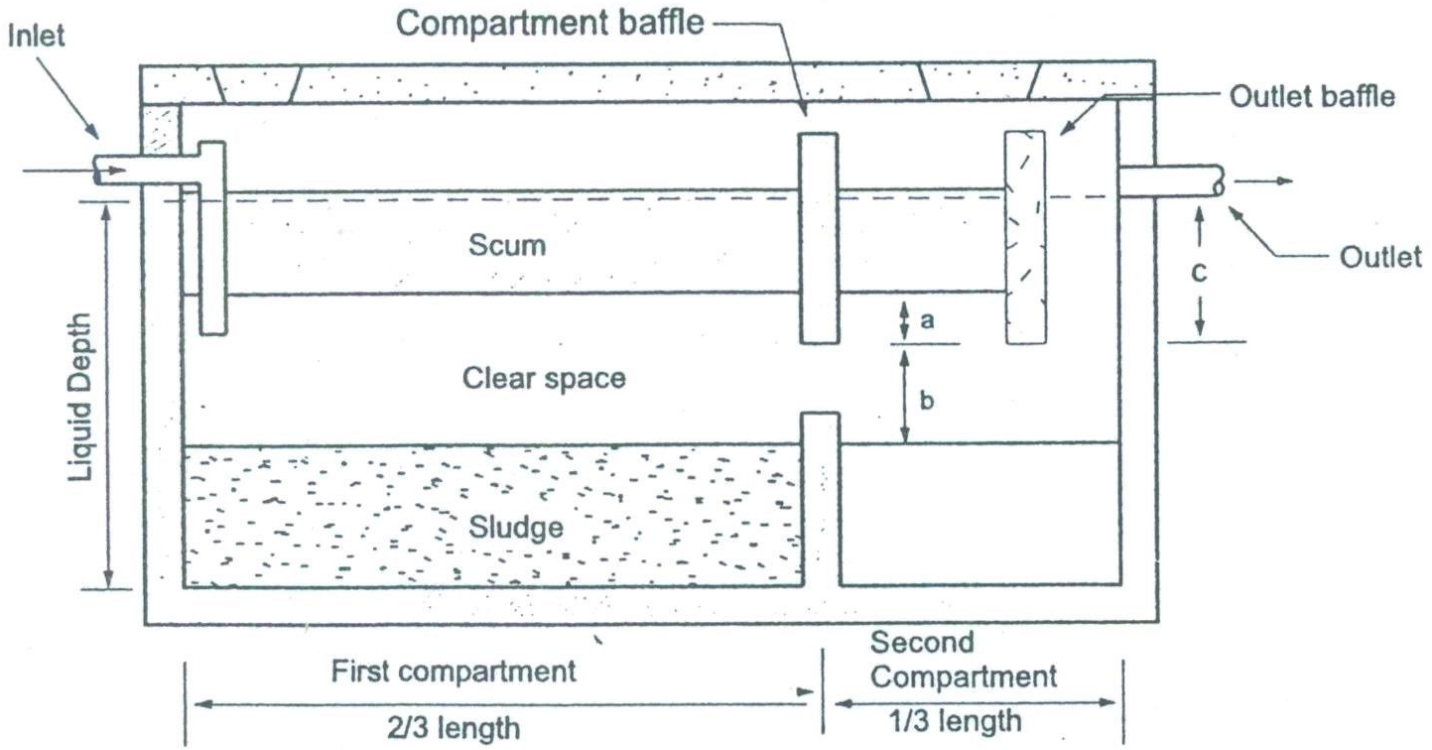
Material Estimation for Septic Tank

Septic Tank

- On-site sewage disposal system
- A buried, watertight receptacle designed and constructed to receive wastewater from a home
- Combined sedimentation cum digestion tank
- Purposes-
  - separate the solids from liquids
  - provide limited digestion of organic matter
  - store solids and to allow the clarified liquid to discharge for further treatment and disposal

