
CITY OF MERCER ISLAND

COMMUNITY PLANNING & DEVELOPMENT

9611 SE 36TH STREET | MERCER ISLAND, WA 98040

PHONE: 206.275.7605 | www.mercerisland.gov



PERMEABLE PAVER BLOCK DESIGN GUIDELINES (Single-Family Residential Projects)

PERMEABLE PAVERS

The City of Mercer Island allows the use of permeable pavers. Refer to MICC 19.02.020(F) to see how they relate to lot coverage and MICC 15.09.050 for how they are regulated regarding stormwater runoff and management.

Not all concrete pavers are considered permeable. The following list of paver materials are considered “permeable pavers” according to the Stormwater Management Manual for Western Washington (Ecology 2014) when installed properly.

Uni-Group USA (<http://www.uni-groupusa.org>)

- Eco-Stone
- Ecoloc
- Eco Optiloc
- Eco Priora

Western Interlock (<http://westerninterlock.com>)

- VS-5 Drain Pave
- Camino Permeare
- Holland Permeare
- Park Permeare

Willamette Graystone (www.willamettegraystone.com)

- Aqua-Bric
- Aqua-Bric Ashlar
- Aqua Bric Type 4
- Aqua Loc
- SF Rima

Note: There may be other paver systems that meet the definition of “paver.” In general, the paver system should be pre-manufactured, interlocking, have an effective open/permeable surface area of at least 12 percent, and conform to the cross-section shown on page 3. Manufacturer’s specifications for paver systems not listed above must be submitted for compliance review prior to issuance of a permit. The use of non-permeable pavers (e.g., flagstone, stepping stones, architectural slabs, dimensional stone, etc.) in a permeable manner is described below in the following section.

Other Pavers and Stones

Other pavers and stone material may be considered permeable when installed in a manner that provides equivalent performance function to permeable interlocking concrete pavers. The installation will require sufficient aggregate material beneath and in between the pavers/stones to allow the free flow of surface water runoff between and below the pavers/stones. The effective open/permeable surface area (“gap”) between the pavers/stones shall be a minimum of 12 percent. See below for paver dimensions and the corresponding minimum gap required

PAVER/STONE SIZE	MINIMUM REQUIRED GAP SURROUNDING EACH INDIVIDUAL PAVER
12" x 12" (144 square inches)	1"
24" x 24" (576 square inches)	2"
24" x 36" (864 square inches)	3"
30" x 30" (900 square inches)	4"

Note: Sizes not specified above, or oddly shaped pavers/stones require submittal of additional performance and specific review of proposed material and design confirming a 12 percent minimum gap.

Additional requirements include the following:

- Joints between pavers shall be filled with ASTM No. 8, No. 89, or No. 9 washed crushed aggregate. Joint cannot be planted if using topsoil or other planting media that impedes the free flow of water between the pavers unless approved by the City Engineer.
- Pavers shall be underlain by at least 6" reservoir course (ASTM No. 57) and 2" leveling course stone fill (ASTM No. 8) in accordance with the typical cross-section for Permeable Interlocking Concrete Pavers (Figure 1).
- Refer also to the design and construction criteria below.

Design and Construction Criteria for Paver Blocks

The following notes (as a minimum) shall be included on the construction drawings for single-family residential projects intended to use permeable pavers:

1. **General:** Installation must be in accordance with the manufacturer's requirements and specifications.
2. **Subgrade:** Compact the subgrade to the minimum necessary for structural stability. Use static dual wheel small mechanical rollers or plate vibration machines for compaction. Do not allow heavy compaction due to heavy equipment operation. The subgrade should not be subject to truck traffic.
3. **Geotextile:** Geotextile fabric shall be placed beneath the reservoir layer in areas where soil remains saturated part of the year, where there is soil freeze and thaw, or over clay and moist silty subgrade soils. The geotextile fabric should pass water at a greater rate than the subgrade soils.
4. **Underdrain:** Provide an underdrain pipe when subgrade soils are poorly draining, or soils remain saturated part of the year.
5. **Aggregate Materials (stone fill, leveling course, and base/sub-base reservoir layer):** Use "open graded" rock containing only a small percentage of aggregate in the small range. Do not use round rock.
 - a. Joint Fill – ASTM No. 8 washed crushed aggregate. ASTM No. 89 or No. 9 washed crushed aggregate may also be used. Minimum 1" to 2" thickness.
 - b. Leveling Course – Minimum 1" thickness washed sand or washed crushed aggregate
 - c. Reservoir Course – ASTM No. 57 crushed aggregate. Minimum 6" to 12" thickness depending on permeability of the subgrade soils.
6. **Limitations:**
 - a. If surface drainage comes from minor or incidental pervious areas, those areas must be fully stabilized.
 - b. Slope adjacent impervious surfaces away from the pavers to the maximum extent practicable.
 - c. Sheet flow from up-gradient impervious area is not recommended, but permissible if the area of permeable interlocking concrete pavers is greater than or equal to the impervious pavement area.
 - d. The maximum installed slope of the permeable interlocking concrete pavers is generally 12 percent.

7. **Protection:** After work is complete, the contractor shall be responsible for protecting work from sediment deposition and damage due to subsequent construction activity on the site.
 - a. Keep heavy equipment off existing soils underneath the proposed paver area to preserve the native soil infiltration rate.
 - b. Do not allow muddy construction equipment on the base material or pavers.
 - c. Do not allow sediment-laden runoff onto the pavers.
 - d. The contractor shall be responsible for protecting work from sediment deposition and damage due to subsequent construction activity on the site.
8. **Improper Installation:** Pavers fouled with sediments or no longer passing an initial infiltration test (ASTM C1781) must be cleaned using procedures recommended by the paver manufacturer. If cleaning does not restore infiltration rates or other construction issues have been observed, reinstallation of the pavers may be required.
9. **Inspections:** The contractor shall call for inspection of the subgrade preparation prior to placement of the reservoir course and for a subsequent inspection of the reservoir course placement prior to installation of pavers.
10. **Maintenance:** Homeowners must adequately maintain their permeable block pavements. Over time, the space between the pavers will tend to clog.
 - a. Annual inspections - Conduct periodic visual inspections to determine if surfaces are clogged with vegetation or fine grained sediment. If water runs off the pavement and/or there is ponding during a rain event, then the surface may be clogged. Clogged surfaces should be corrected within one year.
 - b. Routine surface cleaning – Surfaces should be cleaned with a ShopVac, brush broom, or walk-behind vacuum annually. Surface cleaning is recommended twice per year; preferably, once in the autumn after leaf fall, and again in early spring.
 - c. Damaged pavers – Remove individual pavers by hand and replace or repair per manufacturer’s recommendations.
 - d. Loss of joint fill – Refill per manufacturer’s recommendations.

PERVIOUS CONCRETE BLOCK OR “PAVER SYSTEMS

FIGURE 1. PERMEABLE INTERLOCKING CONCRETE PAVERS

