

Lecture 33

Detailed Estimate for Septic Tank - Basics

Estimation & Costing

Agenda

- 1. Introduction to Septic Tanks
- 2. IS Specifications
- 3. Components of a Septic Tank
- 4. Earthwork and PCC Estimation
- 5. Summary

Introduction to Septic Tanks

A septic tank is an underground chamber made of concrete, fiberglass, or plastic through which domestic wastewater flows for basic treatment.

- Settling and anaerobic processes reduce solids and organics.
- Effluent usually discharges to a soak pit or dispersion trench.
- Dimensions depend on the number of users (capacity).

Indian Standard (IS) Specifications

Important design criteria for estimation (IS 2470):

- **Length to Width Ratio:** Usually 2 to 3 times the width.
- **Liquid Depth:** Minimum 1.0 m to 1.3 m.
- **Freeboard:** Minimum 300 mm above top liquid level.
- **Thickness of walls:** Minimum 20 cm for brick masonry.

Knowing these dimensions is crucial for accurately calculating excavation and material volumes.

Summary

Septic tanks rely on anaerobic digestion.

Standard dimensions dictate the estimation parameters.

Next class: Detailed calculation of brickwork and slabs.

Estimation Logic

- **Earthwork in Excavation:**

$$L_{exc} = L_{inner} + 2 \times (\text{Wall Thickness}) + 2 \times (\text{PCC projection})$$

$$W_{exc} = W_{inner} + 2 \times (\text{Wall Thickness}) + 2 \times (\text{PCC projection})$$

$$\text{Volume} = L_{exc} \times W_{exc} \times \text{Depth from GL}$$

- **PCC Base:**

Normally 1:4:8 or 1:3:6 mix.

$$\text{Volume} = L_{exc} \times W_{exc} \times \text{Thickness of PCC (usually 15-20cm)}$$