



MAINTENANCE MANUAL

The PaveDrain® System is a heavy-duty, low maintenance permeable pavement. It is a next-generation system that began life as an erosion control system, before being adapted for sidewalks, parking lots, and roadways.

Clean when clogged. Skip the preventative maintenance.

PaveDrain is a Permeable Articulating Concrete Block System. It relies on OPEN JOINTS and geometrically interlocked units. Never fill the joints with sand or stone—it pre-clogs the system.

Updated January 2023

MAINTENANCE QUESTIONS & ANSWERS

Cleaning

- How often should the PaveDrain System be cleaned?
- What is the best way to clean the PaveDrain System?
 - PaveDrain Vac Head
 - True Vacuum Trucks
- How do I know when to clean the PaveDrain System?

Winter Weather

- Should the PaveDrain System be sealed?
- Should the PaveDrain System be salted or sanded?
- What is the recommended method for snow plowing PaveDrain?
- Can the PaveDrain System be snow plowed with a steel snow plow blade?

Repairs

- Can a single PaveDrain Block be replaced?
 - Minimal labor, minimal equipment
 - Spot repairs, not area repairs.

If in doubt, give us a shout:
info@pavedrain.com or 888-575-5339

Stormwater Performance Warranty

All PaveDrain installed after January 1, 2023 includes the following manufacturer's warranty

➤ **3-Year Manufacturer Performance Warranty: Surface infiltration ≥ 500 in/hr**

If the PaveDrain surface infiltration is < 500 in/hr we will clean to perform above this benchmark.

- Anytime within 3 years your installed PaveDrain system will infiltrate according to ASTM C1701/C1701M-09, or C1781 test at or above 500 in/hr.
 - *Result is the average of 3 representative test sites: One chosen by manufacturer, one chosen by owner, and one chosen jointly.*
- **Maintenance:** Recommended maintenance process should be followed as per most recent relevant manufacturer guidance at the time of installation (i.e., Sealing and vacuuming or sweeping excessive debris areas such as leaves or lawn clippings)
 - Failure to follow these maintenance guidelines will nullify this warranty.
- Run-on Ratios in excess of 15:1 on municipal streets ONLY. (NOTE: permeable interlocking concrete pavers (PICP), pervious concrete, and porous asphalt recommends a 1:1, 3:1 or 5:1 ratio depending on the application.)
- Additional conditions as below

➤ **Extended 6-Year Manufacturer Performance Warranty: > 8 in/hr**

- Anytime within 6 years your installed PaveDrain system will infiltrate according to the ASTM C1701/C1701M-09, or C1781 test at or above 8 in/hr. (*Why 8 in/hr...SEE BELOW*)
 - *Result is the average of 3 representative test sites: One chosen by manufacturer, one chosen by owner, and one chosen jointly.*
- **Maintenance:** Recommended maintenance process should be followed as per most recent relevant manufacturer guidance at the time of installation (i.e., Sealing and vacuuming or sweeping excessive debris areas such as leaves or lawn clippings)
 - Failure to follow these maintenance guidelines will nullify this warranty.
- Run-on Ratios in excess of 15:1 on municipal streets ONLY. (NOTE: PICP, pervious concrete and porous asphalt recommends a 1:1, 3:1 or 5:1 ratio depending on the application.)
- Additional conditions as below.

Fine Print for both

- **Proper Installation:** Installation must follow [manufacturer's guidance \(https://www.pavedrain.com/installation\)](https://www.pavedrain.com/installation)
 - Base compaction in 6"-8" lifts
 - Proper use of geotextiles and geofabrics
 - Open joints
- **Use**
 - Warranty is voided if pavement surface is used to store loose aggregate (sand, stone, mulch, soil, etc.)
 - Plowing should be done with a rubber tipped blade / raised blade
- **Limitations**
 - Warranty does not cover blocks that are chipped, damaged, cracked or suffer some other cosmetic issue that do not impact stormwater performance.
 - If heavy vehicle traffic is expected, use PaveDrain HD blocks
 - Warranty is only available for block purchased directly from PaveDrain, LLC , Licensed Manufacturers, or its Distribution Partners beginning January 1, 2023
 - Applies only to contiguous areas larger than 300 SF

Manufacturer's Warranty

All PaveDrain also includes a 1-year manufacturer's warranty that covers issues with block manufacturing.

To make a warranty claim please contact: PaveDrain, LLC. info@pavedrian.com (888) 575-5339

Questions & Answers

Q: How often should the PaveDrain System be cleaned?

A: The system need only be clean when clogged. The frequency will depend on the project. Factors that necessitate more frequent cleanings include high run-on ratios, lots of organic debris (leaves), etc.

Following the initial installation, the PaveDrain System should be checked annually to assess the amount of infiltration still occurring, the results of which determines the ideal frequency. Some systems have never been cleaned in over 10 years of use and continue to perform well. An urban site with large amounts of organic may need more frequent attention.

