Pervious paving allows rainwater to either pass through the paving system itself or through joint openings between the pavers.

SOURCE: NEVUE NGAN ASSOCIATES

Pervious paving systems allow rain water to pass through their surface and soak into the underlying ground. While these systems help reduce the amount of stormwater runoff by creating a pervious surface, they are not considered a treatment measure. Pervious paving must be designed to not only manage stormwater runoff adequately, but also maintain the same load bearing capacity as conventional paving in order to support the weight and forces applied by vehicular traffic.

Functionally, the distinguishing feature among the different pervious pavement systems is the means by which the surface is made permeable. Pervious concrete and asphalt are formulated with pore spaces within the material itself. Permeable joint pavers allow rainwater to pass through evenly spaced gaps between the pavers' edges. Reinforced grass and gravel grid systems also allow rainwater to soak into open pore spaces in the soil medium.

The most desirable approach to using pervious paving is to combine this strategy with landscape-based stormwater management whenever possible. Pervious paving is primarily used on roadways with low-traffic speeds and volumes, but there are successful examples of pervious asphalt and concrete employed on high-traffic streets. Pervious paving should not be used in situations with known soil contamination or high groundwater tables. Generally, soil infiltration rates that exceed or meet the accepted standard of 0.5"/hr are suitable for pervious paving systems.

Good Places For Using Pervious Paving:

- Low-volume streets
- Parking stalls (streets and parking lots)
- Alleys
- Residential driveways
- Sidewalks (depending on material and ADA-compliance)

Why Choose Pervious Paving:

- Reduces the size of stormwater treatment measures
- Can be the only viable option in ultra-urban conditions or in parking lots that are interiorly drained

Potential Constraints of Pervious Paving:

- Requires well-drained native soil
- Has a relatively high installation cost
- Can be difficult to maintain and difficult to repair in small batches if using porous concrete and asphalt.
- Has a limited infiltration effectiveness on street slopes over 5%

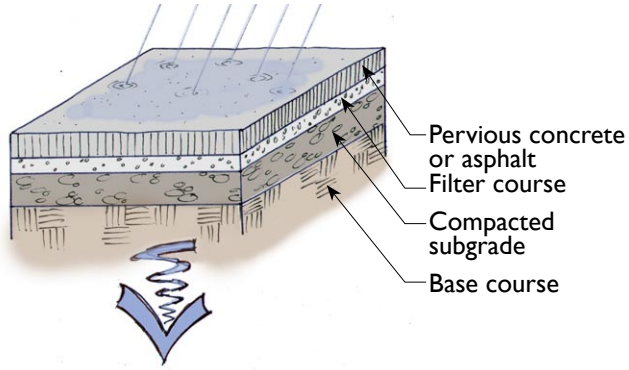

Figure 2-32: **Pervious Concrete/Asphalt Diagram**

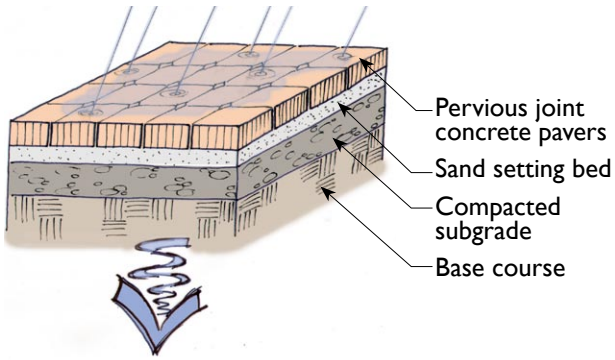

Figure 2-33: **Typical Pervious Joint Paver Diagram**

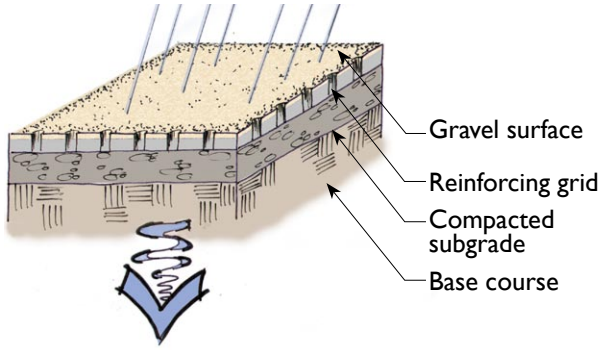

Figure 2-34: **Reinforced Gravel Paving Diagram**

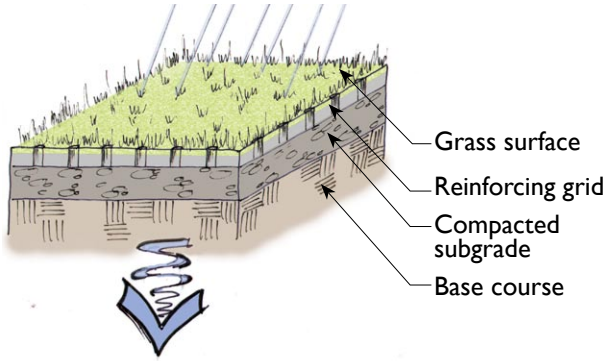

Figure 2-35: **Reinforced Grass Paving Diagram**

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-36: *The difference between drainage on pervious asphalt and impervious asphalt is evident in this photo.*

