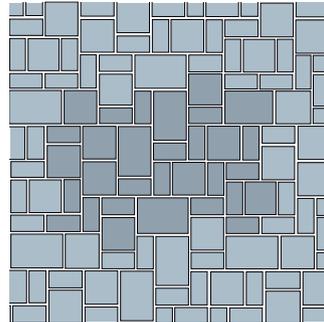
### 3's paving (mixed size pack)



#### Stretcher Bond (uses all 3 sizes)

Uses 300x200, 200x200 + 100x200mm.

Ratio per laying pattern:  
1no. 300x200, 2no. 200x200,  
4no. 200x100.

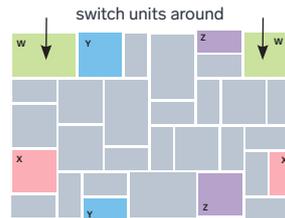


#### Courtyard (uses all 3 sizes)

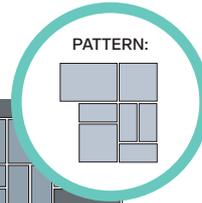
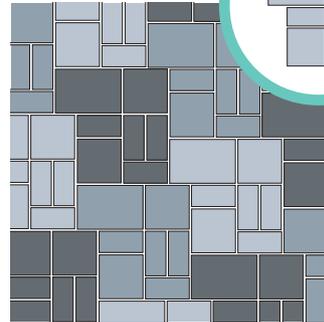
Uses 300x200, 200x200 + 100x200mm.

Ratio per laying pattern:  
1no. 300x200, 2no. 200x200,  
4no. 200x100.

Switch around the appropriate units from each layer in the pack (as shown using the colours and letters below).



each patio pack is stacked in layers (as above)



#### Mixed Size Motif (uses all 3 sizes)

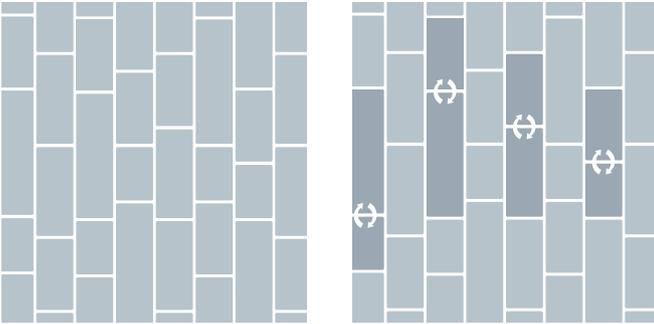
Uses 300x200, 200x200 + 100x200mm.

Ratio per laying pattern:  
1no. 300x200, 2no. 200x200,  
4no. 200x100.

This pattern works with a 7 piece module, creating and interlocking L shaped herringbone structure. Within each pack layer, four of these modules can be created, leaving over three pieces which can be used for cuts or additional units. An ideal pattern for smaller or curved areas where cuts are more frequent.

NB. There will always be extra units left over. These are ideal for cuts and edgings.

## Long Stone paving (mixed size pack)



### Stretcher Bond (4 sizes)

Uses 490x146, 350x146,  
280x146 + 210x146mm

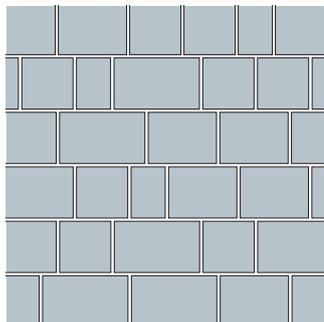
Create a continuous pattern  
of staggered joints just by  
swapping 2 units from every  
pack layer.

**NB:** Two 490x146 units should  
not be laid side-by-side  
(parallel) for driveways, as it  
cannot be guaranteed as load  
bearing for cars.



The pattern you choose will have a big impact on the overall appearance of your design – just as much as the colour and texture of your chosen stone.

## Manor Stone® flags

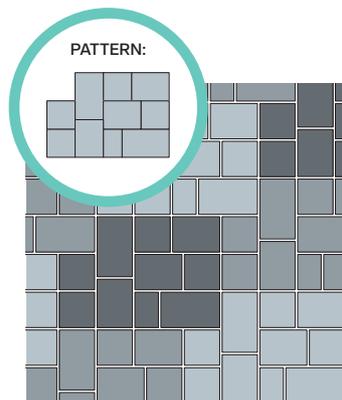


### Stretcher Bond (uses all 4 sizes)

Uses 525x315, 420x315, 315x315 + 210x315mm.

This stretcher bond pattern is simple to lay and uses all four patio pack sizes. Create a continuous pattern of staggered joints just by swapping two flags from every patio pack layer.

swap two units around in each layer



### Courtyard (uses all 4 sizes)

Uses 525x315, 420x315, 315x315 + 210x315mm.

This pattern works with a 10 piece module, creating a more 'random' laying effect. Just lay the units into the pattern highlighted above - this layout will use all the units evenly in every patio pack.

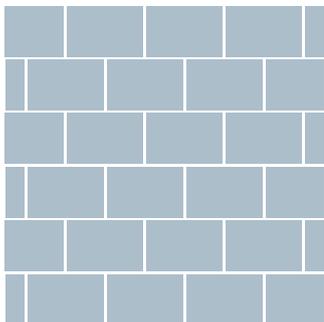


Stretcher Bond (4 sizes)  
MANOR STONE / Blackwater



Courtyard (4 sizes)  
MANOR STONE / Glenarm

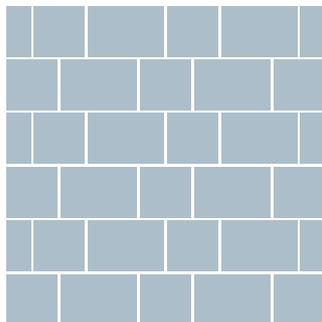
## TerraPave® / Canterra® / Granaza / Rosemount flags



### Stretcher Bond (1 size)

Uses 600x400 or 600x300mm.

Ratio per m<sup>2</sup>: 100% 600x400 or 600x300.

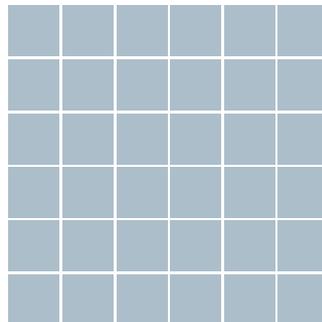


### Stretcher Bond (2 sizes)

Uses 400x400 + 600x400mm.

Ratio per m<sup>2</sup>: 60% 600x400,  
40% 400x400.

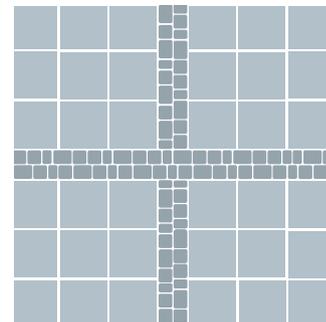
*Not suitable for: Granaza*



### Stack Bond (1 size flag)

Uses 400x400mm.

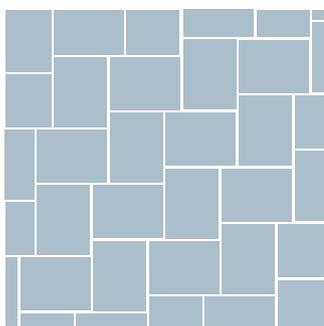
Ratio per m<sup>2</sup>: 100% 400x400.



### Broken Stack Bond (1 size flag + setts)

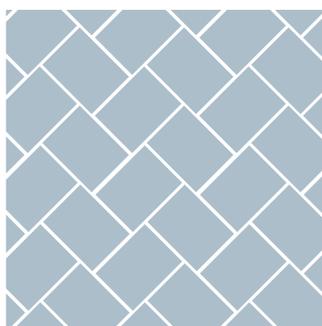
Uses 400x400mm + setts.

Approx: 6no. flags per m<sup>2</sup>  
0.3no. setts per m<sup>2</sup>.



### 90° Herringbone

Uses 600x300 or 600x400mm.

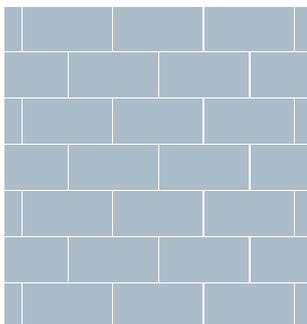


### 45° Herringbone

Uses 600x300 or 600x400mm.

