

***When installing hydraulically pressed paving for pedestrian duty, receiving no vehicular traffic, it can be installed using two construction methods as detailed within both BS 7533-101: 2021 and BS 7533-102: 2025. These methods are either bound (with a bound mortar laying course and 6-10mm mortar joints) or unbound (with an unbound sharp sand laying course and a narrow 2-5mm sand filled joint). The process for the installation of the unbound base is the same for both methods however the bedding courses and jointing materials details differ. The following guide provides details on the installation process for both methods. Under no circumstances should the installation methodology be mixed by having a bound laying course with an unbound joint or unbound laying course with a bound joint. Slabs installed in either process should never be butt jointed and the correct joint detail must be constructed in both methodologies.***

### Step 1: Prepare the Site:

- Determine the finished level of your patio, ensuring it is at least 150mm below the DPC (damp-proof course) of your building.
- For bound installation excavate the area, removing between 175 to 190mm of soil from the finished level to allow for a 100mm of base, 40mm of bound bedding layer and between 35-50mm for paving slab (depending on size of product chosen).
- For unbound installation excavate the area, removing 165 to 180mm of soil from the finished level to allow for a 100mm of base, 30mm of compacted unbound bedding layer and between 35-50mm for paving slab (depending on size of product chosen).
- Recommended levels for longitudinal and cross falls need to be constructed at the sub-grade to allow for water runoff of the final pavement. Longitudinal falls are to be a minimum of 1-100 and cross falls a minimum of 1-80 for smooth paving and 1-60 for riven or textured paving.
- If the pavement is to be constructed over a poor or weak subgrade, then defective areas, or soft spots, will require replacing and remediating until firm ground conditions are achieved. The surface of the subgrade should be tight and compacted so that it does not move under construction, that there are no loose areas and no ridges. If a geosynthetic separation membrane is required, on a subgrade less than 3%CBR or below, it should be installed at this point in accordance with the manufacturer's recommendations.

### Step 2: Base Construction:

- Install a crushed rock compliant Type 1 base, ensuring a minimum final compacted thickness of 100mm. Replicate the levels, longitudinal and crossfalls which were created within the sub-grade to allow proper water runoff and prevent ponding.
- If you are unsure about the amount of surcharge needed for compaction, trial an area to determine the required amount. (Note: Think about the amount of surcharge required to achieve a compacted thickness of 100mm. As a rough guide, 125mm of uncompacted Type 1 will compact down to 100mm when fully compacted. The thickness on any layer being compacted should not be less than 2.5 times the maximum aggregate particle size).
- Before compacting ensure that the base is moist but not saturated, material should not be installed and compacted if it is either frozen or dry. If there is evidence of fine and coarse aggregate separation within the base material, through transportation, then it should be remixed using a loading shovel and water added where necessary.

- Compact the base thoroughly, ensuring a tight and dense surface to prevent migration of bedding course material during construction and use of the pavement. Ensure that the base does not move under construction, that there are no loose areas or ridges and that the final construction surface meets the design levels and tolerances using a stringline.

### Step 3: Install Edge Restraints:

- Securely install suitable edge restraints to the perimeter of the pavement before installation of the bedding course and paving units.
- The restraints should be robust enough to withstand the desired traffic loading and should present a vertical face level with or lower than the underside of the bedding course. If constructing using the unbound installation method then the kerb restraint must be installed to the same level as the surface of the paving to ensure the pavement is firmly retained on all sides. This should be bedded on a minimum of 100mm of C20/C25 concrete and require haunching in concrete to rear of the edging by a minimum of 50mm up the vertical face to mitigate lateral movement. In ambient temperatures haunching must be completed within 2 hours of installing the bedding concrete.

