



**BLOCK &
HARDSCAPE**
Family Owned Since 1946

**PORCELAIN PAVING
SOLUTIONS**

Installation Guide



ORCO Porcelain Paving Installation Guide (Non-Vehicular Applications)

Thank you for choosing ORCO Porcelain Paving products for your project. As you proceed with installation, the porcelain will soon become part of a system that is designed to both highlight the beauty of the surface as well as provide long life. All the components of the system – specific site, native soil, drainage, base materials, bedding materials, joint spacing, edge restraints, and ORCO’s porcelain – must work together to achieve and maximize the value of this sizable investment. Proper installation is critical to overall customer satisfaction.

The cross sections and considerations described in this Guide cover most typical pedestrian, non-vehicular installations. They should be treated as best practices – based on experiences installing porcelain paving throughout the world – and should serve as a starting point for developing a project specific design. Since every project is different, ORCO Block & Hardscape strongly recommends consulting licensed professionals to tailor installation to the particular site. Also, be sure to check with local permitting agencies to ensure proper permits are pulled and all special requirements are followed. With each site different, ORCO Block & Hardscape cannot guarantee or be responsible for any job site issues or failures attributed to use of this Guide.


Each installation method described here is a system, which provide different levels of performance and overall value. Mortar set with grouted joints is the recommended, default application. This Guide covers the most popular pedestrian-only application methods.

- **Mortar Set Over New or Existing Concrete** – The concrete must be crack-free, without defects, and sloped for proper drainage. Typically 1/4" to 3/8" grouted joints.
- **Up to 1/2" Mortar Set Over Existing Concrete** – When finish height is a concern, this option offers an alternative thinner application. The concrete must be crack-free, without defects, and sloped for proper drainage. Typically 1/4" to 3/8" grouted joints.
- **Mortar Set Over Compacted Base** – Minimum 4" compacted base over undisturbed native soil. Typically 1/4" to 3/8" grouted joints.
- **Sand Set Over Compacted Base** – Minimum 4" compacted base over undisturbed native soil. Sand bedding course. Minimum 5/32" sanded joints. Polymeric sand.

Given that the porcelain is a premium product, ORCO strongly encourages using **Mortar Set Over Concrete** whenever possible. It provides the best long-term performance, pairing a premium product and premium installation – creating outstanding value.

Setting porcelain paving with either mortar or sand over compacted base are certainly proven installation methods too - though they do require more attention to compacted base construction.

For deck and rooftops, **Pedestal Installations** – with the porcelain sitting on top of pedestals – are gaining popularity. Since each project is highly technical and a custom installation, ORCO provides site specific guidelines created by Bison Innovative Products.

 **WARNING:** This product when cut or ground can expose you to Silica, crystalline (airborne particles of respirable size) which is known to the State of California to cause cancer. For more information go to <http://www.P65Warnings.ca.gov>.

Critical Items to Consider

Regardless of installation method, the following items should be reviewed at the start of every project.

- Porcelain will show shade variation between each piece and production runs. These variations are not manufacturing defects. ORCO will not be responsible for a buyer's dissatisfaction with shade variations. Installation constitutes acceptance.
- Most damage to porcelain edges occurs during handling after the protective shipping box is removed. Do not remove the box until ready to install.
- ORCO cross sections show typical base, concrete, and bedding thicknesses. Actual design specs should always be determined by qualified professionals. Never install porcelain over topsoil or directly on grass. It is the installer's responsibility to ensure all site and structural factors are properly addressed.
- On **Mortar Set Over Existing Concrete**, never install porcelain paving over a control joint. If ignored, joint movement will result in cracking the porcelain paving above.
- Spacers are required. Minimum 4 mm (5/32") width.
- Installers should use a paver clamp to make installing and removing porcelain easier.
- Ensure the surface of the stone is installed at a 2% slope, pitched away from building structures. Avoid high water table and "ponding" areas.
- Always wet cut the porcelain and rinse residue from both sides. Use a tile saw with a wet cut porcelain diamond blade (no teeth) to minimize chipping.
- Never compact porcelain pavers with a plate compactor.
- Install planks in 1/3 running bond. Do not use stack bond or 50% bond patterns.
- During installation, clean the porcelain surface as you go using clean water and sponge. Do not let the cementitious material set.
- Never use wire brushes or other abrasive metallic products to clean the surface. Nylon bristle brushes work best.
- High pressure washing can damage the porcelain's surface. Use low pressure instead (less than 1600 psi).
- Post installation use of cleaners should always start with soapy water and a nylon brush.