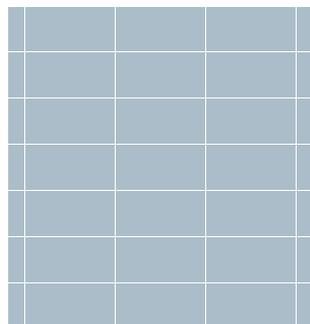
For more in-depth  
information and videos  
on laying patterns visit  
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## Estarano Stone



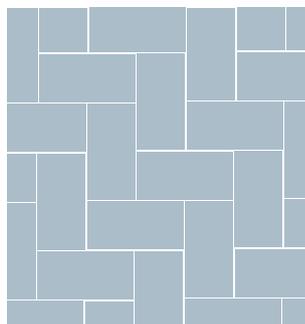
**Stretcher Bond**

Uses 450 x 900mm



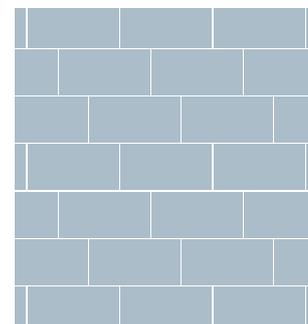
**Stack Bond**

Uses 450 x 900mm



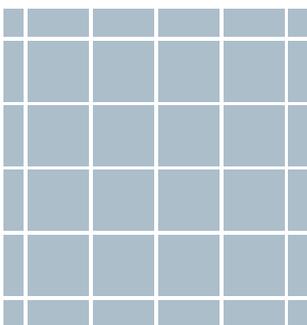
**90° Herringbone**

Uses Uses 450 x 900mm



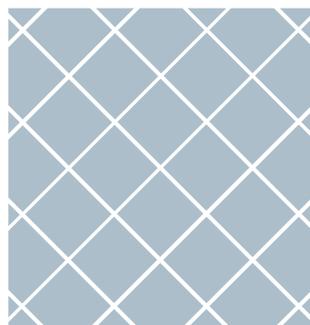
**Staggered Repeat**

Uses Uses 450 x 900mm



**Stack Bond**

Uses 600 x 600mm



**45° Stack Bond**

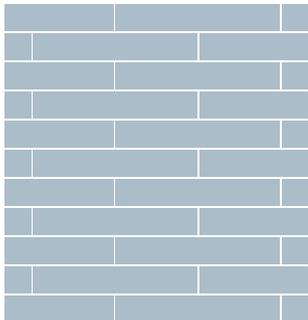
Uses 600 x 600mm



Stack Bond (600x600)  
ESTARANO STONE / Blue

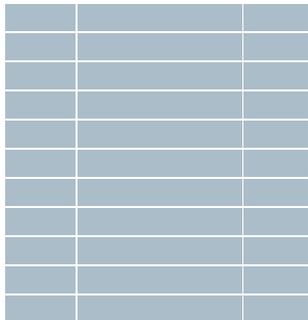
Visit [ag.uk.com](http://ag.uk.com) for more info on  
**Estarano** porcelain flagstones

## Estarano Wood



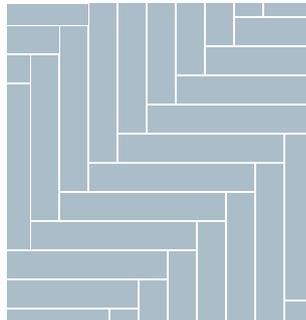
**Stretcher Bond**

Uses 197 x 1200 or 300 x 1200mm



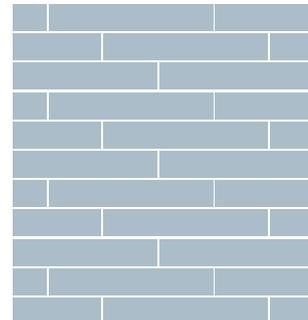
**Stack Bond**

Uses 197 x 1200 or 300 x 1200mm



**90° Herringbone**

Uses 197 x 1200 or 300 x 1200mm



**Staggered Repeat**

Uses 197 x 1200 or 300 x 1200mm



Stretcher Bond (197x1200)  
ESTARANO WOOD / Indie



Stack Bond (197x1200)  
ESTARANO WOOD / Spirit

# Paving + Flags How-to-lay Guidance

Whether you are planning to do the work yourself or employ a professional to do it for you, this guide covers all the essential points you need to know about.

## 1. Preparation

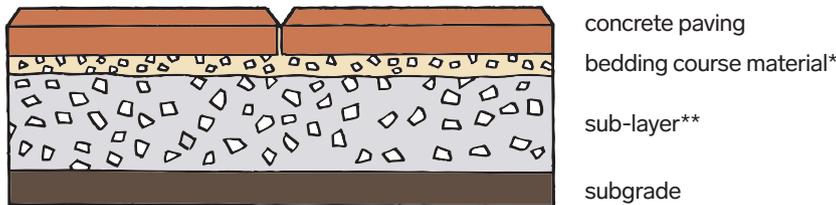
Remove all topsoil then dig down until you reach a layer of hard ground (subgrade) that is firm enough to provide a good foundation. Dig out any soft spots and fill with compacted crushed stone - see below.

**Getting the depth right** - Allow for the depth of your chosen paving block.

**PLUS** a minimum of 30mm for bedding course material.

**PLUS** if laying paving blocks an additional 5mm of loose raked bedding course material\* for bedding in. NB. this is NOT required if laying flagstones - see step 5.

**PLUS** the required depth of crushed stone or hardcore (sub-layer\*\*). For patios and walkways, use a minimum of 100mm of crushed stone. For driveways, at least 150mm should be used. Aggregates for base layers can be sourced from local quarries.



*Example: installing paving on a driveway*

	<b>60mm</b>	(paver)
+	<b>30mm</b>	(bedding course material*)
+	<b>5mm</b>	(loose rake levelling course*)
+	<b>100mm</b>	(sub-layer**)
<hr/>		
=	<b>195mm</b>	(total depth)

\* Option 1: Washed pit sands - Sharp sand or Medium to coarse concrete sand 0 - 4mm sand with less than 3 % silt content - moist that it compacts, but not saturated or dry. Depth: 30mm (+10mm / -5mm)

\* Option 2: Bedding grit 2-6mm clean crushed rock - as per AG bedding and jointing grit used in permeable paving systems. Depth: 30mm (+10mm / -5mm)

\*\* Compacted min. 100mm crushed stone BPT1 (commonly known as MOT Type 1).

## 2. Drainage - how to stay on the right side of the law!

Planning permission is only required for new or upgraded front driveways or parking areas bigger than 5m<sup>2</sup> when the rainwater runs onto the road or into the drainage system.

To avoid the need to apply for planning permission, the driveway can be constructed so that the rainwater soaks into the ground.

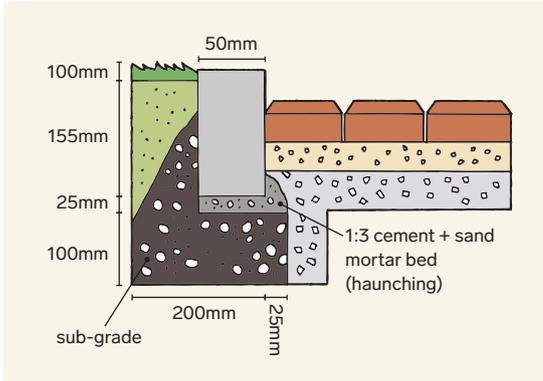
Rainwater can be channelled off the surface of the drive into a soak-away which then allows it to disperse naturally into the ground within the boundaries of your property.



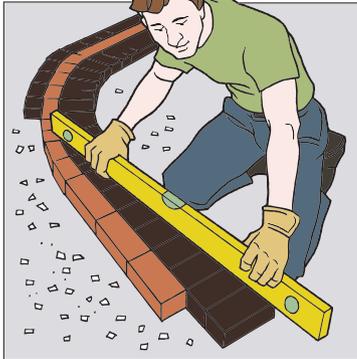
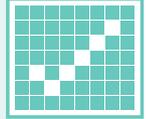
### Don't forget!

Allow for a fall in the finished surface. A gentle slope or fall allows water to run off naturally instead of forming puddles.

If you are planning to use a soak-away, remember to allow for a gentle fall on the driveway so that rainwater naturally runs off the drive and into the soak-away system.



Check out our website for your local  
AG Approved Layer | [ag.uk.com](http://ag.uk.com)



### 3. Restraining edges

When laying any sort of pavers, it's important to work within solidly constructed restraining edges. An edge course should be built using kerbs or blocks and should be laid on a concrete bed.

This will act as a rigid frame, preventing the pavers and their foundations from moving. So if you don't already have your edges in place, these need to be built before moving on to the next step (see above top left diagram).



### 4. Sub layer of crushed stone

Lay crushed stone then compact with a vibrating plate to create a firm base layer. Add more crushed stone and compact again until the required depth has been achieved across the entire area.



