



YARRABEE & CASTLEMAINE STONE

INSTALLATION, CARE & MAINTENANCE GUIDELINES

NATURAL STONE PAVING & WALLING

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1. General Advice Notice

This guide has been prepared to assist customers, builders, landscapers, installers and project managers in the handling, installation and maintenance of natural stone products supplied by Yarrabee & Castlemaine Stone.

Natural stone is a product of nature and every installation is different. Site conditions, drainage, substrate design, exposure, installation methods, workmanship, maintenance practices and environmental factors can all influence the appearance and long-term performance of a natural stone installation.

For this reason, this document provides general guidance only. It is not project-specific advice and should not be relied upon as a substitute for professional assessment of a particular site or installation.

The suitability of any product, installation method, adhesive, mortar, grout, waterproofing system, sealant, sealer or maintenance regime must be assessed by the installer and relevant project professionals before work begins.

This guide should be read together with:

- Current Australian Standards, including AS 3958 where applicable.
- Relevant building and construction regulations.
- Manufacturer technical data sheets and installation instructions.

- Project-specific engineering, waterproofing and design documentation.
- Current Work Health and Safety requirements.

Nothing in this guide is intended to exclude, restrict or modify any rights or remedies that cannot be excluded under Australian Consumer Law.

2. Scope of This Guide

This guide addresses the general installation, care and maintenance of natural stone products supplied by Yarrabee & Castlemaine Stone.

It is not intended to provide:

- Structural engineering advice.
- Geotechnical advice.
- Waterproofing certification.
- Building code compliance certification.
- Fire engineering advice.
- Architectural design advice.
- Project-specific installation instructions.
- Regulatory approval advice.

Projects involving suspended slabs, balconies, rooftops, retaining structures, swimming pools, commercial traffic, public infrastructure, wall cladding systems or other specialised applications may require additional professional advice beyond the scope of this document.

3. Responsibility for Installation

Yarrabee & Castlemaine Stone supplies natural stone products. Unless separately agreed in writing, Yarrabee & Castlemaine Stone does not control:

- Site conditions.
- Substrate preparation.
- Drainage design.
- Waterproofing systems.
- Installation workmanship.
- Adhesive selection.
- Grout selection.
- Sealer selection.
- Cleaning methods.
- Ongoing maintenance practices.

The performance of the completed installation depends on the interaction of all of these elements.

The installer remains responsible for assessing the suitability of the installation method and ensuring that all materials are used in accordance with the relevant manufacturer's instructions.

Where uncertainty exists regarding product suitability, installation methods or exposure conditions, advice should be sought before installation begins.

4. Third-Party Products

Yarrabee & Castlemaine Stone does not manufacture adhesives, mortars, grouts, waterproofing products, membranes, sealants, cleaners, sealers or installation systems.

The performance of these products remains the responsibility of their respective manufacturers.

Installers should always refer to the latest technical documentation provided by the relevant manufacturer before selecting or applying any installation product.

Yarrabee & Castlemaine Stone makes no representation regarding the performance of third-party products outside the scope of any written advice specifically provided by Yarrabee.

5. Product Inspection Prior to Installation

All natural stone should be inspected before installation.

Before laying begins, the customer, installer or project manager should confirm that:

- The correct product has been supplied.
- The correct quantity has been supplied.
- The finish and format are suitable for the project.
- The visible face of the stone has been identified.
- Any coping, corners, cladding returns or special pieces are suitable for the intended use.
- The stone is appropriate for the site conditions.

Any concern regarding the supplied material should be raised with Yarrabee & Castlemaine Stone before installation proceeds.

Once stone has been installed, it may be difficult or impossible to determine whether a concern existed prior to installation, arose during installation or developed because of site conditions.

For this reason, visible product concerns should be addressed before installation commences.

Installation of the product constitutes acceptance of visible product characteristics, except where otherwise provided by law.

6. Understanding Natural Stone

Natural stone is a product of nature. Unlike manufactured materials such as porcelain, concrete pavers or engineered surfaces, every piece of natural stone is unique.

