INSTALLATION

1. All installations and their respective bases indicated in this guide, should always be installed on undisturbed native subsoil. Provisions for drainage and frost protection 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. Cementitious bedding is typically made up of three parts masonry sand and one part Portland Type I or Type II cement. 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. Note: Bond/Slurry coats should always be applied to all surfaces to be adhered. Ardex 8+9 is recommended (see page 11)

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. Both the base and the slab surfaces should have an endfall slope away from the buildings and structures at 1:40. The opposite crossfall slope should be 1:80.

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.

9. Natural Stone slabs installed over wood decking must have impervious jointing compound between joints to prevent water from rotting the wood overtime.

The successful installation of natural stone paving units from Unilock is dependent on the structural integrity of the base 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.

TABLE OF CONTENTS

Disclaimer, Installation, PPE, Cleaning, Acids, Sealers............. 2 & 3

AGGREGATE BASE
   Open Graded or Compacted Granular Base......................... 4

OVER CONCRETE
   Concrete Overlay - Good Surfaces.................................. 5
   Concrete Overlay - Poor Surfaces.................................... 6

OVER WOOD
   Wood Deck Veneer
      - Structural Underlayment for Elevated Decks............... 7
   Wood Deck Veneer
      - Low Profile Pedestal............................................ 8

SPECIALTY APPLICATION
   Pedestal on Concrete Application.................................. 8
   Pool Coping and Pool Deck........................................... 9
   Unicare Cleaners & Sealers......................................... 10
   Ardex Preparation & Installation Mortar.......................... 11
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.

· Recommended Sealers and Cleaners

Unilock offers a complete line of sealers and cleaners for the Natural Stone products we sell. Please refer to page 10 of this guide or visit Unilock.com/nat-stone-guide.pdf
NATURAL STONE
INSTALLATION GUIDE

OPEN GRADED OR COMPACTED GRANULAR BASE

Unilock Natural Stone paving units 7/8" (22mm) thick
Joint spacing approx. 3/8" (10mm)
Use non-permeable polymeric jointing sand

1" - 1 1/2" (30mm - 40mm) Mortar Bed
(such as 3:1 sand:cement mix)

Bond / Slurry Coat applied to bottom of each slab with a brush prior to placement

Unilock EnduraColor™ Plus paver edger

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.

Unilock EnduraColor™ Plus paver edger

Plastic or aluminum edge restraint secured with 12" (300mm) spikes

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 8" - 12" (200mm - 300mm)
3/4" (20mm) Clear or ASTM No. 57 or Compacted Granular Base (CA 6 or equivalent)

DriveGrid™

Undisturbed Native Subsoil

8" - 12" (200mm - 300mm) of open graded base of 3/4" (20mm) clear (ASTM No. 57) or Compacted Granular Base (CA 6 or equivalent)

Bond / Slurry Coat applied to bottom of each slab with a brush prior to placement

1" - 1 1/2" (30mm - 40mm) Mortar Bed

Unilock Natural Stone paving units 7/8" (22mm) thick
CONCRETE OVERLAY
- FOR GOOD QUALITY CONCRETE PATIO, PORCH OR BALCONY SURFACES THAT ARE PROPERLY SLOPED

**Note:** when going over existing concrete, ensure that the surface of the slab is both cleaned and etched prior to adhering flagstone
CONCRETE OVERLAY
- FOR POOR QUALITY OR UNEVEN CONCRETE PATIOS, PORCHES OR BALCONY SURFACES

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 non-permeable polymeric jointing sand or modified latex grout or polyurethane sealant/caulk (suitable for exterior horizontal surfaces)

Mortar bed - 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 stone unit before placing)

Existing poured-in-place concrete slab

In most cases you will not know if the existing concrete patio was constructed over a frost-free base. Never install Natural Stone on to surfaces that are known to be prone to frost movement

Permeable geotextile / geogrid

Topsoil

1/4" (6mm) Foam Backer Rod (reduces amount of caulking required)

Compacted Granular Base (not required for porch or balcony)

Undisturbed Native Subsoil

3/8" (10mm) joint with non-permeable polymeric jointing sand or modified latex grout or polyurethane sealant/caulk (suitable for exterior horizontal surfaces)

Mortar bed - Maximum 1" (25mm) Troweled

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

Bond/Slurry coat applied to back of natural stone slabs prior to placing

Bond/Slurry coat applied to existing concrete surface

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
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. If joints between slabs are left open or permeable, water may penetrate and damage wood structure.
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

Pedestal (install as per manufacturer)
Must be screwed to wood below to prevent lateral movement

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
SAFEY NOTE: NEVER INSTALL NATURAL STONE FASCIA IN OVERHEAD APPLICATIONS.

