Porcelain Installation Guide

built on relationships

Design & Considerations

1) Ensuring 150mm clearance between finished paving level and DPC level.

2) Laying pattern to be used:

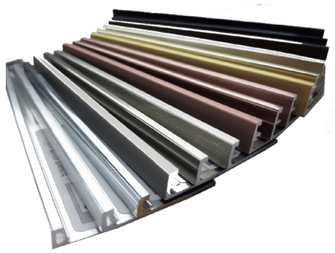
a. Which laying pattern to use? Staggered, stacked, random?
b. Orientation against the house? Think about when the homeowner steps out of the door, will this have the desired effect?
c. Where to start and where will any cuts be placed?

3) Drainage:

a. Crossfalls – typically aim for at least 1:60, with an absolute minimum of 1:80
b. Where is the water going?
   i. Into adjacent soft landscaping?
   ii. A linear or point drainage system & where will this discharge to?
c. Where and when are you going to create the falls? Either form them in:
   i.The formation level. This allows a constant thickness of sub-base and bedding course to be used.
   ii.The sub-base layer. This allows a constant thickness of bedding course to be used.

4) Step Nosing:

When installing steps, consider finishing off the vertical face at the front edge with a simple piece of trim, such as Schlüter®'s Schiene. Also consider possible colours for the jointing, to either complement or contrast the paving and the step's trim.



Schlüter®-Schiene

Ardex Colour Options

Contact the 3rd party manufacturer directly for technical information on the abbove recommended products.

Installation using Traditional Bedding Mortar

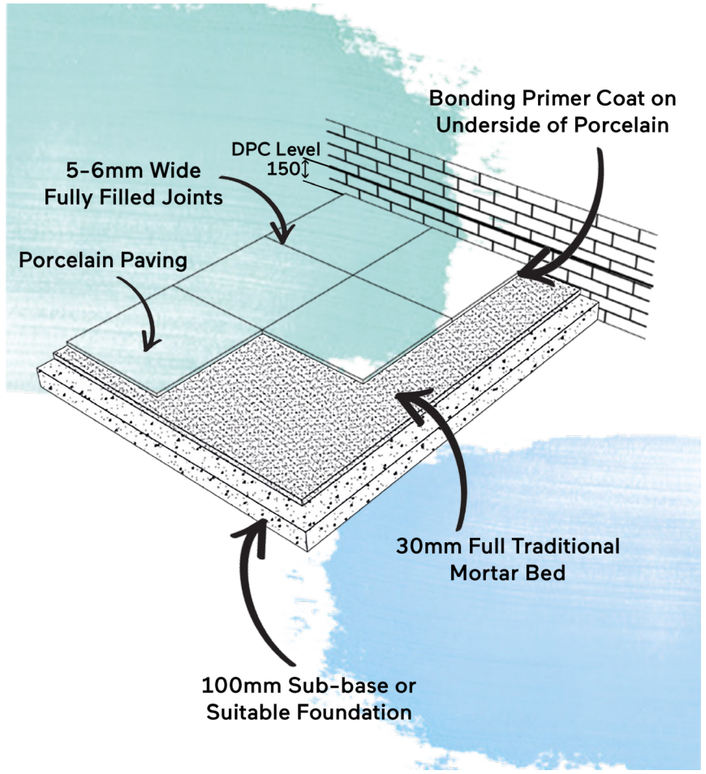
Excavation

• Determine the finished paving level, remember to be 150mm below DPC level.

• Excavate 150mm from the finished paving level. This depth allows for at 100mm of sub-base, 30mm bedding and 20mm porcelain.

• Form any falls at this level if you have chosen this method.

• Compact the formation level.



Bedding Course

• A stiff workable mix of 1-part cement to 3 to 4 parts sharp sand or grit sand.
 - This strong mix is needed for frost resistance.
 - The stiff workable mix is needed to ensure there is sufficient water to hydrate the cement but also stiff enough to support the weight of the porcelain paving.

• Full mortar bed, no bedding on dabs.

• Place sufficient area of mortar for the paving unit to be installed and depending on the mortar's workability, you may need to distress the surface of the mortar. This is sometimes known as 'creating valleys', 'rippling', 'slicing through', etc. This technique creates slightly higher ridges in the mortar so that when the paving unit is placed and tapped down, the ridges collapse into each other to help achieve a full mortar bed without air-pockets being created.

