Lay a concrete driveway at home

A well-laid concrete driveway will give at least 20 to 30 years trouble-free service and can be laid quite easily by the ordinary homeowner.

The concrete must be of high quality and be at least 75 mm thick. A width of 2,75 m is adequate. To prevent random, unsightly cracking, joints should be provided across the driveway at intervals of 2,5 to 3 m: i.e. the concrete should be laid in panels that are square or nearly so.

The surface of the driveway should have a cross-fall of about 1 in 40 so that water can drain off it. There should not be any low areas where water can accumulate. The driveway should slope away from the garage for at least a metre so that the garage is not flooded when it rains.

1. Preparation

The ground below the driveway must be firm and stable to ensure that it does not settle unevenly at a later stage. The base must have the same slope(s) as the driveway.

Remove all roots and vegetable matter, and, preferably, the topsoil.Then trim the base to the required levels and slopes. Next, check that the surface is uniformly firm. Soft areas and any fill used to make up the levels should be tamped down with, for example, the end of a gumpole. If a large area has to be compacted, consult a plant hire firm about suitable equipment.

Formwork

Forms should be provided to retain the fresh concrete. Steelforms or timber, nominally 35 mm by 75 mm, with at least the top edge planed, are suitable. The forms are held in place by stakes at about 1 m intervals. They must be set firmly and accurately because the concrete is finished flush with the top edges. Forms should be given a coat of form oil or white wash before use to prevent the concrete sticking to them.

Side forms are placed along the sides of the driveway. They can be removed, cleaned, re-oiled and re-used the next day.

Cross forms are placed between the side forms to form the panels.

Materials for concrete

You will need cement, sand and nominal 19 mm stone.
All cement sold in South Africa must meet the requirements of SANS 50197 for Common cement or SANS 50413 for Masonry cement and the National Regulator for Compulsory Standards (NRCS) requirements as detailed in NRCS VC9085.

Bags should be clearly marked with the strength grade, notation indicating composition and a Letter of Authority (LOA) number issued by the NRCS. An LOA is issued for each cement type from each source. To verify valid LOA numbers contact the NRCS on 012 428 5199 or www.nrcs.org.za.

Note: that Masonry cements complying with SANS 50413 are not permitted to be used in concrete.

Store cement in a dry place on timber or sheets of plastic or iron to keep it off the floor. If it contains lumps that cannot be crumbled easily, it is old and should not be used. *Protect the sand and stone from contamination.*

Concrete mixes

Each batch of concrete should consist of one bag of cement, 80 litres sand, 80 litres stone and enough water to make a workable mix.

For every cubic metre (m^3) of concrete, you will require 7,7 bags of cement, 0,62 m^3 sand and 0,62 m^3 stone. When ordering materials, allow for approximately 10% waste. (**Note:** 1 000 litres = 1 cubic metre.)

Pigments can be added to the concrete to colour the driveway.

2. Mixing and placing the concrete

Measuring the sand and stone

Wheelbarrows and 10, 20 or 25 litre drums are useful measures.Make sure they are clean because oil, fertiliser, sugar, organic or inorganic material will harm the concrete.

A builder's wheelbarrow holds 65 litres when filled and struck off level with the brim. Drums hold approximately 10 per cent more than their nominal capacity when filled and struck off level with the brim. The capacity can be checked by filling the container with water measured from a 1 litre bottle or jug.

Mixing the concrete

Mix the concrete on a clean, smooth, hard surface such as a steel sheet or a concrete floor. Spread the sand in a layer about 100 mm thick and pour the cement over it. Thoroughly mix the two until the colour is uniform.

Add water slowly and continue mixing until the consistence is rather like a thin porridge. Then add the stone and mix it in thoroughly. The concrete must be able to stand in a heap, but must settle quickly if prodded with a spade. Do not make the concrete too sloppy, or too dry.

Placing the concrete

Moisten the ground before placing the concrete. There should be no free water on the surface when the concrete is laid. Each panel must be completed in one operation.

Place the concrete in the panel so that it stands about 25 mm above the forms. Make sure there are no gaps along the forms or in the corners.

Use a 50 mm thick plank that is long enough to stretch across the panel to compact the concrete. If a handle is fixed to each end of the plank, the job will be easier.

First, use a chopping motion to compact the concrete. When free water appears on the surface, the concrete has been compacted sufficiently.

