Permeable Interlocking Concrete Pavements (PICP’s)

- CBC Title 24/ADA Compliant
- LEED Functional
- Optimum balance of surface infiltration and joint interlock
- Available in a 6 x 9 Quarry Stone that provides a natural look
- Available in a 4 x 8 that’s perfect for architectural applications
- Easily integrated with our standard paving stone lines

calstone.com
THE PROBLEM
Urbanization has increased excess storm water runoff from impervious surfaces. Impervious surfaces prevent ground water from being recharged and decrease the availability of drinking water in many communities. Increased runoff causes stream bank erosion and results in additional pollutants being transported to reservoirs, lakes, and oceans.

THE SOLUTION
Permeable interlocking concrete pavements are typically built on an open-graded, crushed stone base. The base offers infiltration and partial treatment of stormwater pollution and therefore, can be categorized as a structural BMP (Best Management Practice). Infiltration of rainfall helps maintain the balance of water in the soil, groundwater, and streams, thus supporting the water cycle. Besides reducing runoff, a certain degree of treatment occurs to the various pollutants in the water.

If the infiltration capacity of the soil is exceeded, or there are particularly high levels of pollutants, the pavement base can be designed to filter, partially treat, cool, and slowly release water into a storm sewer or water course. When conditions allow, channeling rainfall to the natural aquifer through infiltration is possible.
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<tr>
<th>BENEFITS OF PERMEABLE PAVING STONES</th>
<th>APPLICATIONS</th>
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<tbody>
<tr>
<td>• Improved water quality</td>
<td>• Commercial &amp; residential driveways</td>
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<td>• Reduced construction costs of drainage system</td>
<td>• Public parking lots</td>
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<td>• Reduces storm water runoff and flooding</td>
<td>• Emergency vehicles access lanes</td>
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<td>• Preserves our stream beds and river banks</td>
<td>• Pedestrian paths</td>
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<td>• Can sustain heavy loading</td>
<td>• Commercial entrances</td>
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<td>• Increases storm water storage</td>
<td>• Plazas</td>
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<td>• Promotes groundwater recharge</td>
<td><strong>The unique design of the pavers include a spacing gap that is filled with crushed stone joint material that provides very high infiltration rates to handle severe weather.</strong></td>
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<td>• Can be mechanically installed</td>
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<td>• Allows water infiltration to tree roots</td>
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<td>• Increased lot usage</td>
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6 x 9 Quarry Stone Specifications

- 76 square feet per pallet
- 210 stones per pallet
- 5.91” x 8.86” Coverage Area
- 80 millimeter height
- 2.75 stones per square foot
- 6.0% open area
- Joint material should be stone size #89 or #9 and conform to ASTM D448
- 30 inches per hour initial infiltration rate
4 x 8 Product Specifications
- 88 square feet per pallet
- 400 full stones / 24 half stones per pallet
- 3.94” x 7.87” Coverage Area
- 80 millimeter height
- 4.7 stones per square foot
- 5.8% open area
- Joint material should be stone size #89 or #9 and conform to ASTM D448
- 30 inches per hour initial infiltration rate

The 4x8 permeable paving stone can be manufactured in any of our Quarry Stone colors, (as shown on the next page), or our Classic Cobble colors, which can be viewed at calstone.com in the Paving Stone section.
From a natural stone origin, using up to six blended colors, we created eight distinctively blended choices. *Permeable Pavers come in all the Quarry Stone colors shown on this page.*
Where Calstone Concrete Pavers Can Help Your Project Achieve LEED Credits:

