

'How To' Lay Block Paving

Tools:

Spade/shovel
Wheelbarrow
Spirit level
String line
Line pins or pegs
Rubber mallet
Brush
Straightedge
Screeder board (100x19mm timber)
Screed rails (20mm steel conduit pipe)
Vibrating plate compactor
Block splitter

Introduction:

Block paving requires a substantial “build-up” to give the paving strength. Even a lightweight patio-standard installation will be at least 160mm (6½”) thick, while a driveway suitable for larger cars or 4x4s will be 240mm (9½”) or more. Consequently, the amount of excavated material can be considerable and that is why mini-diggers are often used to help with the vital preparation work. In unfamiliar hands, mini-diggers can cause havoc and do untold damage to a property, so give serious consideration to asking a local contractor to undertake the excavation and “stoning-up” (placing the sub-base), leaving the laying courses and blocks for DIY installation.

A block paved patio or driveway comprises three key layers: a sub-base of crushed stone (hardcore) or recycled material that gives the paving its strength and load-bearing ability; a laying course of very gritty sand that is levelled out to form a bed for the final layer, which is the paving blocks.

Ruscrete stock a wide range of paving blocks in all sorts of sizes and colours. However, they are all laid in much the same manner, so, once you have chosen your blocks, the following guidance should help you construct a perfect patio or driveway.

Drainage:

Think about how the completed paving will be drained. This is most often achieved by sloping the paving in one direction or another. Small patios and pathways can sometimes be drained onto adjacent areas of garden, but larger areas will more probably need to rely on gullies, linear channels or similar. It may be necessary to install additional drainage and this should be done before constructing any of the pavement layers.

The gradient (slope) recommended for patios and driveways is a minimum of 1:60, which is equivalent to 17mm for fall per linear metre. While there is no recommended maximum gradient, patios sloping by more than around 1:40 can be uncomfortable and make it difficult to position patio furniture. On driveways, block paving can be successfully laid to quite steep gradients.

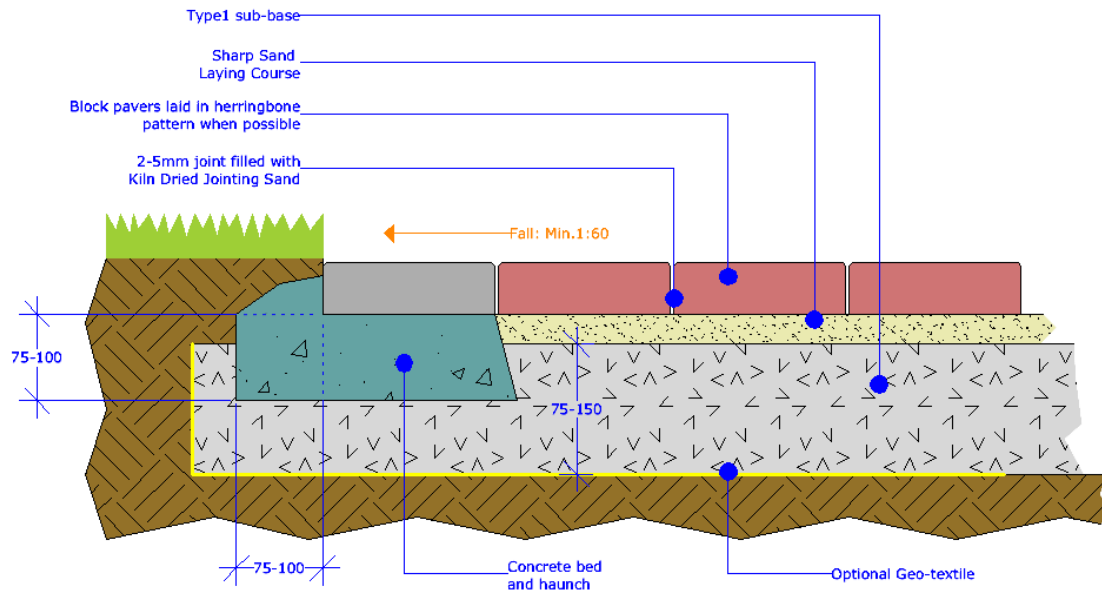
Excavation:

The first step is to mark out the area to be paved, allowing an additional 150-300mm (6”-12”) at all free edges, to allow working room and space for haunching to restraining edge courses.