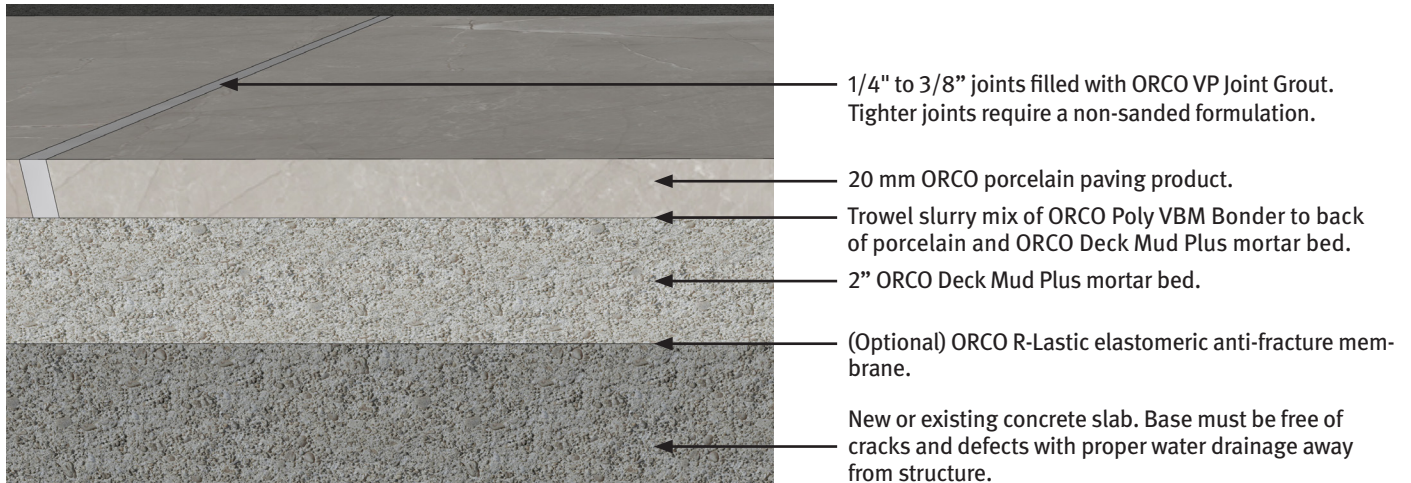
Porcelain Standards

ORCO porcelain paving products are manufactured by Del Conca and Atlas Concorde to satisfy requirements of ANSI A137.1-2017 *American National Standard Specifications for Ceramic Tile*. Installation methods are based on recommendations from Tile Council of North America (TCNA) and ANSI/CTI A108.1 *Installation of Ceramic Tile – Wet Set or Dry Set Methods*.

Personal Protective Equipment (PPE):

Minimum standards for job site PPE must be followed: including hard hat, protective gloves, protective shoes and high visibility clothing. In addition, safety goggles, N100 rated dust mask, and proper gloves are required when cutting any porcelain.

MORTAR SET OVER NEW OR EXISTING CONCRETE FOR PEDESTRIAN USE ONLY



Installation:

Native Soil Condition – Poor soils (clay and disturbed) may result in surface deformation, unwanted settlement, and/or cracking. Engineer consultation is recommended.

Layout:

Plan layout prior to starting installation. Paint outlines and spot all elements – planters, stairs, transitions, etc.

Site Drainage:

Final pavement elevations should slope away from any structure a minimum of 2%. Drains or other means of site drainage must be employed in areas where proper slope cannot be achieved. Max slope for pedestrian accessibility is 8%.

New or Existing Slab:

Must be free of cracks and defects with proper drainage away from structures. Avoid areas prone to water migration through the slab. Slab must be built according to local authority having jurisdiction.