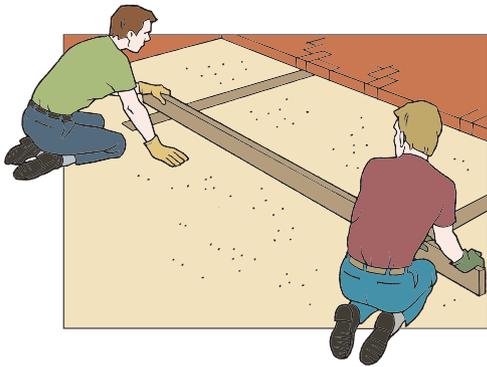
### 5. Bed of compacted grit (laying course)

Use 3-6mm clean washed grit. Spread the grit evenly and deep enough to allow for compaction, then lightly compact using a vibrating plate.

**Remember:** the final compacted layer of grit should be at least 40mm - and, if you are laying paving blocks, don't forget to allow an additional 3-5mm for bedding in!

Do not over compact (1 or 2 passes only) at this stage, otherwise the paving blocks will not be able to bed-in when laid.

**Top Tip...** All the flagstones in the AG range are suitable for internal use. By using these products both indoors and outdoors, you can create a seamless transition between your rooms - from inside to outside. You'll need to seal the surface of any products used internally but this is a straightforward process using a suitable sealant.



## 6. Screeding

Use a screed board (a straight piece of timber) to level the surface of your grit laying course. This can be done by pulling the board along screed rails laid at the desired level in the grit.

Unless you are using one of AG's permeable paving products, remember to allow a gentle fall in the eventual finished level of the paving so that rainwater will run off the surface into your soak-away system.



## 7. Fill gaps left by screed rails

Remove the screed rails then carefully fill and compact the gaps left behind in the sand. Carefully screed off these areas to the level of surrounding sand.

Avoid standing on the sand laying course once screeded.



## 8. Laying paving

Starting from one of the restraining edges, begin laying pavers along one laying face. Set up a builders line and ensure the lines in the pattern remain straight.

When laying product we recommend mixing units from various packs to achieve an even blend of shades.



## 9. Lay header / string course

Think about laying a header course of pavers or setts (see page 10) of a different colour and/or shape along the edge to create an attractive feature.

For more how-to guides and videos visit our website:

[ag.uk.com](http://ag.uk.com)



When using a vibrator plate we recommend using a rubber plate to avoid marking.



## 10. Cut blocks

For best results we recommend using a stone saw to create clean cuts. Alternatively, use a hammer and bolster chisel, mechanical block splitter.

Remember to wear appropriate safety equipment – including safety goggles – when cutting pavers. Carry out all cutting before moving on to the next step.

## 11. Bedding in - paving blocks only!

Compact paving with a plate vibrator. This will reduce the finished level of the paving by the 3-5mm allowed for.

**Notes: Our River Stone paving requires a 'rubber mat' on the vibrating plate to absorb its undulating surface.**

**Flagstones should NOT be compacted with a plate vibrator. Instead, gently bed in each flagstone using a rubber mallet.**

## 12. Spreading jointing sand

After checking and adjusting the pavers to ensure the lines in the laying pattern are straight, spread jointing sand and brush into joints. Fill joints level to top of pavers.

We recommend you use our 'silver flagging sand' when jointing all grey coloured granite aggregate products.

# Types of Joints



## Butt Jointing

This is where flags are laid tightly together with no gap.

**AG do not recommend butt-jointing for the following reasons:**

- contravenes laying standards BS 7533.
- increases potential for spalled edges / shear failure on the edges of adjacent units (see picture).
- removes the ability to adjust alignment / linearity.
- highlights any dimensional variances in the product more vividly – less room for error.

**NB. Canterra or Granaza flagstones should never be Butt Jointed.**



## Close Jointing

Close jointing is where paving / flag units are laid with a 2-4mm gap (plastic spacers can be used to maintain an equal joint width).

AG recommend close jointing in conjunction with a jointing sand.

### The Benefits:

- reduces the visual appearance of allowable tolerances.
- enables the ability to adjust alignment / linearity prior to filling with joint sand.
- allows full penetration / sealing of the jointing sand between paving / flags to the depth of the unit.
- **stabilises the bedding layer by reducing water penetration.**



## Open Jointing

This is most commonly specified as a joint greater than 6mm (plastic spacers can be used to maintain an equal joint width). A solid jointing compound is normally used with this joint (example: Premjoint, Flowpoint, etc.).



**Warning: When installers are using cementitious solid jointing compounds, care must be taken to follow the manufacturers instructions. These compounds normally require expansion and contraction - flexible joints need to be created.**

**NB. Resin joint mortars are only recommended on a flexible bedding layer.**

AG provide two types of jointing sands for a flexible bedding and jointing design as it seals the joints and allows water to run off. **Standard Kiln Dried Sand** – suitable for standard products. **Silver Granite Kiln Dried Sand** – designed specifically for products containing silver and dark granite aggregates (e.g. Plaza and TerraPave). Use of this sand lessens the risk of staining the paving products when brushing in the sand.

# Flexible Bedding Layer Materials



## Bedding Layer Guidance

1. **Washed pit sands** - Sharp sand or Medium to coarse concrete sand  
0 - 4mm sand with less than 3 % silt content - moist that it compacts, but not saturated or dry.
  2. **Bedding grit 2-6mm clean crushed rock** - as per AG bedding and jointing grit used in permeable paving systems.
  3. **Bedding layers** should be within tolerances as per enclosed and also be subbase compatible i.e not fall between subbase gaps – then a geotextile grid may be required.
- **Bedding layer Conventional 30mm**  
Tolerance +10mm / -5mm.
  - **Bedding layer Permeable 50mm**  
Tolerance +20mm / -20mm.

## Not Recommended on Flexible Design

**Building sands or fine lough sands** – too fine to compact and higher silt may retain water – poor drainage.

**Quarry dusts** – retain waters, poor drainage and can stain flag paving surfaces.

**Mortars** – mortar doesn't have permeability to allow water to drain or bond strength to units, as required in a fully bound design.

## Design Considerations

### Design + Specification Checklist:

- Units (slabs, flags, setts, blocks, pavers, large format)
- Bound or Unbound (rigid or flexible)
- Laying course
- Permeable / non-permeable
- Use / trafficking / traffic speed
- Slip / skid potential
- Laying patterns
- Surface drainage
- Sub-surface drainage
- Foundations layers; stiffness
- Movement joints
- Edge restraint

**This is what BS 7533 parts 1-13 is trying to tell the world!**

# Bound/Solid Installation Materials



## Jointing + bedding materials guidance

AG recommend that all bedding layer mortar, primer adhesive and jointing grout is certified in compliance with BS 7533 by the manufacturers.

*Speak to AG on Emtek's Ultrascaple product range below.*





# How-to-install Estarano Porcelain

Porcelain is a specialised product that requires expertise and competency to ensure that it is installed correctly. This guide covers the essential points to consider.

## Installation Guidance

### 1. PREPARATION

- Appoint a trained and competent installer and ask for previous references of workmanship.
- Agree and approve a laying pattern and the best positions to conceal cuts or detailing.
- Decide on the installation method of the porcelain which is dictated by customer / architectural requirements and depends on level of use - installation types as listed:
  - **Grass Installation** as per Concept Guidance drawing 1.
  - **Sand Installation** as per Concept Guidance drawing 2.
  - **Bedding Grit Installation** as per Concept Guidance drawing 3.
  - **Bound or Solid Installation** as per Concept Guidance drawing 4.



### 2. EQUIPMENT REQUIRED FOR CUTTING / DETAILING OF PORCELAIN

**Cutting to length or width** of porcelain should be completed on a bench saw which circulates water (avoids airborne dust) using an appropriate porcelain cutting blade 4mm in width.

**Radius cuts** are best made with angle grinder fitted with a porcelain blade using a template to mark the units and masking tape along cut line reduces edge spalling .

***(Incorrect cutting with hand held saws fitted with the incorrect blade can result in irregular infill cuts and chipped edges).***

### 3. DRAINAGE/WATER RUN OF FALLS

Planning permission is only required for new areas that water runs onto road drains. Avoid planning permission by running water into a soak away within your existing boundary. Industry recommendation for porcelain rainwater fall is a **ratio 1:40 or 2.5%**.

### 4. JOINT CONTROL + JOINTING MATERIAL

- **Spacers:** It is recommended to use fixed, bespoke, clear, tile spacers between the porcelain units to maintain consistent joint widths and reduce moisture build-up in corners.



- **Butt Jointing:** AG do not recommend 'butt jointing' of porcelain units on installation.
- **Close Jointing 2- 4mm:** Kiln dried granite or standard jointing sand.
- **Open Jointing 6mm (Flexible Installation)** Resin mortar *is not recommended when a cementitious mortar or concrete is used as the bedding layer.*
- **Open Jointing 6mm (Bound or Cement Based Jointing):** BS 7533 approved jointing mortars as per the manufacturers instructions for this requirement.

