

## **PAVER EFFLORESCENCE**

Efflorescence is a white deposit of water-soluble salts and alkalis that appear on the surface of masonry products when they dry after being wetted. It sometimes occurs on face brick on buildings, but also occurs on the surface of pavers. Efflorescence is more visible in darker colored pavers, but can be seen on all colors of both concrete and clay pavers.

### **SOURCE OF DEPOSITS**

Some of the soluble salts and alkalis that form efflorescence deposits can come from the pavers themselves. Concrete pavers contain portland cement, which contains a certain percentage of soluble calcium oxide. As the concrete cures, calcium oxide will react with surrounding minerals to become less soluble. Some clay pavers contain soluble salts that can migrate to the surface after wetting and drying. But most clay pavers do not effloresce.

Other possible sources of efflorescence that affect pavers are salt in the bedding sand, sand in the mortar or cement in concrete that is in close contact with the pavers.

1. The coarse sand that is used to bed the pavers can contain soluble salts. Bedding sand should always be washed with potable water to remove these salts.
2. Pavers set in mortar are in contact with that mortar on five of their six sides. If there are soluble cement alkalis or salt from the mortar sand in the mortar, these can leach out into the pavers and migrate to the surface, where they dry as efflorescence.
3. Pavers set in sand over a concrete slab can absorb alkalis from the surface to the concrete. These can migrate to the surface, where they dry as efflorescence.

### **REMOVING EFFLORESCENCE**

Efflorescence deposits are water soluble. Pavers exposed to rain will be washed regularly, which removes the soluble deposits and rinses them away. Often more deposits will form when the paver surface dries again. But with each successive rinsing the amount of efflorescence decreases, because the source of the soluble minerals is being used up. There is no need for special cleaning, but any cleaning that is done with clear water, and even street sweeping with dry brushes will help lessen these deposits.

### **PAVING DESIGN TO PREVENT EFFLORESCENCE**

The best way to prevent paver efflorescence is to allow the pavers to drain to the bottom. This takes the soluble minerals away from the surface so they do not accumulate in the brick and dry on the top surface.

1. Installing pavers in a sand bed on a flexible base of crushed stone or concrete allows water to drain through the paver joints, through the bedding sand, and into the granular base, where it is gradually absorbed into the soil below.
2. For pavers set in sand on concrete slabs, drainage can be provided with holes in the slabs that drain into the crushed stone or crushed concrete base. Drainage holes in the slab should be protected with filter fabric to prevent bedding sand from washing into the holes.
3. Pavers on concrete slabs can also be set in an asphalt setting bed that seals the concrete surface and prevents soluble minerals from dissolving in water from the surface.