Variation should be expected and appreciated as part of the character of the product. Natural variation is not a defect.

Natural stone may contain differences in colour, tone, shading, veining, shell content, fossils, mineral deposits, iron movement, quartz inclusions, surface texture, edge detail, thickness and size. Some stone types may also contain naturally occurring pits, pores, clefts, laminations or surface markings that form part of the appearance of the product.

No two pieces of stone will be identical and no sample can represent every variation that may occur within a shipment.

Showroom displays, website photography, brochures, samples and previous installations are intended to provide a general indication of the product only. They should not be relied upon as an exact representation of the stone ultimately supplied.

Natural stone may also vary between production batches, shipments and extraction periods. This variation is normal and should be expected when ordering additional material at a later date.

Blending During Installation

Natural stone should always be blended during installation.

Installers should open and draw material from multiple crates, pallets or packs at the same time. Blending distributes natural variation across the installation and creates a balanced appearance.

Installing stone from a single crate or pallet before opening the next can result in concentrated areas of colour or texture variation.

Wet Stone Versus Dry Stone

Natural stone can appear significantly darker when wet.

Moisture from transport, storage, installation, cleaning, rain, irrigation or site conditions may temporarily alter the appearance of the stone. Some stones may show substantial colour change while moisture is present.

Stone should not be assessed for final colour while wet. Allow the stone to dry fully before making any assessment regarding colour consistency or appearance.

Natural Characteristics Versus Defects

Natural stone may display characteristics that would not normally be present in manufactured products.

Depending on the stone type, these characteristics may include fossils, shells, mineral markings, cat's paw markings, quartz veining, cleft variation, laminations, open pores, filled areas, texture variation, edge chipping and colour variation.

These characteristics do not necessarily indicate a fault in the material.

If there is uncertainty regarding the suitability of supplied material, Yarrabee & Castlemaine Stone should be contacted before installation proceeds.

7. Storage and Handling

Natural stone should be stored correctly from the time it is delivered until installation begins.

Poor storage practices can affect appearance, create contamination issues and increase the risk of damage before installation.

Stone should be stored on firm, level ground in a stable position. Crates and pallets should remain secure and should not be placed in standing water, mud or areas where groundwater may enter the packaging.

Where practical, stone should be protected from prolonged exposure to rain, irrigation overspray and excessive site contamination. Leaves, soil, mulch, fertilisers, rusting metal objects and other staining materials should not be left in contact with the stone.

Stone may arrive damp from manufacturing, washing, packing or transport processes. Damp stone may appear darker than dry stone. Where appearance assessment is required, allow the stone to dry before inspection.

Care should be taken when unpacking, moving and handling stone. Edge chipping can occur during transport and handling and should be considered when setting out the project and selecting pieces for cutting.

8. Preparing the Base

The supporting base is one of the most important elements of a successful natural stone installation.

A high-quality stone installed over a poorly prepared substrate is unlikely to perform satisfactorily over the long term

Yarrabee & Castlemaine Stone generally recommends installation over a reinforced concrete base unless an alternative system has been designed and approved by an appropriately qualified professional.

As a general guide, pedestrian paving should be supported by a reinforced concrete base with a minimum thickness of 75mm. Standard residential vehicle applications under three tonnes gross mass should generally be supported by a reinforced concrete base with a minimum thickness of 100mm. Concrete strength should generally be a minimum of 25MPa unless otherwise specified.

These recommendations are intended as general guidance only and may not be suitable for every project.

Projects involving driveways, commercial traffic, suspended slabs, reactive soils, retaining structures, unstable ground, fill material or unusual loading conditions may require engineering advice.

Substrate Condition

Before installation begins, the substrate should be fully cured, structurally sound, stable and clean.

The surface should be free from dust, laitance, oil, grease, paint, curing compounds, release agents and loose material.

Any defects in the substrate should be addressed before installation commences.

The substrate should also be formed to the correct levels and falls before stone installation begins. Adhesives and mortar beds should not be relied upon to compensate for major substrate inaccuracies.