PEDESTAL ON CONCRETE APPLICATION

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

Pedestal system (install as per manufacturer)
Note: Neoprene pads on the feet of pedestals are recommended to prevent lateral movement

Waterproofing membrane (consult engineer for project specific engineering)

All concrete surfaces must slope to appropriate drain (consult engineer for project specific engineering)

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 non-permeable 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)

Modified Mortar Bedding Using 1/4" - 3/8" (6mm - 10mm) notched trowel

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

Bond/Slurry coat must be applied to back of flagstone

Natural Stone or Unilock Ledgestone™ perimeter edger set into modified mortar scratch coat

Concrete to metal (waterproof) adhesive (Apply as per manufacturer’s specifications)

Bond/Slurry coat must be applied to concrete slab prior to placement of mortar bed

Modified Mortar Bedding Using 1/4" - 3/8" (6mm - 10mm) notched trowel

Rebar reinforced concrete slab
## UNI-CARE CLEANERS & SEALERS FOR NATURAL STONE
### RECOMMENDED PRODUCTS FOR INSTALLING, CLEANING, ENHANCING & PROTECTING

### AcidClean
- Removes mineral type residues including cement and mortar residues, efflorescence, rust stains, general dirt and grime, hard water scale (limestone), grout haze and grout films.
- **Efflorescence**
- **Cement, mortar and grout residue**
- **Rust stains, mineral deposits and limescale**
- **General dirt and grime**
- **Concentrated.**
- **Coverage 10-50 M² per litre**
- **Available in 1L or 5L sizes**

### PowerClean
- A high alkaline cleaner and degreaser. Can be used on natural stone, grout, ceramic, porcelain, terra cotta, quarry tiles, concrete, pavers and masonry.
- **Oil, grease and food stains**
- **Sap and certain stains from plants**
- **General dirt and grime**
- **Light cement contamination on acid sensitive surfaces**
- **Concentrated.**
- **Coverage 10-32 M² per litre**
- **Available in 1L or 5L sizes**

### BioClean
- Removes organic type soilings such as black spot algae, green algae, staining from birds, berries, leaves, trees, bark, compost and colored food spillages such as tea, coffee, wine and popsicles, etc.
- **Black spot algae, Green algae**
- **Leaves, wood, trees, berries and flower stains**
- **Organic bark and compost stains**
- **Food drink and spills**
- **Concentrated.**
- **Coverage 4-8 M² per litre**
- **Available in 1L or 5L sizes**

### NatMatte Sealer
- **For use on Sandstone and Limestone, NOT including Black Limestone.** NatMatte Sealer is an impregnating sealer, meaning it will leave no sheen, shine or surface coating of any kind. The product soaks into the stone surface which remains completely natural in appearance. NatMatte Sealer protects stone from staining from food, oil, grease, drinks, leaves, trees and general dirt. Helps to reduce algae growth.
- **No sheen or shine**
- **No color change on most stones**
- **General dirt**
- **Algae growth**
- **Stains from food, oil, birds, plants, leaves and trees**
- **Available in 1L or 5L sizes**

### NatColorEnhance Sealer
- **For use on Sandstone and Limestone, including Black Limestone.** NatColorEnhance Sealer is an impregnating sealer, meaning it will leave no sheen, shine or surface coating of any kind. The product soaks into the stone surface which remains completely natural in appearance but enhances the natural color (gives a ‘damp’ look to the surface). NatColorEnhance Sealer protects stone from staining from food, oil, grease, drinks, leaves, trees and general dirt. Helps to reduce algae growth.
- **Enhances Natural Color**
- **No sheen or shine**
- **General dirt**
- **Algae growth**
- **Stains from food, oil, birds, plants, leaves and trees**
- **Available in 1L or 5L sizes**

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*MORE INFORMATION IS AVAILABLE AT UNILOCK.COM*
ARDEX PREPARATION & INSTALLATION MORTAR

**ARDEX 8+9** for slurry coat

Rapid Waterproofing and Crack Isolation Compound is a best-in-class, two-component, solvent-free, cement-based membrane. Comprised of an acrylic-based liquid compound and a Portland and other hydraulic cement-based powder. ARDEX 8+9 can be used for topside waterproofing of all common building substrates including showers, balconies and other wet areas.

- Highly flexible
- Solvent-free
- Reduces risk of efflorescence
- Can be used over concrete and masonry finishes
- Also ideal for crack isolation up to 1/8” (3 mm)
- Comes with Rapid Waterproofing and Crack Isolation Compound

**NOTES**

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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.

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