

DRAINAGE OUTLET PROTECTION

► USES: DOWNSPOUTS, PIPES OR CULVERT OUTLETS



Photo: [NDS](#)

Pipes and downspouts without proper outlet protection can cause erosion. This erosion can damage your property and pollute local waterways.



Photo: [Credit Valley Conservation](#)

Add outlet protection, such as a rock pad or mulched landscaping, to **SLOW** water and let it **SINK** into the ground.

Anytime water flows out of a downspout, pipe or culvert it has the potential to cause damage. The fast-flowing water released to bare soils or steep slopes can cause harmful erosion. As it flows across yards, driveways, and streets it can also pick up pollution and carry it into our local streams, rivers, and lakes. Water that outlets onto hardened or impermeable surfaces, such as driveways, cannot **SINK** into the ground and can contribute to downstream flooding.

The good news is that these problems can be avoided by using proper drainage outlet protection. Use one or more of the four techniques presented below to protect your drainage outlets. They will help **SLOW** water down and/or **SPREAD** it out so it can **SINK** back into the soil. They work especially well when used in combination.

SPLASH BLOCKS

Splash blocks are simple devices that reduce the initial force of the water at downspout outlets. They prevent erosion and allow the water to **SPREAD** out before flowing into an area of stable vegetation. Splash blocks also help move water further away from your foundation. No water should be released within 10 feet of your foundation to protect your basement or crawlspace. If additional length is needed, you can combine a splash block with a splash block with a rock pad underlain by an impermeable liner like plastic or bentonite clay waterproofing membrane to allow water to flow away from your foundation (see Rock Pads).

ROCK PADS

Rock pads are also known as “energy dissipators” because they absorb the energy of the fast-flowing water. They allow the runoff to **SLOW** and **SPREAD** across the width of the pad and work to prevent scouring and erosion at the outlet. Rock pads can be used with or without a splash block and typically outlet to stable vegetation. Rock pads are made by creating a level area and filling it with about 6 inches of rock. A wood border can be added to contain the rock. The design of the rock pad (size and rock type) will depend upon the outlet size as follows:

- **Downspouts and smaller outlets (8 inches or less)** – Pads for small outlets are typically 2 feet by 3 feet. If a narrower pad is desired, extend the length to 4 or 5 feet to ensure it is sufficient to **SLOW** and **SPREAD** the water. Any type of rock – from gravel to cobble – can be used, though larger rock is more effective for higher flows. Make sure that the

WORKING NEAR SLOPES

Avoid directing outlets to steep slopes. If there are no other options, seek guidance from a geotechnical engineer. For gentle slopes, the combination of a rock pad, level spreader, and stable vegetation tend to work well to **SPREAD** the water out so it can infiltrate quickly and not cause channelized erosion. See 2 | Evaluate Your Property for more information on working on or near slopes.



Splashblocks **SLOW** runoff and carry it away from your home's foundation or crawl space.



Photo: [Plan-it Earth Design](#)

A rock splash pad combined with mulched landscaping **SLOWS** the runoff and **SPREADS** it out so it can better **SINK** into the ground.



A level spreader is typically a notched board that **SPREADS** the flow of water coming out of a pipe across a wider area. Often rock pads are placed between the pipe outlet and the spreader board to **SLOW** the flow.

drainage flows away from your foundation. Install a plastic or bentonite clay waterproofing membrane under any portion of the rock pad within 10 feet of your home.

- **Culverts or outlets larger than 8 inches** – Larger pipes are usually associated with right-of-ways, easements, and streams or wetlands. Work on these pipes will likely require the assistance of an engineer and permits. To determine if you need a permit, contact Snohomish County Planning and Development Services (PDS) - "[Ask a Permit Tech](#)" program or call 425-388-3311.