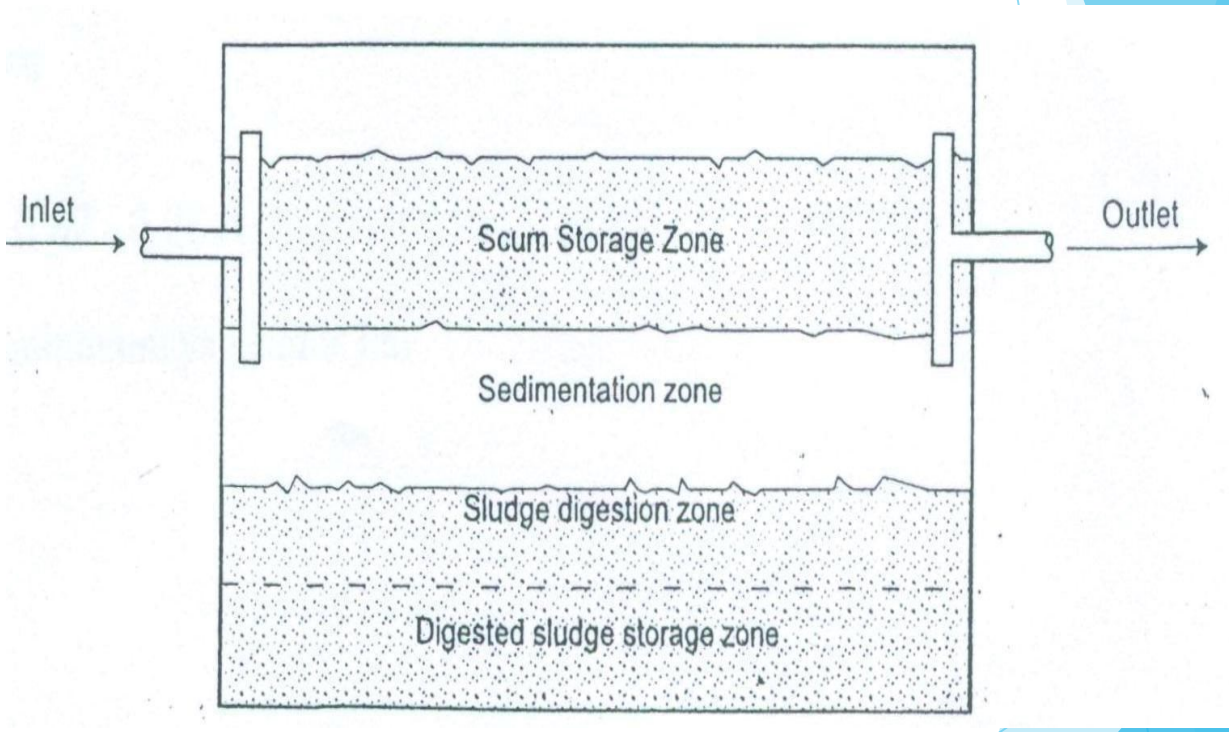
Septic Tank



Components of a septic tank system

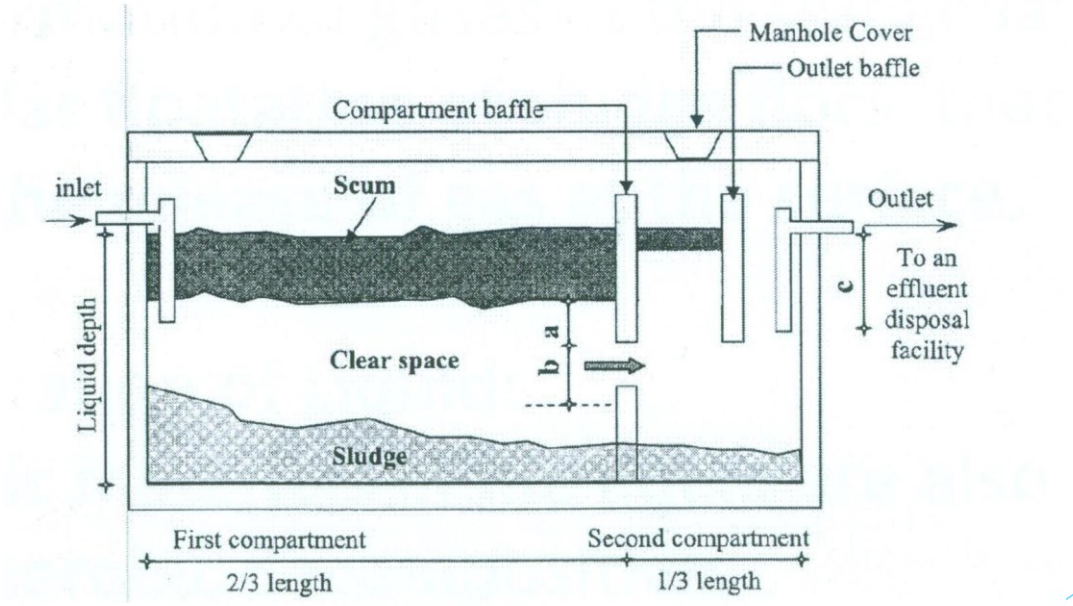
Septic Tank

- Processes in a Septic tank
  - Separation of suspended solids
  - Digestion of sludge and scum
  - Stabilization of the liquids
  - Growth of micro organisms



