

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.

Tank 1 is 2050mm high, has internal diameter 1300mm, wall thickness 140mm (+ 15mm render) and used $15 \times 15 = 225$ 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 Aprotect 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



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 \$US11) 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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