

How to construct a ferrocement rainwater harvesting tank



Philippine Center for Water and Sanitation
WASH Coalition Pilipinas



Ferrocement:

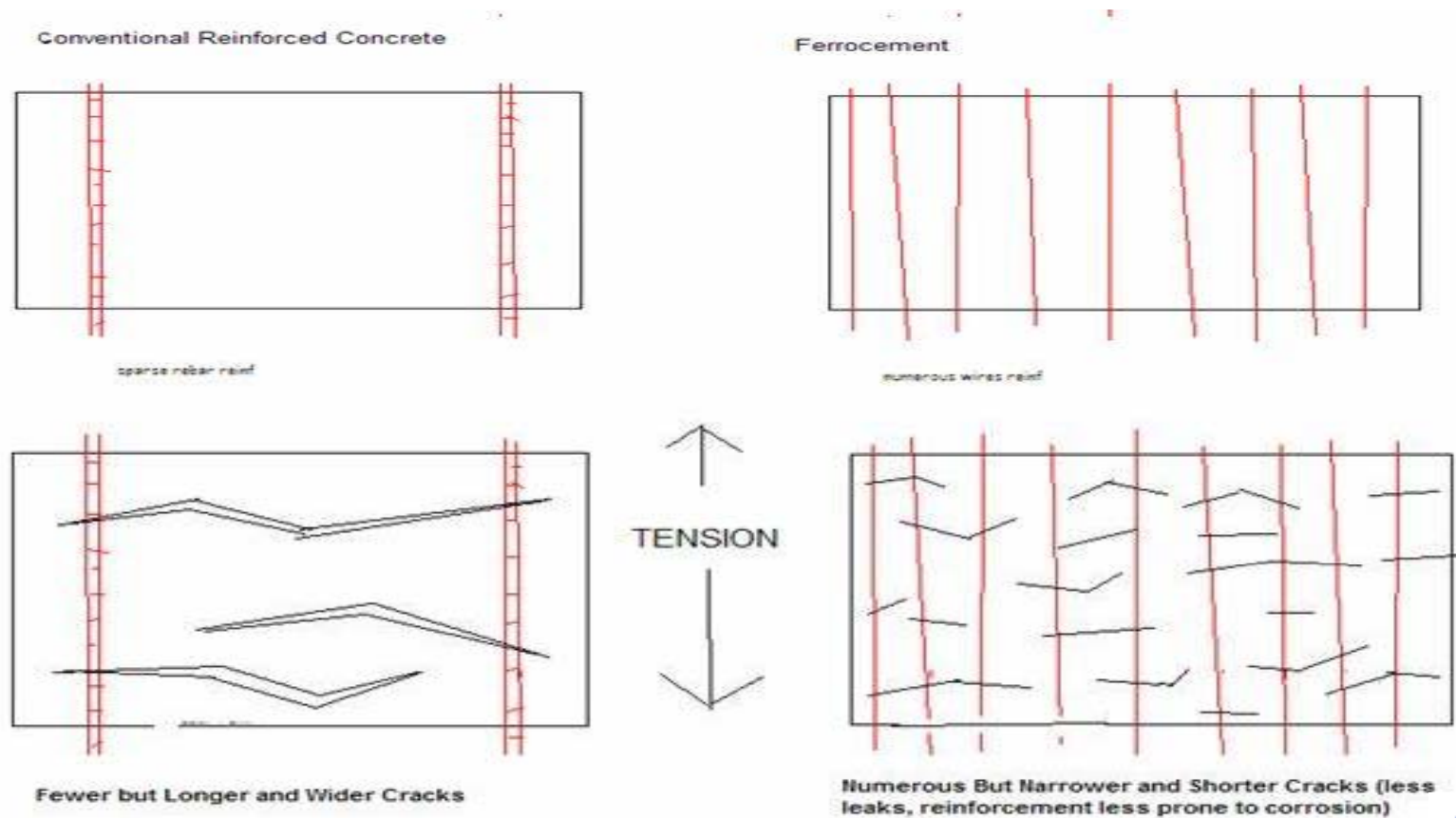


- a concrete construction technology that favors the use of closely-spaced mortar and small diameter reinforcement such as wires and meshes;
- as opposed to graveled concrete and rebars mainly used by conventional reinforced concrete.