Processes in Septic Tank

1. Separation of suspended solids and scum: Results in the formation of
   - A sludge layer at the bottom
   - A floating layer of scum at the top
   - A relatively clear layer of liquid in the middle



Processes in Septic Tank

2. Digestion/decomposition of sludge and scum:

Anaerobic bacteria decomposes organic matter in sludge and scum and produces volatile acids, methane. Decomposition helps to reduce volume of the sludge by releasing various gases.

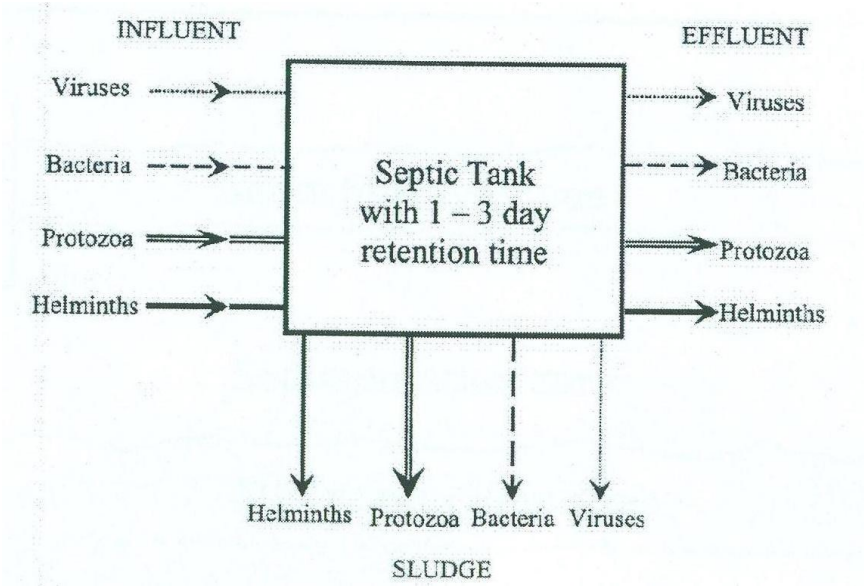
3. Stabilization of liquid:

