

AQUABELLA®



2CM PORCELAIN PAVERS

Aquabella® provides these instructions as general guidelines only. The contractor and/or installer shall be responsible for ensuring that all applicable local building codes are followed, which may require modification of these general guidelines. Aquabella assumes no liability for personal injury or property damage resulting from improper or careless application of the described techniques.

BRIEF INTRODUCTION TO 2CM PORCELAIN PAVERS

Overall, 2CM porcelain pavers are a great choice for outdoor living spaces due to their durability, low maintenance requirements, and design versatility.

Porcelain Pavers are formed by pressing, followed by vitrification. This process involves the total fusion into a single material made from natural raw materials (sand, quartz, feldspars, kaolin, clays, and inorganic pigments) which, fired at temperatures above 1,226.67°C (2240°F), are transformed into a product with exceptional hardness, ultralow absorption rate, and unmatched mechanical characteristics. Each unit is 20mm (2CM) standard thickness or ¾" nominal thickness and is durable enough to withstand use in exterior applications.

Here are some key things you should know about 2CM porcelain pavers:

1. **They are ideal for outdoor use:** 2CM porcelain pavers are designed to withstand the harsh elements of the outdoors, including extreme temperatures, UV rays, and moisture. They are also resistant to stains, making them a great choice for patios, pool decks, and other outdoor living spaces.
2. **Our 2CM Porcelain Pavers are rectified:** Pressed porcelain tiles (like most of our pool tiles) have finished, rounded edges and require more grout between the seams, making the grout more noticeable, while our 2CM Porcelain Tile have are rectified. Rectified porcelain pavers have straight edges and go through a second process after being fired in a kiln to achieve a precise facial dimension and can be installed with narrower grout lines. Porcelain tiles are fully vitrified tiles with water absorption less than or equal to 0.5%. Rectified pavers are tiles that, after firing, are subjected to a precise mechanical grinding of the edges.
3. **Skid-resistant:** Structured paver top textures create slip-resistant surfaces for safety, perfect for around pools/spas or wet climates.
4. **Freeze-thaw resistant:** They are 100% frost-free, and their properties remain unaltered at temperatures ranging from -51.1° to + 60° C (-60° F to +140°F).
5. **They are available in a range of colors and designs:** 2CM porcelain pavers come in a wide variety of colors and designs, allowing the creation of a customized look.
6. **Color durability:** Color is fused by vitrification, becomes an integral part of the porcelain surface, and is not affected by elements.
7. **They are easy to install:** 2CM porcelain pavers are typically installed using a dry-lay method, which means they are laid directly onto a prepared surface without the need for adhesives or grout. This makes installation quick and easy, and also allows for easy removal and replacement of individual pavers if needed.
8. **Modular Design:** Superior accuracy in dimensional sizing and linear sides; the slabs allow perfectly executed installations with tight and accurate lines.
9. **They are low maintenance:** Porcelain pavers are naturally resistant to stains and do not require sealing, making them a low maintenance option for outdoor flooring. They can be cleaned using a mild detergent and water, or a pressure washer if needed*.
10. **They are durable:** 2CM porcelain pavers are made from high-quality materials and are designed to withstand heavy foot traffic, making them a long-lasting option for outdoor flooring. High breakage loads of up to 3,587 lbs (1,627 kg) per foot based on ASTM-C648.

Overall, 2CM porcelain pavers are a great choice for outdoor living spaces due to their durability, low maintenance requirements, and design versatility.

** It is important that all pressure washing of porcelain pavers be done with a low-pressure washer with a maximum of 1,600 psi and nothing more powerful. When pressure washing, care should be taken to prevent damage to the grout (adhesive and grout installations). Re-sanding will be necessary when power washing an installation with sand or polymeric sand joints.*

DIFFERENCE BETWEEN STONE PAVERS AND PORCELAIN PAVERS

Porcelain pavers tend to have a more uniform appearance, which can be desirable in some design styles.

While both options offer durability and versatility, significant differences in their composition, appearance, and maintenance requirements should be considered when choosing.

Composition

Stone pavers are made from natural materials such as sandstone, granite, limestone, and slate. These stones are mined from quarries and then cut and shaped into pavers of various sizes and shapes. Each stone's unique patterns and colors make stone pavers highly desirable for creating a natural and timeless look.

