

Materials

There is a wide range of paving materials available for the modern designer, allowing flexibility of design style and character. This design guide sets out the principal characteristics of typical paving materials and suggests appropriate materials for different situations.



The choice of paving material is often a compromise between capital cost, maintenance cost, appearance and performance:

- natural stone flags may look attractive but cannot take heavy point loading;
- York stone can become slippery without regular cleaning in damp or shady conditions (due to moss and algae);
- Stone paving should be hard and impermeable: porous stone absorbs water that freezes and splits the stone;
- Riven stone paving can present a markedly uneven surface which pedestrians find uncomfortable and which collects dirt.

Concrete blocks do not have the aesthetic quality or heritage character of natural stone, but can provide perfectly acceptable paving in modern settings. Concrete blocks are initially cheaper than stone blocks but are easily spoilt by oil spills and chewing gum and have a shorter lifespan.

Unusual paving materials may prove difficult or expensive to replace, repair or extend and are therefore unlikely to

be adopted by the local planning authority due to budgetary constraints.

The environmental cost of paving materials should also be considered. Imported material may be significantly cheaper in £££, but may carry hidden environmental costs of long-distance transport (fossil fuels, emissions) and lack of environmental protection at the quarry site. Using local materials reduces environmental costs and respects local distinctiveness; reused or recycled materials will reduce the environmental cost further.

Think about:

- capital cost and construction resources
- maintenance costs and resources
- lifecycle and sustainability
- landscape and built context
- function and performance

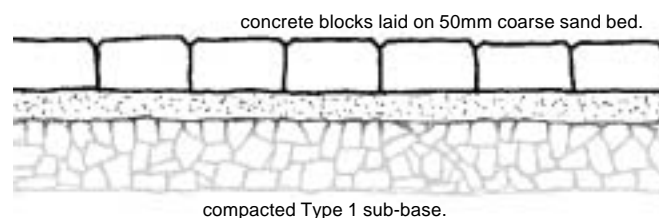
Design Guidance sheets *Roads* and *Footways* give guidance on materials choice and layout considerations for different paving applications.

Flexible & rigid paving

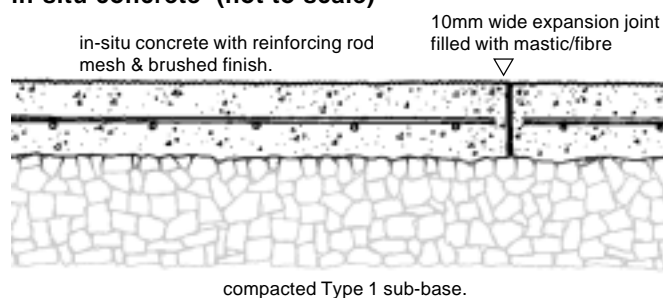
Small unit paving (such as blocks, setts and cobbles) and granular paving (gravel, hoggin, tarmac, asphalt) provide flexible paving: the paving units can take up small changes in levels or deformation caused by subsidence or settling without failure of the paving.

Small unit paving allows for replacement of individual units when damaged or spoilt, although it is difficult to get an exact match in level and colour.

typical section: flexible paving: concrete blocks



typical section: rigid paving: reinforced in-situ concrete (not to scale)



Rigid paving e.g. poured/in-situ concrete can be constructed cheaply and quickly to provide a good smooth surface, but is vulnerable to cracking and shearing if the ground beneath moves horizontally or vertically, or with significant variations in temperature.

Expansion and cracking joints can be designed into the paving to provide for minor movement but rigid paving should be avoided where ground conditions suggest movement is likely.

Permeability

“Soft” surfaces (grass, soil, planting areas) and permeable paving (gravel, proprietary resin-bound stones, special purpose pavers) allow the penetration of air and water into the ground. This is essential for healthy plant growth and recharges ground water.

Impermeable paving (concrete, mortared paving, hoggin) prevents air and water reaching the ground, resulting in stress for plants and increased surface water run-off which can lead to flash flooding.

Sustainable Drainage Systems (SDS) are designed to intercept surface water run-off from paved areas, remove impurities and pollutants and retain the water in soakaways, green swales and balancing ponds to encourage ground water penetration and controlled discharge into watercourses. Contact the Environment Agency (tel: 01904 692296) for further information.

Think about:

- drainage
- groundwater
- nearby planting
- permeable paving design



Access for all

Large areas of paving are difficult for people with visual impairments to navigate: use of special tactile paving can provide a pathway and/or warn of hazards, whilst use of ordinary paving elements such as kerbs and drainage channels can provide a route to follow.

Blister Paving: to identify a pedestrian crossing place (red paving for controlled crossing points e.g. zebra crossings, buff paving for uncontrolled crossing points e.g. side streets).

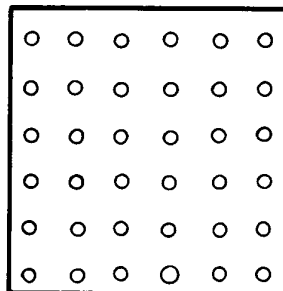
Hazard Warning Paving: half-rod shaped bars to warn of a hazard e.g. top/bottom of stairs.

Directional Guidance Paving: round-ended flat bars laid *along* a sensible obstacle-free route to guide visually handicapped pedestrians through large open spaces.

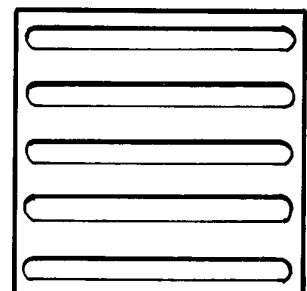
Cycleway Paving: bar pattern used on shared pedestrian/cycle routes (laid *along* the cyclepath and *across* the pedestrian path).

In sensitive areas e.g. Conservation Areas the red/buff colours may be omitted and it is possible to obtain tactile paving in clay or York stone, or fix brass studs as blisters to locally-distinctive paving material.

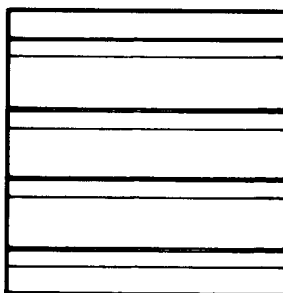
blister



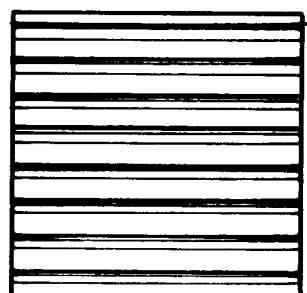
directional



cycleway



hazard



Certain paving surfaces cause accessibility problems: people with diabetes and arthritis find it uncomfortable to walk over bumpy paving (including pimple-blocks at crossing points and cobbles), and it is difficult to push wheelchairs and pushchairs over loose gravel or markedly riven paving.

If a specific visual appearance is required, consider resin coating gravel to provide a smooth surface or providing paths of flat blocks amongst riven paving.