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-37: *This residential driveway utilizes pervious joint pavers in San Mateo County.*

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-38: *A plastic grid system filled with gravel provides the structural strength for a vehicle to slowly drive on.*

SOURCE: WWW.RITTER-TECHNIK.CO.UK

Figure 2-39: *Reinforced grass paving allows water to pass through the root zone of the grass and into the underlying soil while still maintaining a hard surface for vehicular travel.*

SOURCE: WWW.HANNEMANANDFINEIS.COM

Figure 2-40: *Pervious concrete allows water to pass through pore spaces within the aggregate.*

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-41: *Pervious concrete allows for stormwater management and its light color helps reflect heat rather than absorb it.*

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-42: *As shown in this photo, the forces applied by tires at turning, stopping, and starting locations can sometimes leave depressions on the surface of pervious paving.*

Pervious Asphalt and Concrete:

Pervious asphalt and concrete production is similar to that of standard asphalt and concrete. The main difference is that the fines are left out of the aggregate added to the mixture. This results in small holes within the paving that allows water to drain through the surface. When installing pervious asphalt and concrete, it is critical that the subgrade is properly prepared and that the surface is poured correctly. As with conventional paving, if pervious asphalt and concrete are not properly installed, they are prone to failure. Also, once installed, both pervious asphalt and concrete tend to be difficult to patch repair because the paving mixture is typically made in large batches.

One problem cited in past parking lot projects using pervious paving is that sometimes the forces applied by wheels turning, stopping, and starting tore up the surface of pervious asphalt and create depressions within parking lot stalls (see Figure 2-42). However, the technology of pervious paving systems is constantly improving, and this may not be as much of an issue with current technology.

Pervious asphalt has been used successfully on interstates and other limited access roads where there are no turning vehicles. Compared to conventional asphalt, the use of pervious asphalt on high-speed roads reduces the accumulation of puddles and the danger of hydroplaning. It is also generally less expensive to install than pervious concrete.

Pervious concrete is more expensive than conventional concrete; hence, it is economically more viable to use in large batches. Pervious concrete works well for parking lot applications and low volume streets.

Regular maintenance of pervious asphalt and concrete is required for the long-term viability of the paving system. Vacuum cleaning the pervious paving system on a regular basis is imperative to limit the amount of sediment clogging the pore spaces.

Pervious Joint Pavers:

Any type of paver can create a pervious surface if there are spaces between them and those spaces are filled with sand or other porous aggregate. Many interlocking concrete unit pavers are designed specifically for stormwater management applications. They allow water to pass through joint gaps that are filled with sand or gravel and infiltrate into a thick gravel subgrade. This system is widely applicable to both small and large paving applications and it offers the flexibility to be repaired because small sections can be removed and replaced. Interlocking concrete unit pavers offer flexibility in color, style, joint configuration, and paving pattern It is important to note that selected pervious joint pavers along pedestrian walkways must be ADA-compliant and not cause tripping hazards. When installing pervious joint pavers, care should be taken to assure that the base and subgrade is properly constructed in order to minimize the potential for differential settlement. Regular vacuum cleaning of the paver joints will help prevent clogging and extend the longevity of the system. Pervious joint paving tends to be more costly to install than other pervious paving systems.

Reinforced Gravel Paving:

A gravel paving system uses small, angular gravel without the fines and a structure that helps provide support to create a rigid surface. Gravel can be a viable alternative to a traditional paved surface in areas of low use that still require a rigid surface.

Reinforced Grass Paving:

In the right situations, grass paving, or other hybrids between paving and planting, can be used to provide structural support while also allowing for some plant growth and stormwater infiltration. These systems may be appropriate in areas of low use and where soil, drainage, sunlight, and other conditions are conducive to plant growth.

SOURCE: ABBY HALL-EPA

Figure 2-43: *Pervious joint pavers within a parking lot application. Any overflow from the pervious pavers drains into a swale.*

SOURCE: MUTUAL MATERIALS

Figure 2-44: *Sand-set interlocking concrete unit pavers create gaps between adjoining pavers and allow water to soak into the ground.*

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-45: *A close up view of gravel paving within a reinforced plastic grid system.*

SOURCE: NEVUE NGAN ASSOCIATES

Figure 2-46: *Grass paving installed in a residential driveway.*