Porcelain pavers, on the other hand, are manufactured using a blend of fine-grain clays and minerals that are baked at high temperatures. The result is a highly durable and versatile paver that can mimic the look of natural stone, wood, or concrete. Porcelain pavers are available in various sizes, colors, and textures, making them ideal for modern and contemporary design.

Appearance

Stone pavers offer a natural and rustic look that is highly sought after for outdoor spaces. The unique colors and patterns in each stone create a one-of-a-kind look that cannot be replicated. Stone pavers also tend to have a non-slip surface, which makes them ideal for pool decks, patios, and walkways.

Porcelain pavers offer a more modern and sleek look that is popular in contemporary design. Porcelain pavers can look like natural stone, wood, or concrete, giving them various design options. Porcelain pavers also tend to have a more uniform appearance, which can be desirable in some design styles.

Maintenance

Both stone and porcelain pavers require minimal maintenance, but there are differences in how they should be cared for. Stone pavers are porous and can absorb moisture, which makes them more prone to staining and mold growth. Stone pavers

should be sealed regularly to prevent stains and cleaned with mild detergent and water.

Porcelain pavers, on the other hand, are non-porous and do not absorb moisture. This makes them more resistant to staining and mold growth. Porcelain pavers can be cleaned with a mild detergent and water or pressure washed if needed.

Durability

Both stone and porcelain pavers are durable and can withstand heavy foot traffic, extreme temperatures, and weather conditions. Stone pavers, however, are more prone to cracking and chipping over time, especially if they are not installed correctly. Porcelain pavers, on the other hand, are more resistant to cracking and chipping due to their manufacturing process and high compressive strength.

Installation

Both stone and porcelain pavers require professional installation, but there are some differences in how they are installed. Stone pavers are typically set in a bed of sand or gravel, which allows for some flexibility and drainage. Porcelain pavers, on the other hand, are often set on a concrete slab, which provides a more stable and level surface. Porcelain pavers can also be installed using a pedestal system, allowing easy access to plumbing and electrical lines.

GENERAL INSTRUCTIONS FOR ALL INSTALLATIONS

Please note that all information in this document should be considered a guide only and should be checked against your state and local requirements before installation.

The purpose of this installation manual is to provide guidance to skilled hardscape contractors who possess the necessary expertise and experience in installing stone pavers.

REQUIRED & SUGGESTED TOOLS

To successfully complete the installation, the following tools are required or suggested:

- A wet cut tile saw with a diamond blade specifically designed for wet cutting porcelain. The saw should have the capacity to safely cut porcelain pavers up to 24" in length.
- For mortar set installations: Trowels and a grout float, chosen based on the recommendations provided by the grout manufacturers.
- Paver clamps may be utilized to facilitate the installation and removal of porcelain pavers.
- It is highly recommended to wear gloves when handling and installing porcelain pavers for added safety and protection.

JOINT FILLING INSTRUCTIONS:

- To fill the joints, we recommend using polymeric sand that is suitable for the task. Ensure that the sand is finely grained to pass through and effectively fill 4mm joints. Thoroughly sweep the sand into the open joints until they are completely filled. Remove any excess sand and dust from the surface to achieve a clean finish.
- After filling the joints and cleaning the surface, lightly mist the pavement with water. This step activates the polymer within the sand and helps in curing the mixture. It is essential to carefully follow the instructions provided by the manufacturer when using polymeric sand to prevent any potential surface staining. The polymeric sand aids in locking the pavers in place, minimizing movement and ensuring stability.
- Another option is to use dry traditional sand and sweep it into the open joints until they are filled. Take care to remove any excess sand from the pavement by sweeping it off. It's important to

note that over time, wind and rain can cause some erosion in the sand joints. Therefore, periodic re-sanding may be required.

THINGS TO CONSIDER

- Prior to installing porcelain pavers in sand set applications, it is crucial to pre-compact and strike off the sand leveling course. Porcelain pavers are not compacted, hence the need for pre-compaction of the sand layer.
- Avoid using a plate compactor to compact porcelain pavers, as it is not suitable for this purpose. Pre-compaction of the sand layer is necessary.
- Exclusively use a wet cut porcelain blade on a tile saw for cutting porcelain pavers. Ensure the tile saw is specifically designed for wet cutting.
- When planning the project, consider including extra spacers to account for any potential overages. For example, a 200 square foot project typically requires approximately 68 spacers.
- Never attempt to compact porcelain pavers using a plate compactor under any circumstances.
- Always maintain the required 4mm spacing between porcelain pavers during installation. Utilize plastic 4mm spacers specifically designed for sand set applications. The provided photos demonstrate the proper installation and snapping of the spacer to form a "T" shape for supporting and spacing the corners of four pavers.

