

Consolidation

Civil Engineering

Why clay settles for years afterwards.

Saturated clay settles slowly as pore water drains out and the load transfers to the soil skeleton.

$$s_c = C_c H / (1 + e_o) \times \log(\sigma'_1 / \sigma'_o)$$

Sand under new load

Free draining.

Settles almost at once

Clay under new load

Very low k .

Settles over years

Double the clay depth

Time goes with H^2 .

Roughly 4 times as long

THE COMMON MISTAKE

✗ **Quoting only the final settlement**

✓ **Give the amount and the rate**

Consolidation is a rate problem as much as a magnitude one. Differential movement during construction cracks finishes long before the total is reached.

Educational reference. Predictions depend on sample quality and drainage assumptions, both matters for a qualified engineer.