



## Pave Drain FAQ (Updated 10.1.22)

### 1) What is the current total cost (including labor, etc.) per square foot? What is the current cost of the material only per square foot?

**ANSWER:** Depending on your location in the U.S. and the size of your project a conservative installed cost of PaveDrain will be \$14-\$18/square foot.

**Here is what this includes:**

- Hand-Placed (i.e. Palletized Blocks) is common for projects less than 5,000 Square Feet. Larger projects are typically machine installed. Most jobs have some hand placement no matter what.

- o \$7.00 - 8.50 per square foot

**NOTE: COLORED - Earth Tone BLOCKS ADD \$1 – \$1.50 per square foot to block cost. GREEN, BLUE & YELLOW are even more expensive. Check with [info@pavedrain.com](mailto:info@pavedrain.com) for more budget numbers.**

- Shipment of product to the jobsite (Approx. 825 Square foot per truckload)
  - o \$1.00 – 3.00 per square foot. Will obviously vary depending on fuel costs and distance that the product will be hauled.
- Heavy Duty Geotextile (Ex. Mirafi RS280i or 380i is recommended)
  - o \$0.50 – 1.00 per square foot
- 4-6” Rock base, minimum. (3/4 – 1’ dia. *Clean, angular* stone, NO FINES, AASHTO #57 with an LA Abrasion of <50).
  - o \$1.00 - \$3.00 per square foot.

**NOTE: THICKER ROCK CROSS SECTIONS WILL ADD MORE COST. MOST COMMON STONE BENEATH THE #57 STONE IS ATM #2 OR #3. (Fist sized). LOCAL/REGIONAL TONNAGE APPLY.**

- GEOGRID on TOP of AASHTO #57 Stone (Ex. Tensar BX1100 or 1200)
  - o \$0.50 - \$1.00 per square foot
- Installation
  - o \$1.50 - \$3.50 per square foot
    - Prevailing wages will be higher (i.e. \$4.00+/Sq.Ft.)
- Sealing – Required in Northern Climates where salt/brine is utilized. Recommended for **COLORED** blocks to maintain color.
  - o \$0.95 - \$1.35 per square foot
    - Tenon Salt Barrier (Formerly Pro-Spec)
    - <https://ww.tccmaterials.com/product/tenon-salt-barrier/>

### 2) What is the maintenance of PaveDrain?

**ANSWER:** Maintenance will vary greatly from site to site depending on the amount of silts, sedimentations and storm events that occur. The internal storage chamber and larger diameter aggregate bedding layer allow for a significant amount of silts and

sedimentation to occur. The PaveDrain System is designed as an open joint concept between the blocks. Many existing installations have required little, if any maintenance. If the joints become filled or obstructed, maintenance is accomplished by using a vacuum truck or a combination sewer vacuum truck and the PaveDrain Vac Head. If a significant amount of sediment accumulates in the aggregate bedding stone, part or all of the PaveDrain system can be removed allowing the subgrade to be cleaned and then the same product re-installed. Repair of individual PaveDrain blocks can also be accomplished. For more detailed information on these topics go to [www.pavedrain.com](http://www.pavedrain.com) and select Installation & MAINTENANCE, and then click on REPAIR.

### 3) What is the infiltration rate of the PaveDrain system?

**ANSWER:** The PaveDrain System® was tested in accordance with ASTM C1701/C1701M-09 by an independent third party engineering firm. The test were conducted on different **PaveDrain** installations *that had not been maintained* on an average of more than 2 years and still infiltrated in excess of 1,500 inches/hour per one foot diameter.

Inside Dia. of Infiltration Ring (in)	12.19	12.19
Elapsed Time of Test (sec)	20.3	21.95
Infiltration Rate (in/hr) ( $I=KM/(D^2*t)$ )	1,630	1,560
<b>Ave. Infiltration Rate (in/hr)</b>	<b>1,595</b>	

### 4) What is the loading rate of the PaveDrain system?

**ANSWER:** The PaveDrain system has been rated to AASHTO HS-25 Load Rating. <http://www.pavedrain.com/pdf/specifications/PaveDrain-HS-25-AASHTO-Loading-Analysis-Letter.pdf>

