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Case Study 16

Stabilised soil block tanks in Kampala, Uganda



In March 2000, two experimental cylindrical water tanks were built at Kawempwe, Kampala in collaboration with Dr Moses Musaazi, a lecturer at Makerere University. Both were built above ground of curved stabilised-soil blocks with end interlocking, 280mm x 140mm x 110mm high, made with an Approtec (Kenyan) manual block press. The soil used was a red somewhat pozzolanic local soil previously known to make strong blocks. The tanks were built on concrete plinths, lined with 'waterproofed' mortar (3 parts sand, 1 part cement and .02 parts 'Leak Seal' waterproofing compound). There was no metal reinforcing.

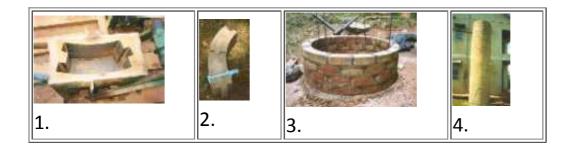
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Tank 1 is 2050mm high, has internal diameter 1300mm, wall thickness 140mm (+ 15mm render) and used 15 x 15 = 225 blocks incorporating 6% cement (100 blocks per 50kg bag). It has been filled with water and therefore has withstood a maximum head of 2.05m at the wall bottom. Volume = 2720 litres, max hoop stress = 0.19 MPa

Click on the thumbnails below to see:

1. The Aprotech curved interlocking block making machine

- 2. The finished curved interlocking blocks
- 3. A small diameter tank under construction
- 4. The 5m high SSB tank built for pressure testing purposes



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Tank 2, for test purposes, has been built to 5m high, has internal diameter 1000mm and the same wall thickness, but with only 3% cement (180 blocks per 50 kg bag). It has been filled with water and therefore withstood a head of 5.0m at the wall bottom.

Materials used for a standard 2 m high tank included 1 packet (50kg costing $\$_{US}$ 11) of cement for the render, 1 packet for a conical (reinforced) lid, 1 packet for mortar between the blocks and 1/2 packet in the foundation. Thus only 20%. to 25% of the cement is in the blocks themselves. Experiments to achieve curved blocks with *vertical* interlocking, if successful, will significantly reduce the quantity of mortar needed for block-laying. The lid may well be made more cheaply, as that employed was designed to carry certain testing devices.

Report by Dr Terry Thomas of the DTU

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