
Installation Guide

GENERAL INFORMATION,

TO BE CHECKED IN RELATION TO EACH SPECIFIC CASE

This installation guide contains indications and suggestions based on real work-site experiences and on continuous exchanges of information with “on the field ” experts. The information herein contained, is in any case to be considered a generic and indicative guideline. In practical applications, the solutions and procedures to be adopted, in order to obtain proper workmanship of the laying procedure and in absolute safety for the best end result, will always have to be determined by a qualified professional expert and after evaluating the context in which the laying will take place, all the features of the site and the regulations in force in the specific area where the laying job will take place.

FOR QUALIFIED INSTALLERS ONLY

The information in this installation guide refers solely to laying procedure and performance, entrusted to qualified professionals, experienced in laying outdoor paving, who have the necessary equipment to perform such job and are aware of the safety rules and of all the construction techniques needed to ensure a result in line with the best quality standards. We cannot accept any liability for “do-it -yourself” work or work carried out by unqualified and unprofessional personnel.

BUTT-JOINTING OF TILES

It is not recommended. It is not doable if the pavers are pressed and not rectified because of the different dimension/calibration of the pieces. Even if the product is rectified, although it theoretically could be done, it is not recommended because the tiles could chip by friction of one against the other.

DOES THIS PRODUCT EXPAND OR CONTRACT OVER TIME DUE TO THE CHANCE OF TEMPERATURE?

Porcelain pavers coefficient of linear thermal expansion is very limited @ $6.3 \times 10^{-6} \text{ c}^\circ$ exceeding the required standard of $< 9 \times 10^{-6} \text{ c}^\circ$ applied to porcelain tiles as per iso 10545-8

ARE THERE ANY MAINTENANCE REQUIREMENTS? SEALING, ETC.

No maintenance other than periodic cleaning is required. No sealing is necessary on porcelain. Cleaning sheets recommendations are supplied by kronos just as for any other porcelain suggesting products and techniques to use. Running water by a hose is usually the best way to keep the pavers cleaned. Water sitting on the tiles may leave residue of lime/calcium that can be eliminated with a rubber brush. When hosing down pavers installed with drain mortar in between, it is important not to concentrate the stream on the joint since that could wash the sand grout away. 2cm Architech Porcelain Pavers are “class 5” as per en 10545-14 stain resistance test. That means that any stain can be removed with brush and hot water.

ARE PORCELAIN PAVERS CHEMICAL RESISTANT?

Porcelain pavers are chemical resistant as below, following the standards of iso 10545 13.2000.

Ua = resistance to domestic and thermal

+ swimming pool salts

U1 = low concentration acids

(i.E. 3% Hydrochloridric acid + others)

Uh = high concentration acids

(i.E. 18% Hydrochloridric acid + others)

DOES THIS PRODUCT STAIN FADE IN THE SUN OVER TIME?

Porcelain does not fade in the sun as resulting from din 51094 test results.

GENERAL INFORMATION,

ARE PORCELAIN PAVERS FIRE RESISTANT?

Yes, they are, as any porcelain tiles, the rating class is a1 as per en13501-1 standard.

WHAT IS THE THERMAL SHOCK RESISTANCE OF PORCELAIN PAVERS? WHAT IS THE TEMPERATURE ABOVE/BELOW WHICH IT IS NOT RECOMMENDED TO INSTALL PORCELAIN PAVERS?

Porcelain pavers pass the thermal shock resistance test iso 10545-8 and can be safely installed in temperature between -40 c (-40 f) and +80 cent (175 f). Pedestals have a good thermal shock resistance (i.e. Ivica measures 18.7 Kn frost/ defrost) and overall are safely suitable for installation at the above temperatures (please refer to manufacturers specs)

WHAT ARE 2CM ARCHITECH PORCELAIN PAVERS?

2CM ARCHITECH PORCELAIN PAVERS ARE A CERAMIC MATERIAL, MANUFACTURED BY:

- atomized high quality clays, quartz, feldspars and metal oxides;
- pressed the obtained mixture at 400 kg/cm² pressure (2200 lbs/square inch);
- fired in industrial kilns at 1200°C to 1400°C (2192°F - 2552° F) to obtain a complete sinterization of the mixture
- squaring the edges by use of precision diamond cutting

Basically, this process industrially creates pieces of man-made stone. This material is dense, waterproof and durable; the product is exceptionally strong, and hard and is highly resistant to staining. Water absorption is less than 0.05% (required value: 0.5%).

The density of 2cm Architech Porcelain Pavers is 2300 kg/m³

- concrete has a density of about 1600 kg/m³
- marble granite has a density of 2100 kg/m³
- weight per m² is approximately 50kg

CUTTING PORCELAIN PAVERS

THE FOLLOWING NOTES ARE BASED ON PERSONAL EXPERIENCE. WE WOULD WELCOME HEARING FROM ANYONE WHO MAY HAVE ADDITIONAL COMMENTS OR INFORMATION TO SHARE. DIAMOND WET SAW BLADES WILL ALWAYS GIVE A BETTER RESULT THAN DRY CUTTING.