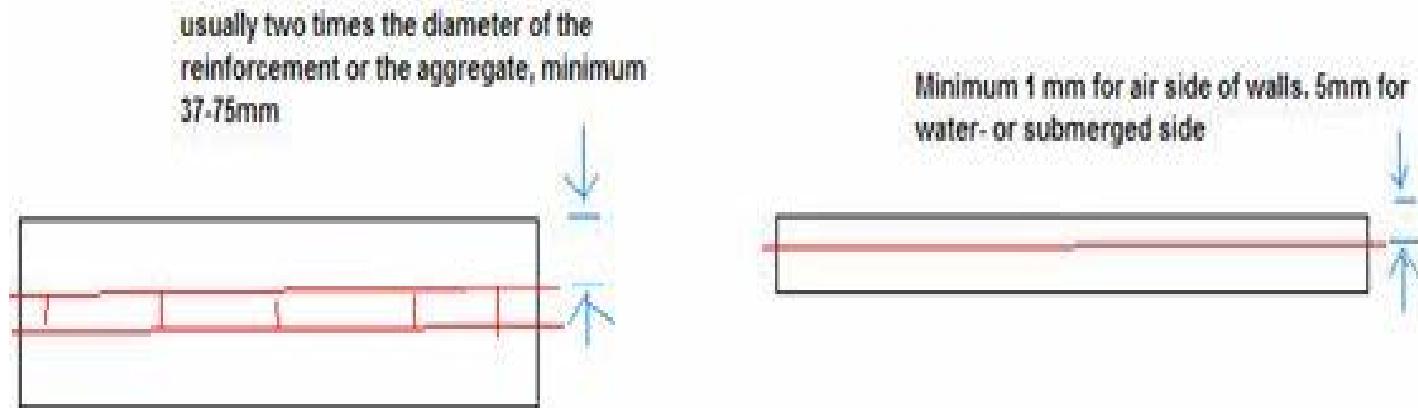
Advantages of Ferrocement Over Conventional Rebar Concrete

1. More bonding area, more dispersed reinforcement = more crack resistance and usually, savings in reinforcement needed.



Advantages of Ferrocement Over Conventional Rebar Concrete

2. Smaller diameter reinforcement + smaller aggregate sizes = less concrete as steel cover = thinner sections = possible savings in concrete.



Ferrocement structures usually cost 65-85% less than conventional reinforced concrete.

Advantages of Ferrocement Over Conventional Rebar Concrete

3. Thinner sections = enables the use of reusable forms.



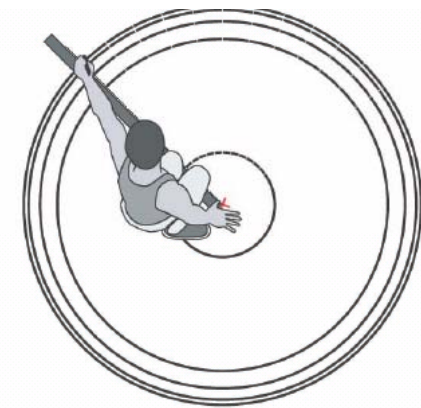
Advantages of Ferrocement Over Conventional Rebar Concrete

4. Reusable molds facilitate curved shapes = stronger structures.

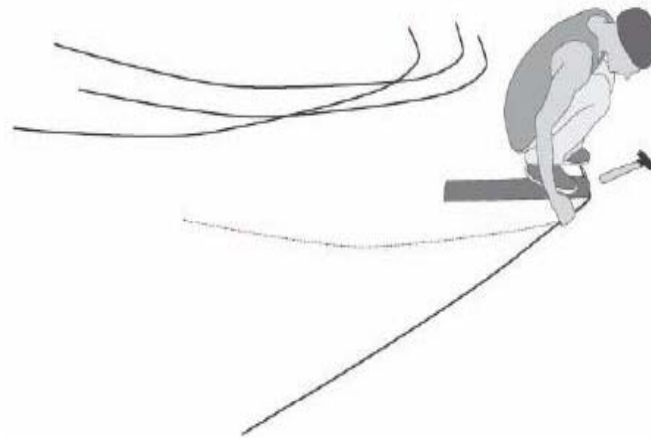


MAKING A 5,000-LITER TANK: A Typical Ferrocement Construction

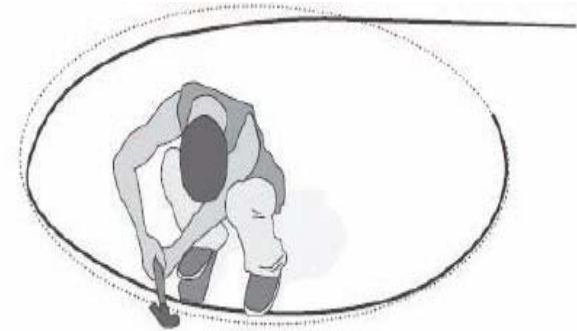
1. Making the reusable mold:



Drawing the rebar patterns.



