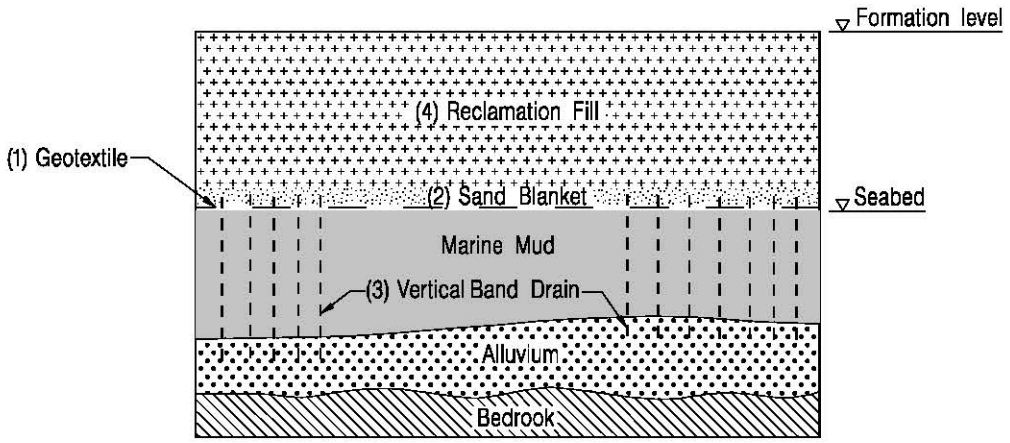


Notes:

1. Laying of geotextile on the seabed.
2. Deposition of blanket layer.
3. Installation of vertical drains by marine plant.
4. Controlled thin-layer placement of reclamation fill.

Figure 1 – Sequence of Drained Reclamation

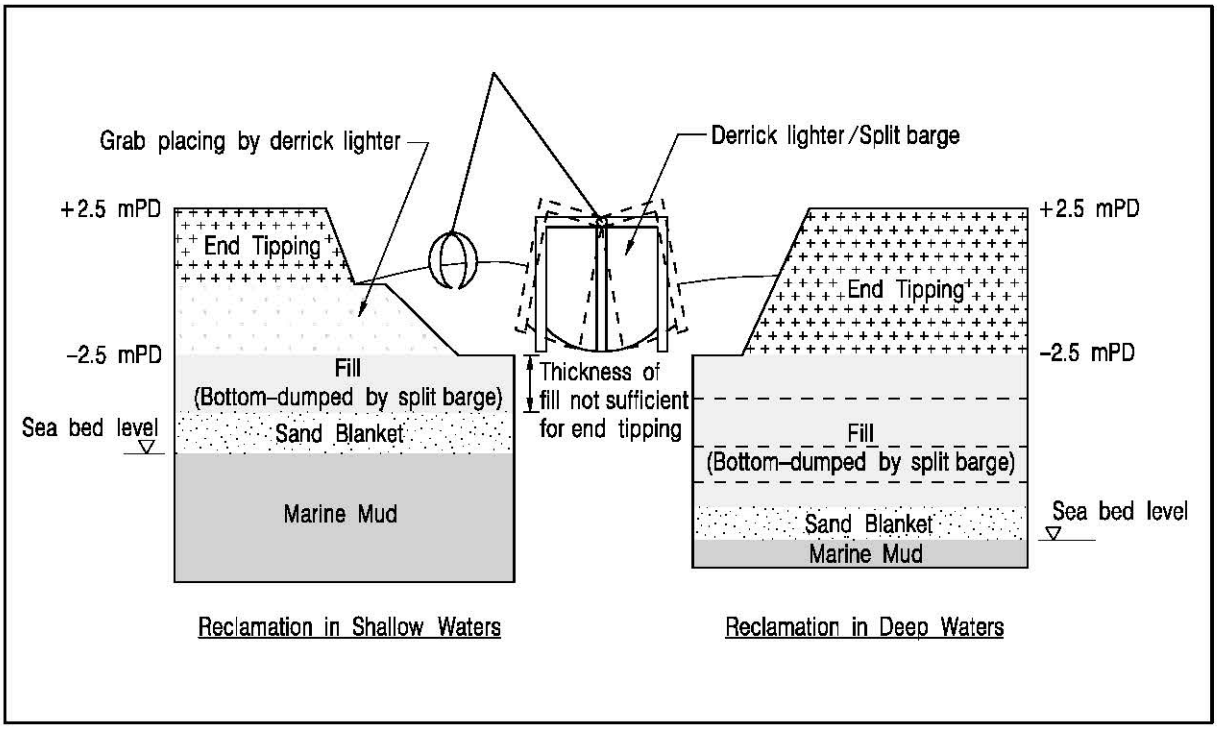
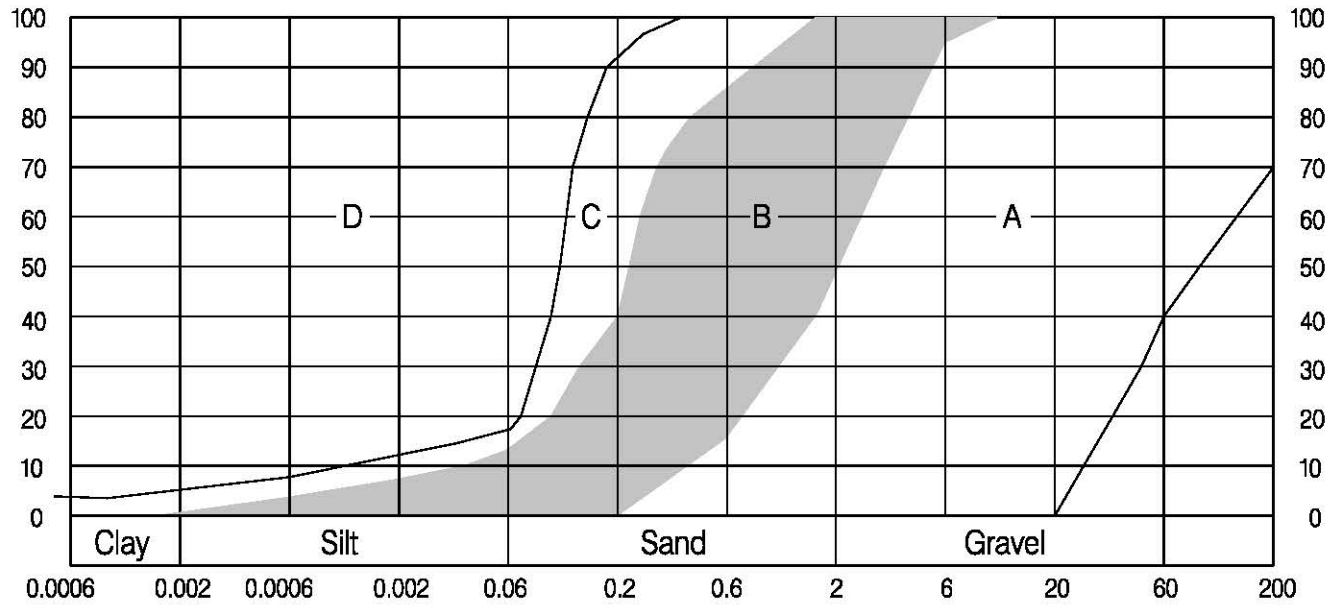