Some other hints:

- A bridge saw is much easier to cut these heavy pavers since you are pulling the saw blade across the paver instead of pushing the paver into the saw blade.
- An 200mm bridge saw works OK but a 250mm bridge saw with a higher horsepower motor would be preferable for large jobs.
- Thinner blades seem to be better than thicker blades, especially in terms of cleaner cuts.
- When cutting darker pavers in particular, avoid cutting the pavers if they have been lying in full sunlight and are quite hot. If using a wet saw, it seems that the water causes some differential cooling across the paver as you are cutting. When the blade is half to 3/4 across the paver, the cut line tends to close up a little and can cause the blade to jam - and trying to extract a jammed blade from a bridge saw is not easy.
- A blade that is becoming worn will tend to 'wander' across a 600mm cut resulting in a bowed cut rather than a perfectly straight line.
- It's worth purchasing a dressing stone which is designed to sharpen and reactivate diamond blades.

PROTECTIVE PACKAGING

- Porcelain pavers are protected by cardboard packaging material. Do not remove this protection until it is time to lay the slabs.
- In order to avoid the risk of chipping the slabs, do not pile them loose / out of the box on top of each other or handle them without the protective cardboard either then when you're to finally lay them.

COMPULSORY GENERAL INFORMATION APPLICABLE TO ALL INSTALLATION TYPES

SUBSTRATE

- Level the substrate and compact it with care before proceeding with installation consisting of resting the slabs on the substrate.
- It is advisable to lay a separating cloth (geotextile) to stabilise the substrate in order to limit any washing away along the gaps/joints between the pavers and to minimize the growth of weeds and possible dens of insects in between the joints.
- In the event of a sandy substrate, before compacting it, make sure that the level of moisture of the sand is sufficient to guarantee the best possible compacting.



SPACERS BETWEEN PAVERS

When laying porcelain pavers by resting them directly on the substrate, they must never be laid so that they touch each other, as this would drastically increase the risk of chipping caused by micro-movements while the pavers are settling into place.

- Always use plastic spacers for gaps of (4 mm), available with X and T-shapes.



DO NOT USE A PLATE COMPACTOR AFTER LAYING

To avoid any risk of chipping the material, never use a plate compactor once the porcelain paver slabs have been laid.



X-SHAPED SPACER

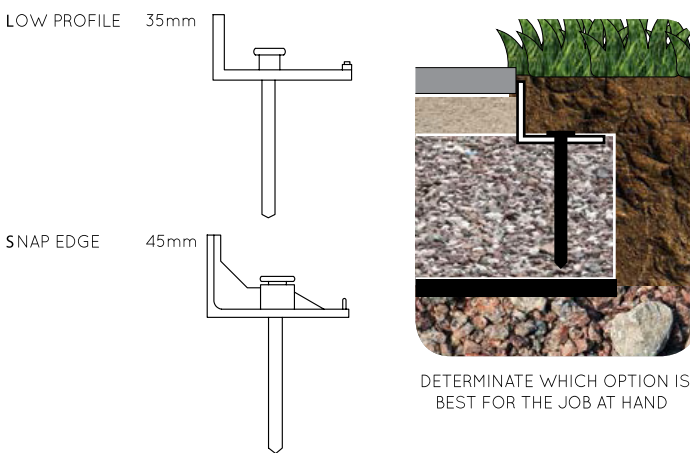
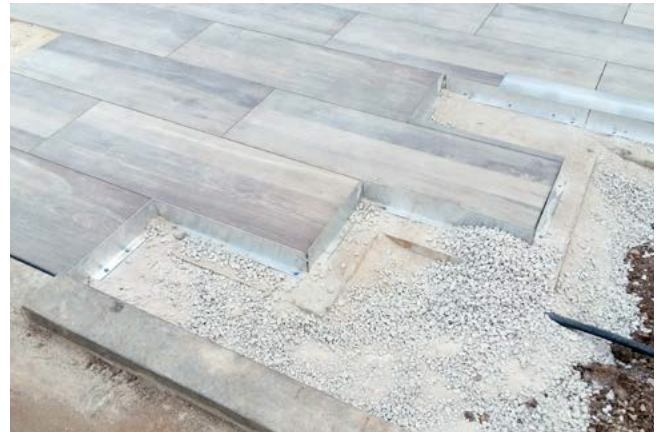
T-SHAPED SPACER

COMPULSORY GENERAL INFORMATION APPLICABLE TO ALL INSTALLATION TYPES

EDGE RESTRAINTS

When pavers are laid on draining sand or gravel, always prepare an edge restraint system to hold the substrate material used and prevent any washing away of sand or gravel, therefore keep the paver slabs in place. It is possible to use different types of restraint systems:

- invisible edging, lower than the thickness of the slab plus that of the base; this must be suitably fixed to the ground.
- visible edging, with a strip of concrete, stone, porcelain stoneware or other material.



SUBSTRATE

To ensure the necessary stability in time, the area provided as a substrate must always be larger than the actual paved area. Its size will have to be defined depending on the type of substrate used and on the characteristics of the site. Generally speaking, an extra space of about 200 to 230mm on each side is sufficient.

