

Pervious Concrete

Pervious concrete, also referred to as porous concrete, is a permeable paving material. Pervious concrete is typically used in conjunction with an underlying stone reservoir that can capture rainfall and store runoff before it infiltrates into the subsoil. When used as an alternative to typical concrete paving it makes a natural occurring stormwater infiltration system. When installed by a certified contractor and with proper maintenance, pervious concrete has a void space of 15% or more (up to 25%) and can be used as a stormwater solution even during heavy rain reducing costly permits and subsequent compliance initiatives.

Pervious can be installed and used very successfully as a stormwater solution. Very careful consideration should be taken when pre-qualifying suppliers and installers. Pervious installation differs greatly from conventional concrete and a bad installation or improper mix will almost always result in having to re-do the whole project.

Ideal Uses:

- Walkways
- Courtyards
- Parking lots
- Low volume roads
- Driveways
- Shoulder/Median along high volume highways
- Patios
- Around swimming pools
- Nature/Bike trails

Site considerations

- When designed with a stone reservoir, the reservoir needs to have sufficient depth to accommodate stormwater storage for the anticipated storm event.
- Options include wells and/or drainage channels through a subgrade and/or underground storage chamber for below surface storage.
- If used to treat off-site runoff, pervious should include pre-treatment.
- Pervious pavement should be sited, at a minimum, 3 feet above the seasonally high ground water table and at least 100 feet away from drinking water wells.

When not to use

Land that is used for industries that produce highly contaminated runoff should not use pervious as a stormwater solution. Fueling stations, hazardous material storage, auto recycle yards, etc.. contain an excess of contaminants typically found in stormwater runoff. The potential for groundwater contamination in these conditions far outweigh the benefits of utilizing pervious as an appropriate stormwater solution.

Regional – Freeze/Thaw Concerns

Pervious has been slowly accepted as an acceptable stormwater solution in areas that experience freeze/thaw activity. Pervious applications in climates that freeze do have challenges and need to be extra diligent not only during installation but also with continued maintenance. Sand used for de-icing may clog the surface and prevent melting snow or ice from seeping back into the ground reducing the effectiveness of the pervious stormwater solution. When the snow melts, it will seep into the ground and keep the thawed snow from re-freezing reducing the need to sand. A regular de-icing material is preferable to sanding. Regular cleaning with vacuuming or pressure washing will keep the clogging under control.

Another consideration is frost heave due to infiltrated water freezing below the surface. Design modifications that utilize an adequate base layer greatly reduce this risk.

Design Considerations

Pretreatment. Pervious concrete acts as a pretreatment to the below stone reservoir. Because of this, scheduled maintenance needs to be done for optimal performance.

Treatment. The stone reservoir needs to be sized to contain the storm event. Typical uses for pervious is to treat small storm events ranging from 0.5 inches to 1.5 inches. Water can only be stored in the void spaces of the stone reservoir. Storm events larger than normal need to be taken into consideration when designing the site to allow for a larger reservoir or drainage pipes.

Conveyance. Water passes to the stone reservoir through the surface of the pavement and into the ground through the bottom of the stone reservoir. A geosynthetic liner should be placed below the stone reservoir to prevent preferential flow paths and to maintain a flat bottom. If designing for larger storm events, drainage pipes may be included below the pavement to divert stormwater to catchment areas.

Maintenance. Maintenance includes vacuuming (preferred) or pressure washing the surface to remove clogs and other buildup. Vacuuming or pressure washing should be done on an as needed basis but no less than annually. Signs should also be posted identifying pervious concrete areas especially in regions where snow shoveling or de-icers are used. An annual inspection for surface deterioration needs to be performed by a knowledgeable inspector.

Landscaping. Another typical use is when vegetation is used in landscaping for aesthetics or for environmental purposes. Because of the porous nature, trees and other vegetation are watered during storm events reducing manual watering and the need for irrigation. Pervious also allows the use of vegetation in urban or other areas where typical concrete placement wouldn't allow vegetation to grow.