Cutting and bending the rebars for the molds.

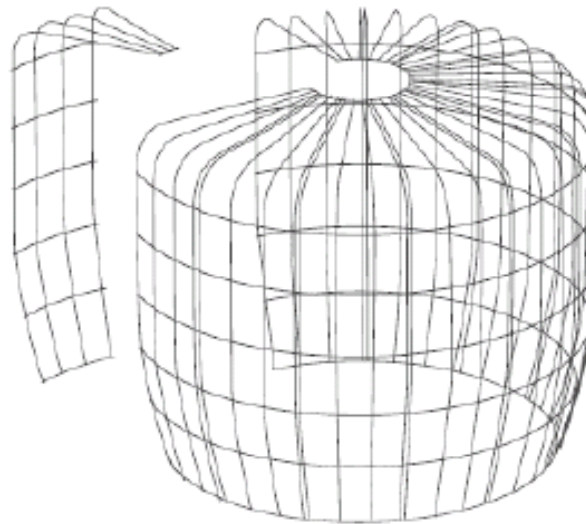


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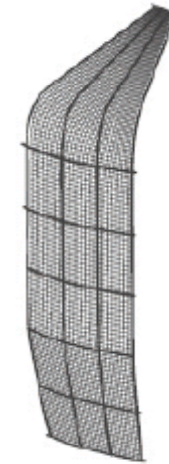
1. Making the reusable mold (cont'd.):



Welding the rebars together to form the mold.



Cutting the mold into panels.

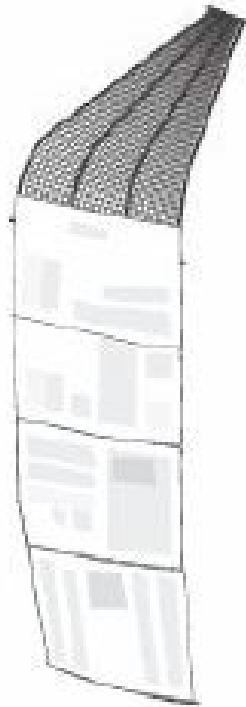


Cladding the panels with wire mesh.

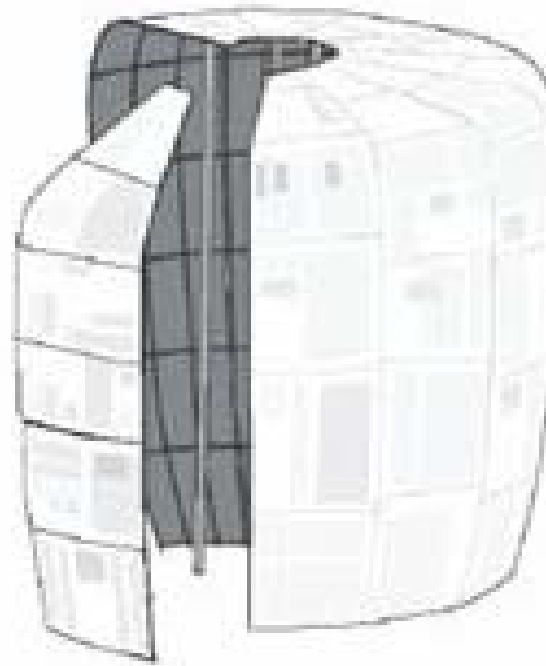


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2. Making the tank (cont'd): Preparing the molds for use



Papering over the mold panels.