Organic materials in the liquid are also stabilized by anaerobic decomposition

Processes in Septic Tank

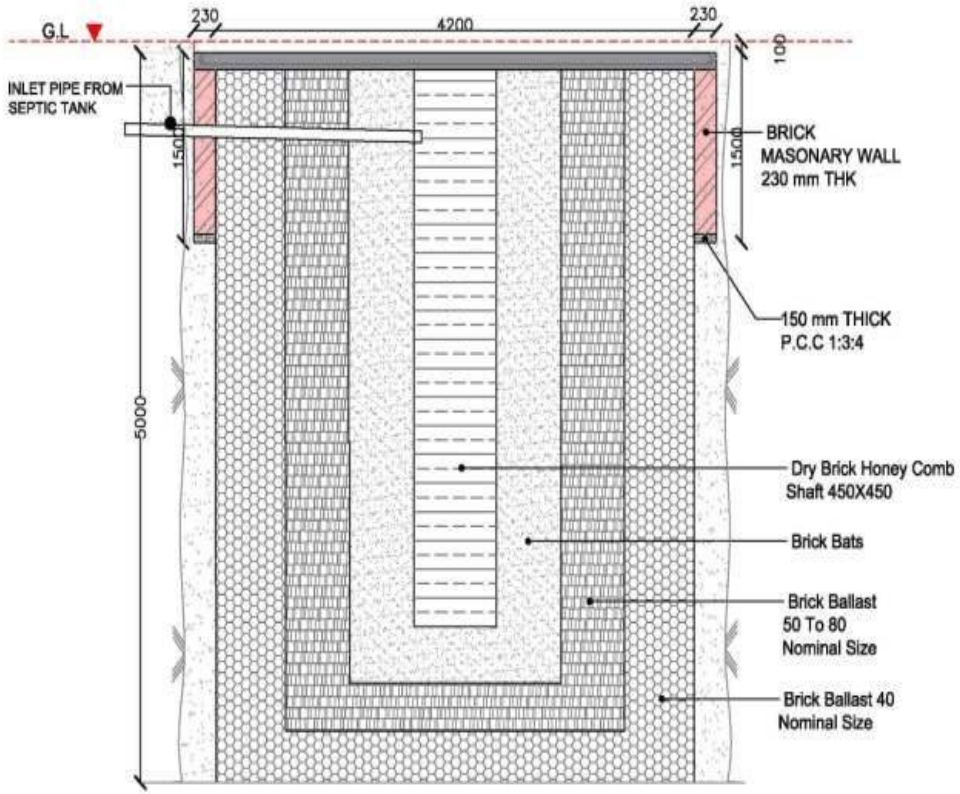
4. Growth of Micro organism

A large variety of microorganisms grow, reproduce and die during biodegradation processes in the tank. Most of them are separated out (by settling) with solids. However a large number of microorganisms (bacteria, viruses, protozoa, helminthis) survive the processes in the tank and remain in the effluent, the sludge and scum.

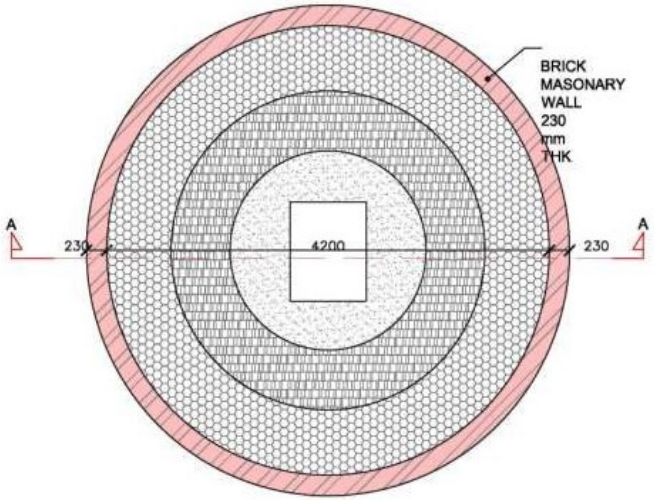


Soak Pit

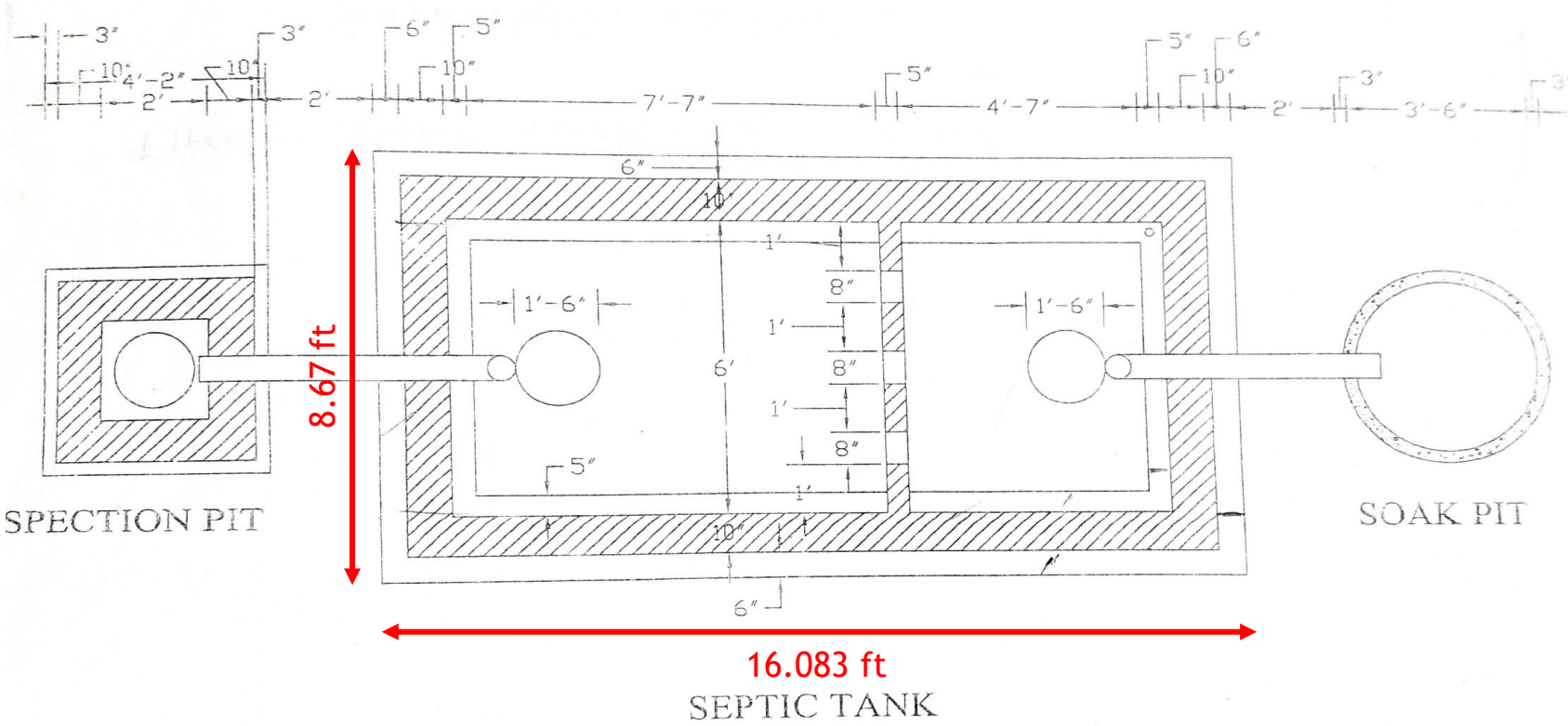
- The pits may be of any regular shape, circular or square being more common.
- The pit may be lined with stone, brick or concentrated blocks with dry open joints. The pit is generally filled with layer of loose stones, bricks bats and brick ballast. The pit may be covered with a RCC slab.
- The Soak pit is a pit through which effluent is allowed to seep or leach in to surrounding soil. The effluent may be disposed of in a soak pit.
- It should be minimum 10 m and preferably 30m away from any source of drinking water, such as well, even bore well to mitigate the possibility of bacterial pollution of water supply.