### 5) How does the product perform in the freeze/thaw cycle?

**ANSWER:** PaveDrain is based off of articulating concrete block technology that has been utilized in the U.S. for over 70 years. The system of interlocking blocks gives PaveDrain a tremendous advantage in freeze-thaw conditions over traditional systems because the system is flexible and very little freeze-thaw forces are placed on the block itself. The mix design of the block itself is derived from *local block manufacturers'* knowledge and experience. It has been subjected to dozens of freeze-thaw tests (i.e. ASTM C 1262) from other products which measures a coupon cut from the block. The *mix design* is one critical aspect, but the articulating design of PaveDrain compliments the mix design. Unlike traditional impervious surfaces, the permeable world has rarely if ever experienced freeze/thaw issue, even though water is allowed to get into the base. The open graded aggregate, which ranges from 30% to 43% depending on the aggregate size allows the water *ROOM* to **EXPAND** when it *FREEZES*. Rather than put all of the pressure on the surrounding aggregates and fines, which shift and move and then adversely affect the surface (i.e. traditional asphalt and concrete), we give the aggregate some room.

**6) What is the percent open area of PaveDrain?**

**ANSWER:** The arch comprises a 20% open area of a standard 11.9” x 11.9” x 6.00” PaveDrain unit. The surface open area is 7%.

**7) What is the projected amount of water that can be “held” in the arch?**

**ANSWER:** The following is from Emmons & Olivier Resources, Inc. Oakdale, MN [www.eorinc.com](http://www.eorinc.com)

*One acre impervious surface generates the following volumes:*

- 2.5” event: 0.189 acre feet
- 5-year storm: 0.272 acre feet
- 10-year storm: 0.330 acre feet
- 100-year storm: 0.472 acre feet

For a one acre parking area PaveDrain would achieve a volume within the storage chamber of 0.090 acre feet. Adding 1.0 foot of rock storage below the entire parking lot adds 0.401 acre feet of storage for a grand total of .491 acre feet of storage. This is more than sufficient to accommodate the runoff volume for a 2.5” event and large enough to hold the 100-year storm if built as if it was a swimming pool. This calculation does NOT include any additional infiltration PaveDrain would achieve through porous subgrade.

**8) Can PaveDrain come in different colors?**

**ANSWER:** Yes. Similar to the retaining wall industry PaveDrain is available in multiple colors. The most popular are earth tone colors such as tans, browns, reds and charcoal. This will typically ADD \$1 - \$1.50 to the square foot price and there may also be minimum production requirements (Typically around 5,000 Sft). Local manufacturing will determine which colors are available. Special colors such as blends, **yellow**, **blue** and **green** will be subject to increased pricing above the typical \$1 per square foot color price increase.

**9) How is a broken block replaced?**

**ANSWER:** The easiest way is with the PaveDrain Extraction tool. This is a modified “slab grabber” for those in the paver industry. If the joints have not been cleaned in quite some time (typical), then you may need to play “Jenga” to see which blocks around the broken unit are loose enough to remove. Once extracted it is very easy to drop a new replacement block into place. For more information go to: <http://www.pavedrain.com/installation-maintenance/>

**10) Can the PaveDrain system be snow plowed with a steel snowplow blade?**

**ANSWER:** *Accidents do happen. Once or twice...yes. However, it should be noted that the edges and tops of the blocks may be scored or damaged by a steel snowplow blade (SEE BELOW). An individual PaveDrain block will **not** be “flipped” or “kicked out” from being struck by a snowplow blade. To prevent damage during the winter snow plowing operations from standard steel snowplow blades, it is recommended to float the steel blade 1/4-1/2” above the PaveDrain system to avoid damaging the edges of the PaveDrain blocks that MAY be sticking up due to the*

variances in subgrade preparation. (A rubber edge blade for plowing fixes this!) Many municipalities already float the blades on their traditional concrete and asphalt streets to protect their steel blades and roadway infrastructure. Winter care, if done *improperly*, typically has the greatest impact to the life of the system. SEE BELOW.



*In order to minimize any surface damage to a PaveDrain block, the recommended snow plowing method would be with a rubber tipped snow blade. The following is an excerpt from a popular rubber snow blade provider. **NOT AN ENDORSEMENT** [www.plowrubber.com](http://www.plowrubber.com)*

**Long Lasting:** Our rubber snowplow edges are made of a tough, resilient rubber compound that shows very little wear after many hours of use. They can outlast steel edges many times. No Gouging: Rubber edges easily adjust to irregular road surfaces & pavement markers-without gouging. Rubber edges save you costly repairs to submerged lighting and surfaces such as cobblestone and brick.