<table>
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<tr>
<th>LEED Credit</th>
<th>LEED Intent</th>
<th>How Calstone Pavers Contributes</th>
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<tbody>
<tr>
<td>Sustainable Sites (SS) 6.1 - Storm Water Design Quantity Control 1 Point</td>
<td>Limit disruption of natural water hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff.</td>
<td>Permeable Interlocking Concrete Pavement (PICP) captures and treats stormwater beneath the pavement. Captured stormwater can be infiltrated to ground water, released at a controlled rate to a storm drain, or harvested for use in any of 5 water efficiency credits.</td>
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<tr>
<td>Sustainable Sites (SS) 6.2 - Storm Water Design Quantity Control 1 Point</td>
<td>Reduce or eliminate water pollution by reducing impervious cover, increasing on-site infiltration, eliminating sources of contaminants, and removing pollutants from stormwater runoff.</td>
<td>PICP systems can be designed to infiltrate all stormwater on site. Water that is infiltrated on site is considered 100% treated. All PICP’s reduce the Total Suspended Solids (TSS) in captured water.</td>
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<tr>
<td>Sustainable Sites (SS) 7.1 - Heat Island Effect 1 Point 50% 2 Points 100% (ID)</td>
<td>Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.</td>
<td>Calstone offers high albedo colors that reduce heat absorption. Lighter colored pavements aid in improving night time visibility and reduce site lighting requirements.</td>
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<td>Materials and Resources (MR) 2.1 and 2.2 - Construction Waste Management 1 Point 50% 2 Points 75% 3 Points 95% (ID)</td>
<td>Divert construction and demolition debris from disposal in landfills. Redirect recyclable recovered resources back to the manufacturing process.</td>
<td>100% of the materials used in a PICP system are recyclable, and 100% of Calstone packaging materials are recyclable. All shipping pallets, excess paving stones, cut &amp; scrap stones, and base &amp; bedding materials, can be returned directly to Calstone for on-site recycling.</td>
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<td>Materials and Resources (MR) 3.1 and 3.2 - Materials Reuse 1 Point 5% 2 Points 10% 3 Points 15% (ID)</td>
<td>Reuse building materials in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.</td>
<td>Paving stones, and most of the components in a PICP system, are completely reusable. A PICP can be removed and replaced in the original or new layout with little to no additional material required.</td>
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<tr>
<td>Materials and Resources (MR) 4.1 and 4.2 - Recycled Content 1 Point 10% 2 Points 20% 3 Points 30% (ID)</td>
<td>Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.</td>
<td>Calstone is constantly active in research and development of mix designs using recycled materials. Special high recycled content custom mix designs are available. Many of these designs offer additional performance advantages.</td>
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<tr>
<td>Materials and Resources (MR) 5.1 and 5.2 - Regional Materials 1 Point 10% 2 Points 20% 3 Points 40% (ID)</td>
<td>Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.</td>
<td>All Calstone manufacturing facilities service the same area within a 500 mile radius. Over 99% of the materials used in our paving stones are sourced within a 500 mile radius.</td>
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<td>Innovation in Design (ID) 1.1 - 1.4</td>
<td>To provide design teams and projects the opportunity to be awarded points for exceptional performance.</td>
<td>Additional points as noted above for exemplary performance SS 7.1, MR 2.2, 3.2, 4.2, and 5.2</td>
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INSTALLATION

For Design, Construction, and Maintenance please refer to: ICPI - Permeable Interlocking Concrete Pavements by David R. Smith.

Installation drawings are available at www.icpi.org in the publications section.

For a complete set of specifications go to www.calstone.com under specifications in the paving stone section.

Technical Guidelines

- Pavers conform to ASTM C936
- Construction aggregates must conform to ASTM D448
- Joint filling stone gradation: ASTM # 89 or 9
- Base gradation: ASTM # 57
- Subbase gradation: ASTM # 2, 3 or 4 (railroad ballast)
- Soil subgrade: classified per ASTM D2487; tested for permeability per ASTM D3385
- Structural design: ICPI design chart determines minimum base thickness to support pedestrian and vehicular traffic

Manufacturing Service Centers:

**San Martin** - phone (408) 686-9627
13775 Llagas Ave. San Martin, CA 95046

**Sunnyvale** - phone (408) 984-8800
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**Galt** - phone (209) 745-2981
421 Crystal Way, Galt, CA 95632

**Tracy** - phone (209) 833-7366
426 East Grant Line Road, Tracy, CA 95376

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