Ideally, the visual inspection to determine the need to clean should occur during a rain event. Else a ring infiltration (ASTM C1701/C1781) test can be used. If the average of three infiltration tests <100 in/hr, it is time for a cleaning.

It is also possible to use an in-situ sensor to determine clogging. As the PaveDrain surface clogs, the time-delayed and reduced volumes of rainwater uptake will be observed. When they reach a critical threshold, you will know it's time to clean.

Q: What is the best way to clean a PaveDrain System?

A: The TWO BEST maintenance options to clean the PaveDrain System are:

1. PaveDrain VAC Head: best for small areas
2. A true vacuum truck (e.g, Elgin Whirlwind, Bucher V65, etc.): best for large areas

Unlike other permeable systems, there is **no preventative maintenance**. Cleaning with a vacuum will restore >90% of its original infiltration rate of 1,600 in/hr.



Combination Sewer Truck with 1,500 gallon water tank

Two years of stormwater runoff from adjacent asphalt, mulched flower beds, flowering trees, and residential lawns. Before and after cleaning with PaveDrain VAC Head.



Vac Head Attachment



1. 36" diameter circular deck (maximum 2,500 cfm).
2. Green Carrying Handles.
3. Cotter Pins for attaching removable handle.
4. 30" Angled suction port located on underside of circular deck (maximum 2,500 cfm).
5. 6" diameter hose attachment (maximum 2,500 cfm).
6. Water hose connection manifold (maximum 2,000 psi).
7. (2) - Rigid solid rubber wheels.
8. Hard Rubber debris guard.
9. (4) - wands with 3 nozzles located on underside of circular deck (maximum 2,000 psi).
10. (2) - 360° Swivel solid rubber wheels.



- 36" diameter deck with (4) 15" wands
- (4) 15" wands with (3) nozzles
- Continuous suction up to 2,500 CFM
- Up to 2,000 psi water displacement
- 30" angled suction port
- VAC Head weight is under 50 lbs
- Swivel handle for ease of moving
- (2) Swivels wheels on front of head
- (2) Rigid wheels on rear of head
- Hard rubber debris guard around deck

A video of the PaveDrain VAC Head in action is available online.

<http://www.youtube.com/watch?v=I2U-4xsy3wo>



The PaveDrain VAC Heads are available from local distributors.

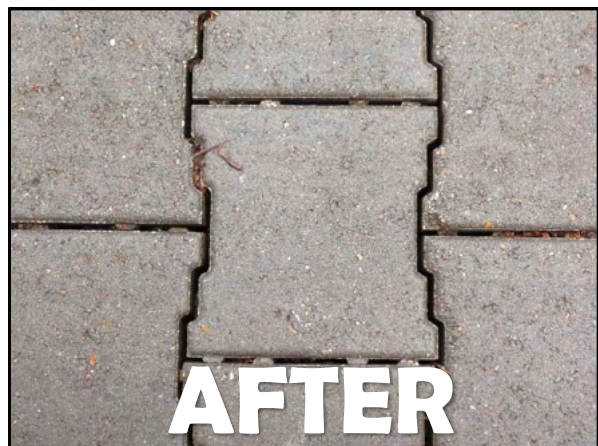
info@pavedrain.com or (888) 575-5339

True Vacuum Truck



Figure: Bucher V-65 (top left), Elgin Whirlwind (bottom left), post cleaning (right). Any true vacuum, NOT regenerative vacuum would work.

Just one pass of a Vacuum Truck over the PaveDrain System filled with mulch and road debris. **PRE- WETTING OF THE DEBRIS WILL HELP IN THE VACUUMING PROCESS.**



Q: How do I know when to clean the PaveDrain System?

A: The PaveDrain® system is unlike any other permeable system. The PaveDrain system can “tell” you when it needs maintenance even when it is NOT raining. A simple visual inspection can be accomplished by walking on it and determining if the joints are filled with debris.

Visual Inspection to see if the joints between the PaveDrain Blocks are filled with debris (see photo 1 & 2 below).

Example: If you have a 5,000 square foot installation and if 50% (approx. 2,500 SF) of the joints between the PaveDrain blocks are filled with debris. It is time to schedule a cleaning.

Photo 1 – PaveDrain in need of cleaning



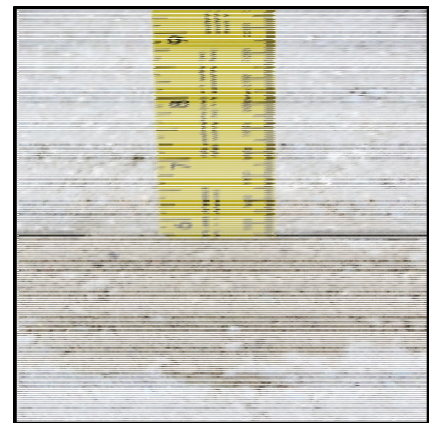
Photo 2 – PaveDrain following cleaning



Ruler Inspection Insert a ruler between the joints of the PaveDrain to determine the depth of debris between the PaveDrain blocks.

