cement & concrete institute

paving
paths & patios

1. introduction

Well constructed paths and patios will enhance any domestic property or garden. They are practically free of maintenance, and make a satisfying home improvement project.

This leaflet covers all types of paving laid with open joints on either a mortar or a sand bed. It will give the homeowner or DIY enthusiast guidance on selecting materials, preparing the site and recommends methods of laying the paving.

The publication excludes interlocking paving blocks which are laid very close together without open joints on a sand bed. The Concrete Manufacturers Association (CMA) publications cover this type of paving.

2. general

The paving materials you choose will depend on cost, personal preference and whether a formal or informal effect will suit your home. Generally, the thicker the units, the stronger the paving will be and the greater the loads the paving will carry without distorting.

The finished paving must have a minimum slope of 1 in 50 for proper drainage. Paving must slope away from buildings. Avoid low areas where water can collect.

3. preparing the site

The ground below the paving must be firm and stable so that it does not settle unevenly with time. It must have the same slope as the finished paving.

Remove all roots and vegetable matter from the site, and preferably, the topsoil. Then trim the bed to the correct level and slope. Soft areas and areas that have been filled must be well stamped down with, for example, a gumpole. If the fill is very dry, mix in just enough water to dampen it and then compact it.

Finally, recheck surface levels and slopes and correct them if necessary.

4. materials for the mortar bed

Cement

For the mortar bed always use cement which has an SABS mark and complies with SANS 50197-1 (common cements).
Use a 1:6 cement sand mix. Note: SANS 50197- specifies a number of properties and performance criteria. Composition and strength are required to be displayed by the manufacturer on the packaging of each cement produced.

Sand

A simple way of deciding whether a sand is suitable for mortar is to mix 5 kg of cement with 25 kg of air dry sand and then add enough water to produce a consistency suitable for mortar.
If more than 6 litres of water is needed, the sand is unsuitable.

5. recommended methods of laying

Units less than 40 mm thick should always be laid on a bed of mortar to give a total thickness of not less than 40 mm. Thicker units may be laid on a sand bed.

Type of paving and methods of laying

Type of paving	Thickness of Units	Method of Laying
Open-spaced bricks	50 mm or more	Preferably on a sand bed: otherwise on earth. Joints 10 mm wide, filled with mortar.
Concrete paving flags	35 to 50 mm	On a sand bed with sand-filled joints (paths); or on a mortar bed with mortar-filled joints (patios).
Slate or 'slasto'	35 to 40 mm	On a mortar bed. Joints filled with mortar.
Quarry or concrete tiles	20 to 25 mm	On a mortar bed. Joints filled with mortar.

If paving is laid on sand, a kerb should be provided to prevent outward movement.

6. laying procedures

On mortar

Mix one part cement with six parts sand until the colour is uniform and then add water slowly. You will need soft mortar - about the consistence of toothpaste.

Alternatively the in situ soil can be stabilized as follows:

- Loosen the top 50 mm of soil and then spread cement at a rate of 1 bag / 8 m^2.
- Mix and add water until the mix has the consistence of a smooth paste.

Lay small areas of about 1 m^2 at a time. Lay a bed of mortar so that the paving plus mortar will be 40 mm or thicker. The mortar layer thickness should not be less than 15 mm. Place the paving units on the mortar, tap each one down firmly and check that it is level and at the correct slope. The mortar will rise a little into the joint between the units.

On sand

Spread a layer of loose sand 25 mm thick and level it off. Lay the paving units on this and tap each one firmly into place with, for example, a wooden mallet.

Check regularly that the paving is at the correct slope and that the units are correctly lined up.

7. jointing

With sand

Pour dry sand on the surface of the paving and brush it into the spaces between the units. Then water it lightly to wash the sand well down into the joints. The sand stabilises the paving by limiting the movement of the units.

With mortar

For a jointing mortar mix one part cement thoroughly with four parts sand, then add water slowly and mix to a soft paste. Completely fill the joints with mortar.

If the units are laid on a mortar base, the joints should preferably be filled within about two hours of laying the mortar bedding. This will ensure a good bond between the joint and bedding mortars.

Dry sand-cement mix (1 part cement, 3 parts sand) can be brushed over the paving and lightly watered into place provided that the surfaces of the units are smooth enough to ensure that spillage on the surface can be removed entirely.

Use a wet cloth or brush to remove any mortar from the top of the paving while it is still plastic: once it has hardened it is difficult to remove.

Where large areas are paved with mortar-filled joints, it is advisable to provide contraction joints at intervals of not more than 2 metres. They should be about 10 mm wide, extend right through the paving and be filled with sand.

8. curing mortar

Cover paving that has been laid with mortar with wet sacking or plastic sheeting for two or three days so that it does not dry too quickly. Premature drying results in the mortar not developing its full strength and the paving may crack.

Note: Methods of paving for driveways and other areas that will be used by motor vehicles may differ from the above. Consult relevant publications before building driveways or other areas which may need to take heavier loads.

More information can be obtained from the Cement and Concrete Institute (contact details below) and the Concrete Manufacturers Association on e-mail cma@mweb.co.za or the website at www.cma.org.za

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