Movement Joints

Movement joints are essential in natural stone installations.

Concrete, stone, mortar, adhesive and grout all expand and contract in response to temperature, moisture and structural movement.

Existing control joints, construction joints and movement joints within the substrate must continue through the finished stone surface. These joints should never be bridged with stone, grout, mortar or adhesive.

Additional movement joints may also be required depending on the size of the installation, stone format, exposure conditions and project design.

The movement joint layout should be determined by the installer or relevant project professional.

9. Moisture, Drainage and Water Management

Most long-term natural stone problems are linked to moisture.

Water that becomes trapped beneath, behind or within an installation can contribute to staining, efflorescence, lifting, drummy paving, adhesive failure, grout deterioration and long-term surface damage.

For this reason, moisture management should be considered during every stage of design and installation.

Falls and Drainage

External paving should be installed with sufficient falls to move water away from buildings, structures and paved areas.

As a general guide, smooth stone surfaces should be installed to a minimum fall of 1:100. Heavily textured surfaces should generally be installed to a minimum fall of 1:50.

Water should not be allowed to pond on the stone surface or remain trapped within the bedding system.

Drainage should be considered before installation begins. Depending on the project, suitable drainage may include strip drains, spoon drains, subsurface drainage systems, waterproofing systems or other moisture management measures.

Efflorescence

Efflorescence is a white salt deposit that can appear on concrete, masonry and natural stone surfaces.

Efflorescence occurs when moisture moves through cement-based materials and carries soluble salts to the surface.

In most cases, efflorescence is a moisture-management issue rather than a product defect.

Good drainage, suitable falls, appropriate waterproofing and correct installation practices can help reduce the likelihood of efflorescence.

Waterproofing and Crack Suppression

Certain applications may require waterproofing systems, moisture barriers or crack suppression membranes.

These applications commonly include balconies, rooftops, suspended slabs, wet areas, swimming pools, water features and other moisture-exposed environments.

Where waterproofing or crack suppression products are used, they should be compatible with the substrate, adhesive system and stone being installed.

Manufacturer instructions should always be followed. Waterproofing systems are not a substitute for good drainage design and correct falls.

10. Installation Methods

The installation method should be selected based on the stone type, stone thickness, substrate condition, exposure environment and intended use of the finished surface.

No single installation method is suitable for every project. The installer remains responsible for determining the most appropriate installation system for the specific application.

Calibrated Stone

Calibrated stone has a relatively consistent thickness and may be suitable for direct adhesive fixing where the substrate has been accurately prepared.

Direct adhesive fixing requires a flat, stable substrate and should not be used as a method of correcting significant substrate irregularities.

Uncalibrated Stone

Natural stone with greater thickness variation may require a wet-bed installation system to achieve correct levels and falls.

The presence of thickness variation does not remove the requirement for full support beneath the stone.

Bedding and Bonding Requirements

The underside of every stone should be adequately supported.

Spot fixing, dollops of mortar, ribbon bedding, unsupported corners and other methods that leave significant voids beneath the stone should be avoided.

Voids beneath the stone can trap moisture and may contribute to cracking, drummy paving, staining, adhesive failure and efflorescence.

Back-buttering is strongly recommended. Applying adhesive or bonding slurry to the underside of the stone helps improve coverage and reduces the likelihood of voids.

Installers should periodically lift freshly laid pieces during installation to confirm that adequate contact is being achieved between the stone and the bedding system.

Mortar Beds

For wet-bed installations, Yarrabee generally recommends a mortar mix consisting of washed sand and cement at approximately 3:1 unless otherwise specified by a project professional or product manufacturer.

The mortar should be workable but not excessively wet.

Brick sand is generally not recommended for natural stone paving installations because of its moisture-retention characteristics.

Where a mortar bed system is used, suitable bonding should be achieved between the substrate, bedding layer and stone.

Adhesives

Adhesive selection should consider:

- Stone type.
- Stone colour.
- Stone thickness.
- Stone format.
- Substrate type.
- Exposure conditions.
- Moisture sensitivity.
- Pool or wet-area exposure.
- Movement within the substrate.