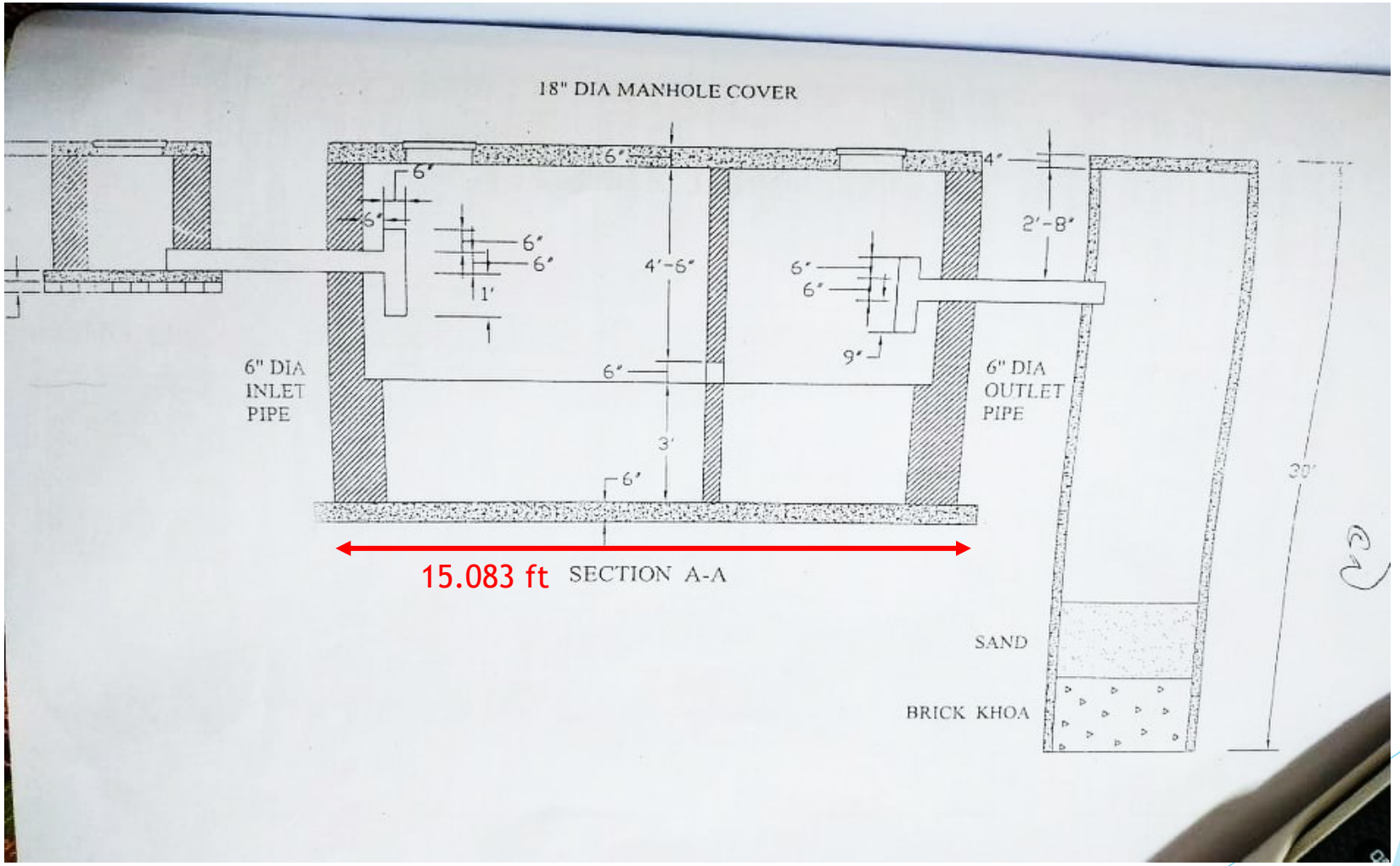
SECTION"A-A"



