Soak pit design — Septic tank Design calculation (Step by Step)

Soak pit design and Septic tank Design calculation

Hello, guys in this article we will discuss the design of the septic tank and soak pit. Septic tank is made up of concrete, polyethylene, fiberglass, etc. It is buried underground which is a watertight container.

Septic tank holds waste and useless water for a long time enough to allow the solid particle in water to settle down in the form of sludge but oil grease and fat remains floating on the surface of the tank as scum.

Now let us discuss the design of the soak pit and septic tank.

Step- One

Suppose we have to Design a Septic Tank & Soak Pit for 10 Residential Buildings.

Given,

No of Buildings = 10 Assume

1. No of persons per family = 6 nos

2. Water supply = 200 lits/day

3.Sewage generation = 85 % of water supply

4. Detention period = 24 Hours

5.Cleaning period = One year

6. Length = 4 x Breath, Height = 1.5 meter

7. Sludge Deposit = 40 lit/person/year

8. Minimum freeboard = 300mm

Step- Two

Calculation for Septic tank

Waste water coming from all Building to septic tank= 10 x 6 x 200 x 0.85 = 10200 lit/day

Detention period = 24 hour

Capacity of tank required = 10200/24 x 24 = 10200 lit

Capacity required for Sludge accumulation = 10 x 6x 40 = 2400 lit/ year

Total volume req = 10200+2400 = 12600 lit or 12.6 cum

Area of tank = 12.6/1.5= 8.4 sqm As L = 4xB 4B x B = 8.4 B= V8.4/4 = 1.44 say 1.5m

So, L = 4 x 1.5 = 6 m

Total Depth of Tank = 1.5+0.3 = 1.8 m

Step- Three

Soak Pit Design calculation

Waste water coming out from septic tank = 10200/day

Percolation rate = 1500 lit/m3/day

Volume of filter media = 10200/1500 =6.8 m3

Assume depth of pit= 2m

Area of soak pit = 6.8/2 = 3.4 sqm

Diameter of Soak well required = 73.4 x 4 / = 2.07 m say 2m.

Septic tank Design calculation

Design of Septic Tank & Sock Pit for 10 Residential Buildings
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Assume
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3.Sewage generation = 85 % of water supply
4. Detention period = 24 Hours
5.Cleaning period = One year
6. Length = 4 x Breath, Height = 1.5 meter
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8. Minimum freeboard = 300mm

Septic tank Design calculation

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So L = 4 x 1.5 =6.0m
Total Depth of Tank = 1.5+0.3 = 1.8 m

Soak Pit Design calculation
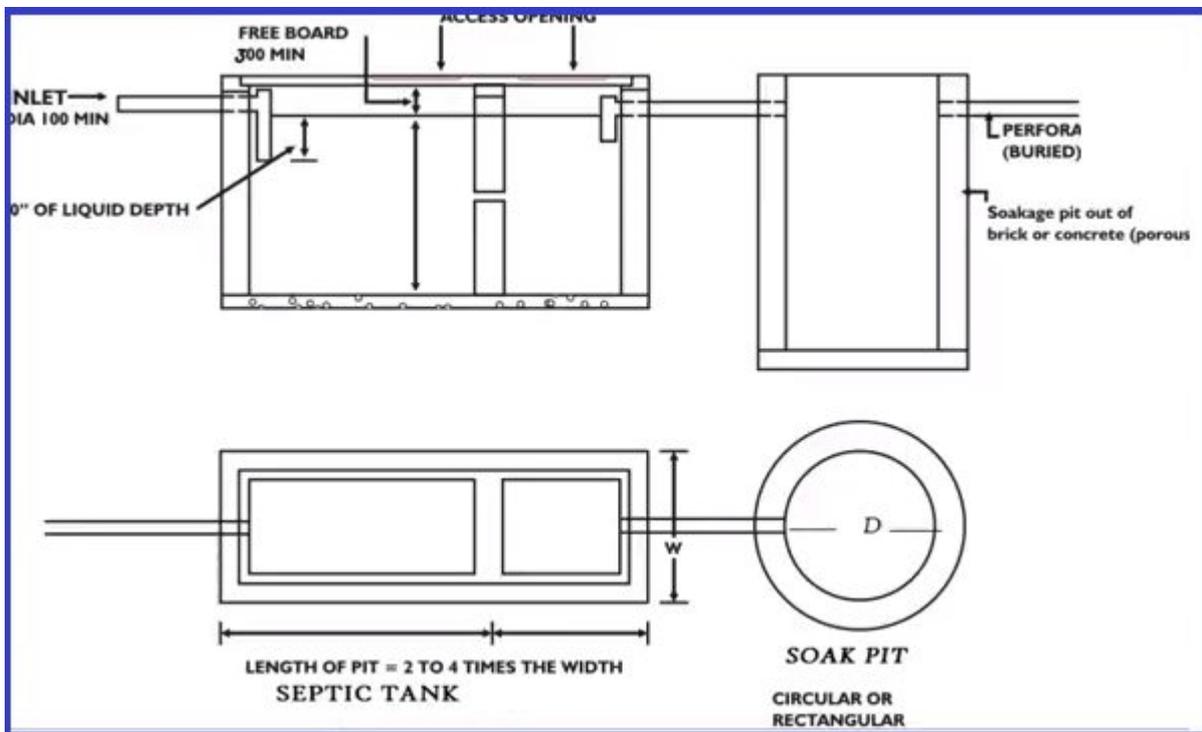
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Video for better Understanding

Hence, in this way we can design a Soak pit for Septic tank Step by Step.

I hope this article on "Design of soak pit" remains helpful for you.

Happy Learning – Civil Concept

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