

**Draft Short Manual  
On  
Fabricating Brick Cement Tanks**



*A large brick cement tank, Chimoio Mozambique, June 2006*

**Arrakis & Connect International**  
[www.arrakis.nl](http://www.arrakis.nl) & [www.connectinternational.nl](http://www.connectinternational.nl)

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### Context

- A water reservoir can store rainwater for domestic use or for irrigating a vegetable garden. The Brick cement tank is inexpensive and can be constructed with bricks, cement and steel wire. No construction steel is needed.
- A tank can be build for instance under a roof to collect rain water or within 1 meter from a well with a rope pump.

### Materials needed :

Tank Data		TANK of 400 ltr	Tank of 2 m3	Tank of 10 m3
Description	Unit	Measure	Measure	Measure
D=Diameter tank	m	0.85	1.95	3.60
H=Height of tank	m	0.70	0.70	1.00
Layers of stones	nr	3.00	3.00	4.00
V= Volume of tank	M3	0.40	2.09	10.17
Size of stones	mxm	0.23 x 0.11	0.23 x 0.11	0.23 x 0.11
<b>Number of stones (+spares)</b>	<b>nr</b>	<b>90</b>	<b>200</b>	<b>540</b>
<b>NET Length of 1.5 mm black steel wire</b>	<b>m</b>	<b>30</b>	<b>60</b>	<b>140</b>
<b>Bags of cement</b>	<b>bags</b>	<b>0.5</b>	<b>1</b>	<b>2</b>
<b>Sand</b>	<b>bags</b>	<b>2</b>	<b>4</b>	<b>8</b>
<b>1 " PVC pipe</b>	<b>m</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>

### How to make

#### Example of the 400 liter Tank.

1. Take the materials to the place where you will build the tank.
2. Clean surface of a round of diameter plus 0.5 m, make it horizontal and flat.
3. Draw a circle of 85 cm, for instance with a piece of wire and 2 sticks
4. Put a first round of bricks around this circle, with long sides vertical. Make sure that bricks are more or less straight and without obstacles
5. Put a wire around the bricks, 3 cm from the top. Tighten the wire by making a loop on 1 end and pulling through the other end
6. Put 2 other wires, 1 in the middle and one 3 cm from the bottom
7. Put a second and a third round of bricks on top and also place wires, step 5 and 6.
8. Make cement starting with 1/3 bag of cement . Mix 1 part of cement with 4 parts of sand, small gravel (if available), and water
9. Apply a thin layer on outside and inside of the tank just to cover bricks
10. Make a water outlet. a steel pipe or thick walled PVC pipe of 1 " , 25 cm long
11. If steel is used weld pieces of round bar to it to fix it in the cement. If PVC is used put PVC glue and sand to increase grip of the Pipe in the cement, or make the PVC pipe end a bit square by heat from a fire
12. Place it 3 cm from the bottem and make wall thickness at the part of the outlet 15 cm thick
13. Put cement on the floor of the tank 3 cm thick

14. Mix only cement and water to form a thin solution and "paint" on the inside of the tank with a tool or large brush. Let it dry for about half a day.
15. Let the cement cure, Cover the tank with plastic sheet or paper and KEEP IT WET during 10 days, Put water 2 times or more every day!!
16. Place a filter (Sock or other piece) on the water outlet to filter impurities. This is important if the water is used for drip irrigation. It will keep the little holes from getting blocked.)

If bigger tanks are needed make bigger circle and increase number of bricks and cement accordingly.

***Brick cement tank (400 Litre) Construction Used in Arrakis and CI projects***



*Prepare surface, Horizontal  
Draw a circle. Place bricks,  
Mount 1<sup>st</sup> wire 3 cm from top*



*Measure with a stick to make sure the circle is round.  
Mount 2 more wires*



*Place 2<sup>nd</sup> round of bricks,  
Scrape of a little from edge to safe on cement*



*Make sure bricks are in line as much as possible  
to safe on cement.*



*Make bricks wet, before applying cement*



*Finish inside and outside and as last part bottom  
and outlet pipe*