(Optional) ORCO R-Lastic:

Elastomeric anti-fracture membrane. Apply per manufacturer's recommendations. Roll or trowel.

ORCO Deck Mud Plus:

3:1 dry pack mortar bed. Dry pack methods. Use a concrete mixer to achieve proper consistency. Follow manufacturer's recommendations to create a "brown sugar" consistency that is clump-free and 100% hydrated material. Place and screed material to a minimum of 2".

ORCO Poly VBM Bonder:

Mix bonding mortar to slurry consistency. Use trowel to completely cover back of porcelain and dry pack mortar bed.

Placement:

Use spacers to carefully align and place porcelain. Tamp, level, and ensure proper drainage fall as you build.

Expansion Joints:

All expansion control joints must be brought to the surface. "Hidden" joints will crack the porcelain.

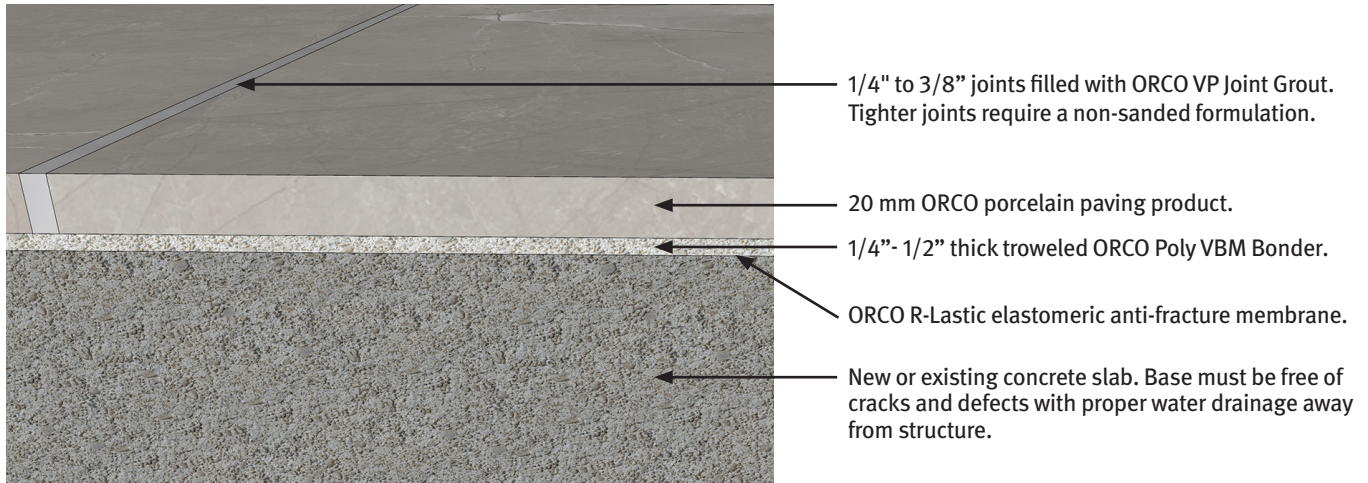
ORCO VP Joint Grout:

Mix joint grout per manufacturer's recommendations.

Joints:

4 mm (5/32") minimum. Fill joints with ORCO VP Joint Grout and tool. Promptly clean grout or cement paste from the porcelain surface.

UP TO 1/2" MORTAR SET OVER EXISTING CONCRETE FOR PEDESTRIAN USE ONLY



Installation:

Native Soil Condition – Poor soils (clay and disturbed) may result in surface deformation, unwanted settlement, and/or cracking. Engineer consultation is recommended.

Layout:

Plan layout prior to starting installation. Paint outlines and spot all elements – planters, stairs, transitions, etc.

Site Drainage:

Final pavement elevations should slope away from any structure a minimum of 2%. Drains or other means of site drainage must be employed in areas where proper slope cannot be achieved. Max slope for pedestrian accessibility is 8%.

New or Existing Slab:

Must be free of cracks and defects with proper drainage away from structures. Avoid areas prone to water migration through the slab. Slab must be built according to local authority having jurisdiction.

ORCO R-Lastic:

Elastomeric anti-fracture membrane. Apply per manufacturer's recommendations. Roll or trowel.

