

Table 4-2: Permeable Joint Paver Types and Possible Applications		
Paver Type	Description	Possible Applications
Turf Blocks	Open celled unit paver filled with soil and planted with turf. Sometimes the cells are filled with crushed rock only.	Areas of low flow traffic and infrequent parking, residential driveways and overflow parking areas, emergency access roads, utility roads, street shoulders, and outer edges of commercial and retail parking lots where low-use spaces are located.
Unit Pavers	Discrete units set in a pattern on a prepared base. Typically made of precast concrete in shapes that form interlocking patterns, some unit paver shapes form patterns that include an open cell to increase permeability. Solid unit pavers are made of impermeable materials, but can be spaced to expose a permeable joint set on a permeable base.	Parking stalls, private driveways, walkways, patios, low volume streets, and travel lanes, and bikeways.
Source: Design Guidelines for Permeable Pavements, Redwood City		

Design and Sizing Guidelines

The design of each layer of the pavement must be determined by the likely traffic loadings and their required operational life. To provide satisfactory performance, the following criteria shall be considered:

- The subgrade shall be able to sustain traffic loading without excessive deformation.
- The turf block or permeable joint pavers shall give sufficient load-bearing to provide an adequate support for loading.
- The paver materials should not crack or suffer excessive breakage under the influence of traffic.
- Both turf block and pavers require a single size, grading base to provide open voids. The choice of materials is thus a compromise between stiffness, permeability and storage capacity.
- The uniformly graded single size material cannot be compacted and is liable to move when construction traffic passes over it. This effect can be reduced by the use of angular crushed rock material with a high surface friction.
- The base shall be sized for strength and durability of the aggregate particles when saturated and subjected to wetting and drying. To allow for subsurface water storage, the base must be open graded, crushed stone (not pea gravel), meaning that the particles are of a limited size range, with no fines, so that small particles do not choke the voids between large particles. If subsurface water storage is not an objective, uncompacted soil with a sand bed to support the turf block or paver may be considered. The base should be reviewed by manufacturer of turf blocks or pavers. Check with the local jurisdiction regarding any local requirements for the base layer.
- Runoff coefficients for turf blocks and permeable joint pavers are presented in Table 5-3 in Chapter 5. Because of the higher infiltration rates and localized storm water storage compared to an impervious surface, the size of downstream stormwater treatment measures can be reduced.

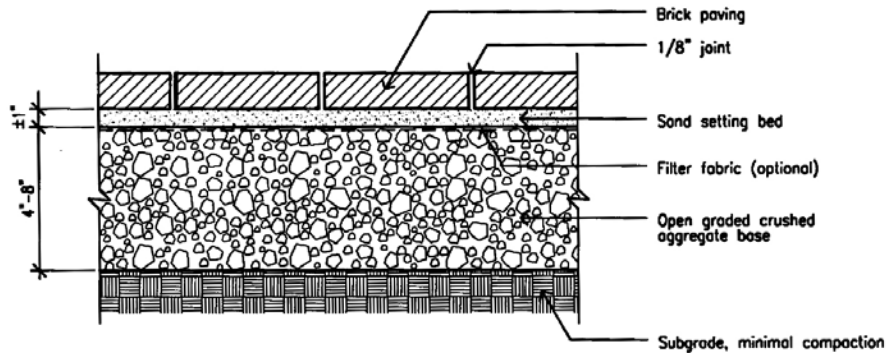


Figure 4-16: Profile of Brick Paver Installation (BASMAA, 1999)

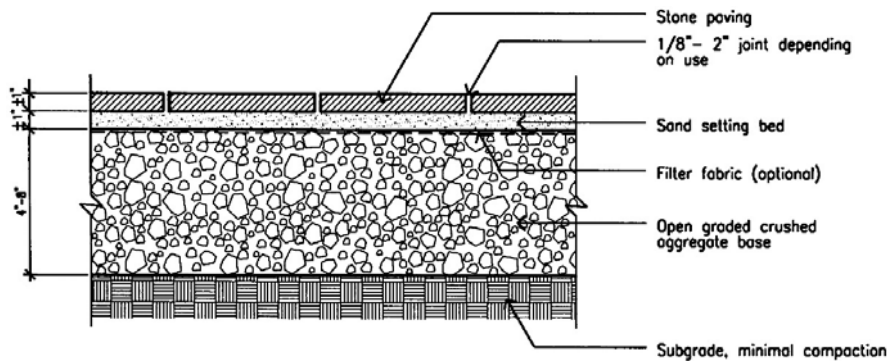


Figure 4-17: Profile of Natural Stone Paver Installation (BASMAA, 1999)