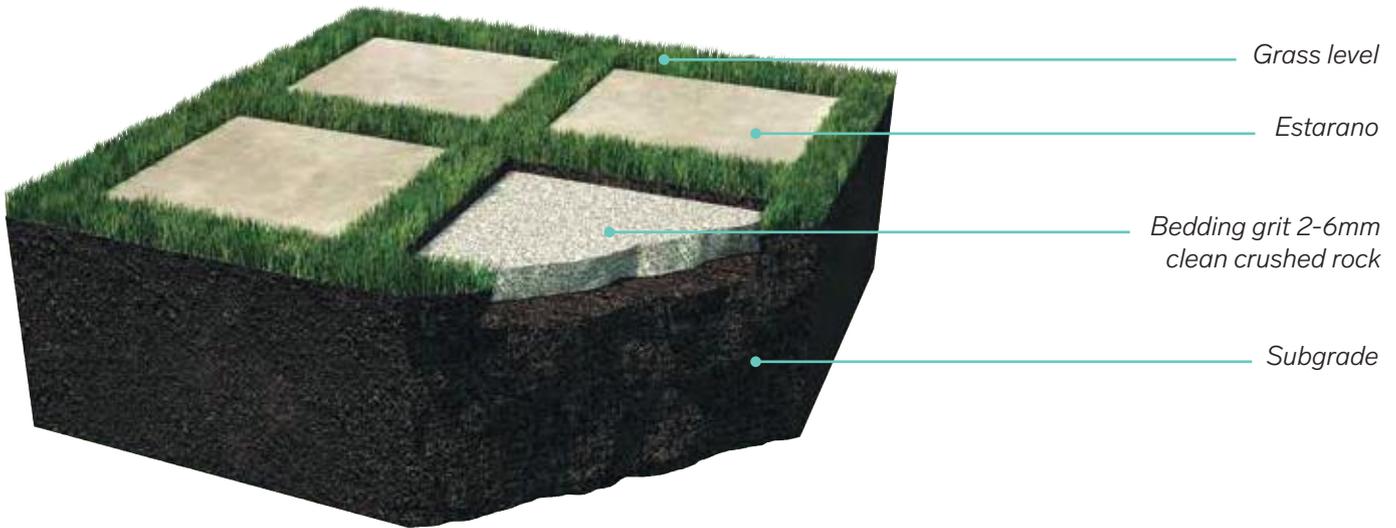
# How-to-install Estarano Porcelain

continued

This guide covers all the essential points you need to know about installing Estarano Porcelain Stoneware.

## PORCELAIN CONCEPT GUIDANCE 1

### Installation on Grass

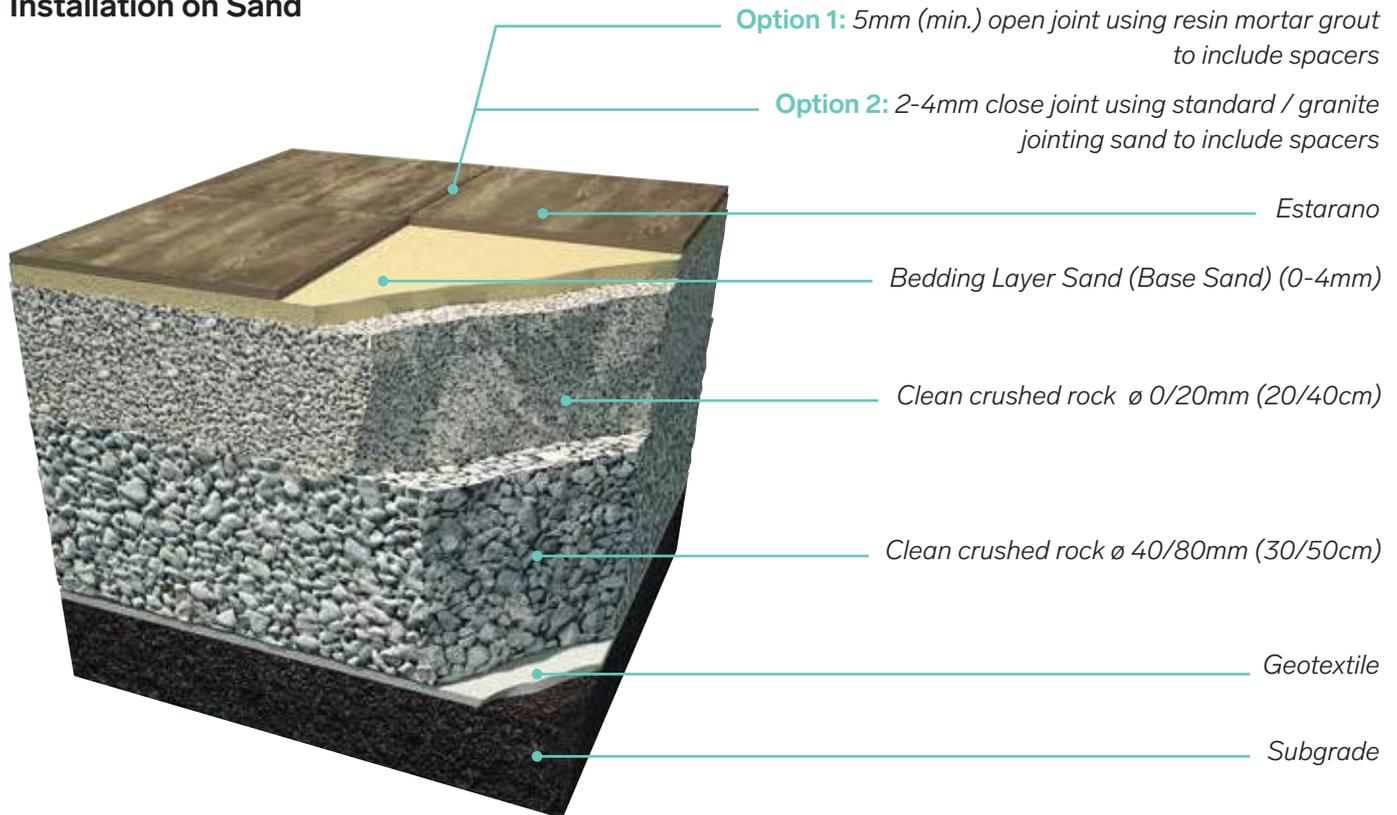


**NB.** These proposed concept drawings are offered to provide guidance to the specifier/installer of a typical composite design for porcelain Estarano in various applications, installers and specifiers should ensure the specific technical requirements for each contract is designed and approved by the Project Engineer.

**NB.** Resin mortars and dried jointing sand are only suitable when used in a flexible installation design system and are not suitable as jointing when laid on a mortar bedding layer.

## PORCELAIN CONCEPT GUIDANCE 2

### Installation on Sand



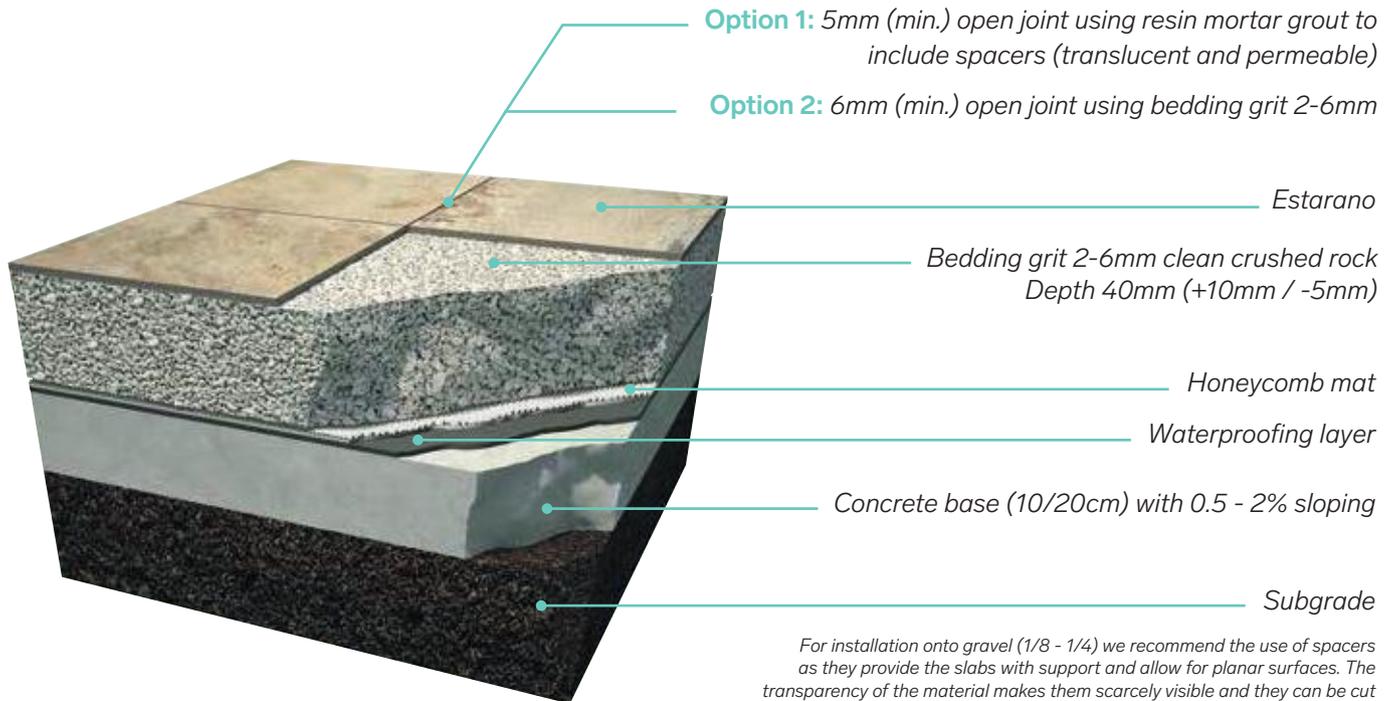
**NB.** These proposed concept drawings are offered to provide guidance to the specifier/installer of a typical composite design for porcelain Estarano in various applications, installers and specifiers should ensure the specific technical requirements for each contract is designed and approved by the Project Engineer.