• The mortar's final thickness should be 30mm.
(Note: Think about the amount of surcharge required to achieve the final thickness of 30mm. If you are not familiar with a mortar, trial an area to see how much surcharge is required. As a rough guide, 35 to 40mm of mortar will reduce down to 30mm.)

• The maximum working time for a mortar is typically up to 2 hours. After this time, fresh mortar should be used.

Sub-base

• If installing on a weak ground, such as a clay, a geotextile laid directly onto the ground and beneath the sub-base will prevent any sub-base material being forced under compaction into the ground.

(Note: a geogrid can be used instead of geotextile, this can perform the same function but will also provide better stability to the sub-base material).

• Install Type 1 sub-base to achieve a final compacted thickness of 100mm and form any falls at this level if you have chosen this method.

(Note: Think about the amount of surcharge required to achieve a compacted thickness of 100mm. If you are not familiar with a material, trial an area to see how much surcharge is required. As a rough guide, 125mm of uncompacted Type 1 will compact down to 100mm when fully compacted.)

Placing Porcelain Paving

• The backs of the slabs must be brushed down to remove any excess dust as a result of the manufacturing process which may negatively impact the bond between primer and paving unit.
(Note: this dust contains magnesium oxide which is part of the releasing agent from the manufacturing process. This chemical compoud can interupt the bond.)

• For each porcelain unit, the back of the unit needs to coated with a cementitious slurry primer. This is to increase the adhesion of the porcelain to the mortar bed for long-term performance.
(Note: this is required due to the low water absorption characteristics of the porcelain. Slabs should not be wet prior to the slurry primer being applied as this may negatively impact the bond between primer and paving unit.)

• Coat the back of the porcelain paving, then immediately place the paving onto the mortar bed and tamp to line and level.
(Note: when tamping into final position, use a rubber maul and we would suggest using a lighter coloured maul for lighter paving colours, to avoid leaving any marks on the tamped paving.)

• Between adjacent paving units, use a spacer to maintain a consistent 5 to 6mm joint width during installation.
(Note: never butt joint, this is when the adjacent units are in contact with each other.)

• As work progresses, clean off any mortar or slurry stains from the face of the paving. Don't wait until the end of the day.

• Allow at least 24 hours before walking on the surface.

Cutting

For cutting porcelain, this should be carried using a diamond cutting blade which is continuous (i.e. no gaps and uninterrupted), bench mounted and sufficient water being applied during cutting to both suppress any dust and cool the blade.
On the face of the unit, mark out where the cuts are required and cut on the top surface.
When starting to cut, initially have the rpm low and increasing to 10,000rpm to ensure a decent cut face.

Jointing

For all jointing materials and methods, care should be taken to ensure the joints are fully filled and correctly finished is required (i.e. striked finish to create a close texture finish) in accordance with the manufacturer's recommendations. Additionally, care should be taken to prevent and remove any jointing residue from the face of the paving to avoid compromising the final. If in doubt, we would suggest seeking advice on how to apply from the manufacturer and carry out a trial in a discreet area before committing to the entire installation. Don't underestimate the effort that may be required to remove any residue!
Consideration should be given to the working method (for any preferences you may have) and working times of the different jointing materials.
• Grouting – wide range of colour options are available, ensure a suitable product is used for external applications and any other features (e.g. swimming pools, etc.)
• Cementitious Jointing – various colour options from different suppliers. These products can be either slurry applied or gun applied.

Suggested Suppliers:

Bedding Mortar, Bonding Slurry, Mortar Jointing
• Parex: www.parex.co.uk
• Instarmac: www.instarmac.co.uk
• Larsen: www.larsenbuildingproducts.com

Grouting:

• Ardex: www.ardex.co.uk
• British Adhesives Ltd: www.bal-adhesives.com

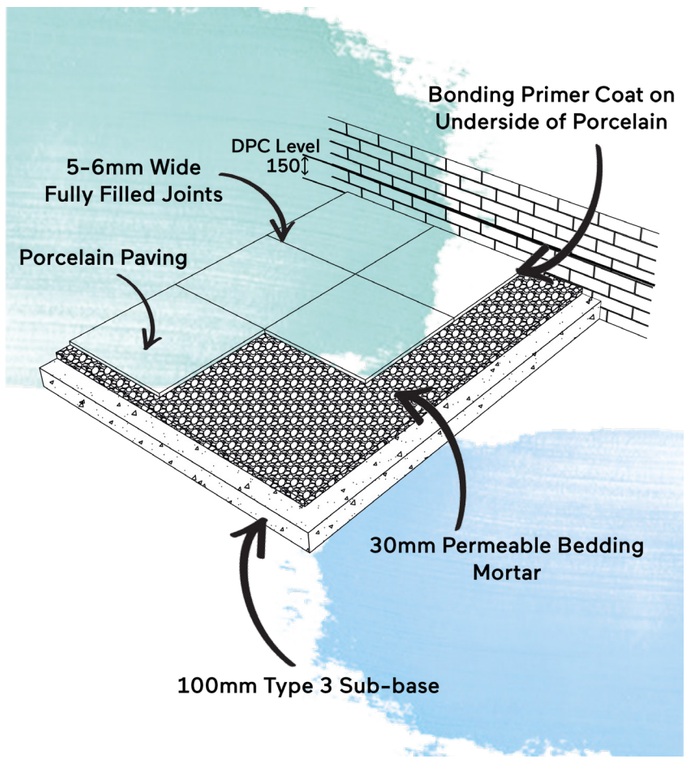
Note: we would advise advice is sought from the supplier of any bedding and jointing material to ensure its suitability, compatibility with porcelain and long-term in-situ performance. As these products are not sold, manufactured by Brett, we cannot take any responsibility for their advice offered and/or the performance of their products.

Installation using permeable Bedding Mortar

The use of a permeable bedding is intended to relieve any water that may enter the pavement during the jointing process (depending on the jointing material being used) and any water that may seep throw any hairlines cracks and/or imperfections between the jointing and the paving. This allows any water to escape and prevent any possible damage due to the water freezing. Surface water runoff is still intended and should be allowed for. The overall pavement is not intended to be used as a permeable pavement, such as a part of a sustainable drainage system.

Excavation

• Determine the finished paving level, remember to be 150mm below DPC level.
• Excavate 150mm from the finished paving level. This depth allows for at 100mm of sub-base, 30mm bedding and 20mm porcelain.
• Form any falls at this level if you have chosen this method
• Compact the formation level



Bedding Course

• A suitable bagged permeable mortar should be used. Suggested suppliers are provided within this guide. Considerations when using a permeable mortar are:
 – This strong mix is needed for frost resistance.
 – A stiff workable mix is needed with sufficient water to hydrate the cement whilst also providing enough support for the porcelain paving.

• Full mortar bed, no bedding on dabs.

• Place sufficient mortar for the paving unit which is to be laid and only likely distress the mortar's surface. Permeable mortar moves a lot less than a traditional mortar, so any 'rippling', 'slicing through', etc should be minimal but a full mortar bed after tamping down is still required.

• The mortar's final thickness should be 50mm. Due to the grading of the aggregates, the initial placing of the mortar needs to be much more accurate as there isn't the ability to tamp down the depth of mortar in the same way a traditional sand cement mortar performs.
(Note: Think about the amount of surcharge required to achieve the final thickness of 50mm. If you are not familiar with a mortar, trial an area to see how much surcharge is required.)

• The maximum working time for a permeable mortar can be significantly less than a traditional mortar. The working time can be between 30 to 45 minutes, after this time, fresh mortar should be used.

Sub-base

• If installing on a weak ground, such as a clay, a geotextile laid directly onto the ground and beneath the sub-base will prevent any sub-base material being forced under compaction into the ground.

(Note: a geogrid can be used instead of geotextile, this can perform the same function but will also provide better stability to the sub-base material).

• Install a Type 3 sub-base to achieve a final compacted thickness of 100mm and form any falls at this level if you have chosen this method.

(Note: Think about the amount of surcharge required to achieve a compacted thickness of 100mm. If you are not familiar with a material, trial an area to see how much surcharge is required.)

Placing Porcelain Paving

• For each porcelain unit, the back of the unit needs to coated with a cementitious slurry primer. This is to increase the adhesion of the porcelain to the mortar bed for long-term performance.
(Note: this is required due to the low water absorption characteristics of the porcelain.)

• Coat the back of the porcelain paving, then immediately place the paving onto the mortar bed and tamp to line and level.
(Note: when tamping into final position, use a rubber maul and we would suggest using a lighter coloured maul for lighter paving colours, to avoid leaving any marks on the tamped paving.)

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• Instarmac: www.instarmac.co.uk
• Larsen: www.larsenbuildingproducts.com (note: Larsen do not offer a permeable bedding mortar)

Grouting:

• Ardex: www.ardex.co.uk
• British Adhesives Ltd: www.bal-adhesives.com

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