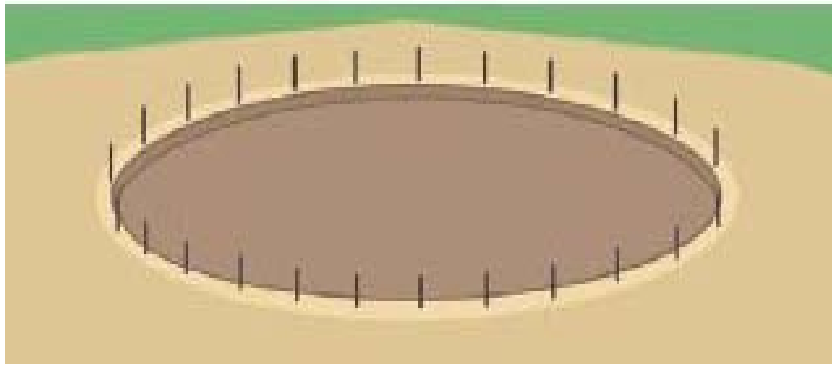


Assembling the panels together over the tank base.

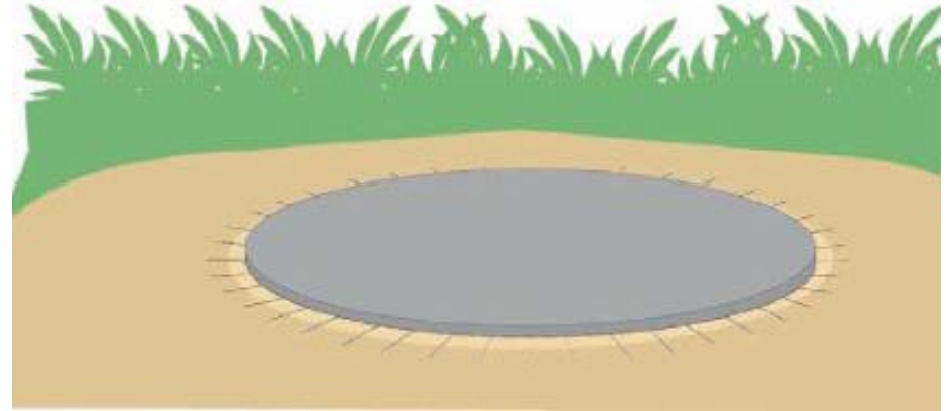


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Making the tank base



a. The ground is leveled and staked.



b. Plain GI strips and rebar ring comprise the base mold; a base course of gravel is laid.



c. A reinforcing grid of tie wire is laid; concrete is troweled in.

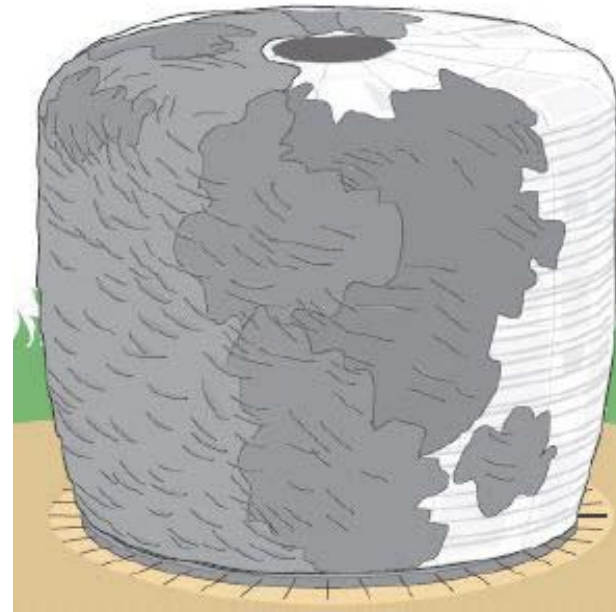


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Constructing the tank



Winding some wire around the tank to hold the paper.



One or two mortar coats.



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Constructing the tank



Vertical wire reinforcement.