SNOW REMOVAL

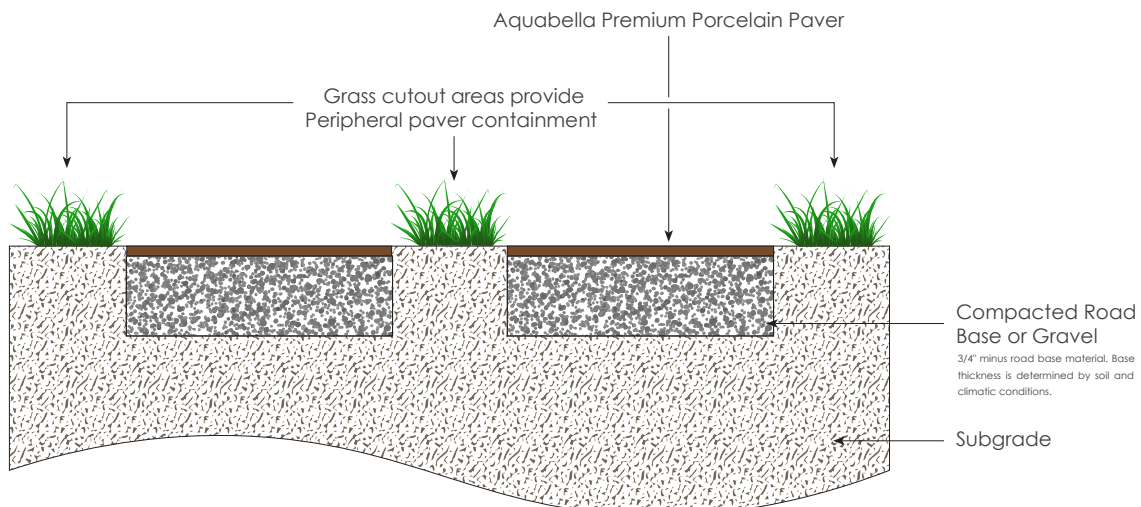
- During snow removal, it is recommended to use a plastic or plastic-edged shovel. This helps prevent accidental damage to the edges of the pavers, as metal shovels can potentially cause chips on the surface corners. If using a snow blower, adjust the impeller to be at least ¼ inch above the surface, or higher if necessary, to avoid any damage.

DRY INSTALLATION ON GRASS - PEDESTRIAN FOOT TRAFFIC

Please note that all information in this document should be considered a guide only and should be checked against your state and local requirements before installation.

1. Arrange the pavers on the ground to determine the desired layout. For stepping stone walkways, consider the pace length and ensure that the pavers are evenly spaced.
2. Use a spade to mark the edges of each paver, outlining their designated positions.
3. Excavate the area to accommodate the necessary base and the size of the porcelain pavers. Prepare the designated areas on the patio or walkway by removing any existing grass and plantings, digging to a depth of approximately 5cm-6 cm (1.5"-2 1/4").
4. While it is possible to lay the pavers directly on the grass, we recommend placing each paver on top of gravel or road base to enhance the stability of the walkway. It is recommended to apply a layer of gravel with a particle size of over 4 mm, with a minimum thickness of 3 cm (1").
5. Ensure the base is compacted and leveled thoroughly, aiming for a smooth surface under each paver.
6. Proceed to lay the porcelain pavers directly on top of the prepared base. Position the pavers in such a way that they are set approximately 0.5cm-1 cm below the ground surface, ensuring a uniformly even walkway.
7. Use a rubber hammer to gently tap and flatten the edges around the slab until they are level with the surrounding ground surface.

