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DISCLAIMER

The cross sections and diagrams included in this document are intended for the preliminary design and installation of natural stone paving units from Unilock. Unilock cannot guarantee and will not be held responsible for any installation failure and accepts no liability for the improper use of these details.

It is the installer’s responsibility to ensure that all site and structural factors are properly addressed and a structural engineer may be required to provide site-specific engineering and installation specifications.

NOTE: Unilock cannot guarantee the tensile strength of natural stone paving units for pedestal applications or when substructures shift or deteriorate.

The successful installation of natural stone paving units from Unilock is dependent on the structural integrity of what lies below the surface of the slabs. This will include many factors such as wood or concrete decking integrity, site drainage, cutting and quality of concrete mortars and grouts.

INSTALLATION

1. All installations and their respective bases indicated in this guide, should always be installed on undisturbed native subsoil. Provisions for drainage and load-bearing capacity are ultimately the installer’s responsibility and can be managed by slope, drains or depth of base.

2. Only use cementitious adhesives, modified mortars and grouts that are approved for exterior use. Always observe manufacturer’s directions and be sure to conform to all ACI (American Concrete Institute) and PCA (Portland Cement Association) standards. Always install in accordance with ASTM C615, Standard Specification for Granite Dimension Stone; ANSI/CTI A108.1.

3. Building code requirements may vary. Always review local building codes prior to design and construction.

4. Use only approved geotextiles and geogrids.

5. DO NOT compact the surface of natural stone paving units with a plate compactor.

6. Use only diamond blades specifically designed for cutting natural stone paving units. Always “wet-cut” natural stone and wash slurry from both surfaces before installing.

7. Impervious sub-structures must always be sloped for drainage or be designed with provisions for drainage.

8. Thicknesses of base, concrete and bedding indicated in these details are typical. Actual design specifications should always be determined by a qualified professional. All base materials must be placed over undisturbed subsoil and compacted to 95% SPD. Never lay product on topsoil.
PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal Protective Equipment (PPE) should be worn on site such as goggles, N100 stone dust rated masks and gloves, especially when the units are being cut. A minimum requirement for personal protective equipment on site should include a hardhat, protective gloves, protective shoes and high visibility clothing.

CLEANING

Natural stone may be susceptible to staining. When stains do occur, it is imperative that they are cleaned properly and safely to ensure that the appearance is restored and that the surface is not altered or damaged. Natural Stone can often be cleaned with just soap and water. Plain water with a stiff brush (DO NOT use a metal wire brush) is the best start; it won’t cause damage to stone. NEVER USE PRESSURE WASHERS on fine finished materials; this can leave marks on the stone.

Organic stains, such as coffee, wine, food, algae etc., on unsealed surfaces, will usually dissipate naturally over time. Natural stone can be sealed to help prevent the penetration of stains. Always observe sealer manufacturer’s directions for usage.

Always test cleaners and sealers on an unobtrusive area of the installation to ensure that the cleaner is producing the desired outcome before applying to the entire project.

ACIDS

NEVER use Hydrochloric or Sulphuric (Muriatic) Acid based cleaners to remove pointing/grouting residue from natural stone.

Phosphoric acid-based cleaners can be used on acid-resistant sandstones and granites.

NEVER use any acid on limestone.

SEALERS

Any sealer applications in wet areas such as pool decks or patios should be done with impregnating sealers that remain “breathable”. See manufacturer’s specifications.

Products that form a film are not recommended for most applications because they do not allow moisture to get through and may also be slippery when wet.

Always test a small area in an unobtrusive location before sealing entire area.
OPEN GRADED BASE - RIGID BEDDING (STABILIZED CHIP)
- FULLY PERMEABLE

Unilock Natural Stone paving units 7/8" (22mm) thick
Joint spacing approx. 3/8" (10mm)

Use polymeric jointing sand for joints over
1/8" (2.5mm) wide

2" (50mm) thick layer of cement stabilized chip*
made with open graded 3/16" (5mm) - 3/8" (10mm)
(ASTM NO.8 or 9) - Must cure overnight prior to stone placement

Modified mortar thin-set (back buttered to slab using
a 3/8" - 1/2" (10mm - 13mm) notched trowel
(assists leveling and adhesion)

NOTE: A slurry coat (sometimes called a bond
or milk sealer coat) is brushed on to the back
of each natural stone unit prior to installation in
order to limit moisture penetration, prevent
staining and aid adhesion.
The low water absorption of Unilock Natural
Stone coupled with an open-graded base
installation make the slurry coat, OPTIONAL.

