

Guidelines for the maintenance of areas of Prima Porphyry paving

Porphyry consists of beautiful large-grained crystals dispersed through igneous rock – solidified lava or magma. Sourced in Northern Italy, the material is known for its unique rich colour tones created from volcanic actions that have occurred over thousands of years.



Material Properties

Used as a symbol of great prestige and majesty in ancient times, Porphyry has been discovered in great empires in Assyrian-Babylonian and important relics found on Egyptian and Roman sites.

Today, Porphyry has become the panacea of paving choice, due to its strength and resistance to wear. Because it's incredibly hard, it is resistant to scratches and harsh chemicals. The colour characteristics of the material depend on the level of iron content – Porphyry means 'purple' in Greek – and its purplish-red or greenish-brown swirled patterns have made it a popular choice over centuries as a hard landscaping material.

Key properties include:

- **High Density:** Typically, 2.57 g/cm³, ideal for large areas of heavy traffic due to its structural strength and durability
- **Extreme Durability & Strength:** It has a very high compressive strength, exceeding 145 MPa, making it significantly stronger than concrete or many other natural stones
- **Low Water Absorption:** With a porosity typically below 0.5–0.9%, it absorbs almost no water, making it highly resistant to cracking caused by freeze-thaw cycles
- **Slip & Skid Resistance:** Its naturally rough, undulating surface provides excellent grip even when wet, which is vital for public walkways and pool surrounds
- **Stain & Chemical Resistance:** The stone's density makes it naturally resistant to oils, salts, and acids, requiring no sealing for standard outdoor use

- **Thermal Stability:** It maintains structural integrity under extreme temperature fluctuations and high UV exposure without fading or warping

Hazard Identification and Inspection

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

Surface Condition

- Cracked slabs or blocks (hairline or structural cracks)
- Spalling or surface breakdown
- Excessively worn or polished surfaces affecting slip resistance
- 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

Jointing and Bedding

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

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

- 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

Porphyry has very low porosity, making it highly resistant to staining and long-term damage, however, the sooner cleaning treatments are applied, the less likely harsher cleaning will be required. 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.

General Dirt and Detritus

Routine cleaning should include sweeping and periodic low-pressure washing. Neutral cleaning solutions and low-abrasion equipment should be used where necessary. Thoroughly rinse surfaces after cleaning.

Moss, Lichen and Algae

These typically occur in shaded or poorly drained areas. Treat affected areas with an appropriate proprietary biocide or weed killer 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 mild detergent and hot water. Steam cleaning may be used for stubborn marks where appropriate.

Chewing Gum

Fresh gum may be removed by scraping. Hardened gum can be removed by freezing and chipping away, or with high-pressure water cleaning.

Oil Stains

Absorb excess oil using an absorbent material. Clean the area with a suitable detergent or proprietary solution 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 detergent and hot water. Steam cleaning 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

Clean using a mild detergent and water. Persistent stains may require stronger detergent or diluted bleach followed by thorough rinsing. Steam cleaning may be used for stubborn contamination where appropriate.

Smoke and Fire Stains

Clean using a mild detergent and hot water. Persistent stains may require stronger detergent followed by thorough rinsing.

Winter Maintenance

Porphyry paving can be treated with standard de-icing salts without damaging the surface. Temporary discolouration may occur after thawing but normally disappears through natural weathering.

Where consideration of jointing materials or aesthetic appearance exist, alternative de-icing materials such as general sand and urea may be used.

Warranty

Granite paving is expected to have a **service life exceeding 50 years** when properly maintained, based on historical performance and Environmental Product Declaration (EPD) data.

A **10-year warranty from the point of purchase** is provided to cover material defects and ensure the long-term performance of the paving system.

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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)

Porphyry typically contains approximately 70% total silica, with its crystalline silica content usually falling within the 25% to 50% range. Cutting or grinding porphyry 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)