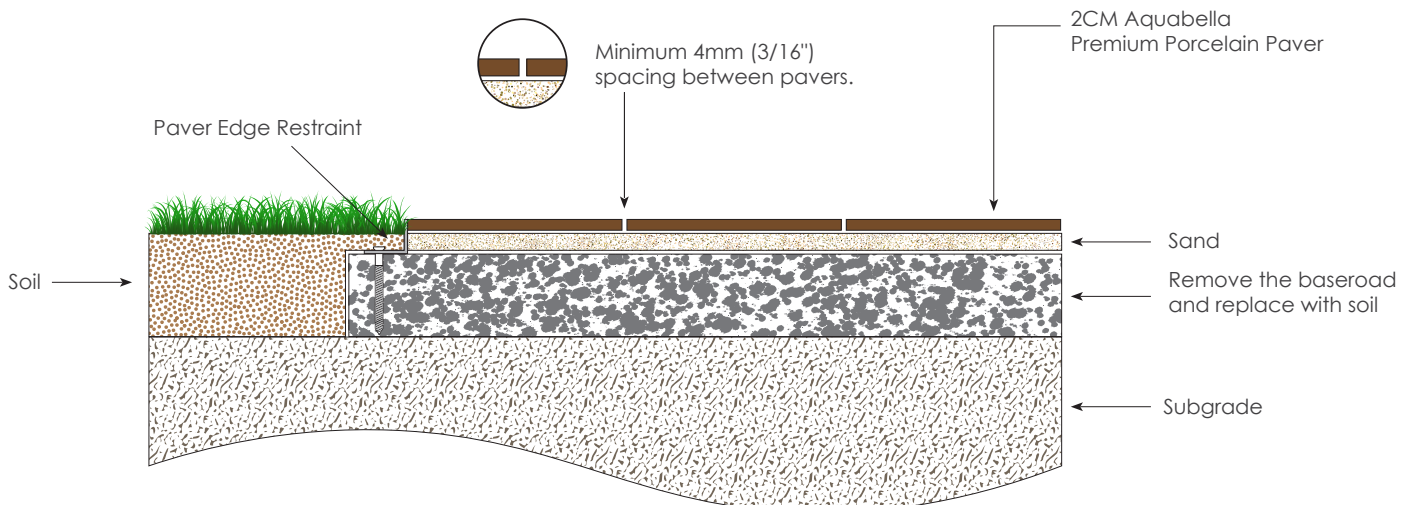
Grass Diagram – Pedestrian Foot Traffic



DRY INSTALLATION ON GRAVEL - PEDESTRIAN FOOT TRAFFIC

1. Excavate the area to a depth of 7 ¾" to 9 ¾" for sandy soil or 9 ¾" to 13 ¾" for clay soil, ensuring proper depth for your specific soil type.
2. Extend the perimeter of the excavated area 6"-8" beyond the final pavement's perimeter. Additionally, ensure the excavated area is sloped at least 2% (1/4" per 12") away from nearby structures.
3. Compact the excavated area using commonly utilized small (3,000 lbs) and medium (4,000 lbs) compactors to achieve proper stability.
4. Install a permeable geotextile fabric that allows for free water drainage, separating the native soil from the base material.
5. Add a base layer of 6"-8" depth of ¾" clear stone (ASTM No. 57) as the base material, adjusting the thickness based on the depth of excavation.
6. Compact the base material thoroughly to minimize any void space and prevent potential settling issues in the future.
7. Install a bedding layer using clear 1/8" chip stone, following the specifications of ASTM No. 8 or No. 9. This layer provides a stable and even surface for the pavers.
8. Install the Aquabella 2CM porcelain pavers, ensuring a minimum joint width of 3/16" (4mm) between each paver. Use spacers to maintain consistent spacing throughout the installation process.
9. Depending on the desired aesthetic, the joint width can be wider without the use of spacers.
10. The joints can be left empty or filled with various jointing materials.
11. For narrow joints, it is recommended to use fine sand or polymer-modified sand to slow down joint erosion.
12. To ensure the joints are completely filled, compact them with a rubber mallet and add more sand as needed. Never use a plate compactor on porcelain pavers.
13. For wider joints, the bedding layer stone can be used as a jointing material. If using bedding material, an optional joint stabilizing sealer can be applied to the joints to prevent the migration of joint materials.
14. If necessary, an edge restraint can be placed around the perimeter to prevent horizontal movement. However, the weight of the tiles typically prevents movement under regular foot traffic conditions.
15. If you are using edge restraints, the required edge restraint system for this installation has a vertical height of 2 ½. Follow the edge restraint manufacturer's recommendations for the use of their product in permeable applications regarding geogrid usage and placement to maintain the performance of their edging.