NOTE: Cement stabilized chip is a mixture of 80% open graded chip and 20% portland cement with enough water to create a pasty yet flowable mix.
OPEN GRADED BASE - FLEXIBLE BEDDING
- FULLY PERMEABLE

Plastic or aluminum edge restraint spiked in or poured-in-place concrete curb

Unilock Natural Stone paving units 7/8" (22mm) thick
Joint spacing approx. 1/8" - 1/2" (2.5mm - 10mm)

Low profile spacer disk - max 1/8" (2.5mm high) - If design permits

Use permeable polymeric jointing sand or EasyPro® jointing compound for joints over 1/4" (5mm) wide

1 1/2" - 2" (30mm - 50mm) screeded layer of open-graded chip (ASTM 8, 9, or 10) (Also known as HPB)

Slurry / bond / milk sealer coat (see note)

NOTE: A slurry coat (sometimes called a bond or milk sealer coat) is brushed on to the back of each natural stone unit prior to installation in order to limit moisture penetration, prevent staining and aid adhesion.

The low water absorption of Unilock Natural Stone coupled with an open-graded base installation make the slurry coat, OPTIONAL.

TRADITIONAL SAND-SET

Plastic or aluminum edge restraint spiked in or poured-in-place concrete curb

Unilock Natural Stone paving units 7/8" (22mm) thick
Joint spacing approx. 1/8" - 1/2" (2.5mm - 10mm)

Low profile spacer disk - max 1/8" (2.5mm high) - If design permits

Use non-permeable polymeric jointing sand in joints

1/2" - 1" (10mm - 20mm) screeded layer of coarse concrete sand (sometimes referred to as torpedo sand)

Slurry / bond / milk sealer coat (see note)

NOTE: A slurry coat (sometimes called a bond or milk sealer coat) is brushed on to the back of each natural stone unit prior to installation in order to limit moisture penetration, prevent staining and aid adhesion.

Even though Unilock Natural Stone has low water absorption, a sand set installation can remain wet for longer periods of time. To mitigate risk of any discoloration to the natural stone as a result of moisture, a slurry coat is required.
INTERLOCKING POLYETHYLENE FOAM BOARD (IPFB) 
- COMPACTED GRANULAR BASE

**NOTE:** Interlocking polyethylene foam board (IPFB) facilitates the rapid installation of natural stone paving slabs. Although foam board distributes load, it is important that the area below the board has good load bearing capacity and provides sufficient drainage to keep the area below free of any frost movement or settlement. IPFB’s must have manufactured drainage holes.

Only use IPFB’s manufactured for paving applications. DO NOT use for vehicular applications.

**Permeable Base Option:** The compacted granular base may be substituted with 3/4" (20mm) clear stone (ASTM 57), in which case the bedding course will need to be 1" (25mm) of clear chip stone (ASTM NO.8 or 9).
NEW OR EXISTING CONCRETE PATIO, PORCH OR BALCONY OVERLAY - MODIFIED MORTAR BEDDING

Use this detail if the concrete pad surface is flat, slopes correctly and is in good condition.

- Topsoil
- Poured-in-place Concrete Slab
- Compacted Granular Base (if required)
- Undisturbed Native Subsoil
- Saw-cut control joints
- Unilock Natural Stone paving units 7/8" (22mm) thick
- 3/16" (5mm) joint with impervious polymeric jointing sand or modified latex grout or polyurethane sealant / caulk (must be suitable for exterior horizontal surfaces)
- Poured-in-place reinforced concrete slab 4" - 8" (100mm - 200mm) thick 2% slope for drainage
- Geo-textile / geogrid
- Bond/Slurry coat (brushed onto concrete pad prior to applying the bedding. Apply the same bond coat to the backs of each stoned unit before placing)
- Modified mortar bedding Using 1/4" - 3/8" (6mm - 10mm) notched trowel
- Unilock Natural Stone paving units 7/8" (22mm) thick
- For joints 3/16" (5mm) use impervious polymeric jointing sand, modified latex grout or polyurethane sealant/caulk suitable for exterior horizontal surfaces
- 1/4" (6mm) Foam Backer Rod (reduces amount of caulking required)
- Bond/Slurry coat
- Modified Mortar Bedding Using 1/4" - 3/8" (6mm - 10mm) notched trowel
- Rebar reinforced concrete slab
- Locate saw-cut control joints in accordance with ACL and PCA. Position saw cuts directly under paving unit joints wherever possible

Note: when going over existing concrete, ensure that the surface of the slab is both cleaned and etched prior to adhering tiles.
EXISTING CONCRETE PATIO, PORCH OR BALCONY OVERLAY - CEMENTITIOUS BEDDING

Use this detail if existing concrete surface is uneven or in poor condition.