Consider how the paving will be used and select the most suitable minimum sub-base thickness for the table below:

Use	Sub-base	Laying Course	Blocks	Total
Patio/foot-traffic only	75mm	35mm	50mm	160mm
Small car	100mm	30mm	50mm	180mm
Large car/4x4/ 2+ cars	150mm	30mm	60mm	240mm

Other than at doorways, paving should always be laid at least 150mm lower than the damp proof course (DPC) of any adjacent property.



Excavation should reduce the level to at least that required to accommodate the layers outlined above, but it is essential that all topsoil, organic material and any loose or soft sub-soil be removed, building up levels using extra sub-base if necessary.

When completed, the excavated area should be reasonably firm with no soft or spongy areas. If walking over the excavated area leaves bootprints, then it may be a good idea to cover the area with a **construction geo-textile**. These are NOT used to prevent weeds, but prevent the sub-base sinking into the ground, and so make for a stronger block pavement.

Sub-base:

The first build-up layer is the sub-base. This is the layer that gives a block pavement its strength: the other layers are simply loose sand and loose blocks, so the sub-base is essential if the paving is to take the weight of a car or even a patio table.

The best material to use for the sub-base is a Type 1 road building stone, sometimes referred to as MOT1 or DTp1. Some other crushed aggregates (such as 50mm crusher run) are satisfactory for light-use driveways and patios but the cost saving is minimal and the performance will not match that of the Type 1.

The loose sub-base material is spread and levelled, allowing for the fact that it will compact by around 25%. Compaction is normally done using a vibrating plate compactor and it will take at least 10 passes of a typical plate to compact 100mm of sub-base. It is

essential that the sub-base is 'compacted to refusal'; that is, compacted to the point where it cannot be compacted any further.

The finished level of the compacted sub-base should be $\pm 10\text{mm}$ from the required level. Add or remove material as required to achieve the correct levels and profile. It is not a good idea to rely on the laying course to correct levels, as this often results in differential settlement which can cause ponding. Time spent ensuring the sub-base is thoroughly compacted and accurate in both level and profile will help create a pavement that will give many years of good service.

Edge courses:

The next stage in construction is installation of the restraining edge courses (also referred to as 'soldier courses'). Along with the sub-base, the restraining edge courses are vital to the performance and longevity of a block pavement. Their purpose is to hold everything in place, and so it is essential that they are firm, robust and strong. That's why they should be laid on concrete and haunched with concrete.

To make a concrete for laying edge courses, mix 4 buckets of shingle with 2 buckets of coarse sand (grit) and 1 bucket of cement. Alternatively, mix 6 buckets of all-in ballast with 1 bucket of cement. Add enough water to make the concrete damp but not sloppy,

The edge courses can be formed using the same pavers as the main pavement, from blocks of a contrasting colour, or from block paving kerbs. Block pavers are normally used around the entire perimeter of the paving, including where the paving lies against a wall or other fixture, whereas kerbs would normally be used only at 'free edges', that is, those edges that lie against garden or lawn.

Restraining edge courses must be robust, and so they should be laid onto a bed of concrete that is not less than 75mm thick (100mm for heavy use driveways). It will be necessary to scrape out a channel in the sub-base material laid earlier to accommodate the concrete bed.

Against walls, it may be possible to use the brick jointing as a level guide, but elsewhere taut string lines fastened to line pins or pegs are the best guide to line and level. Establish the string along the outside edges of the paving and set it to the required fall using a spirit level. Remember that a string line needs to be pulled tight to be accurate. A loose string line will sag.

Lay the edge course units one at a time, tapping each down to the required level using a rubber mallet. Check the levels using a straightedge and/or a spirit level, and then haunch by pacing concrete at the rear. The haunching concrete should be at least 75mm wide (100mm for heavy use driveways) and be brought up to around 25mm from the top of the block/kerb.