Grass Installations – Pedestrian Foot Traffic

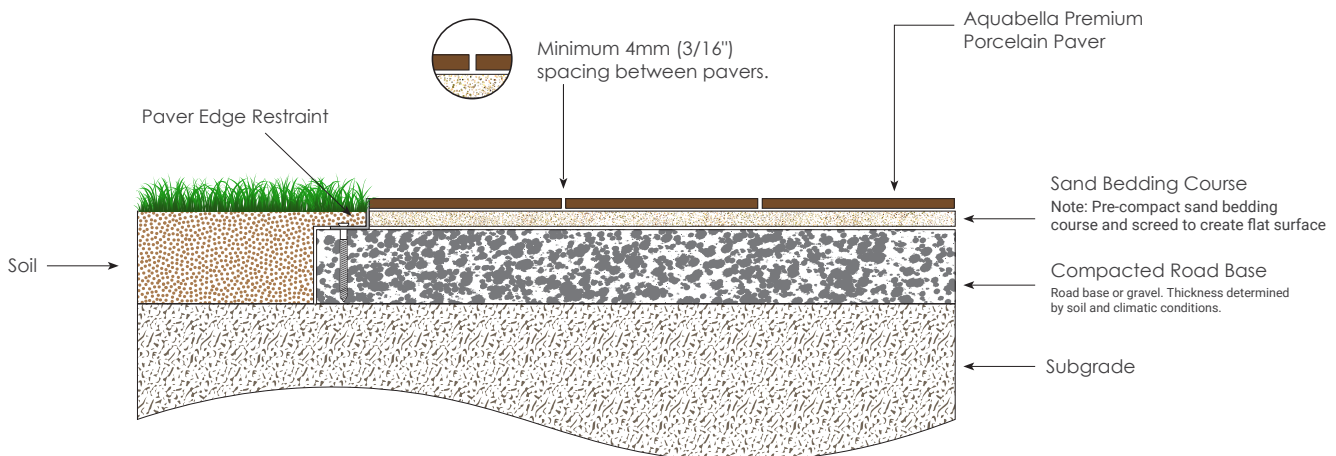


DRY INSTALLATION ON SAND - PEDESTRIAN FOOT TRAFFIC

Please note that all information in this document should be considered a guide only and should be checked against your state and local requirements before installation.

1. Begin by creating a layer of sand with a depth of at least 5cm-10 cm (2"-4"). Make sure to compact the sand to a layer of around 1" thickness, and to level the sand surface thoroughly to ensure a proper foundation.
2. Place the pavers directly on the prepared substrate, ensuring they are properly aligned and positioned.
3. Arrange the pavers according to the desired layout, taking into consideration the overall design and aesthetics.
4. Choose the appropriate gap width between the pavers based on the desired overall appearance, usually a minimum of 4mm (3/16") of spacing is required. Consider the visual effect and functionality when determining the spacing between the tiles.
5. CAUTION: Do not compact the porcelain pavers with a plate compactor.
6. If necessary, an edge restraint can be placed around the perimeter to prevent horizontal movement. However, the weight of the tiles typically prevents movement under regular foot traffic conditions.
7. If you are using edge restraints, the required edge restraint system for this installation has a vertical height of 2 1/2". Follow the edge restraint manufacturer's recommendations for the use of their product in permeable applications regarding geogrid usage and placement to maintain the performance of their edging.

