HARDSCAPE PRODUCTS

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Guidelines for the maintenance of areas of Kellen paving

For more than a decade now, the ingenious modular concrete Kellen range from Hardscape has provided a creative and imaginative alternative to traditional hard landscaping paving products.

Material Properties

Kellen paving is a high-end, modular concrete paving system characterized by its natural stone aggregate top layer and high durability. Developed by Hardscape and its supply partners, the range is widely used in prestigious public and commercial spaces for its aesthetic versatility and sustainable manufacturing options.
Kellen comes in many sizes, forms, colours, and finishes to create paving slabs, setts, blocks, kerbs, and steps.

Key properties include:

Natural Stone Surface: Each block features a top coating made from real stone aggregates rather than just coloured concrete.

- **Breccia:** This is an ultra refined architectural paving with a 100% pure aggregate non fading top layer to maximise colour fastness. The cultured surface is composed of a 4 aggregate size mix which provides the surface impact. The top layer is water washed during production to reveal the varied colour of the aggregate form and thereby provides a market unique stone realistic surface
- **Lavaro:** With a 70% natural aggregate surface in slightly coarser grain size. The top layer is water washed during production to reveal the varied colour of the aggregate form and thereby provides a market unique stone realistic surface
- **Liscio:** Using the Breccia product as the start this surface is created using stone polishing machinery which produces a highly engineered ground refined surface. With 100% natural aggregate top layer slip resistance is maximised
- **Lucida:** Using the Breccia top layer to start, then further surface treated creating a delicate feint rippled feel. An ultra refined architectural paving with 100% pure aggregate, with no sand, to maximise colour fastness and non fading top layer
- **Sferio:** Split and shot-blasted top layer with 100% natural stone granulates in multiple grades

Surface Finishes: The top layers are typically water-etched with high pressure or shot-blasted with stainless steel pellets to expose the sparkling natural stone and provide a high-quality, slip-resistant finish.

Colour Stability: Because the colour comes primarily from the natural stone aggregates rather than just added pigments, the paving maintains its original appearance over time.

Extreme Durability: Engineered for high-traffic areas, the dense surface is resistant to wear, making it difficult for dirt to penetrate and ensuring it is not susceptible to general fading.

Breaking Strength: >3.6Mpa

Density: Kellen Breccia is typically around 2,350 kg/m³.

Thermal/ Fire Resistance: Fire resistant with low heat conductivity.

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Sustainability & Innovation

Low Carbon (CERO): Kellen is available in a "CERO" version which uses geopolymer technology instead of traditional cement. This can reduce CO_2 emissions by up to 70% compared to standard concrete products.

Permeability (H2O): The Kellen H2O system provides an innovative permeable block paver that allows for effective surface water drainage, making it suitable for Sustainable Urban Drainage Systems (SuDS).

Circular Economy: Many Kellen products are compliant with "Cycle for Concrete" (C4C) standards, focusing on recyclability and the use of sustainable raw materials.

Initial Maintenance

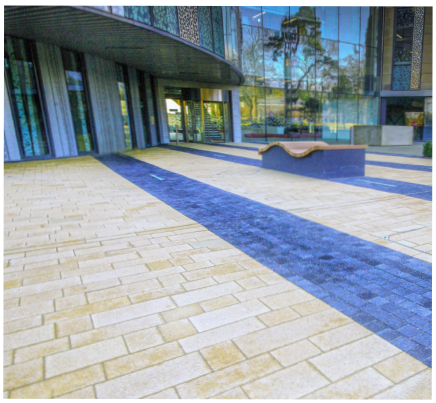
Sub-base construction

Flexible block paving requires a sub-base of graded and broken stone (unbound granular material) topped off with 30mm to 50mm grit sand for bedding. The thickness of the load bearing sub-base depends on the frequency and type of vehicular traffic. For commercial applications a layer of 150mm+ is recommended.

The sub-base material should be spread out in layers no thicker than 150mm. Once level, it should be compacted by multiple passes with the compacting equipment, both longitudinally as transversely, until full compaction is achieved. Once compacted, the level of the sub-base layer should be checked. Any part of the sub-base deviating from the required level by 10mm+ should be raked off or topped up with additional material and re-compacted to the correct level. Sub-bases of thickness greater than 150mm should be constructed in layers not exceeding 150mm. For example, a 250mm thick sub-base would be constructed as 150mm layer, laid and compacted and 100mm layer laid and compacted over it.

Paving

The concrete pavers should be paved equally in height, angle and in line (with help of a taut string) with enough jointing space, not too tight against each other.



Fill jointing space

Brush in jointing space with dry jointing sand, preferably with a surplus of fine particles. Repeat this several times, also after compacting the paving. Leave jointing sand on the pavement after finishing the work.