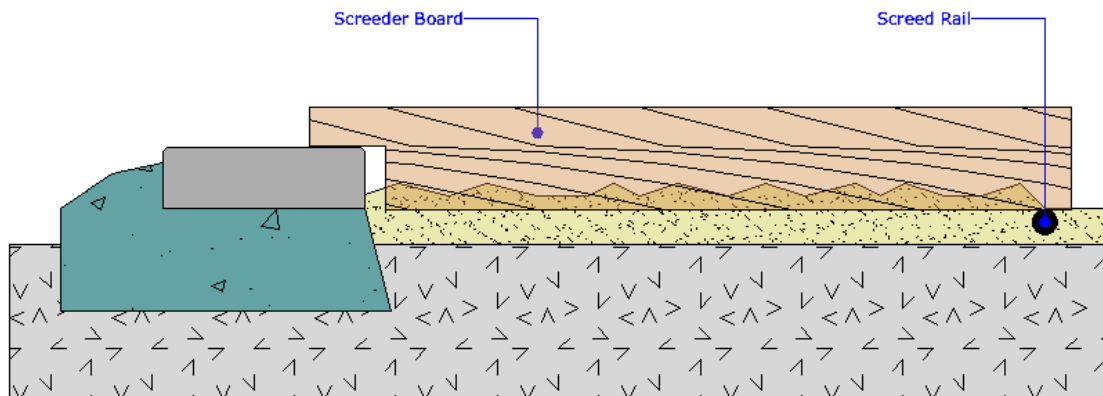
While not essential, many contractors prefer to lay those edge course blocks which lie against a wall on a bed of concrete, although the haunching will obviously not be necessary. This is done as it makes screeding of the laying course (see later) much easier.

Laying course:

This is the sand layer that is used as a bed for the paving blocks. It must be a coarse, free-draining sand: building sand is NOT suitable. The sand is spread out over the area, roughly levelled and then lightly compacted. It should not be 'compacted to refusal' at this stage: there needs to be some 'give' in the sand to allow the blocks to bed in.

The laying course is then screeded to level by scraping over it using a screeder board, which is often a length of 100x19mm timber. A notch can be cut in one or both ends of the

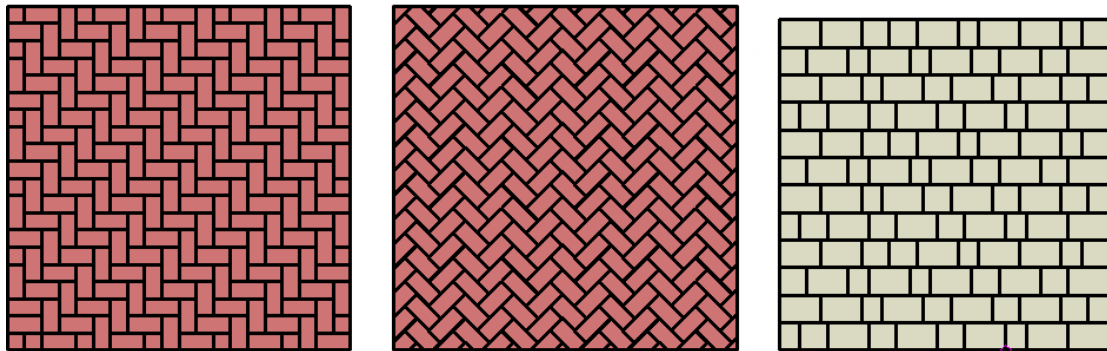
timber to allow the screeder board to ride over the edge courses, using them as a guide to level. Where the screeder board will not span the full width of the pavement, a screed rail can be set into the sand at the level of the underside of the paving blocks. The screeder board can then ride over the screed rail to set the laying course level.



When complete, the screeded laying course should be at a level that leaves the paving blocks 4-8mm high. This is done to allow the blocks to be compacted when laid.

Paving blocks:

There are two main laying patterns used with block pavers: coursed, where the blocks are laid in lines, much like brickwork, and herringbone, where the blocks are laid to form an interlocking pattern. Whenever possible, a herringbone pattern should be used for driveways as it is much stronger.