### Step 4: Bound Installation (with Mortar):

- Prepare a stiff workable mix of M6 mortar, consisting of 1-part ordinary portland cement to 4 parts sharp sand. This strong mix ensures frost resistance, and the stiffness supports the weight of the paving.
- Place enough mortar on the bedding layer for one paving unit, prepare a full flat bed with no trowel mark, which can be compacted to the desired final design level. This will achieve a full contact bed and prevent voids from forming when the paving unit is tapped to level. Do not use mortar dabs, as they can create voids and weak spots beneath the paving slab which will lead to structural issues in the future.
- The final thickness of the bedding layer should be not greater than 40mm and a minimum of 35mm. The maximum working time for a mortar in ambient temperatures is typically up to 2 hours. After this time, fresh mortar should be used, rehydrating will weaken the mix and this practice should not be undertaken.
- Lay the paving unit onto the mortar, ensuring a full contact bed and tap to level and falls with a pavior's maul, ensuring they do not rock after bedding and there is sufficient compaction of the mortar bed. Any rocking paving slabs should be lifted and re-laid as necessary. Repeat this process for each paving unit, ensuring they are laid to line and level with the use of string lines in both directions at regular intervals.
- Lay the paving slabs with joint widths typically ranging from 6mm to 10mm. Exclude the chamfer (if present) from the joint width measurement. Slabs must not be butt jointed on a bound bedding layer as this allows surface water to infiltrate through the narrow joints and is unable to drain through the bedding layer and may cause staining and structural issue with the paving.
- Measures should be put in place to prevent the bedding mortar from rising within the open joint. Bedding mortar should not come within 30mm of the pavement surface or the full depth of the paving depending on which is the greater.
- The pavement surface should be cleaned thoroughly to remove cement or mortar staining as the installation progresses.

### Step 5: Bound Installation Jointing (With Mortar):

- Prepare a designation M12 sand cement mortar with 1 part cement to 3 parts sand. Firmly press and compact the mortar into the joints using a suitable pointing/flat iron.
- Fill the joints to the full depth of the paving, leaving a gap of 2 to 3mm from the top surface ensuring there are no voids in the joint.
- Clean off any excess mortar from the surface of the paving immediately to avoid staining.
- Allow a minimum of 24 hours before walking on the paved surface. During this time, protect the area from any heavy use or disturbance. This can be up to 48 hours in cooler temperatures.
- When installing paving over an impermeable traditional M12 site batched mortar permeable jointing compounds should not be used. These permeable jointing mortars allow for surface water to infiltrate through the joints and are unable to drain through the bedding layer causing possible staining and structural issue with the paving slabs. These jointing compounds should only be used if a suitable proprietary permeable mortar is to be used as the bedding layer.

### Step 6: Unbound Installation (with Sand):

- The laying course should be a naturally occurring sand GF85 0/4 (MP), in compliance with BS 7533-101:2021, which contains nothing which acts as a binder, and could detract from the unbound nature of the pavement, e.g. cement, lime bitumen or resin, and should be free draining.
- Install the laying course with a pre-compacted thickness of 30mm in either of the below methods.
- Method 1: Spread the material in one layer and compact it with a plate compactor. Loosen the top 10mm using a rake to accommodate slab thickness tolerances.
- Method 2: Screed out 25mm of laying course material and compact, this will compact the layer to approximately 20mm thick. Then screed out an additional 10mm of loose material to achieve a total installed thickness of 30mm. Ensure the surface is level and smooth by screeding.
- Place the paving units onto the laying course, ensuring a joint width of 2-5mm between the slabs. (this should not include any chamfers, and the slabs should never be butt jointed). Ensure the paving slabs are correctly aligned with the use of string lines in both directions at regular intervals.
- Compact the paving units into the unbound laying course with a pavior's maul. The units should not rock after bedding, any rocking flags should be adjusted and re-laid as necessary.

### Step 7: Unbound Installation Jointing (with Sand):

- If a joint width wider than 5mm is desired, then the bound installation method must be used.
- Fill the 2-5mm joints of the paving with kiln-dried silica joint filling sand ensuring the sand is firmly brushed into the joint.
- Check and top up the joints as needed, especially in the early life of the patio when jointing material can be removed by wind and rain.

- Stabilisation solutions can be used to reduce the weathering effects on the unbound sand filled joint. If these are to be used then the manufacturers' recommendations must be followed and a trial should be carried out in a small inconspicuous area to ensure the aesthetics of the paving are not affected.

### Site Best Practice

- Installation of both methods should be carried out in good weather conditions with the temperature above 4 degrees Celsius, and rising above 5, for the bound installation.
- Ensure that enough paving is available from a single batch to complete the installation of the hard landscaping on each individual plot. Mixing of batches on a plot may result in colour variation and banding of the paving.
- For larger areas select paving from multiple packs, from the same consistent batch, to ensure any shade variations are minimised across the pavement.
- Through installation of the paving site construction materials should not be pre-stacked or stored on the surface of the paving as material can leach contaminants into the surface pores of the concrete.
- Once the installation is completed the paved area should be covered and protected to ensure that the risk of contamination to the face of the paving by construction site traffic is minimised. This can be done by covering the completed paving with walk boards.

Any information provided within this installation Guide by Brett Landscaping & Building Products is purely in compliance with the current British Standards suite of BS 7533 standards. Any advice for ancillary products used in conjunction with the installation of Hard Landscaping should be sought from the relevant manufacturer.