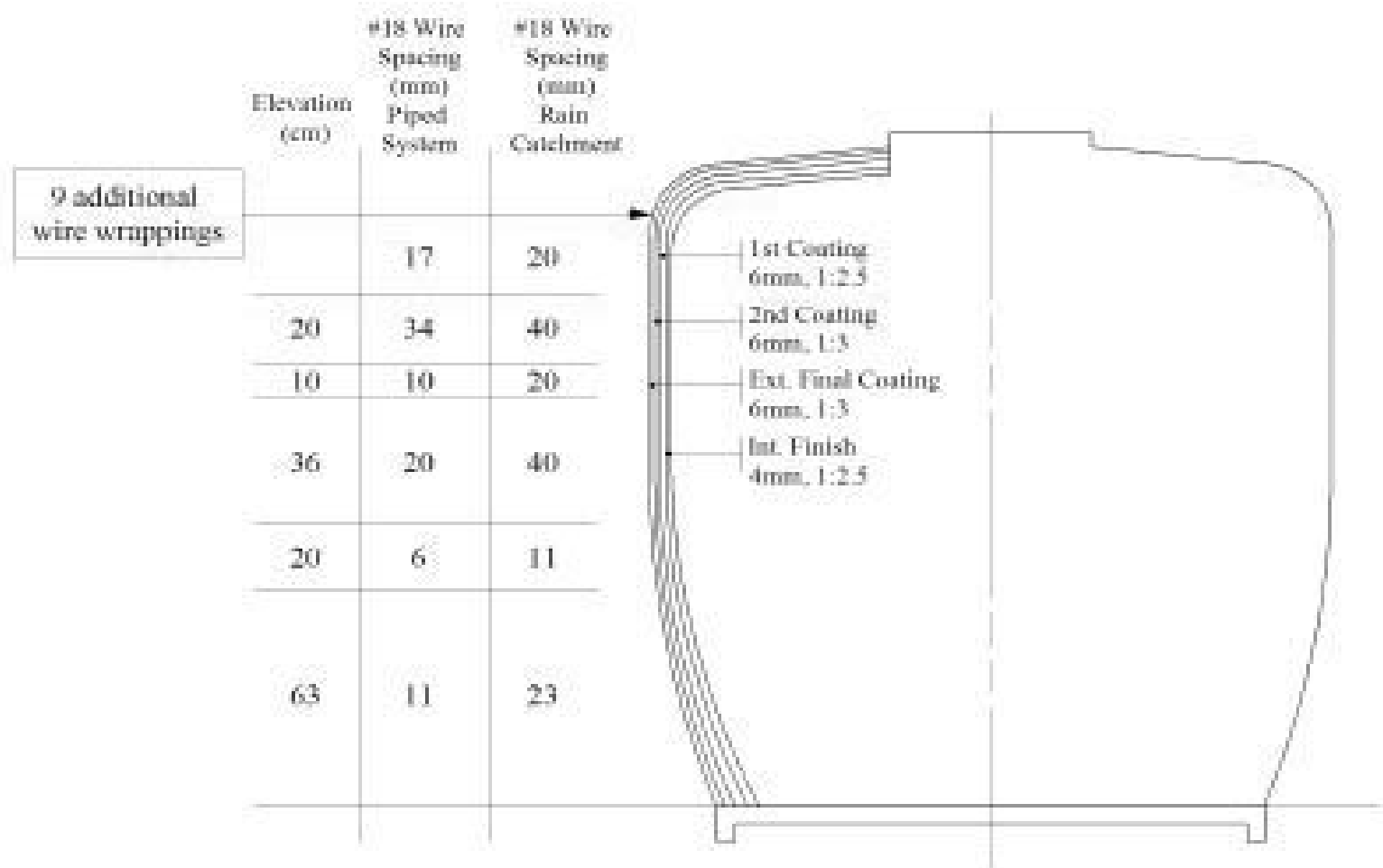
Horizontal wire reinforcement
to resist the water pressure.



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Constructing the tank

Wire positions and spacings.