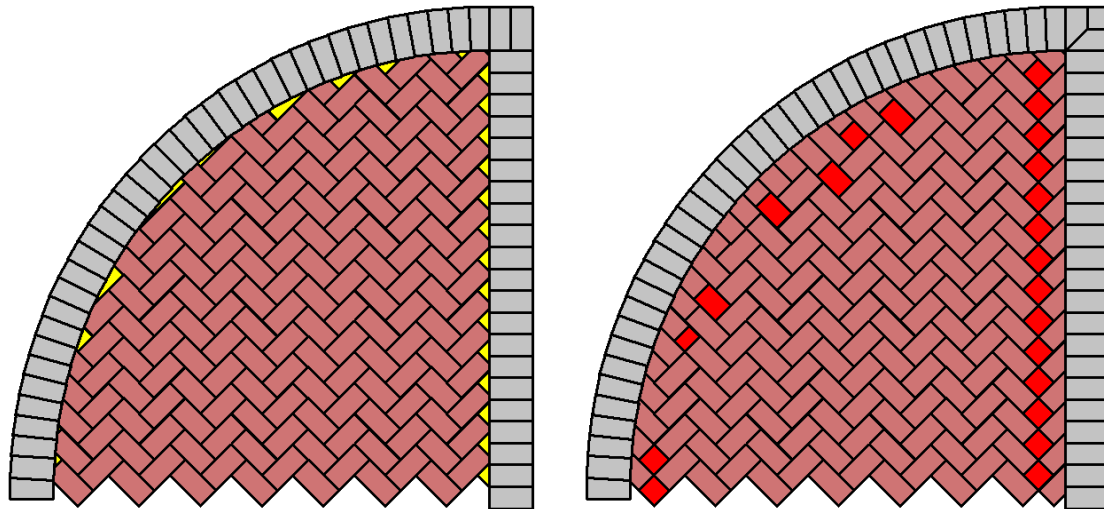
Always start laying at the bottom of any slope and work uphill. The pattern should be aligned to the house, so that it is square or parallel to the main building. Setting-out from gates or the public footpath may result in the laying pattern being skewed around the house.

Lay blocks by butting up against the preceding block(s) and then lower down onto the laying course. Do not place blocks onto the bed then push across to abut preceding blocks as this will trap sand between the blocks and cause the laying pattern to become distorted.

Lay all the full blocks; leave any cutting until later. Use taut string lines and/or straightedges to ensure the pattern does not 'drift' offline. Check the alignment every metre or so to prevent problems developing.

Cutting-in:

When all the full blocks have been laid and the pattern alignment has been checked, the cutting-in can be started. Blocks are best cut using a block splitter. Cut-off saws may be used but they are much slower and far dirtier, producing clouds of dangerous silica dust that **MUST** be suppressed using a water spray. Try to avoid any cut pieces that are less than one-quarter of a full block; if necessary, cut two blocks rather than have small pieces. There should be no gaps/joints wider than around 5mm.



By using one-third, two-thirds and half blocks, most small pieces can be eliminated resulting in a much stronger finished pavement.

Compaction and Jointing:

Once the cutting-in is completed and the paving has been checked for alignment, it can be compacted and jointed. Make sure the surface is clean and free from any gravel or off-cuts, and then compact it by running over the surface with the vibrating plate compactor. Two or three passes will be adequate.

After initial compaction, check the paving once again in case any blocks have broken or become damaged. Remove and replace any damaged/broken blocks.

Next, the special kiln-dried jointing sand can be spread. For this, the surface of the paving **MUST** be bone dry otherwise the dried jointing sand will not flow and fill the joints. Depending on the type of paving block used, each 25kg bag of jointing sand will cover approximately 6m². Spread the sand using a brush, chasing it into the joints and ensuring each joint is properly filled.

When the joints appear full, sweep all the surplus sand to one corner of the pavement: it will be needed again shortly. Use the vibrating plate compactor once again to compact the surface, rattling the jointing sand firmly into each joint. One or two passes should be sufficient for this.

Many joints will now appear empty again, so sweep over once more with the salvaged jointing sand, topping up the joints as necessary.

Once the joints are all full, the pavement can be trafficked immediately. The jointing sand may settle slightly over the next few weeks, so it should be checked and topped up again as and when necessary.

Now that the paving is finished, you may want to consider protecting it from spills and stains by applying one of the high quality jointing stabilisers and/or sealants available from Ruscrete.

Please do not hesitate to call Ruscrete for any further technical advice on 023 8086 5046.