Now, resting the plank on top of the formwork and using a sawing motion, work it gradually from the one end of the panel to the other to level the surface and remove the excess concrete.Fill any hollows, if necessary. Wood float the placed concrete to an even surface. The concrete can be lightly brushed with a soft broom once it has started to harden. Use an edging tool to round the edges of the panel.

3. Joints

If mixing is done by hand, it will be possible to lay one or maybe two panels (2,75 x 3,0 m) in a day. If a concrete mixer is used, more panels can be laid.

To form joints, it is suggested that alternate panels be laid on the first day. The cross forms are removed and the in-fill panels laid against the hardened concrete the next day or later.

If large quantities of concrete are ordered from a ready mix supplier, plan the job carefully so that the concrete can be placed, compacted and finished before it hardens. In this case joints can be formed by pressing a blade about 3 mm thick about 20 mm into the concrete before it has hardened.
Remove the blade and drop a piece of bituminous felt (Malthoid) or heavy duty plastic sheeting, cut to size, into the groove.

4. Protection and curing

It is essential that concrete be prevented from drying out. If there is any delay between placing and finishing off the concrete, it needs to be protected especially in dry, windy weather. Covering with plastic sheeting is recommended until finishing occurs. For the concrete to develop strength it should be kept damp for an adequate period after placing. Damp-curing should be continued for at least 10 days in warm weather and 14 days in cold weather. The curing procedure recommended is to cover the work, as soon as surface texturingis complete, with plastic sheeting that is kept in place with a thin layer of sand or soil over it and stones, planks, pipes or gumpoles along the edges to stop the wind getting under the sheeting.

5. Opening to traffic

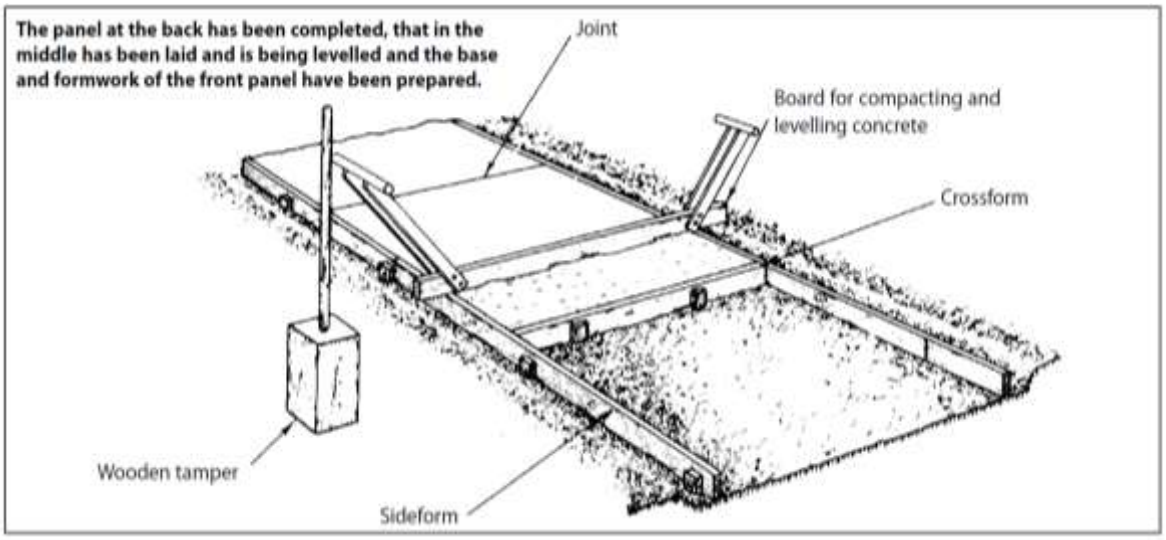
The driveway can be used by pedestrians after one day, by cars after about five days and by other heavy vehicles after ten days.

6. Strip driveways

Strip driveways are much more economical. Each strip should be 600 mm wide and the centres of the strips should be 1,5 m apart.

The concrete must be at least 85 mm thick and joints should be provided every 1,5 to 2 m. The easiest way to make joints will probably be to cast 50 mm wide strips of hardboard (3 mm thick) vertically in the concrete so that the top of the hardboard is flush with the surface of the concrete.

All other aspects of laying strip driveways are the same as those for full-width driveways. (See also *Concrete Strip Roads for the Farm* leaflet).



The panel at the back has been completed, that in the middle has been laid and is being levelled and the base and formwork of the front panel have been prepared.

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