- **Unilock Natural Stone paving units** 7/8" (22mm) thick
- **3/8" (10mm) joint with impervious polymeric jointing sand or modified latex grout or polyurethane sealant/caulk** (suitable for exterior horizontal surfaces)
- **Cementitious bedding - Maximum 1" (25mm) troweled**
- **Saw-cut control joints (see below)**
- **Bond/Slurry coat** (brushed onto concrete pad prior to applying the bedding. Apply the same bond coat to the backs of each stoned unit before placing)
- **Existing poured-in-place concrete slab**
- **Sufficient base must be used to prevent frost movement 6" - 8" (150mm - 200mm) recommended**
- **Geotextile**

- **1/4" (6mm) Foam Backer Rod** (reduces amount of caulking required)
- **Cementitious bedding - Maximum 1" (25mm) Troweled**
- **Unilock Natural Stone paving units 7/8" (22mm) thick**
- **Bond/Slurry coat**
- **Locate saw-cut control joints in accordance with ACI and PCA**
- **Position saw cuts directly under joints between paving units whenever possible.**
- **Existing poured-in-place concrete slab**

- **Topsoil**
- **Compacted Granular Base (not required for porch or balcony)**
- **Undisturbed Native Subsoil**

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Use this detail if existing concrete surface is uneven or in poor condition.
WOOD DECK VENEER
- STRUCTURAL UNDERLAYMENT FOR ELEVATED DECKS

Unilock Natural Stone paving units
7/8" (22mm) thick

Non-woven geotextile - Min 3.1 oz

Structural underlayment designed for use under pavers and slabs. Refer to manufacturer’s specification for installation

For joints 1/8" - 1/2" (2.5mm - 13mm) use polyurethane sealant caulk or haze free polymeric sand (pattern and texture dependent)

Unilock Easy-Pro™ jointing compound can also be used

Unilock Natural Stone or Ledgestone™ Coping adhered with modified mortar tile adhesive - 1/4" (6mm) notched trowel

Wire lath and modified mortar scratch coat

Marine grade plywood 3/4" (20mm)

Deck Framing

Note: The success of any natural stone installation over wood decking is entirely dependent on the decking structure. Always refer to underlayment manufacturer’s specification for new or existing deck installations, and always follow local building codes.

To accommodate varying heights, structural underlayment can also be cut and recessed between joists.
WOOD DECK VENEER
- LOW PROFILE PEDESTAL

NOTE: The longevity of this installation method is directly related to the longevity of the wooden decking materials.

Unilock Natural Stone paving units 7/8” (22mm) thick
Joint ranges may vary 1/8”-1/4” (2.5mm - 6.4mm) according to desired appearance

1 1/4” (31.75mm) pedestal (install as per manufacturer)

Unilock Ledgestone™ perimeter edger

Wire lath with modified mortar scratch coat

2 x 6 - Deck boards (must be in good structural condition and not cupped or warped)

Natural stone, cedar or composite decorative fascia panel adhered using structural outdoor wood adhesive
SAFETY NOTE: NEVER INSTALL NATURAL STONE FASCIA IN OVERHEAD APPLICATIONS.

NOTE: The longevity of this installation method is directly related to the longevity of the wooden decking materials.

Concrete sub-structure of building roof top or floor

NOTE: Specific installation details may vary based on pedestal height, load-bearing requirements, safety standards and wind-lift. All roof top slab/pedestal installations must be engineered by a professional engineer.
Unilock Natural Stone paving units 7/8” (22mm) thick
3/8” (10mm) joint with impervious polymeric jointing sand or modified latex grout or polyurethane sealant/caulk (suitable for exterior horizontal surfaces)
Modified mortar bedding using 1/4” - 3/8” (6mm - 9.5mm) notched trowel
Two-level poured-in-place reinforced concrete slab 4’ - 8’ (100mm - 200mm) thick, 2% slope away from pool
Locate control joints over tubular support footings
Natural Stone or Unilock Ledgestone™ perimeter edger set into modified mortar scratch coat
Concrete to metal (waterproof) adhesive (Apply as per manufacturer’s specifications)
Side wall vinyl liner mount
Water level
Metal pool wall (vinyl liner type)
8” (200mm) diameter tubular concrete support column front and back of concrete pad. Spacing to be determined by qualified professional and in accordance with ACL and PCA.
Compacted open graded granular backfill ASTM No. 8 or 9 or High Performance Bedding (HPB)
Metal pool wall "X" frame support braces (Design may vary per manufacturer)
Poured concrete pool wall foundation / stabilization (As per pool manufacturer’s specifications)