

Storm Water Management

Q: Storm water management is a broad term. What does it refer to and how does it affect the construction and maintenance of parking lots or roadways?

A: Storm water management is something that has existed since the first roads were constructed. We've always had to account for what happens to the rainwater on roadways or parking lots. Typically this was addressed through sheet drainage offsite or inlets which carried the water offsite through underground municipal systems. Recently through increased regulation, due to limited infrastructure or concern about polluting the ecosystem, the design considerations have changed.

Q: What considerations are being made and how are they different?

A: For major reconstruction and new construction you may need to address two issues, especially in urban environments. First, you must prevent erosion and offsite sedimentation during construction. Second, you must determine where water will go during a rain event - and in many cities it must be retained onsite.

Q: What methods are employed for erosion or sediment control?

A: Each site and situation will dictate what BMPs (Best Management Practices) are required, but typically this will involve silt fencing, vegetative stabilization, inlet protection, or any number of options that take into account slope, climate, work being performed, adjacent properties, or proximity to public waterways. This should all be part of the design of a project from a qualified engineer or architect.

Q: How do you retain water onsite?

A: There are three main ways to accomplish this: retention ponds, underground storage vaults, or porous/pervious designs. Which option you choose is often a result of the constraints of the property or the preference of the design team, but an option we've had success with is installing a porous system.

Q: How does a porous system work?

A: It allows water to drain through the surface rather than sheet drain over the top. The water actually filters down through the stone base and into the soil mirroring what occurs naturally in undeveloped areas. As a result the parking lot itself becomes a retention area.

Q: What is the benefit of a porous design?

A: A porous design fulfills the retention requirement. A design using permeable paver bricks, for example, offers several additional benefits which can help the environment. The filtration that occurs will trap most heavy metals and pollutants before they reach the soil, plus a light brick color can be chosen which will improve reflectivity and help maintain a cooler surface. Permeable paver bricks are also made with recycled & regional materials. As an alternative to bricks, there are concrete and asphalt mixes available which can be used for a porous system.

Q: What is the process for installing a porous system?

A: The first and most important step will be to determine the natural drainage class of the soil; this will help to ensure the system is capable of draining properly. Based on the soils, it is then important to create a layered system using a disked stone based (washed single-sized aggregate) followed by the brick, concrete, or asphalt surface. Other things may be implemented as well such as under drains, fabrics, bioswales, or even traditional inlets.

Q: How do I know if this is a solution for me?

A: Ideally this option is something which should be considered during the design phase either as an established choice or an alternative. Many times the storm water requirements may not be known until the municipal authority is involved in the permitting process, so if/when these issues arise it is worth considering this economic and environmentally sustainable alternative.