# How-to-install Estarano Porcelain

continued

## PORCELAIN CONCEPT GUIDANCE 3

### Installation on Bedding Grit

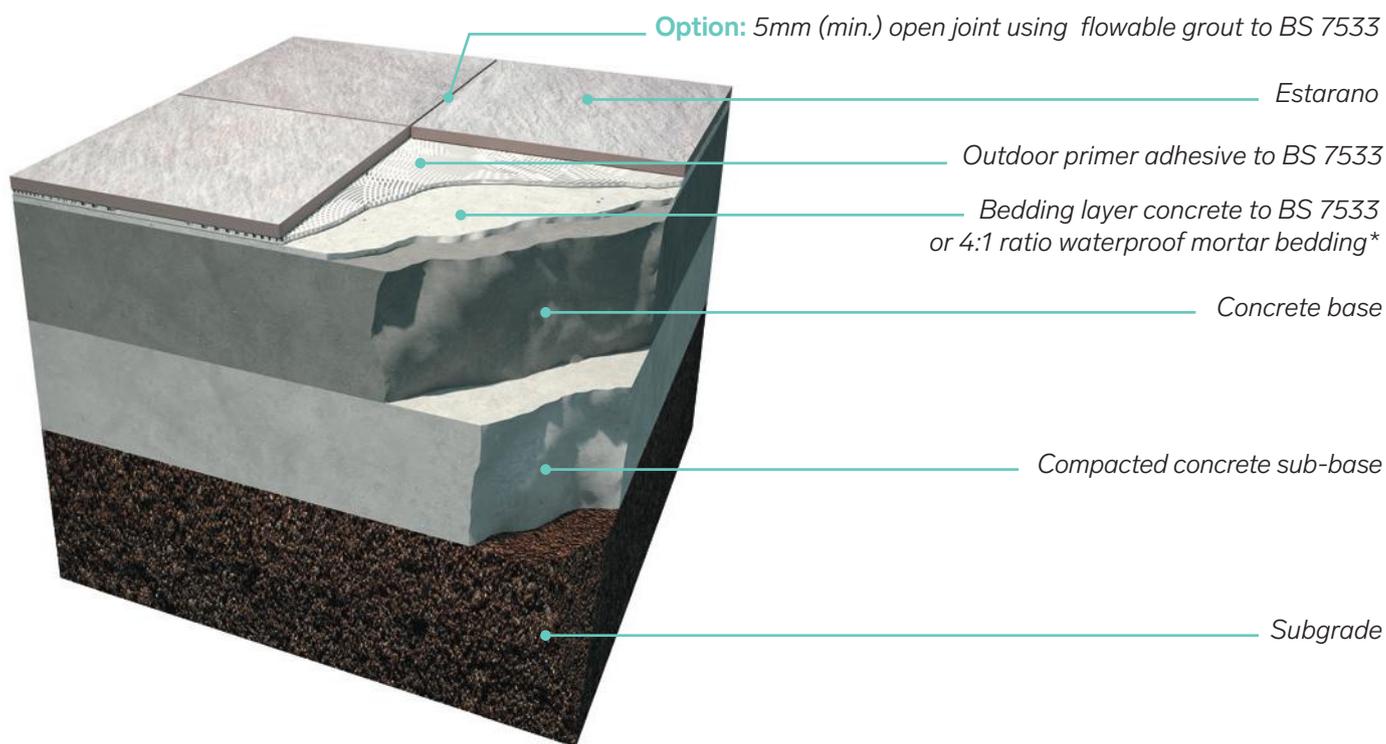


**NB.** These proposed concept drawings are offered to provide guidance to the specifier/installer of a typical composite design for porcelain Estarano in various applications, installers and specifiers should ensure the specific technical requirements for each contract is designed and approved by the Project Engineer.

The premium installation solution for outdoor driveways, garage ramps and patios as the laid surface is extremely resistant to both dynamic and concentrated loads. Expansion joints are required and the gaps between the tiles must be filled with cement-based grout compliant to BS 7533 as per the manufacturers instructions.

## PORCELAIN CONCEPT GUIDANCE 4

### Bound / Solid Installation



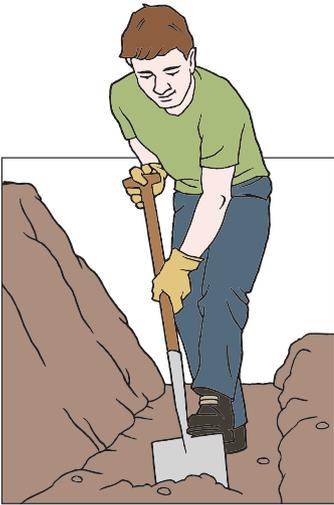
\*4:1 mortar bedding layer does not meet the performance requirements of BS 7533 bedding layer concrete.

**NB.** These proposed concept drawings are offered to provide guidance to the specifier/installer of a typical composite design for porcelain Estarano in various applications, installers and specifiers should ensure the specific technical requirements for each contract is designed and approved by the Project Engineer.

# How-to-build Walling

Guidance on how-to-install your new garden walling products.

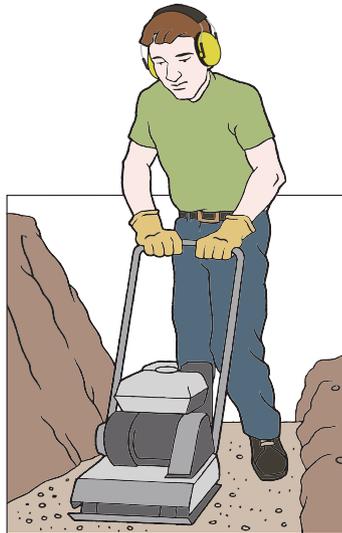
Aspen Stone, Bayfield + Diamond only.



## 1. Excavation

Dig out a trench where the new wall is to be installed. This trench should be 600mm wide and 300mm deep.

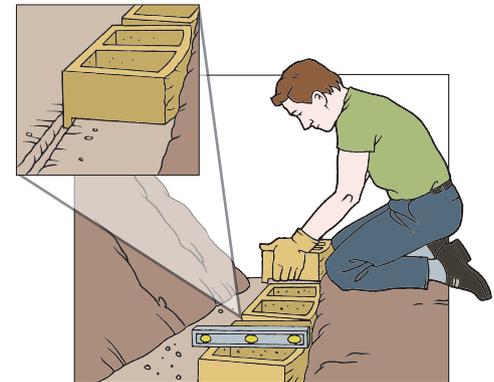
Once you have finished digging out, firmly compact the soil in the bottom of the trench using a vibrating plate.



## 2. Create a firm footing

Add a layer of crushed stone (such as MOT type 1, 20mm aggregate with fines) then compact using a vibrating plate.

The final compacted layer should be 150mm deep and extend the full width of your trench. Make sure your footing is level front-to-back and side-to-side.



## 3. Laying the base course

This is the most important step in the whole process! Begin laying blocks at the lowest elevation of the wall. Screed out a thin layer of course grit sand on top of the levelling pad. The base course blocks must be fully bedded (below ground level) and lie completely flat on the levelling pad.

**Important: To level the blocks you will need to dig out a small channel in the footing for the lip at the back of each block to sit in to (Bayfield / Aspen Stone / Diamond).**

Lay the first block, levelling it front-to-back and side-to-side, using the screeded sand to fully bed the block.

Use a string line **along the back of the blocks** (not the front) to align the units or evenly align the back of the units to form smooth and consistent curves.

