

Permeable Pavers

Opus, Via Appia 60 and Via Appia 80 pavers

Product Description:

The installation of Bolduc's permeable pavers over an open graded crushed stone base, that acts like a retention reservoir, creates a temporary storage system for surface water runoff. This system can replace traditional impermeable paving in order to control and/or reduce surface water runoff, minimize the need for temporary water retention structures, and improve the quality of surface water runoff. Rainwater recharges the water table, and fewer pollutants and sediments enter waterways, helping the environment.

The Bolduc permeable pavers meets CSA A231.2 physical and mechanical standards. USEPA (United States Environmental Protection Agency) recognizes permeable paving as one of the best ways to manage surface water.

Bolduc paver models that can be used as permeable paver or as regular residential paver.

	Opus paver	Via Appia 60	Via Appia 80 module 1
Thickness	2 ^{3/8} in.	2 ^{3/8} in.	3 ^{1/8} in.
Dimensions	3 ^{15/16} x 7 ^{7/8} in.	2 ^{3/8} x 3 ^{1/8} to 7 x 4 ^{3/4} to 9 ^{1/2} in.	3 ^{1/8} x 3 ^{1/8} to 4 ^{3/4} x 4 ^{3/4} to 9 ^{1/2} in.
Pieces Count per ft ²	4,1	4,1	5,1
Surface opening percentage	6,8%	4,3%	4,5%
CN* coefficient	65	65	65

*Coefficient for the SCS method. This approximate value is based on a conservative long-term infiltration rate through the pavement of 1 inch/hour. Lower Cn values can be used in design if a maintenance program that includes cleaning/replacing of permeable joint filling material is expected to be strictly followed during the expected life of the pavement.

Opus Paver



Via Appia 60 Paver



Via Appia 80 Paver



BOLDUC

Fashioned in line with nature!

Permeable Pavers

Opus, Via Appia 60 and Via Appia 80 pavers

An Example of Permeable Pavers

The preferred option is to let the water that gets stored in the crushed stone reservoir infiltrate the native soil. This can be accomplished if the following conditions are achieved:

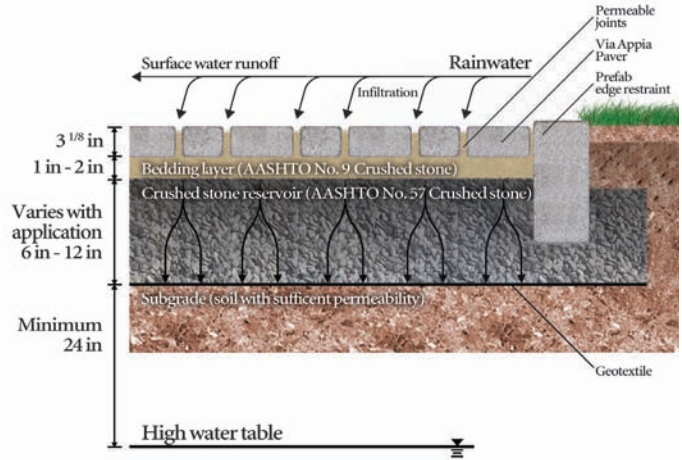
- Native soil (sub grade) below the reservoir must have a water permeability greater than 0.5 inches/hr.
- The base of the crushed stone reservoir must be flat.
- The crushed stone storage system must be at least 2 feet above the water table and more than 100 feet from a drinking water supply (well).
- The paved surface of the storage system must have a slope of at least 1% but no more than 5%.

In some cases water can't or must not be absorbed by the existing soil and must instead be redirected toward a more conventional wastewater collection network. In such cases, the system acts as a retention structure, designed to reduce peak flows in the surface water collection network.

Permeable Paver Design

The reasons for using a permeable paving system must be clearly established. It must be determined if the system allows for complete or partial water infiltration into native soil. When designing a permeable paving system, it is common practice to include a secondary surface water control system to manage surplus water not dealt with by the permeable paving system when precipitation exceeds levels anticipated during the design process. Once the basic parameters have been established, the permeable paving system is then designed, taking into account site conditions such as precipitation data (for recurrence and intensity) and affluent runoff surfaces other than the paving surface itself (if applicable), as well as the runoff characteristics of these surfaces. These data allow the designer to establish the flow and volume of water that will percolate through the permeable joints between the pavers and be collected in the crushed stone reservoir beneath the pavement. Characteristics that are representative of the system's long-term absorption capacities must be used in the design stage. For applications where a periodical joints maintenance program will apply (rehabilitation of original permeability of joint material) and where permeability of natural soil is high, infiltration rates of 5 inches/hour and more can be used in design. Otherwise, the recommended conservative long-term infiltration rate for the design stage is 1 to 3 inches/hour.

Typical cross section of permeable pavement structure for residential applications.



Surface runoff is directed toward the crushed stone reservoir via openings (joints) in the paving system. AASHTO no. 9 crushed stone is used as a bed face for the pavers and to fill the joints between them. The bed face is generally 1 to 2 inches thick.

AASHTO number 9 grading

Nominal size (Sieves with square openings)	Pourcent passing%
3/8 in.	100
No. 4	85 to 100
No. 8	10 to 40
No. 16	0 to 10
No. 50	0 to 5

For pedestrian and low vehicular application like residential driveways, sidewalks, patios, the stone reservoir is generally made up of AASHTO no. 57 crushed stone with a void percentage of at least 32%—preferably 40%—to allow water to be stored inside. The thickness of the reservoir normally varies from 6 to 12 inches depending on anticipated traffic loads and surface water runoff. When water running over the pavement is to be absorbed by the native soil, a permeable geotextile membrane is usually placed below the stone reservoir. When the water collected cannot be absorbed by the existing soil, an impermeable membrane is installed at the bottom of the open graded base.

For application where medium to high vehicular circulation is expected, a sub base is generally added to the pavement structure. The sub base is generally made up of open graded AASHTO no. 2 crushed stone with a void percentage of 32 to 40%.

For more information, contact:



1358-2nd Street, Industrial Park, P.O. Box 608,
Sainte-Marie, Beauce, Québec, Canada G6E 3B8

Sainte-Marie: (418) 387-2634
 Québec: (418) 692-0855
 Toll free Canada: 1-800-463-8966
 Toll free USA: 1-800-603-5567
 Fax: (418) 387-6438
 www.bolduc.us
 info@bolduc.us