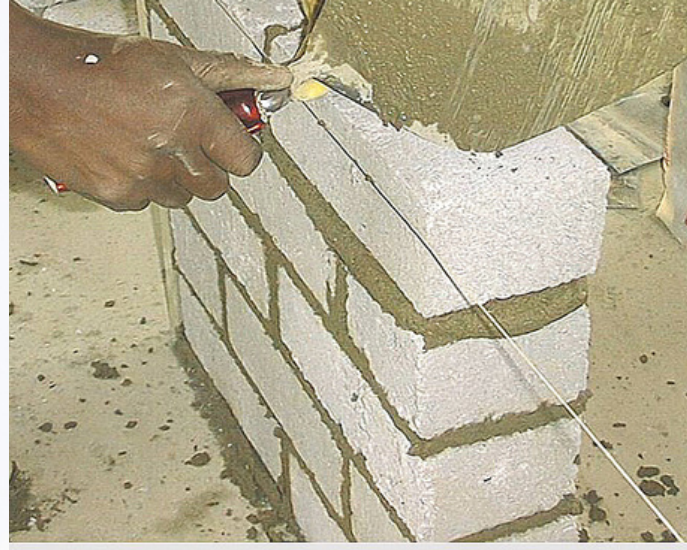


QUALITY OF MORTAR MIX IMPORTANT FOR SUSTAINABILITY



The quality of the mortar invariably determines the durability of any new structure, says Matthews Magwaza, lecturer at Cement & Concrete SA's School of Concrete Technology.

"Mortar binds bricks and blocks together to give strength and stability to a wall. In developing countries, where contractors tend to produce their mortar rather than factory-purchase it, correctly produced mortar is essential to ensure sustainable structures," Magwaza states.

He says freshly mixed mortar must be soft and plastic to spread easily and make good contact without becoming too strong. Mortar that is too strong may crack and is wasteful and expensive. "The proportion of each material in the mix should suit the type of work. In general terms, the classes of mortar commonly used in South Africa are Class I for high-strength structural units such as multi-storey load-bearing buildings or reinforced masonry. Class II mortar for normal loadbearing applications, parapets, balustrades, retaining structures, freestanding and garden walls, and walls exposed to possible severe dampness."

Magwaza says the preferred cement types for quality mortars are:

- Common cement complying with SANS 50197-1; and
- Masonry cement complying with SANS 50413-1; strength class 22,5X.

"The addition of lime in the mortar mix is optional. However, lime should be used if the sand lacks fine material or is single-sized, as such sands tend to produce mortar with poor workability unless lime forms part of the mix. Lime also helps the fresh mortar to retain water when it is placed against dry masonry units and helps to prevent cracking of the hardened mortar. Use only building lime complying with SANS 523, and do not use quick-lime, lime wash or agricultural lime.

Never use lime with masonry cement.

"The sand in the mix must not contain organic material produced by animal or plant activities, nor particles retained on a sieve of nominal aperture size 5 mm. When 2,5 kg of cement is mixed with 12,5 kg of air-dry sand, the mixture shall not require more than 3 litres of water to be added to reach a consistency suitable for laying masonry units. When mixed with the cement in accordance with the mix proportions, the sand must have workability suitable for laying masonry units. Sands that require more than 3 litres of water to reach a consistency right for the laying of masonry units can, in some instances, be blended with coarse sand for compliance. Trials can determine the proportion of the blended sand. Some pit sands are suitable. However, river, dune and beach sands are often too uniform or too fine to give good results without being blended with another suitable sand.

"When it comes to batching, a 65 litres builder's wheelbarrow is a convenient measure for large batches. Steel drums of 20 or 25 litres capacity and buckets are useful for small batches.

"Mixing should be done on a clean hard surface such as a smooth concrete floor or a steel sheet. Small batches may be mixed in a wheelbarrow provided that the volume of the batch is no more than half the capacity of the barrow. Sand, cement, and lime (if used) should be mixed dry until the colour of the mix is uniform. Then add water in small quantities, mixing after each addition, until the mix is soft and plastic," he explains.

Magwaza says if the mortar is left in the sun before use, it must be covered with plastic sheeting or a wet sack. Mortar that has stiffened so much that it is impossible to restore workability without adding more water should be discarded.

"Mortar must not be used after it has started to set, which usually occurs about two hours after it has been mixed. Also, do not use too thick a layer of mortar between bricks or blocks; this is wasteful and may lead to cracking," he cautions.