Before cleaning, identify the contaminant and select the appropriate treatment. Where the contaminant is unknown, test the chosen cleaning method on a small, inconspicuous area first. These maintenance guidelines apply to all concrete products.

Compacting

Clean the surface of the paving from sand or other particles. Compact the paving in dry conditions with a wacker. Make 4-6 passes over each section of paving, alternating passes at 90° to the previous pass. Vibrate capacity > 4000/min.

For paving blocks with a top layer use a mat attached to the base of the wacker to prevent spalling damage to the edges of the pavers.

Especially for Liscio beware of scratching the surface. Make sure that the surface is clean and cover it with a mat or an old carpet as precaution.

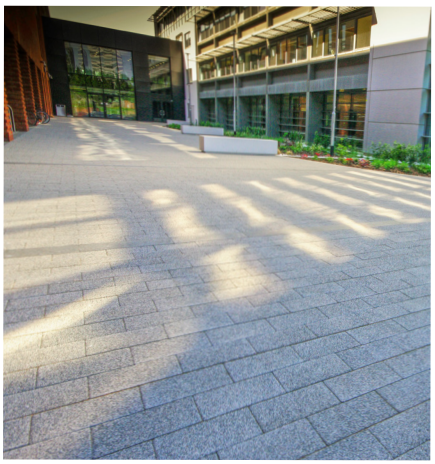
Hazard Identification and Inspection

Regular inspections should assess the following conditions, which apply to all concrete products.

Surface Condition

The best results are achieved by using the correct equipment correctly.

- Cracked slabs or blocks (hairline or structural cracks)
- Deep scratches, spalling, or pitting in the surface
- Excessively worn surfaces.Loose paving units or rocking slabs
- Missing units creating hazards



Level and Alignment

- Uneven levels between units (trip hazards)
- Subsidence or settlement indicating sub-base failure
- Heave or uplift (often caused by roots or frost)
- Misalignment or movement from the original layout
- Missing units creating hazards

Jointing and Bedding

- Missing or failed joint material
- Widened or eroded joints
- Vegetation growth (weeds or moss)

Drainage

- Standing water after rainfall
- Blocked drainage channels or gullies
- Incorrect surface falls directing water away from drainage points

Edge Restraints

- Displaced or loose kerbs
- Failure of edge restraints causing spreading
- Damaged transitions between surfaces

Safety and Accessibility

- Trip hazards (generally >15 mm level difference)
- Slip hazards caused by algae, moss, oil or polishing
- Damaged tactile paving at crossings
- Obstructions or poorly positioned street furniture

Structural Integrity

- Repeated settlement or rocking slabs indicating sub-base issues
- Damage from heavy vehicles or service traffic

Cleanliness

- Efflorescence: Check for white powdery residue. (Further details below)
- Debris build-up affecting drainage
- Oil, gum or chemical staining
- Surface deterioration from salts or chemicals

Inspection frequency should be determined by site usage, risk level, and local authority requirements.

General Maintenance

The surface of the paving blocks can be cleaned with a sweeping-vacuum cart. For manual brushing, use plastic brushes.

Efflorescence

Efflorescence may occur on the surface of paving as a patchy white or milky deposit. In simple terms this occurs as a natural phenomenon where the free lime from the cement used to manufacture paving can react with the moisture and local environment to produce a Calcium Carbonate deposit on the surface. Efflorescence causes no damage to the paving in any way and although deposits can be unsightly, they will disappear over time and more quickly in areas where the paving receives more traffic. Efflorescence is not caused by a problem with the Paving or the manufacture of it. It is naturally occurring and whilst every effort is made to minimise efflorescence, it is unfortunately not possible to eliminate this. Hardscape advise against the use of any acid cleaners to remove efflorescence, as these are often very harsh on the surface and may cause permanent damage. It is best to let efflorescence weather away naturally.

General Dirt and Debris

Regular brushing should be all that is required to clean properly maintained paving. Pressure washing is not recommended for regular cleaning but reserved for very dirty areas and carried out without using excessive pressure and keeping the lance at a low angle relative to the surface. Joints are likely to need topping up after pressure washing operations.

Weeds

Certain types of weeds and grasses can grow in between the joints in a paved surface. Particularly in flexible laid areas, the jointing sand will hold a certain amount of moisture and over time detritus builds up in the sand and the weeds will live off this. Usually weeds only grow in areas where the paving receives very little traffic or if it has been poorly maintained. Weeds can be removed manually before they become established by pulling low on the stem to drag out all the roots. Often treating the area with a suitable weedkiller will treat the rest. When using weedkiller, it is best to try the selected product and concentration in an inconspicuous area first to ensure it doesn't stain or damage the surface of the paving. Weedkiller should be applied in dry conditions for optimal effect. Where the area being treated has been particularly neglected, a second treatment may be required. The weeds may take some time to die and can then be removed by hand.