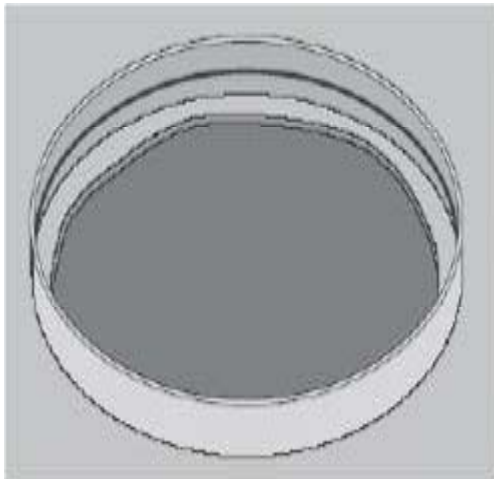


Example of horizontal wire spacing for a 5,000 liter tank

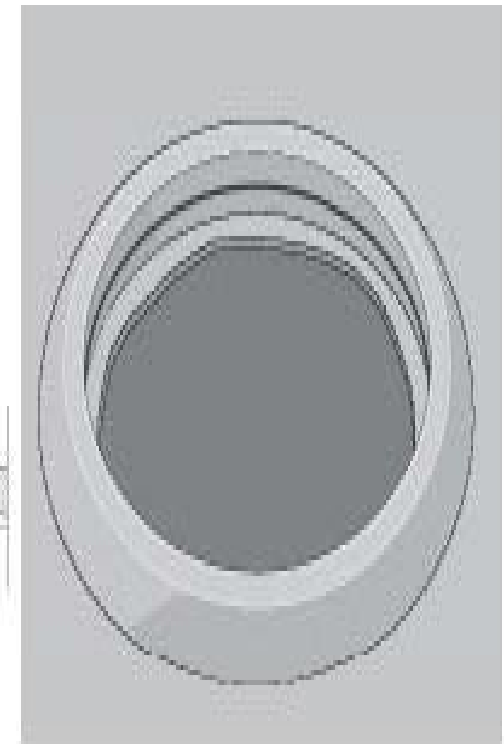
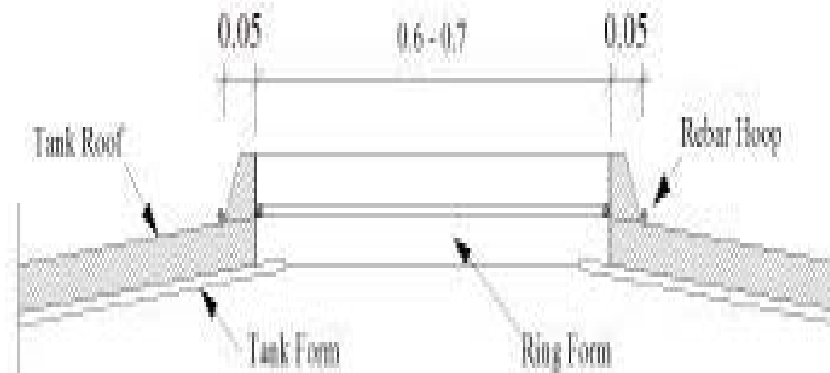


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Making the tank (cont'd): Lip construction details



Lip mold set atop tank.