SLOPES AND DISTANCES FROM BUILDINGS

In order to prevent water from collecting and to facilitate drainage, the surface must always have the appropriate slope, the extent of which has to be defined on the basis of the specific features of the site and on a job to job basis (indicatively, 2° degree). It is advisable to leave a suitable draining distance between the paved areas and any building wall.



MATERIAL FOR FILLING THE JOINTS BETWEEN THE PAVERS

In the case of pavers resting on the ground, there are several solutions for filling the gaps between them.

LAYING ON SAND

- Fill the gaps between the pavers with sand and eliminate the excess material. In time, rain, wind and cleaning activities may remove the sand, therefore calling for some occasional re-filling when necessary.

LAYING ON SAND WITH ADDED CEMENT

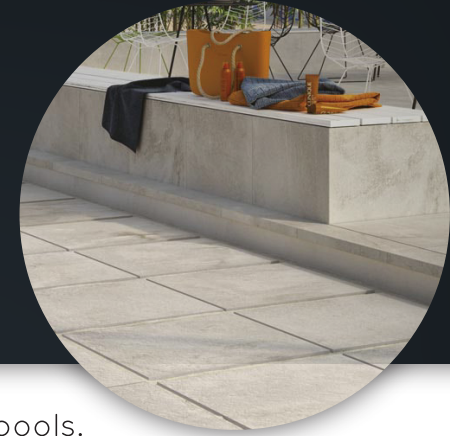
- Prepare a dry mixture of sand and cement (indicatively the cement will be 1/4 of the total) and fill the gaps between the pavers with it.
- Eliminate any excess material carefully, making sure that none remains on the slabs.
- Lastly, wet the gaps with water so as to consolidate the filling material by activating the cement contained in it.

LAYING POLYMERIC SAND OR GRAVEL

- Polymeric sand is a composition created specifically for making joints in outdoor paving. It is important to use specific sand for porcelain stoneware (which absorbs small quantities of water). This sand, has polymeric substances that bind together in the presence of water added to it.
- Once the polymeric sand has been compacted, it will prevent the growth of weeds and the removal of the filling material by the action of rain and wind or due to cleaning activities.
- Once the gaps have been filled with polymeric sand, eliminate with great care all the excess material, removing any residues of sand from the surface, even using mechanical blowers.
- Lastly, wet the gaps between the pavers with water to activate the reaction of the polymers that will transform the sand into a compact body.

STRENGTH & VERSATILITY: 2CM ARCHITECH PORCELAIN PAVERS

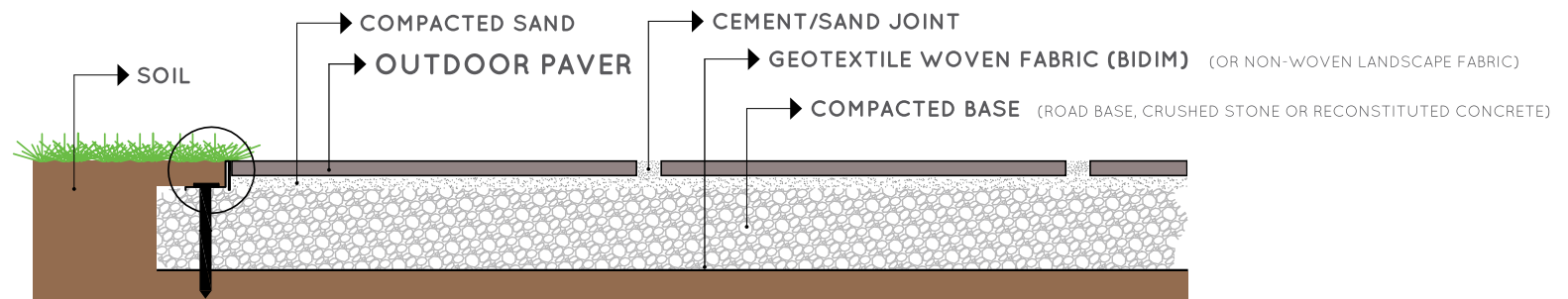
SAND SET INSTALLATION



For areas such as courtyards, terraces, patios, walkways and perimeter areas around private swimming pools.

Recommendations for Installation:

- Install a bidim or non-woven landscape fabric over the native soil in the area where you want to install the porcelain tile pavers.
- Apply a 100mm base of compacted road base, crushed stone or reconstituted concrete, as appropriate.
- Install an appropriate edge retention system around the perimeter of the area where the tile pavers are to be installed.
- Apply 30mm of compacted concrete sand over the compacted base area. Compaction must be done by hand or using a small plate compactor with a maximum PSI of 3000.
- Lay the porcelain tile pavers onto the compacted sand bed and tap with a rubber mallet to eliminate any unevenness.
- A minimum joint of 5mm between tile pavers is required for a sand set installation. For joints between 5mm - 12mm, a sand/cement joint filler is recommended to keep the pavers from shifting and to reduce damage from side impact.



Note: Once pavers are installed they must not be tamped down with a plate compactor. Sand set installation systems should not be used in areas where motor vehicles or other high dynamic loads move across the surface.