Algae and Moss

Algae generally form in damp areas and tend to grow in or around the paving joints and may spread over time. Usually seen as a thin green growth on the paving, algae shouldn't be mistaken for moss which tends only to grow in very damp joints. Algae can be treated easily using an appropriate water-based fungicide. The colour fastness of the surface should be checked in a small inconspicuous area before treating the whole area. Sealing the treated pavement will dramatically reduce recurrence and aid future maintenance.

Moss is commonly seen in all material types and tends to grow in shaded, damp and unmaintained areas. Typically, moss will form in the joints of paved areas where the sand remains damp and nurtures the growth of moss. Moss can be treated using an appropriate water-based fungicide. It is advised to test first on an inconspicuous area ensuring that it does not stain the surface. When the moss had been killed, it can be brushed or scraped off and the surface cleaned.

Lichen

Paving which hasn't been cleaned or treated for long periods of time is prone to developing Lichen growths which is a fungus which can live off the minerals deposited on the surface and can spread over large areas in some cases. This is very common and seen as white or black spots dotted around the paving. This type of growth unlike algae tends to penetrate the surface and the longer its left.

Treat only the affected areas with an appropriate proprietary biocide or weed killer 2 to 3 times per year following manufacturer instructions. Application is most effective during dry weather.

Rust Stains

Identify and remove the source of rust. Clean the affected area using a mild acidic solution or poultice, then rinse thoroughly.

Scuff Marks

Clean using a small stiff brush and warn water to minimise abrasion of the surface.

Chewing Gum

Firstly, remove the chewing gum using the lance with the low-pressure option at a 45-degree angle 5cm away from the gum and remove in a methodical movement. Only turn up the pressure option in the case of stubborn gum removal.

Oil Stains

Absorb excess oil using an absorbent material. Clean the area with a suitable neutral or mild detergent and rinse thoroughly. Steam cleaning can be used for more stubborn stains.

Bitumen

Allow bitumen to cool before removing mechanically using a scraper. Ice may help make the material brittle. Remaining residue can be removed with abrasive powder and rinsed.

Paint and Graffiti

Fresh paint should be absorbed without wiping. Clean the area using a suitable solvent followed by rinsing with water. Steam cleaning or low-pressure washing can be used for more stubborn stains. Dried paint should be scraped off before applying an appropriate paint remover. Specialist graffiti removal services may be required for large areas.

Beverage Stains

Brushing and hosing down with water should be all that is required to clean occasional beverage stains. Low pressure washing or steam cleaning may be used for stubborn contamination when continual and excessive.

Winter Maintenance

Kellen paving can be treated with standard de-icing salts without damaging the surface, if it is used sparingly and rinsed following thawing. Temporary discolouration may occur after thawing but normally disappears through natural weathering.

Where aesthetic concerns exist, alternative de-icing materials such as general sand or urea may be used.

Health and Safety Risks

Hazardous Substances

Some cleaning methods involve chemicals that may be harmful if misused. Always follow manufacturer safety instructions. Ensure:

- Suitable PPE is worn (Goggles, gloves, overalls)
- Surrounding materials and infrastructure are protected
- Public access is controlled during cleaning operations
- Adequate ventilation is maintained
- Flammable materials are protected from ignition sources
- Care taken to avoid chemical run-off into drains or vegetation

Any significant chemical or contaminant release into drains or watercourses must be reported to the Environment Agency.

Manual Handling

Damaged paving should be repaired or replaced promptly to prevent further deterioration and reduce trip hazards Potential hazards during removal include:

- Cuts from sharp edges
- Musculoskeletal injuries from lifting heavy paving units (often over 30 kg)
- Impact or crush injuries when breaking paving units

Mechanical lifting equipment should be used wherever possible.

Respirable Crystalline Silica (RCS)

Kellen commonly contains between 25% and 75% silica. Cutting or grinding concrete produces RCS dust, which can cause serious respiratory diseases including silicosis, lung cancer, and COPD. Control measures should include:

- Wet cutting or dust suppression
- Local Exhaust Ventilation (LEV)
- Suitable respiratory protection (FFP3 or P3 filtration)

Warranty

Kellen paving or blocks expect to have a **service life exceeding 25 years** when properly maintained, based on historical performance and Environmental Product Declaration (EPD) data.

A **5-year warranty from the point of purchase** is provided to cover material defects and ensure the long-term performance of the paving system.

PLEASE NOTE – Any advice, recommendation or representation given by an employee of Hardscape Products Ltd shall not be made liable & therefore acted upon at the Customer's own risk.

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