Example:

If the ruler only goes down <2” in 50% of the area covered with the PaveDrain System. It is time for a cleaning. A PaveDrain block is 5.65” thick.



Sensor Notification an in-situ sensor can also provide information regarding clogging and

performance, alerting you automatically to the need to clean (Form more information: www.pavedrain.com/infil-tracker-by-p4-infrastructure)

Checking various spots within a PaveDrain installation is always recommended.

Q: Should the PaveDrain System be sealed?

A: Yes, especially in these situations

- **YOUR TOWN, CITY OR STATE USES SALT.**
- Your PaveDrain install involves colored blocks.
- If you want to do less maintenance and keep your site looking as good as the day it was installed.

Sealing is maintenance and an economical way to assist the PaveDrain system to resist the damages caused by salt to concrete. Sealing of the PaveDrain system will increase its longevity. Contact your local hardscapes dealer or block manufacturer for a recommended concrete sealer that complies with local rules and regulations. (EXAMPLE – Tenon Salt Barrier by Blue Stone Products OR EQUAL)

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

*Sealant being applied on PaveDrain via
Sprayer*



*Close up immediately following
sealant*



Water beading on the surface, indicates the sealer has sealed up the concrete pores in the PaveDrain. A penetrating sealer will further improve the longevity of sealer and the surface of the PaveDrain block

NOTE:

- It is strongly recommended to vacuum/clean the PaveDrain system prior to applying a sealant.
- Sealer should be reapplied at the frequency recommended by its manufacturer.

Q: Should the PaveDrain System be salted or sanded?

A: **NO.** If it must be done sanding is preferred over salt. Covering the PaveDrain surface with a heavy dose of salt (as granules or brine) is NOT recommended. Salt is hard on virtually everything! Sanding will help with traction but also has the adverse effect of washing the sand between the open joints and into the base material. Which may lead to increased maintenance costs (i.e. vacuuming out the joints). Over time, this may decrease the infiltration performance of the entire system.

**PAVEDRAIN PAVEMENT
IS PERMEABLE TO REDUCE
STORMWATER RUNOFF**

**DO NOT APPLY
DE-ICING AGENTS (SALT)**

VACUUM TO CLEAN JOINTS

OK TO SEAL



Q: What is the recommended method for snow plowing PaveDrain?

A: In order to minimize surface damage to the PaveDrain system, the recommended snow plowing method would be with a rubber tipped or polyethylene snow plow blade. 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.

NOTE: NO MATTER HOW MUCH CARE IS TAKEN...ICE AND SLIPPING IS ALWAYS A POSSIBILITY! (SEE HEATED PaveDrain...!) PaveDrain, LLC and it's manufacturing, distribution and licensed partners can NOT be held liable in a slip or fall situation.

Q: Can the PaveDrain System be snow plowed with a steel blade?

A: 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 snow plow blade.

To prevent damage during the winter snow plowing operations from standard steel snow plow blades, it is recommended to float the steel blade $\frac{1}{4}$ " - $\frac{1}{2}$ " 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.

Steel Snow Plow Damage



Rust marks from steel snow blades



Q: Can a single PaveDrain Block be replaced?

A: **Yes!** If a PaveDrain block breaks it is easy to replace the single block without having to pull out any of the adjacent blocks or the entire mattress (if your installation method was mats). Follow this method to repair a single block.

Extraction starts with the right tool: it is recommended that you have a SlabGrabber (Probst), PaverPuller (Probst), or similar tool. A snug fit on the block works best. The Probst SlabGrabber may need to be modified so that the steel edges that slide between the PaveDrain blocks need to be cut to fit. Best size setting is four holes from the end



NOTE: New units may slip a few times before they get “roughed up” and catch the block firmly.

Please go to www.pavedrain.com and review the Maintenance Information located under the “Installation and Maintenance” section of the site.

There are also many informative PaveDrain videos at https://www.youtube.com/results?search_query=pavedrain

You may have to clean the joints between the PaveDrain block for removal. Even the smallest rock can make removal more difficult than expected.



Adjust the PaveDrain Extractor so that it will pick from the two flat sides of a PaveDrain block. Pull and move handle of extractor back and forth to remove damaged block



Once the target block is removed, debris should be cleaned out of area. Use the PaveDrain extractor to install the new block.
If you need to remove more blocks, continue the process.



Slide the new block down into place. You may use a rubber mallet to tamp it down securely at the edges. Be sure not to damage the new block by using 5 lb dead blow hammer!