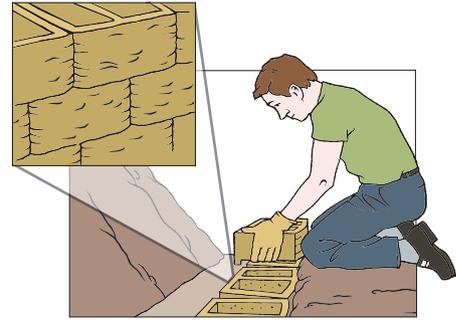
Place the blocks side-by-side, just touching each other at the front and the back. Make sure the blocks are fully bedded on the sand screed. Level the blocks in both directions with a spirit level.

**Top Tip...** If you are using more than one pack of blocks we recommend mixing blocks from different packs. This will help achieve a balanced blend of colours.

#### 4. Laying the second and subsequent courses

Make sure the top of the course that's just been laid is free of debris then start to lay the second course. As you position each block, move it until the rear lip (Bayfield / Aspen Stone / Diamond) is securely in contact with the block below.

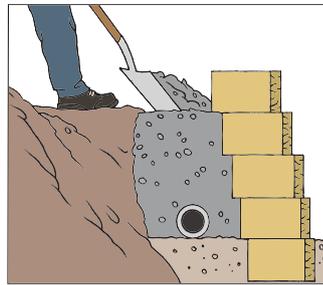
Stagger each course in relation to the course underneath it so that each block overlaps the joints in the blocks below - known as a "stretcher" or "running" bond.



#### 5. Drainage and backfilling

Place a perforated drainage pipe along the middle of the footing. Generally the pipe should be placed as low as possible so that water drains down, out and away from the wall and into a suitable drainage system such as a soak-away.

Fill the block cores and all the gaps between the blocks with drainage aggregate then backfill behind the course you have just laid. Use a no fines aggregate.

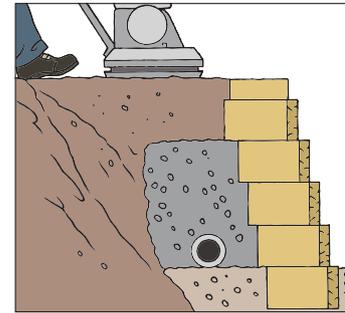


#### 6. Backfilling

Add 150mm of drainage aggregate at a time then compact fully. The bed of drainage aggregate should extend at least 300mm from the rear of the wall.

Place soil in front of the base course - then compact adding more soil as required until the base course is completely buried.

Add more soil behind the drainage zone and compact. Continue to fill and compact as each course is constructed.



#### 7. Finishing off

Secure a capping stone at the top of the wall using concrete adhesive. To ensure water drains away properly from the wall add and then compact a top layer of 150mm of soil with low permeability (a clay soil is ideal). Finally brush off any soil or debris.

**IMPORTANT:** If you are planning to build a wall taller than 1.2m, geosynthetic reinforcement will be required and you will need to consult a suitably qualified engineer.

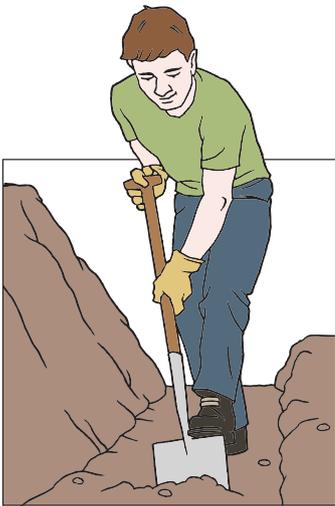
For more how-to guides and videos visit our website:

[ag.uk.com](http://ag.uk.com)

# How-to-build Kamden

Guidance on how-to-install your new 'double-sided' garden walling, as either free-standing or as a gravity retaining wall. Perfect for both straight and fixed-radius curved walls.

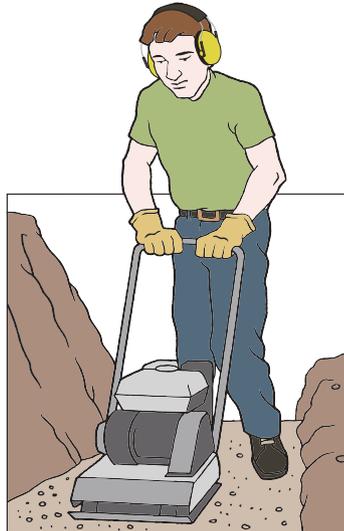
Kamden only (max. wall height 0.9m).



## 1. Excavation

Dig out a trench where the new wall is to be installed. This trench should be 600mm wide and 300mm deep.

Once you have finished digging out, firmly compact the soil in the bottom of the trench using a vibrating plate.



## 2. Create a firm footing

Add a layer of crushed stone (such as MOT type 1, 20mm aggregate with fines) then compact using a vibrating plate.

The final compacted layer should be 150mm deep and extend the full width of your trench. Make sure your footing / base levelling pad is as level as possible front-to-back and side-to-side.



## 3. Laying the base course

This is the most important step in the whole process! Begin laying blocks at the lowest elevation of the wall. Screed out a thin layer of coarse grit sand on top of the levelling pad. The base course blocks must be fully bedded (below ground level) and lie completely flat on the levelling pad.

**Important: Build the first row of Kamden with the locator nib facing up.**

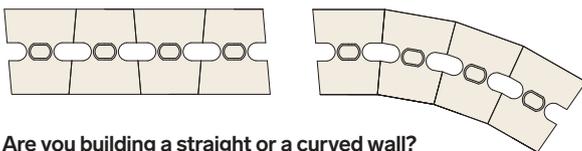
Lay the first block, levelling it front-to-back and side-to-side, using the screeded sand to fully bed the block.

**Useful Tip: When corners are required, Kamden walls should start construction from the corners.**

Use a string line **along the back of the blocks** (not the front) to align the units or evenly align the back of the units to form smooth and consistent curves.

Place the blocks side-by-side, just touching each other at the front and the back. Make sure the blocks are fully bedded on the sand screed. Level the blocks in both directions with a spirit level.

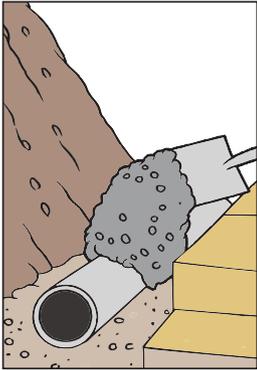
Locator nibs may need to be removed at the corners to facilitate the Corner Block.



**Are you building a straight or a curved wall?**

**Curved Wall  
Min. Radius: 1.02m**

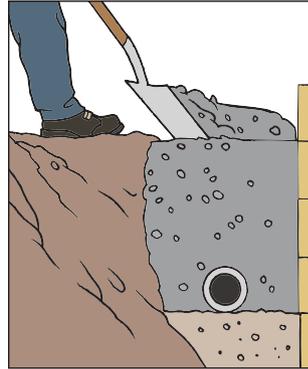
To build a straight wall, just alternate the blocks (short-side, long-side, short-side and so on). To create a curved wall, use the same block length for each course (either the short or the long edge).



#### 4. Drainage and backfilling (for Retaining Walls only)

Place a perforated drainage pipe along the middle of the footing. Generally the pipe should be placed as low as possible so that water drains down, out and away from the wall and into a suitable drainage system such as a soak-away.

Fill all the gaps between the blocks with drainage aggregate then backfill behind the course you have just laid. Use a no fines aggregate.

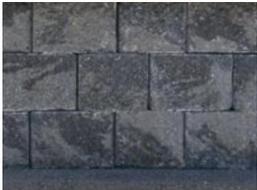


#### 5. Backfilling (for Retaining Walls only)

Add 150mm of drainage aggregate at a time then compact fully. The bed of drainage aggregate should extend at least 300mm from the rear of the wall.

Place soil in front of the base course - then compact adding more soil as required until the base course is completely buried.

Add more soil behind the drainage zone and compact. Continue to fill and compact as each course is constructed.



#### 6. Laying the second and subsequent courses

Make sure the top of the base course blocks are **free of debris**, then start to lay the second course.

Kamden blocks should be installed in Stretcher Bond, where the joints are staggered in relation to the course above and below.

Ensure each row has as accurate alignment as possible and **continue to brush off any soil or debris before installing each row.**



#### 7. Finishing off

The final row can now be built nib down, which facilitates the capping block.

Secure a capping stone at the top of the wall using an appropriate external concrete adhesive. For retaining wall purposes, to ensure water drains away properly from the wall add and compact a top layer of 150mm of soil with low permeability (a clay soil is ideal).

Finally, brush off any soil or debris, and your wall is complete.



#### Building Corners and Freestanding Wall Ends

Ensure that Corner Blocks, Stop End Blocks and Half Blocks are fixed with an appropriate external concrete adhesive for increased stability.

**Top Tip...** If you are using more than one pack of blocks we recommend mixing blocks from different packs. This will help achieve a balanced blend of colours.



KAMDEN BLOCK

Double-sided blocks that are completely vertical.



HALF BLOCK

Used to finish alternate rows on a stop-end wall.