Sand Set Over Compacted Road Base Installation Diagram – Pedestrian Foot Traffic

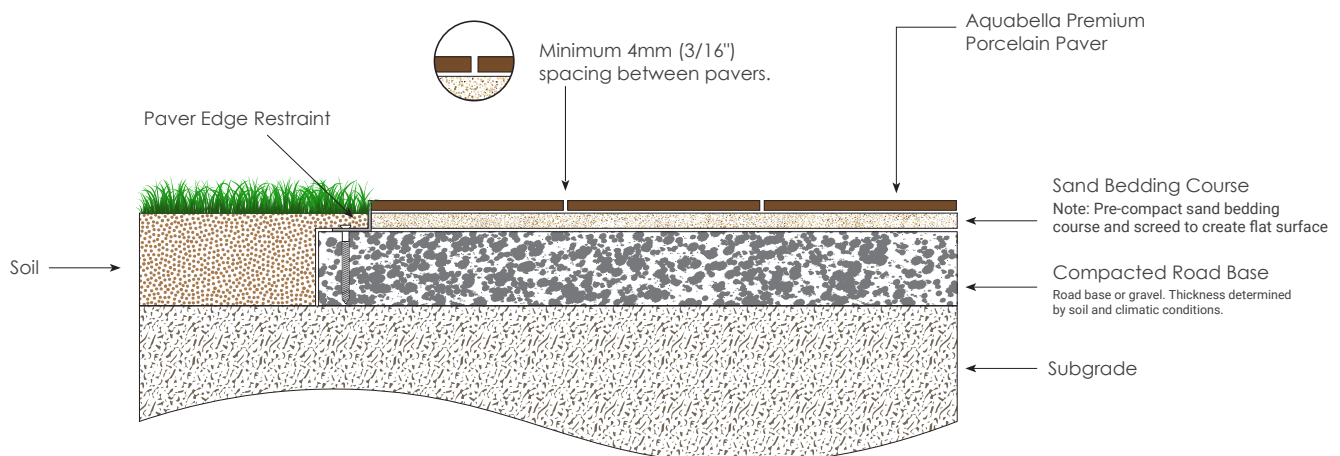


DRY INSTALLATION ON SAND OVER COMPACTED ROAD BASE INSTALLATION

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1. Begin by creating a layer of compacted road base of around 4", although the thickness should be determined by the type of soil and climatic conditions.
2. Next, add a layer of sand with a depth of at least 5cm-10 cm (2"-4"). Make sure to compact the sand to a layer of around 1" thickness, and to level the sand surface thoroughly to ensure a proper foundation.
3. Place the pavers directly on the prepared substrate, ensuring they are properly aligned and positioned.
4. Arrange the pavers according to the desired layout, taking into consideration the overall design and aesthetics.
5. Choose the appropriate gap width between the pavers based on the desired overall appearance, usually a minimum of 4mm (3/16") of spacing
6. is required. Consider the visual effect and functionality when determining the spacing between the tiles.
6. CAUTION: Do not compact the porcelain pavers with a plate compactor.
7. If necessary, an edge restraint can be placed around the perimeter to prevent horizontal movement. However, the weight of the tiles typically prevents movement under regular foot traffic conditions.
8. If you are using edge restrains, the required edge restraint system for this installation has a vertical height of 2 ½. Follow the edge restraint manufacturer's recommendations for the use of their product in permeable applications regarding geogrid usage and placement to maintain the performance of their edging.

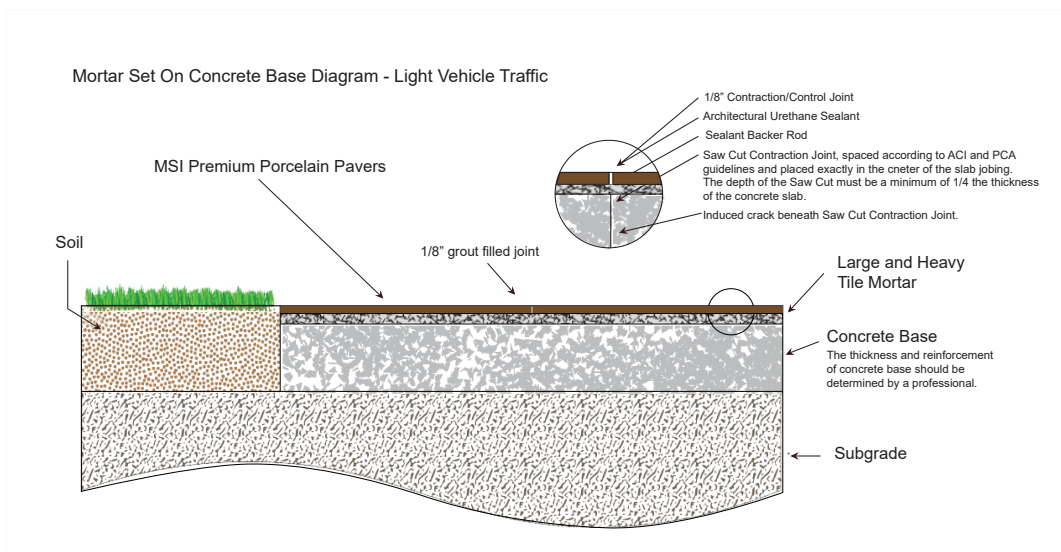
Sand Set Over Compacted Road Base Installation Diagram – Pedestrian Foot Traffic



