

Lecture 32

Earthwork: Canal Sections, Lead and Lift

Estimation & Costing

Agenda

- 1. Canal Cross Sections
- 2. Fully in Cutting / Banking
- 3. Partial Cutting and Banking
- 4. Lead and Lift
- 5. Summary

Canal Cross Sections

Unlike roads, canals carry water and therefore their cross-section design is critical for flow and preventing seepage.

Canals can be constructed in three main ways depending on ground level (GL) and full supply level (FSL):

- **Fully in Cutting:** GL is above the top of the canal banks.
- **Fully in Banking:** GL is below the bed level of the canal.
- **Partially in Cutting and Banking:** GL is between bed level and top bank level.

Lead and Lift Concepts

Earthwork rates depend significantly on how far and how high the excavated earth must be moved.

Definitions

Lead: The horizontal distance from the center of the borrow pit (excavation) to the center of the spoil bank (disposal/embankment). Standard lead is usually 30m.

Lift: The vertical distance from the center of gravity of the excavated earth to the center of gravity of the placed earth. Standard lift is usually 1.5m.

Extra payment is required for lead or lift exceeding standard values.

Summary

Canals have specific cross-section requirements.
Balancing cutting and banking is economical.
Lead and Lift determine the transportation cost of earthwork.

Canal in Partial Cutting and Banking