STOP END BLOCK

Used to finish alternate rows on a stop-end wall.



CORNER BLOCK

Required to create 90° return angles.



SHORTCUT™ CAP

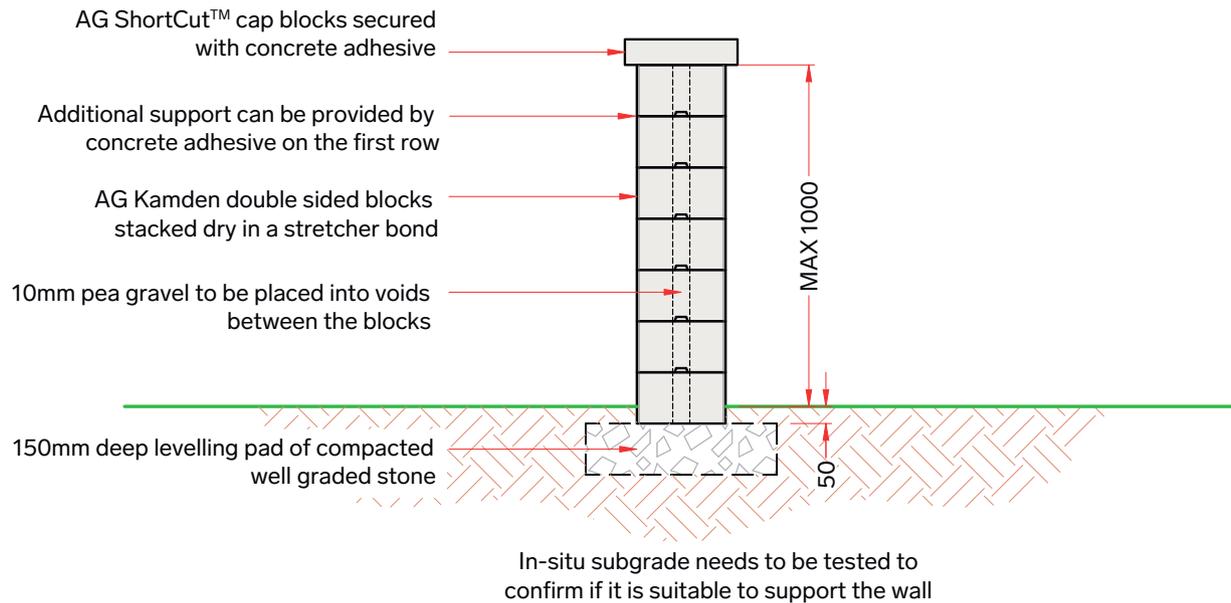
Used to finish cap for a wall.



# Concept Design for Kamden

Guidance on usage  
and limitations.

## Freestanding Gravity Wall





# Aftercare Guidance

## PAVING + FLAGSTONES

AG recommend regular seasonal maintenance at least three times a year. A good rule of thumb is to commence at the start of the growing season (April), the middle of the growing season (July) and at the end of the growing season (September) - this may vary depending on weather conditions. Check out our Mildew, Moss and Fungus Removal product on page 18.

### General Wear

Newly completed areas of paving or flagstones should only receive a light brushing in the first few months to allow joints to settle naturally. From then on, general maintenance should be carried out regularly. Using a bristle brush with mild detergent and hot water is normally all you need to remove any build-up of dirt and grime.

### Weeds, Moss + Lichen

Unwanted plants, moss and fungi are easily controlled. The trick is to tackle them as soon as they appear - don't allow them to get established. Use a proprietary weed killer on weeds and grass and a water-based fungicide or algicide on moss and lichen. As well as stocking all the products you need, your local builders merchant will also be able to offer you impartial advice and answer any questions you might have.

**Top Tip... Use a separate spray to wash, as combined sprays aren't as effective.**

### Heavy Staining

To remove hard to shift stains use a non-acid based proprietary cleaner. Always test a small area first and always follow the manufacturer's instructions. Avoid acid based cleaners as they may damage the paving.

### Efflorescence

Efflorescence (white crystals also known as 'white bloom') can appear on newly installed walls, paving and flagstones which have a high cement content. It is hard to predict how long efflorescence will last due to varying factors such as climate conditions, location and aspect. In some cases it can take around a year to disappear completely. It is in no way detrimental to the performance of the product. AG cannot be held responsible for this natural phenomenon.

### Oil Stains

Oil will readily penetrate into most surfaces and once staining occurs it can be difficult to remove. If the staining is substantial it may be necessary to replace the products in the damaged area. Do not attempt to wipe the spilt oil as this only drives the oil deeper into the surface. Soak up stains promptly using absorbent material such as a paper towel then use a non-acid based proprietary cleaner in accordance with the manufacturer's instructions.

### Power Washing

We don't recommend using a power hose to clean your paving as high pressure hoses can damage the surface of products and remove the jointing sand or grout which holds them in place.

If you carry out the simple, regular maintenance (as recommended previously), power washing shouldn't be necessary. However, if you do decide to use a power washer you can help minimise the risk of damage by observing the following guidance:

- 1) Remove loose debris with a broom;
- 2) Test a small area first;
- 3) Use a medium pressure or low pressure setting;
- 4) Hold the hose at not more than a 30° angle;
- 5) After the paving has dried, replace any jointing sand which has been removed.

### Sealing of Paving + Flags

A variety of sealers and cleaners are available through your local builders merchant. However, please note that applying sealant may affect the colour of paving. Be sure to follow the manufacturer's instructions and check the product's suitability by testing on a small area first. Responsibility for the performance of sealers and cleaners lies with the user and manufacturer of the product.

### Abrasion Assistance

Abrasion marks maybe present on pavers with undulating surfaces, these marks are a superficial effect from the slight movement of the product during transit and will disappear after a few weeks weathering.

## GARDEN WALLING

### Concrete Adhesive

Aspen Stone, Bayfield and Diamond are all mortarless systems requiring no cement to hold them together. Cap stones should be applied using a concrete adhesive thus eliminating the need for mortar and the associated risk of mortar stains.

### Power Washing

Using a power-hose is not recommended as it may damage the surface of the product.

### General Wear

Clean using a stiff bristle brush, mild detergent and water from a low pressure hose.

### Remedial Work

Any type of remedial work should first be tested on a small area. Remedial cleaning procedures may affect the appearance of the masonry.

## GENERAL INFORMATION

All products are manufactured from natural materials and although we strive to provide consistency of colour, variation may occur in the manufacturing process - this applies to all concrete products within the paving industry. It is for this reason we recommend that products are selected from at least three bales, within each delivery.

# Aftercare Products

How to look after your hard landscaping products.

**SAFETY NOTE:** Please wear protective clothing including glasses for eye protection, a face mask and gloves.



## STONE + TILE CLEANER

Stone and Tile Cleaner reduces the surface tension of the dirt and cleans powerfully.

### EQUIPMENT REQUIRED:

1. Measuring Jug
2. Soft Floor Brush
3. Hard Deck Scrubbing Brushes
4. Buckets
5. Garden Hose/Water Supply

### APPLICATION:

1. **Preparation** - soak the area to the point in which the flagstones/paving blocks are saturated, and remove any access surface water with soft floor brush.

**NB. If you have a large area to cover, do it in sections. Only soak an area you will be able to cover - keep it manageable.**

2. **Dilution of cleaner** - this is to be done depending on the type and degree of contamination.
  - Solid Area - dilute the tile and floor cleaner concentrate to a ratio of 3 parts water to 1 part concentrate, this normally suffices for ground in dirt, etc.

- Heavily Stained Area - in heavy stained cases wash area as per 'solid area' directions, then do a secondary wash using 1 parts water to 1 part concentrate.
- Concentrated Staining - in extreme cases use undiluted. Care to be taken using neat to not leave cleaner on surface any longer than 2-3 minutes.  
(It may require 2 to 3 washings depending on staining. We recommend mixing the solution in a bucket or basin).

### 3. Cleaning process -

- STEP 1 - Apply the appropriate dilution of "cleaning mix" using a hard scrubbing brush ensuring each flag is covered several times backwards and forwards and scrubbing vigorously a flag at a time as you progress (a white soapy appearance should be seen over the flags).
- STEP 2 - Apply more of the cleaning mix using the soft brush, working a section at a time using circular motion to work the cleaner into the surface as much as possible.
- STEP 3 - Repeat step 1.

4. **Allow cleaner to soak** - Leave the flags for approximately 5 minutes.

**NB. In dry conditions avoid allowing the solution to dry out, as this may result in permanent white staining on surface. In fast drying conditions we recommend this to be a two person process.**

5. **Rinse area** - Using scrubbing brush working from an edge, rescrub the flags before or in front of the person rinsing off the cleaning solution. Ensure the flags are rinsed thoroughly.



## MILDEW, MOSS + FUNGUS REMOVER

For the removal of Mold, Mildew and Fungus on any surface in your outdoor area.