LEVEL SPREADERS

Level spreaders are erosion control devices. They are boards of synthetic or pressure treated wood that have been notched along the top edge. As the name implies, these evenly **SPREAD** runoff across a wider area. This allows the water to more readily **SINK** into the soil where pollutants naturally get filtered out. Level spreaders are often used in combination with a rock pad to spread out higher flows from larger pipes or culverts. They are also used to spread out water for outlets within 5 feet of a property line or on gentle slopes. Level spreaders are not typically needed for individual downspouts unless several downspouts are combined to flow out of a single outlet.

STABLE VEGETATED AREAS

Stable vegetated areas are a great way to **SLOW**, **SPREAD**, & **SINK** the water on your property and are almost always used in combination with a splash block, rock pad, or level spreader. Examples include lawns or densely planted landscape beds. To be considered stable, plants or coarse mulch must cover the entire

area without any bare soil peeking through. Plants with lots of small stems, such as grasses and groundcover, work well to **SLOW** and **SPREAD** the runoff while woody plants and trees work to stabilize soils. Spaces between plants should be covered in coarse mulch – such as wood chips – to help the water **SINK** in and prevent soil from washing away (see Mulch).

✓ Maintenance

It is important to inspect your system regularly, especially after a storm event, to clear debris, to ensure there are no signs of pooling water or erosion, and to ensure that runoff is being diverted to a safe location.

DO

- ✓ Protect ALL outlets on your property from causing erosion.
- ✓ Direct downspouts to splash blocks, rock pads, or vegetated areas and ensure water moves 10 feet away from and downslope of your foundation.

DO NOT

- ✗ Direct water to impermeable surfaces (streets, driveways sidewalks etc.).
- ✗ Direct water to waterbodies.
- ✗ Direct water close to property lines and driveways.
- ✗ Outlet to bare soils or areas prone to erosion.
- ✗ Outlet to steep slopes without guidance of a geotechnical engineer.

INSTALLING A LEVEL SPREADER – THREE STEPS

BEFORE YOU BEGIN

Before you install a level spreader be sure it will work in the desired space and with your site conditions. Level spreaders are typically 4 to 8 feet long. Longer is better when dealing with larger flows. The ground abutting the ends of the spreader should be higher so that water does not go around the board. Alternatively, a longer spreader can be used. Also, look downstream of the board and ensure that the land, vegetation, or mulch will not tend to reconsolidate the flow of water. Be sure the spreader isn't too close to the outlet to avoid flows splashing over it. Consider using a rock pad to **SLOW** water down before it reaches the spreader.

- Tools needed: saw, drill, level, shovel, rubber mallet
- Materials:
 - Rocks for energy dissipation (see details on previous page)
 - 2" wide level spreader board cut to desired length
 - 4" x 4" support posts
 - Bolts to anchor spreader board to support posts

STEP 1 INSTALL A ROCK PAD AT OUTLET (OPTIONAL)

To prevent erosion, consider installing a rock pad between the outlet and the level spreader. Sizing guidelines are in the rock pad description.

STEP 2 NOTCH YOUR LEVEL SPREADER BOARD

A notched board tends to disperse flows better than a straight length of board especially if it becomes "out of level."

- Start by selecting a 2" X 10" wide board. Synthetic boards work well as they are easily cut with a hand saw, are long-lasting and don't contain toxic materials that may leach into the water.
- Cut 1" deep notches approximately every 6 inches along the entire length of the board. Notches can be any shape, but V-shaped notches are best at spreading flow and preventing clogging.

STEP 3 INSTALL THE LEVEL SPREADER

- Install your notched level spreader board with the notched edge up. The bottom of the notches should be at ground level. If the bottom of notches are higher than the downstream ground, place rock on the downstream side to prevent erosion as water flows through the notches.
- Drive support posts into the ground. Typically two 4"x 4" posts per 4' spreader board will ensure it remains upright
- Adjust the spreader board as needed to ensure it is level.
- Bolt the spreader board into the posts ensuring that the board stays level.