PLAN
SOAK PIT DETAIL


3″
3″
6″
5″
10″
4′-2″
10″
2′
2′
7′-7″
5″
4′-7″
5″
6″
10″
2′
3″
3′-6″
3″
6″
10″
1′
8″
1′-6″
1′
8″
1′-6″
6′
1′
8″
5″
1′
10″
6″
8.67 ft
SPECTION PIT
SOAK PIT
16.083 ft
SEPTIC TANK

Plan View


18" DIA MANHOLE COVER
6"
6"
6"
6"
6"
1'
4'-6"
6"
6"
9"
4"
2'-8"
6" DIA
INLET
PIPE
6"
3'
6"
6" DIA
OUTLET
PIPE
30"
15.083 ft SECTION A-A
SAND
BRICK KHOA

Earthwork Excavation:

Septic Tank:

Length= 16.083 ft

Width= 8.67 ft

Height= 9 ft

Volume= L X W X H = 1254.54 cft

Soak Pit:

Area= πr^2 sft

= $\pi(2)^2$ sft =12.57 sft

Height= 30 ft

Volume= A X H = 377 cft

Cement Concrete Floor:

Length= 16.083 ft

Width= 8.67 ft

Height= 0.5 ft

Volume= L X W X H = 69.72 cft

Precast RC Work

Roof Cover Slab of Septic Tank:

Length= 15.083 ft

Width= 7.67 ft

Height= 0.5 ft

Volume= L X W X H = 57.84 cft

Roof Cover Slab of Soak Pit:

Area= πr^2 sft

= $\pi(2)^2$ sft =12.57 sft

Height= 4 in = 0.33 ft

Volume= A X H = 4.2 cft

Side Wall of Soak Pit:

Area= $\pi(R^2 - r^2)$ sft

= $\pi(2^2 - 1.75^2)$sft = 2.94 sft

Height= 29.67 ft

Volume= A X H = 87.22 cft

1st Class Brick with 1:4 Cement Mortar in septic tank

- (a) Long Wall
- 1st step:

  Length= 15.083 ft

  Width= 1.25 ft

  Height= 3 ft

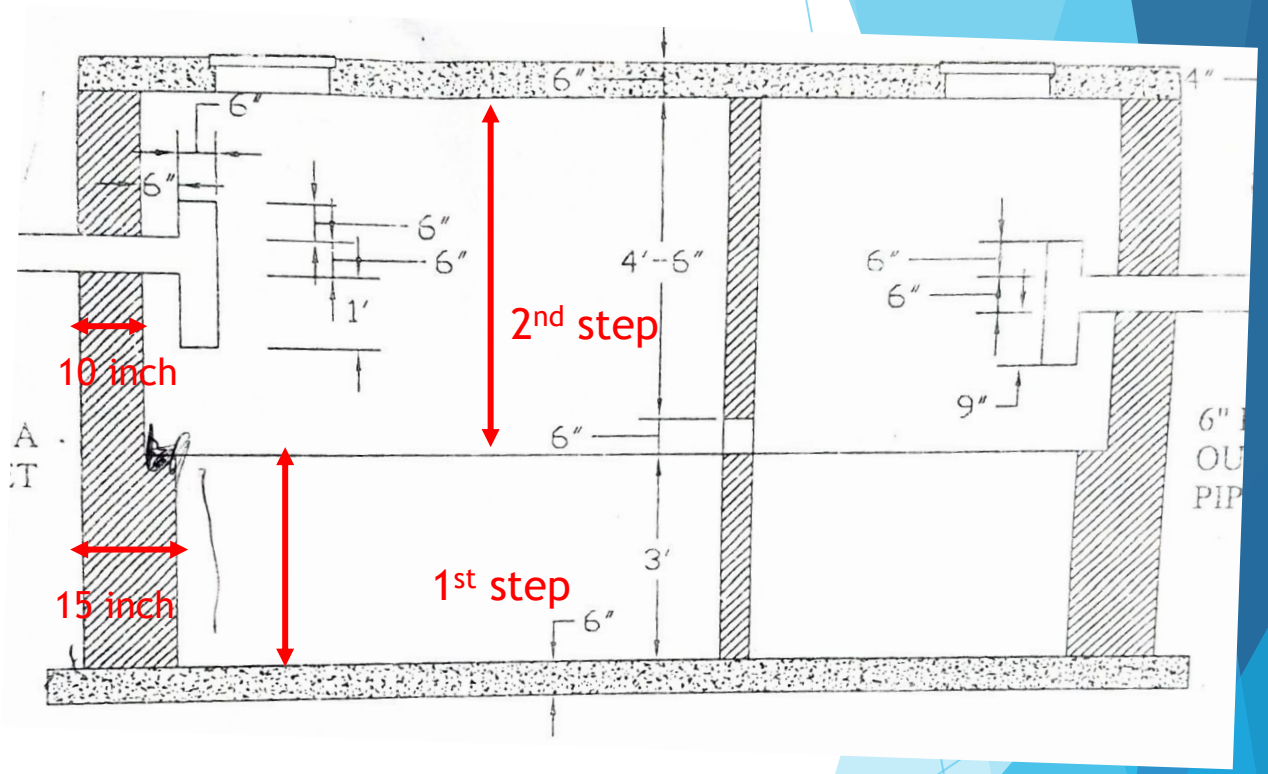
  Volume= 2 X L X W X H
- 2nd step:

  Length= 15.083 ft

  Width= 0.833 ft

  Height= 5 ft

  Volume= 2 X L X W X H



1st Class Brick with 1:4 Cement Mortar in septic tank

- (b) Short Wall
- 1st step:

  Length= 5.167 ft

  Width= 1.25 ft

  Height= 3 ft

  Volume=2 X L X W X H = 38.75 cft

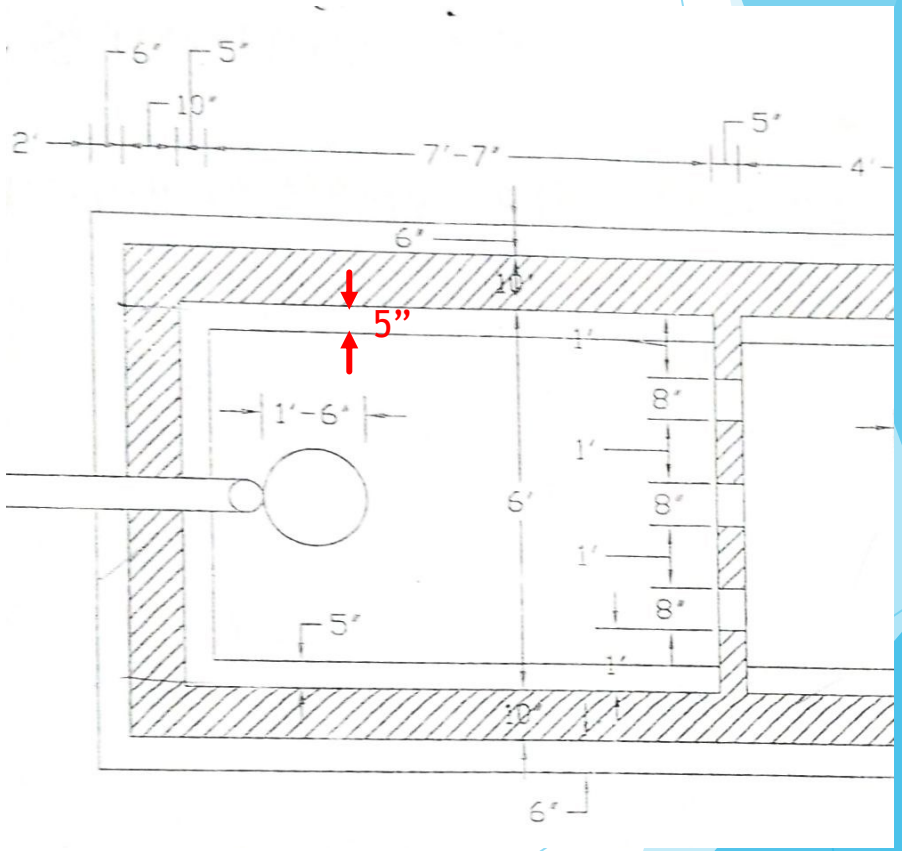
- 2nd step:

  Length= 6 ft

  Width= 0.833 ft

  Height= 5 ft

  Volume=2 X L X W X H = 50 cft



1st Class Brick with 1:4 Cement Mortar in septic tank

- (c) Partition Wall
- 1st step:

  Length= 5.167 ft

  Width= 0.417 ft

  Height= 3 ft

  Volume= L X W X H = 6.46 cft

- 2nd step:

  Length= 6 ft

  Width= 0.417 ft

  Height= 5 ft

  Volume=L X W X H = 12.51 cft

½ inch Cement Plaster 1:3 in wall of septic tank

- (a) Long Wall
- 1st step:

  Length= 15.083 – (30/12)= 12.583 ft

  Height= 3 ft

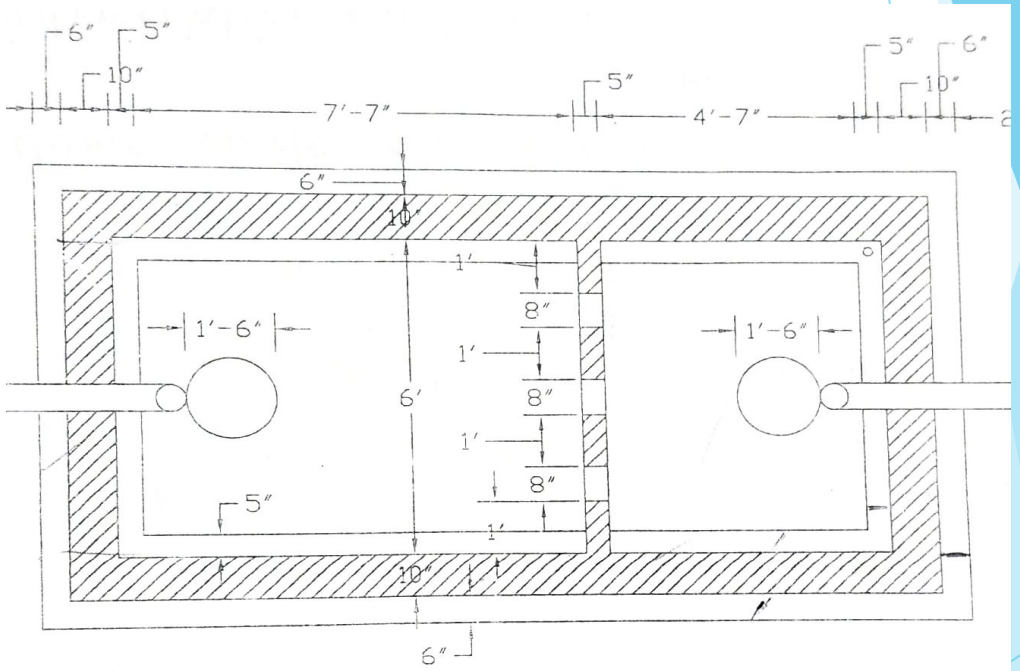
  Area= 2 X L X H

- 2nd step:

  Length= 15.083 – (20/12) = 13.417 ft

  Height= 5 ft

  Area= 2 X L X H



- ¾ inch Cement Plaster 1:3 in floor of septic tank

  Length= 12.583 ft

  Width= 5.167 ft

  Area= L X W = 65.02 sft

- 2 inch size Brick Aggregates at Bottom of Soak Pit

  Area= $\pi(1.75)^2$ sft

  Height= 1 ft

  Volume= 9.62 cft

- Course Sand at Bottom of Soak Pit

  Area= $\pi(1.75)^2$ sft

  Height= 1.5 ft

  Volume= 14.43 cft