### EQUIPMENT REQUIRED:

1. Brush
2. Measuring Jug
3. Sprayer
4. Garden Hose/Water Supply

### APPLICATION:

1. **Preparation** - brush any loose debris from the area.
2. **Dilution of product** - dilute the Mold, Mildew and Fungus Remover to a ratio of 5 parts water to 1 part concentrate (this can be mixed stronger depending on the degree of contamination).
3. **Directions** - using a sprayer, apply the solution to all the affected areas.
4. **Allow solution to soak** - leave the area for approximately 24 hours.
5. **Follow-up** - after a week organic matter will start to turn brown. Any loose debris to be brushed from the area.

# Jointing Products

## RESIN MORTARS

Pro-Pave grout is a decorative, fine, brush-in, paving joint solution available in natural grey + slate grey through our Outside Room Centres.

Resin mortar is a one-component, ready to use jointing mortar, suitable for concrete paving and flagstone products.

### SELLING POINTS:

- Resin mortar is easy to apply.
- Much easier to use than jointing with a trowel.
- Can be applied regardless of weather conditions.
- It is permanently water permeable.
- Prevents weeds from sprouting.

### INFO:

Joint Width: **To achieve the best results we recommend that a min. 6-10mm gap/joint is created between the base of the flags.**

Joint Depth: min. 20mm (1 inch).

**NB. Technical data sheet for Emtex Pro-Pave grout is available on request.**

## What do I need to do?

Before you begin, the under-base must be water permeable to allow the water to get away, otherwise resin mortar won't cure properly. Ensure your base is correct - proper drainage must be put in.

Ensure there is a good aggregate below. The base needs to be solid beforehand. If the paving moves before you fill the joint, then it will move with the material and cause problems. It is important to have your base correct first.

Make sure there are no contaminants and that the surface is clean before you begin. If sand is present in the joint it will weaken the integrity of resin mortar and cause cracks and breaks to appear.

An essential part of any flexible paving system.

**NB. Resin Mortars + Dried Jointing Sand are only suitable when used in a flexible installation design system and are not suitable as jointing when laid on a mortar bedding layer.**



### Application:

1. Soak the paving area thoroughly, ensuring it is completely saturated with water. Presoaking the surface will prevent the build-up of residue on the concrete surface.

NB. If you have a large area to cover, do it in sections. Only soak an area you will be able to cover - keep it manageable.

2. Open the bucket and empty the Pro-Pave grout along the joints on the wet surface. Using a soft brush, sweep the material diagonally into the joints until they are completely filled (don't use a hard brush or it will scrape the material out of the joints again).
3. Rinse the material into joints with soft jets of water - this helps to fill the joints deeply and without voids. Re-apply resin mortar where necessary.
4. Finally, spray the paving area with a soft jet of water and sweep off any loose material before the drying process begins. This will ensure the joints are flush to the paving. **Do not** point jets of water directly into the joints.
5. When it is dry, you can go along and brush any loose product from the paving.

### Notes:

Depending on how wet the area is, it could take a max. 24 hours to set. On a good sunny day it can take only a couple of hours to cure.

While it's drying, you can walk on the paving but don't walk on the joints (so there's no cracking).



## JOINTING SAND

### Standard Kiln Dried Sand + Silver Granite Kiln Dried Sand

Specially selected for its quality grading, Standard Kiln Dried Sand is provided in 25kg bags.

Silver Granite Kiln Dried Sand is also available to complement our paving and flags range. It is recommended for use with any AG product that is 'grey' in colour (using brown sand on grey paving products may cause staining).

### Usage Guide

AG products	25 kg bag	coverage
Rectangular	1no.	8 - 9m <sup>2</sup>
Country Cobble®	1.5no.	8 - 9m <sup>2</sup>
Flagstones 40/50mm	1no.	15m <sup>2</sup>
Plaza flagstones 50mm	1no.	10m <sup>2</sup>

# Advice + Guidance

## Product Inspection

All products should be carefully inspected for defects or damage upon delivery and prior to being installed. Delivery documentation is required to be signed and should include a record of such defects, which will need to be notified to an AG Sales representative within five working days of delivery.

AG are BS EN ISO 9001:2014 registered and use an integrated quality management system.

## Colour Blending

All products are manufactured from natural materials. Although we strive to provide consistency of colour, slight colour variations are inevitable with all concrete product manufacturing processes.

When purchasing products, AG recommend that packs are selected from the same date of production (DOP). Products should then be mixed on site from a minimum of three packs to help reduce the effect of banding.

Products which have been installed for a period will weather naturally, so the colour of any new products, when compared, will inevitably vary.

## Efflorescence

Efflorescence is a white crystalline deposit that can occur naturally on the surface of all concrete materials. AG use market leading technologies to significantly reduce the frequency and occurrence of efflorescence but these cannot totally prevent the phenomenon in all instances.

Where it does occur, efflorescence may mask the colour of the product for a period of time but this tends to gradually weather off naturally with rainfall given time. AG will not replace products affected by efflorescence.

AG recommend that customers ensure that packs of products which have had their packaging removed should be recovered to prevent secondary efflorescence.

## Waste

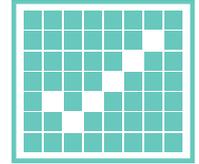
AG advise that customers can expect a percentage up to 5% of delivered product may be damaged due to loading, unloading, transport and site handling. Any product damaged should be set aside and reused for cutting or detailing and AG will not be held liable for such waste.

Where the customer experiences waste of greater than 5% of the total quantity ordered, an AG Sales Representative should be informed without delay.

AG recommend that customers ensure that their contractor accurately measures the area on site before ordering products. Dimensions taken from a product plan can vary significantly from the final layout. When ordering, customers should allow for an additional 5% to cater for detailing, cutting and acceptable waste. This quantity may need to be greater in the case of curved or circular designs.

# Finding an Installer

Choosing the right layer is an important decision. Follow these simple suggestions to ensure a good quality job.



## Plan early

Good contractors are in demand and are often booked up weeks or months in advance. Be wary of contractors who can start immediately.

## Always get more than one quotation

We recommend getting at least three but make sure they are like-for-like for a true price comparison. These should be dated with details of how long the quotation is valid for and must be on headed paper with the contractors contact information.

## Check them out

Ask if they have the relevant Public and Employer Liability insurance and if they are members of any Trade Associations. Ask for references from previous customers and details of where their work can be viewed. Contact these references and perhaps go and see the job they're currently working on.

## Ask their advice

The added bonus of contacting more than one contractor is that you often get a range of valuable free design advice. Many will have a photograph album of previous jobs that can help you visualise how our products will look in your plan.

## Don't decide purely on price

We know that this will be at the forefront of any decision but it's important that you feel comfortable with your contractor, that they understand your needs and that you are confident in their abilities.

## Once you have made your decision

Get an estimated start and completion date. These dates should be a little flexible as they can often change due to weather conditions and extended time spent on earlier jobs.

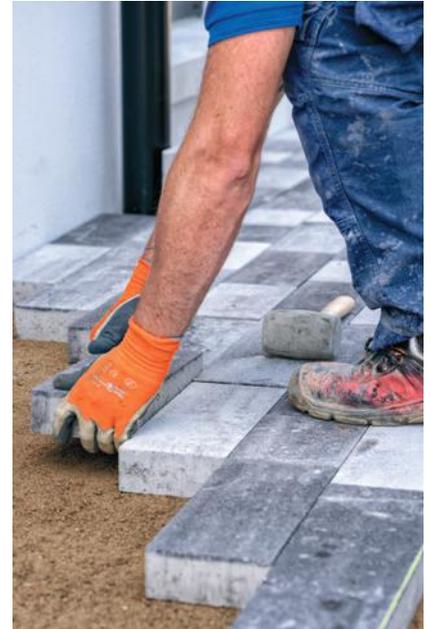
Make any changes or amendments from the initial quotation and have an up-to-date quotation agreed and drawn up.

Make sure you understand the plan fully and that the area measurements and order quantities are correct.

Take an ongoing interest in the work and if there are any variations to what has been agreed deal with them face-to-face.

## To avoid wastage

Get your contractor to accurately measure areas on-site before placing an order. It is important to note that some builders merchants do not accept returns on materials.



**AG's Approved Layers have met the desired level of criteria as outlined by AG's approval process. This includes but is not limited to competency in hard landscaping installation, quality customer service and good site practice. As Approved Layers are independent contractors, AG cannot be held responsible for the quality of workmanship or issues relating to the contractor-client relationship.**

Check out our website for your  
local AG Approved Layer  
[ag.uk.com](http://ag.uk.com)

# Find an Outside Room Near You



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## Fivemiletown

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## Derry at Murdock Builder's Merchants

Beraghmore Road  
Skeoge Industrial Estate  
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Visit our website for maintenance  
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