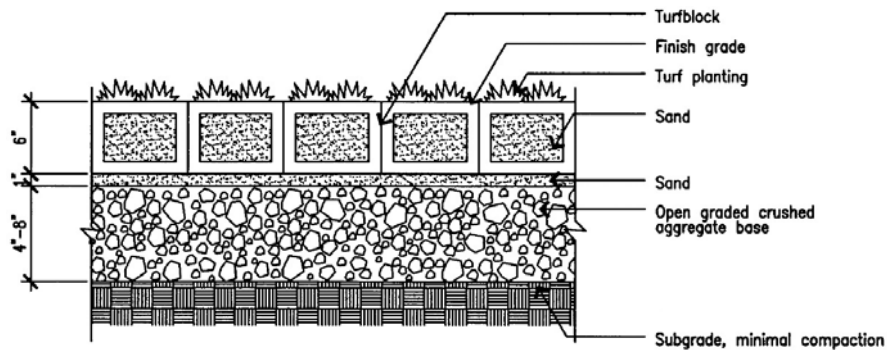


Figure 4-18: Profile of Turf Block Installation (BASMAA, 1999)

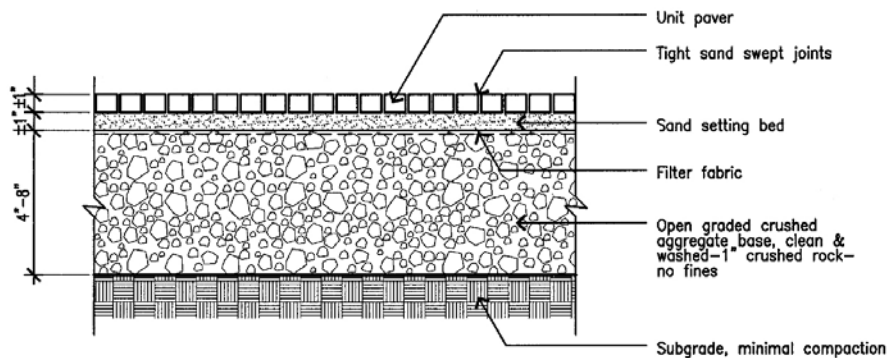


Figure 4-19: Profile of Unit Paver Installation (BASMAA, 1999)

MAINTENANCE

A maintenance plan shall be provided.

Standards for Ongoing Maintenance and Upkeep :

- Keep landscaped areas well maintained
- The surface of the unplanted turf block and permeable joint pavers shall be vacuum cleaned using commercially available sweeping machines at the following times:
 - End of winter (April)
 - Mid-summer (July / August)
 - After autumn leaf-fall (November)
- Planted turf block can be mowed, as needed.
- Inspect outlets yearly, preferably before the wet season. Remove accumulated trash and debris.
- When vacuum cleaning is conducted, inspect turf block and pavers for any signs of hydraulic failure.



Figure 4-20: Unit Pavers in Private Road, Redwood City

As needed maintenance:

- If routine cleaning does not restore infiltration rates, then reconstruction of the part of pervious surface not infiltrating is required.
- The surface area affected by hydraulic failure should be lifted, if possible, for inspection of the internal materials to identify the location and extent of the blockage.
- Surface materials should be lifted and replaced if damaged by brush (or abrasive) cleaning.
- Sub-surface layers may need periodic cleaning and replacing.
- Deposits may need to be disposed of as controlled waste.
- Replace permeable joint materials as necessary.



Figure 4-21: Notched pavers (Source: Unigroup-usa.org). This photo is for example purposes only. It is not an endorsement of any proprietary product.