MORTAR SET ON CONCRETE BASE INSTALLATION – LIGHT VEHICLE TRAFFIC

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1. Ensure that the pavement is constructed with a slope of 1.25% and 2.5%, angled away from any adjacent buildings to facilitate proper drainage.
2. Choose a high-quality, heavy-duty tile mortar suitable for large format tiles.
3. Use grout specifically approved for exterior applications to ensure durability and resistance to outdoor conditions.
4. When using cementitious adhesive and grout, follow the outdoor installation instructions provided by the adhesive and grout manufacturer for best results.
5. For concrete foundation slabs that do not require contraction/control joints, a minimum grout joint width of 4mm (1/8" to 3/16") is acceptable. However, for larger concrete foundation slabs that do require contraction/control joints, the joint width should be 3/8". It is crucial to locate all contraction/control joints precisely on the designated joint lines to ensure proper functionality and structural integrity.
6. Install the pavers, using the approved exterior mortar following the specific instructions provided by the adhesive manufacturer. For pavings subjected to high levels of stress, it is essential to utilize the double coating method to ensure even compaction of the laying material.
7. The pavers should be laid with open joints of variable width, but no less than 5 mm.
8. **Expansion joints are mandatory and should have a minimum width of 5 mm, except for structural joints. These joints should extend up to the top surface of the paving.**
9. CAUTION: Do not compact the porcelain pavers with a plate compactor.
10. Seismic joints should form a square or rectangular grid pattern across the surface, with the ratio between the sides not exceeding 1.5 m. Grid sizes typically range between 3 x 3 m and 4 x 2.5 m.
11. Edge restrains must be included at the points where the paving meets walls, steps, raised areas, pillars, etc. Compressible materials, such as polystyrene, should be added to these joints.
12. Thorough cleaning after laying is of utmost importance for subsequent procedures and to ensure proper maintenance of the paving.



PEDESTAL INSTALLATION - PEDESTRIAN FOOT TRAFFIC

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CHOOSE THE PEDESTAL

The pedestals used in exterior raised floor systems are typically constructed from recycled plastics. These pedestals are engineered to withstand substantial loads and are designed to endure various climate conditions found throughout North America. They have a temperature tolerance ranging from -30 to 75 degrees Celsius. The height of the pedestals is adjustable, ranging from 12.5 mm (1/2") to unlimited heights, and can accommodate gradient variations of up to 5%.

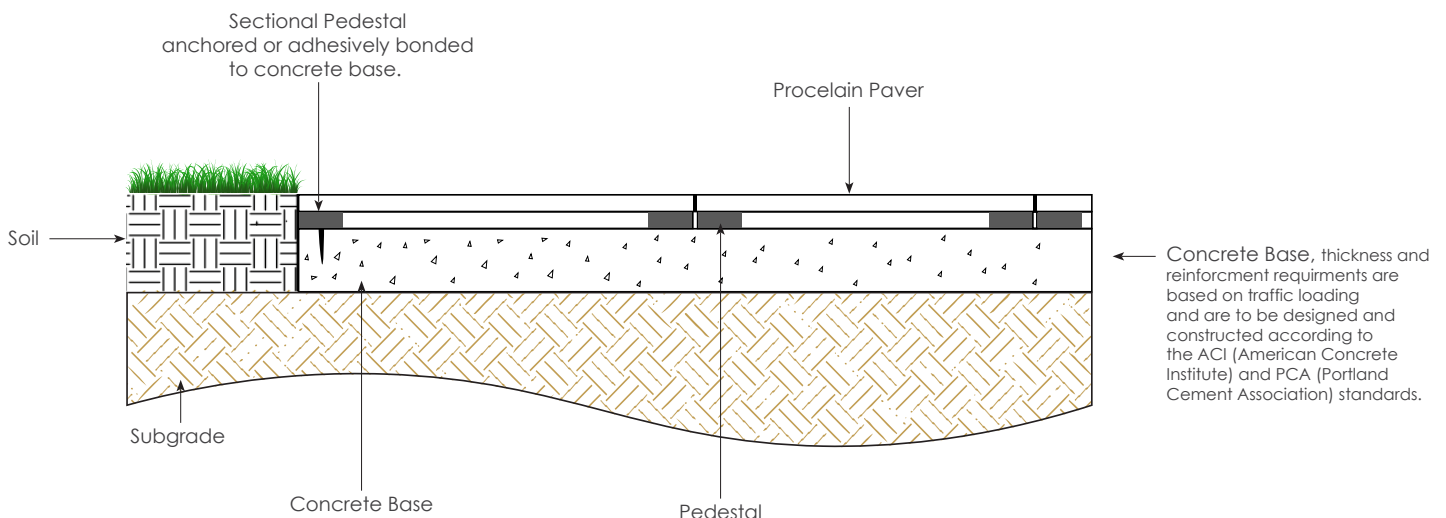
As there are no specific standards for outdoor raised porcelain paver applications, it is crucial for architects and customers to thoroughly assess the requirements of the project.