ORCO Poly VBM Bonder:

Mix/install bonding mortar per manufacturer's recommendations.

Placement:

Use spacers to carefully align and place porcelain. Tamp, level, and ensure proper drainage fall as you build.

Expansion Joints:

All expansion control joints must be brought to the surface. "Hidden" joints will crack the porcelain.

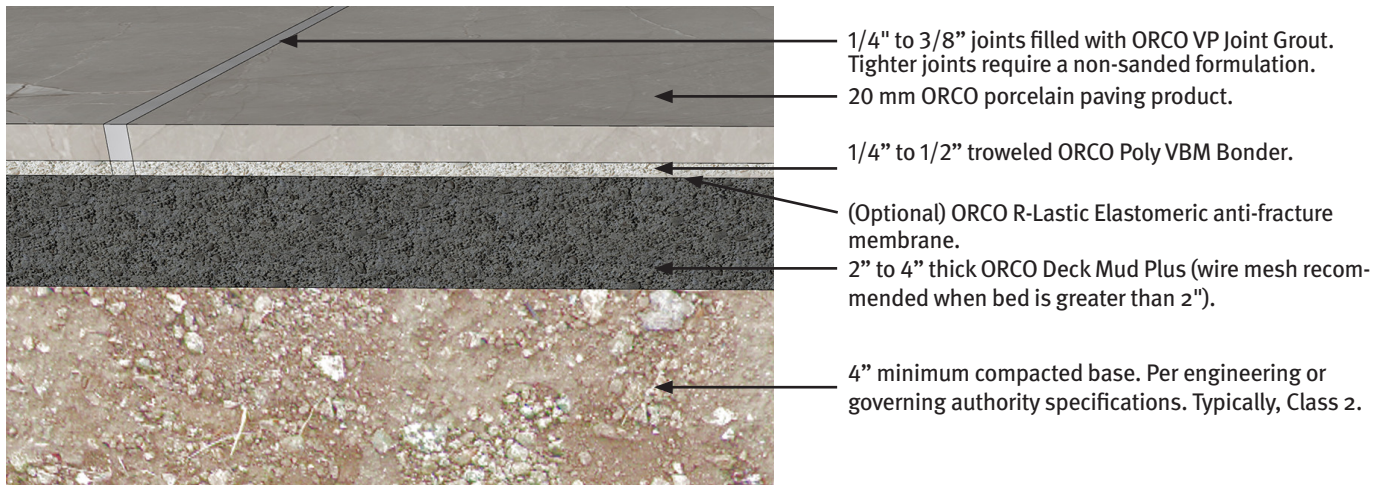
ORCO VP Joint Grout:

Mix joint grout per manufacturer's recommendations.

Joints:

4 mm (5/32") minimum. Fill joints with ORCO VP Joint Grout and tool. Promptly clean grout or cement paste from the porcelain surface.

MORTAR SET OVER COMPACTED BASE FOR PEDESTRIAN USE ONLY



Installation:

Native Soil Condition – Poor soils (clay and disturbed) may result in surface deformation, unwanted settlement, and/or cracking. Engineer consultation is recommended.

Layout:

Plan layout prior to starting installation. Paint outlines and spot all elements – planters, stairs, transitions, etc. Design area perimeter should be a minimum of 8" greater than edge of the porcelain to allow for placement of restraints. Laser levels are recommended for precise grading.

Site Drainage:

Final pavement elevations should slope away from any structure a minimum of 2%. Drains or other means of site drainage must be employed in areas where proper slope cannot be achieved. Max slope for pedestrian accessibility is 8%.

Excavation:

Excavation depth will depend on site conditions.

Base Compaction:

Proper compaction is critical. Compact subgrade to 98% Proctor Density. Avoid overly wet or dry soils.

ORCO Deck Mud Plus:

3:1 dry pack mortar bed with optional wire mesh. Use a concrete mixer to achieve proper consistency. Follow manufacturer's recommendations to create a "brown sugar" consistency that is clump-free and 100% hydrated material. Place and screed material to a minimum of 4".

(Optional) ORCO R-Lastic:

Elastomeric anti-fracture membrane. Apply per manufacturer's recommendations. Roll or trowel.