Some moisture-sensitive stones may require specialist adhesive systems or fast-setting adhesives.

Light-coloured stones may benefit from white adhesives or white mortars to reduce the risk of staining, shadowing or picture framing.

Always follow the adhesive manufacturer's recommendations.

Cutting and Silica Safety

Natural stone should be cut using suitable equipment fitted with appropriate diamond blades.

Wet cutting is strongly recommended. Any slurry or cutting residue should be removed from the stone immediately after cutting.

Natural stone may contain crystalline silica. Installers and contractors must comply with all current Work Health and Safety requirements relating to the handling, cutting, grinding and drilling of silica-containing materials.

Yarrabee recommends that all cutting be undertaken using appropriate dust-control measures and personal protective equipment.

11. Pools, Wet Areas and Dip Sealing

Swimming pools, wet areas, water features, coastal environments and salt-exposed locations place additional demands on natural stone installations.

These environments require greater attention to moisture management, installation methods, drainage, cleaning and maintenance.

Before installation begins, the installer should confirm that:

- The selected stone is suitable for the intended environment.
- Falls and drainage have been correctly designed.
- Appropriate waterproofing measures have been considered.
- Adhesives and grouts are suitable for the exposure conditions.
- The proposed sealing system is appropriate for the project.

Dip Sealing

Yarrabee does not generally recommend pre-sealing for standard paving installations.

However, certain stones require dip sealing prior to exposure to an elevated salt environment.

Dip sealing involves sealing all faces of the stone before installation and may assist in reducing moisture uptake in specific environments.

Dip sealing is most commonly considered for:

- Pool coping.
- Water features.
- Salt-water pools.
- Coastal environments.
- High-moisture applications.

Because some sealers can affect bond strength, compatibility with the installation system must always be confirmed before dip sealing is undertaken.

Pool water chemistry should be maintained within recommended operating ranges. Poorly balanced water can affect stone, grout, sealers and installation products.

Contact Yarrabee & Castlemaine Stone to confirm if your stone requires dip sealing prior to installation.

12. Grouting

Grouting plays an important role in both the appearance and performance of a natural stone installation.

The selected grout should be suitable for the joint width, exposure conditions and stone type.

Before grouting begins, installers should confirm that the bedding system has cured sufficiently and that joints are clean and free from debris.

Grout should be mixed strictly in accordance with the manufacturer's instructions.

Excess water should not be added during mixing or clean-up.

Joints should be completely filled to minimise water entry into the bedding system.

Excess grout should be removed from the stone surface before it hardens.

Flood grouting may be appropriate for some installations but should only be undertaken where the method is suitable for the stone being installed.

13. Cleaning and Sealing

Once installation is complete and all bedding and grouting materials have cured, the stone should be cleaned and sealed where appropriate.

Cleaning

Routine cleaning should be undertaken using pH-neutral stone cleaning products.

Different stone types respond differently to cleaning chemicals and it is important to select products specifically designed for natural stone.

Acidic cleaners should generally be avoided unless specifically recommended by a qualified stone-care professional.

Limestone, travertine and many other calcareous stones can be permanently damaged by acidic cleaning products.

Pressure Cleaning

Pressure cleaning should be approached with caution.

Excessive pressure can damage grout joints, remove sealers, erode softer stone surfaces and force water into the installation.

Where pressure cleaning is considered necessary, testing should be undertaken first and appropriate equipment should be used.

Sealing

Sealing may assist with stain resistance and ongoing maintenance.

Sealers do not make natural stone waterproof, stain-proof or maintenance-free.

Two common categories of penetrating sealer are:

- Natural-look sealers.
- Enhancing sealers.

The most appropriate sealer depends on the stone type, exposure conditions and desired appearance.

All sealers should be tested before widespread application.

Re-Sealing

Sealer performance will reduce over time.

The frequency of re-sealing depends on the stone type, exposure conditions, traffic levels, maintenance practices and the sealer used.