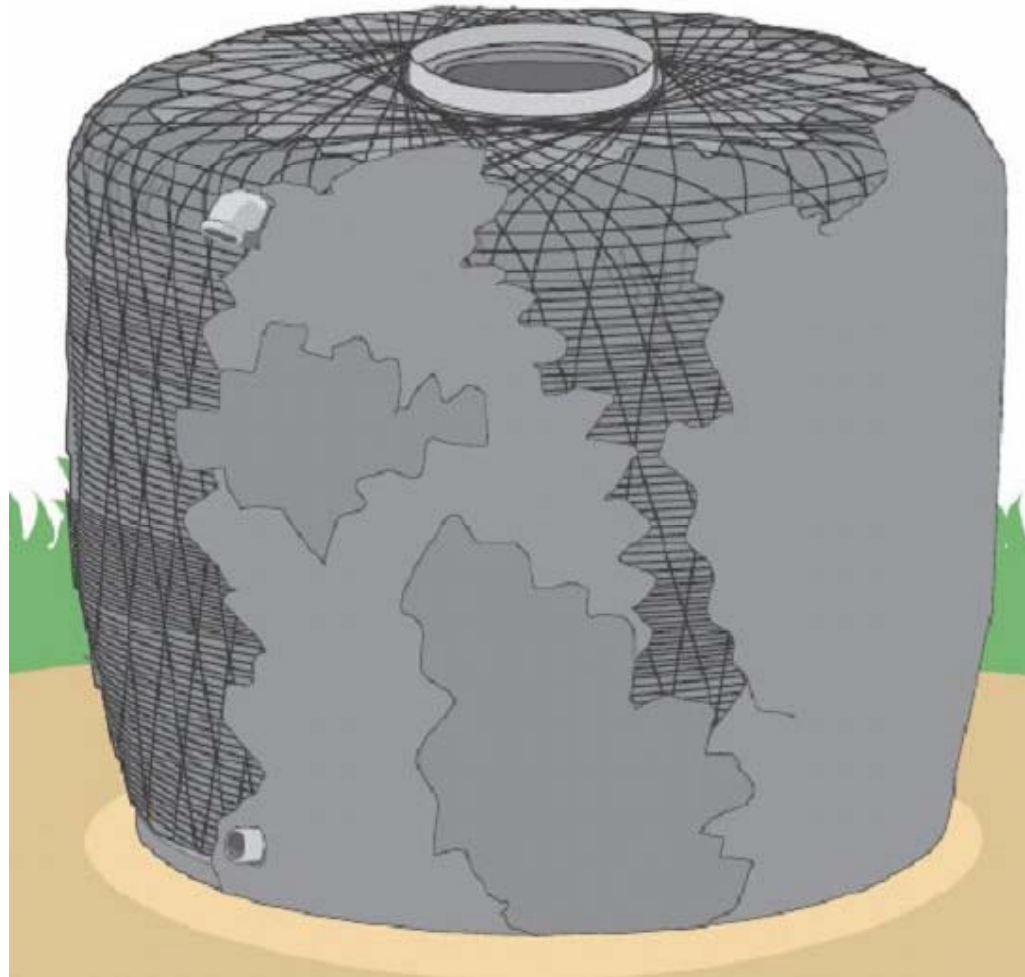


Lip mold details.



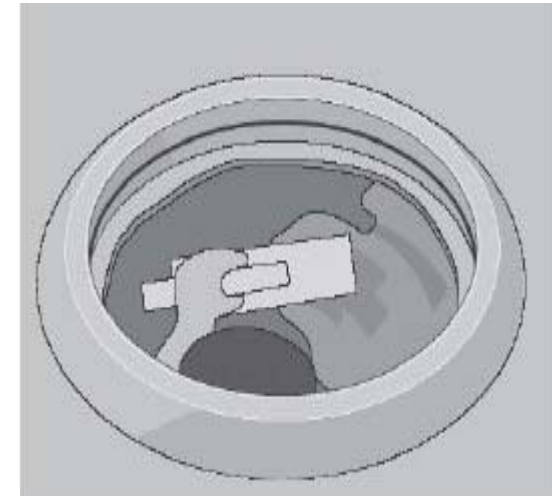
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Finishing the tank exterior with more mortar



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Finishing the interior

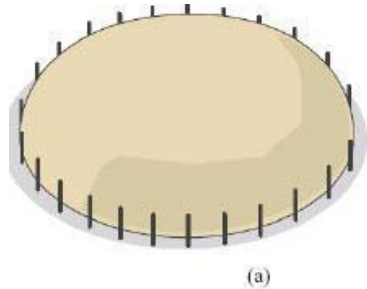


Interior finish of
mortar then a final
flooring layer.

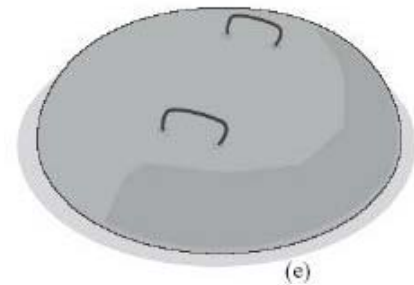
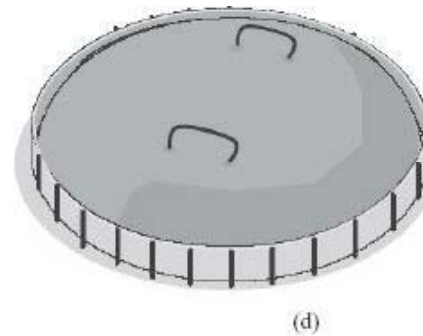
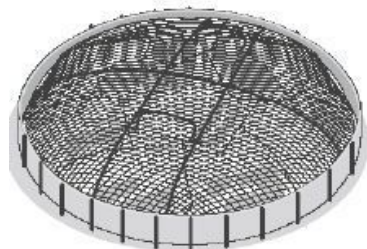
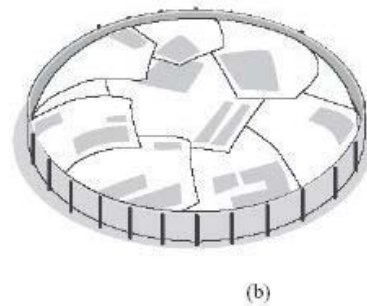
De-molding the following morning.



MAKING A 5,000-LITER TANK: A Typical Ferrocement Construction



Making a manhole lid



Emplace mortar;
demold.

Shape earth. Stake. Line with
news papers. Place lid mold and
reinforcement.



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A finished
rainwater
harvesting
tank



For more information please contact



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and



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