ORCO Poly VBM Bonder:

Mix/install bonding mortar per manufacturer's recommendations.

Placement:

Use spacers to carefully align and place porcelain. Tamp, level, and ensure proper drainage fall as you build

Expansion Joints:

All expansion control joints must be brought to the surface. "Hidden" joints will crack the porcelain.

ORCO VP Joint Grout:

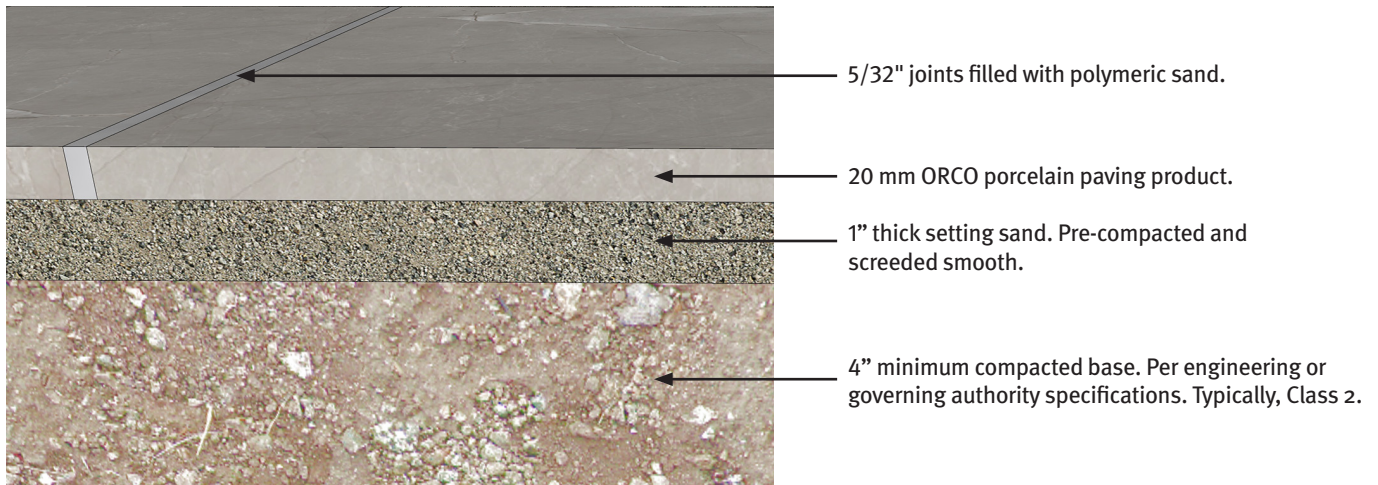
Mix joint grout per manufacturer's recommendations.

Joints:

4 mm (5/32") minimum. Fill joints with ORCO VP Joint Grout and tool. Promptly clean grout or cement paste from the porcelain surface.

ACTUAL DESIGN AND INSTALLATION SPECIFICATIONS SHOULD ALWAYS BE DETERMINED BY QUALIFIED PROFESSIONALS

SAND SET OVER COMPACTED BASE FOR PEDESTRIAN USE ONLY



Installation:

Native Soil Condition – Poor soils (clay and disturbed) may result in surface deformation, unwanted settlement, and/or cracking. Engineer consultation is recommended.

Layout:

Plan layout prior to starting installation. Paint outlines and spot all elements – planters, stairs, transitions, etc. Design area perimeter should be a minimum of 8” greater than edge of the porcelain to allow for placement of restraints. Laser levels are recommended for precise grading.

Site Drainage:

Final pavement elevations should slope away from any structure a minimum of 2%. Drains or other means of site drainage must be employed in areas where proper slope cannot be achieved. Max slope for pedestrian accessibility is 8%.

Excavation:

Excavation depth will depend on site conditions.

Base Compaction:

Proper compaction is critical. Compact subgrade to 98% Proctor Density. Avoid overly wet or dry soils.

Placement:

Use spacers to carefully align and place porcelain. Tamp, level, and ensure proper drainage fall as you build

Polymeric Joint Sand:

Install per manufacturer's recommendations.

Joints:

5/32" minimum. Promptly clean jointing material from the porcelain surface.



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