Rather than relying solely on a predetermined time period, the condition of the installation should be assessed periodically to determine whether re-sealing is required.

14. Ongoing Maintenance

Natural stone is a maintenance product and should be cared for accordingly.

Routine maintenance is generally straightforward and can significantly extend the appearance and service life of the installation.

Regular sweeping and removal of debris will help prevent staining and reduce surface wear.

Leaves, mulch, soil, fertilisers, rusting metal objects, oils and pool chemicals should not be left in contact with the stone for extended periods.

Spills should be cleaned promptly.

Drainage systems should be inspected periodically to ensure water continues to move freely away from the installation.

Failure to undertake reasonable maintenance may affect both the appearance and long-term performance of the stone.

Professional Maintenance

Some installations may benefit from periodic professional maintenance.

Professional services may include:

- Deep cleaning.
- Stain treatment.
- Efflorescence treatment.
- Grout repair.
- Sealant replacement.
- Re-sealing.

Pool surrounds, commercial installations, coastal projects and heavily used outdoor areas may require more frequent maintenance than standard residential paving.

15. Product Specific Notes**Limestone and Travertine**

Limestone and travertine are generally more porous and more sensitive to acidic cleaners than many other natural stones.

These products should be cleaned using pH-neutral products and maintained appropriately.

Natural characteristics may include fossils, shells, veins, open pores, filled areas and tonal variation.

Additional care may be required in pool and wet-area applications.

Bluestone

Bluestone may naturally contain cat's paw markings, quartz veining, mineral movement, colour variation and tonal variation.

Large-format bluestone products require particular attention to bedding coverage, moisture management and movement joints.

Granite

Granite is generally dense, durable and hard-wearing. Correct substrate preparation, movement joints and bedding support remain essential.

Sandstone

Sandstone can vary significantly in density and porosity. Moisture management, sealing and ongoing maintenance should be considered when selecting sandstone products.

Slate

Slate may contain natural cleft variation, laminations, mineral variation and localised exfoliation. These characteristics are inherent to the product.

Crazy Paving

Crazy paving is supplied as a random-format product. Variation in size, shape, thickness and piece distribution should be expected. Installation waste and selection waste vary between projects.

Customers and installers should allow sufficient material for cutting, selection and layout requirements.

Cobblestones

Cobblestone installations should be designed to suit the intended traffic loads.

Particular attention should be given to substrate design, bedding support and drainage.

Wall Cladding

Natural stone cladding is only one component of a complete wall system. Fire performance, structural adequacy, weatherproofing, drainage performance and regulatory compliance are determined by the complete wall assembly rather than the stone alone.

Additional engineering, waterproofing or compliance advice may be required depending on the application.

16. Common Problems and Prevention**Drummy Paving**

Drummy paving is commonly associated with inadequate bedding coverage, voids beneath the stone, poor substrate preparation, moisture-related movement or installation defects. Full bedding support, back-buttering and regular coverage checks during installation help reduce the likelihood of drummy paving.

Staining

Common causes of staining include leaves, mulch, rusting furniture, oils, fertilisers, pool chemicals and inappropriate cleaning products. Prompt cleaning and regular maintenance help reduce staining risk.

Efflorescence

Efflorescence occurs when moisture transports soluble salts to the surface. Good drainage, suitable falls and moisture management are the most effective preventative measures.

Picture Framing

Picture framing can result from moisture movement, grout penetration, adhesive selection, stone porosity or incompatible installation products. Careful product selection and installation practices help minimise the risk.

Surface Deterioration

Surface deterioration may result from trapped moisture, aggressive cleaning methods, pressure washing, poor maintenance or unsuitable product selection. Selecting the correct stone for the intended environment remains one of the most effective preventative measures.

17. Conclusion

Natural stone is a durable and attractive building material that can provide decades of service when correctly selected, installed and maintained.

The most successful installations are those where the stone, substrate, drainage, bedding system, movement joints, sealing system and maintenance practices are considered together as a complete system. For project-specific advice, contact Yarrabee & Castlemaine Stone before installation begins.