**11) Is sealing the PaveDrain system recommended?**

**ANSWER 1: IF YOUR TOWN, CITY OR STATE USES SALT...SEAL THE PAVEDRAIN BLOCK!!!**

**ANSWER 2:** This depends on the climate. A sealant is **REQUIRED** in salty, northern environments. A sealant is an economical way to assist the PaveDrain system to resist the damages caused by salt. Sealing of the PaveDrain system will increase its longevity. (EXAMPLE – Tenon Salt Barrier by TCC Materials.)

<https://www.tccmaterials.com/product/tenon-salt-barrier/>

*For warmer climates it is strongly recommended to seal the PaveDrain system on projects utilizing colored blocks (i.e. Charcoal, Rose, Brown,. etc.)*

*The PaveDrain system can be sealed AFTER it has been installed. Due to its open joint design, the PaveDrain system will remain permeable AFTER a sealant has been applied if the joints are open and free of debris. (Excess sealant will simply run down the sides of the PaveDrain Blocks). The PaveDrain system can be sealed with a boom sprayer or any other hand or mechanical applicator for ease of installation.*

*Sealant being applied on installed PaveDrain via hand sprayer. Each block is basically one square foot making application rate per gallon easy.*



***NOTE: It is strongly recommended to vacuum/clean the PaveDrain system prior to applying a sealant.***

**12) What is the life expectancy of the PaveDrain system?**

**ANSWER:** The PaveDrain system is based off articulating concrete block technology that has been utilized in the U.S. for over 70 years. Cleaning of the PaveDrain with a vacuum truck such as an Elgin Whirlwind® or Megawind® or a combination sewer vacuum truck and the PaveDrain Vac Head is a project specific condition. Individual blocks *MAY* occasionally break over time. This does NOT constitute a system failure. Individual PaveDrain blocks can be replaced over time lengthening the lifespan of the PaveDrain system. A life expectancy of 25+ years can be expected in most installations.

**13) Does the PaveDrain system conform to ADA requirements?**

**ANSWER:** Yes. ADA Design Guidelines require that surfaces be firm, stable and slip resistant. Gaps between PaveDrain blocks do not exceed 1/2". The PaveDrain system easily exceeds all of these requirements by incorporating a 1/4" gap between individual PaveDrain blocks.

**14) Should different striping paint be utilized?**

**ANSWER:** No. A conventional striping paint utilized on conventional asphalt or concrete can be utilized on the PaveDrain system. Installations have shown that the paint sticks exceptionally well to the PaveDrain system.



**15) What are the estimated LEED points that PaveDrain can qualify for?**

**ANSWER:** It is up to the architect and engineer of record to determine which LEED points apply to their respective sites. The following LEED points are most commonly applicable to PaveDrain projects

**SUSTAINABLE SITES**

- Credit 6.1      **Stormwater Design, Rate and Quality Control**      **1 Point**
  - Limit distribution of natural water flows by managing stormwater runoff
- Credit 6.2      **Stormwater Design, Treatment**      **1 Point**
  - Implement a stormwater management plan that reduces impervious cover, promotes on-site infiltration, and eliminates contaminants.
- Credit 7.1      **Heat Island Effect, Non-Roof**      **1 Point**
  - Reduce heat islands.

**MATERIALS & RESOURCES**

- Credit 5.1      **Regional Materials**      **1 Point**
  - 10% Extracted, processed, and Manufactured Regionally. *(Most materials (sand, rock, cement) for the manufacture of block is produced within 100 miles of the manufacturing facility).*
- Credit 5.2      **Regional Materials**      **1 Point**
  - 20% Extracted, processed, and Manufactured Regionally. *(Most materials (sand, rock, cement) for the manufacture of block is produced within 100 miles of the manufacturing facility).*

**INNOVATION & DESIGN PROCESS**

- Credit 1.2      **Innovation in Design: Life-Cycle Benefits**      **1 Point**
  - PaveDrain can easily be vacuumed and cleaned. Unlike traditional asphalt when it is sealed, re-painting of the pavement striping is not needed.