When the pedestal height exceeds 4" (10 cm), it is recommended to incorporate additional pedestals as illustrated in the provided diagram. This helps ensure a more balanced distribution of the load

applied to the raised paving surface.

Architects should give special attention to the design data that pertains to the conditions of use. Factors such as weather conditions (including wind strength and frequency), exposure to direct sunlight, the type of zone (e.g., urban, industrial, etc.), the intended use (e.g., pedestrian, vehicular, etc.), the expected level of traffic, static and dynamic loads, the presence of water or other fluids on the surface, as well as any chemicals on the surface, should be considered. This information should be used to evaluate the anticipated mechanical stresses (both surface and mass), as well as chemical and temperature-humidity stresses on the tiles. Additionally, any specific safety requirements or additional performance needs should be taken into account.

1. Make sure that the concrete slab is smooth and



PEDESTAL INSTALLATION - PEDESTRIAN FOOT TRAFFIC (CONT.)

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level across its entire surface. Additionally, ensure that the slab is constructed with a 2-degree pitch, sloping away from any adjacent building.

2. Install plastic pedestal supports at all corners of the pavers. Depending on the specific requirements of the installation, additional support may be needed in areas other than the corners. Follow the instructions provided for the pedestal system and use the diagram below as a guide.

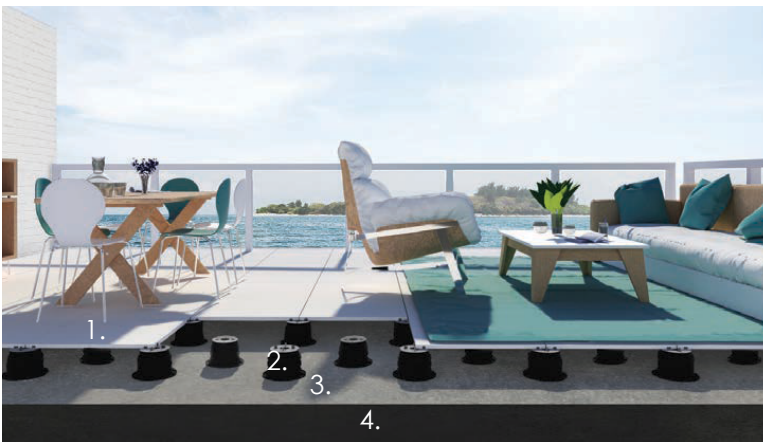
INSTALLING OVER EXISTING LIVIGN STRUCTURES (LIKE A ROOF)

1. When installing pavers over existing living areas, it is crucial to ensure that a waterproofed roof assembly has been constructed according to the building code regulations. Once the waterproof

layer is in place, proceed with the following steps:

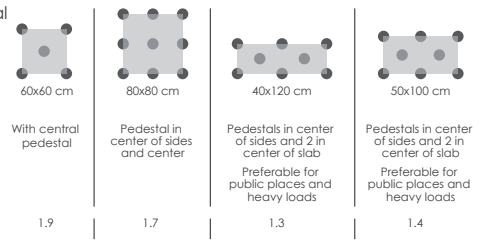
- Place pedestals directly onto the waterproof layer, ensuring they are properly positioned and spaced according to the manufacturer's instructions.
- Carefully place the paver tiles onto the pedestals, making sure to use appropriate joint spacers to maintain consistent spacing between the tiles.
- By following these steps, you can ensure a proper and secure installation of the pavers over the waterproofed assembly.

**It is recommended to consult a structural engineer before proceeding with the installation to ensure proper planning and adherence to any specific structural requirements.*



1. 2CM porcelain paver tile
2. Pe destals
3. Waterproofing layer
4. Substrate

Possible pedestal layouts



Note

Pedestal counts are a guideline. Results are rounded down and may vary depending on the size of the area and the regularity of the perimeter.