Figure 2 – Reclamation in Shallow Waters and Deep Waters



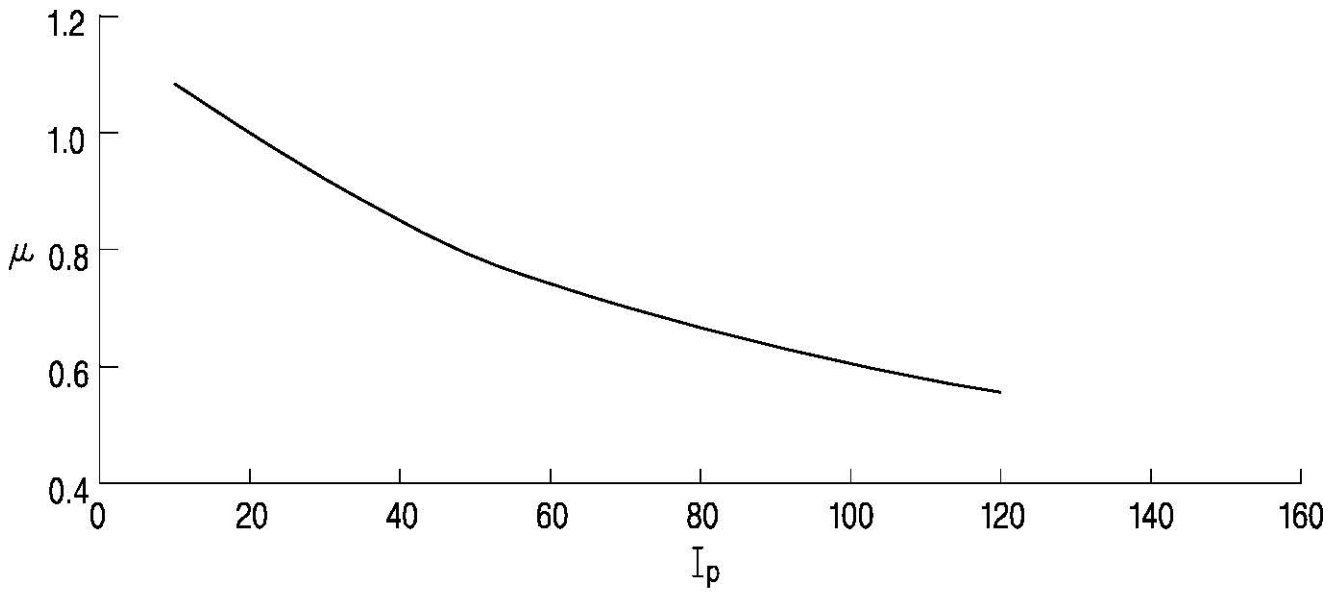
Zone A: The soils of this zone are very well compactable.
The rightmost borderline in the graph indicates an empirically found limit where the amount of cobbles and boulders prevents compaction because the vibroprobe cannot reach the compaction depth.

Zone B: The soils in this zone are ideally suited for vibrocompaction. They have a fines content of less than 12%. As for the soils of zone A, the in-situ soil flows towards the vibroprobe during compaction, so that no backfill has to be added from the top, providing the resulting settlements of the ground are tolerable. Depending on the initial density and the required densification, settlements due to vibrocompaction are between 2% and 15% of the thickness of the treated layers.

Zone C: Zone C is still suitable for vibrocompaction, but the required compaction time is drastically increased compared to zone B. This happens because the surplus water does not drain fast enough from the compacting soil.
A compaction is only possible by adding backfill from the surface, since the in situ soil does not flow by itself towards the vibroprobe.

Zone D: Soils of this zone are not compactable.

Figure 3 – Soils Suitable for Vibrocompaction



Ref. : Bjerrum (1972)

Figure 4 – Relationship between Correction Factor μ for Field Vane Shear Strength and Plasticity Index

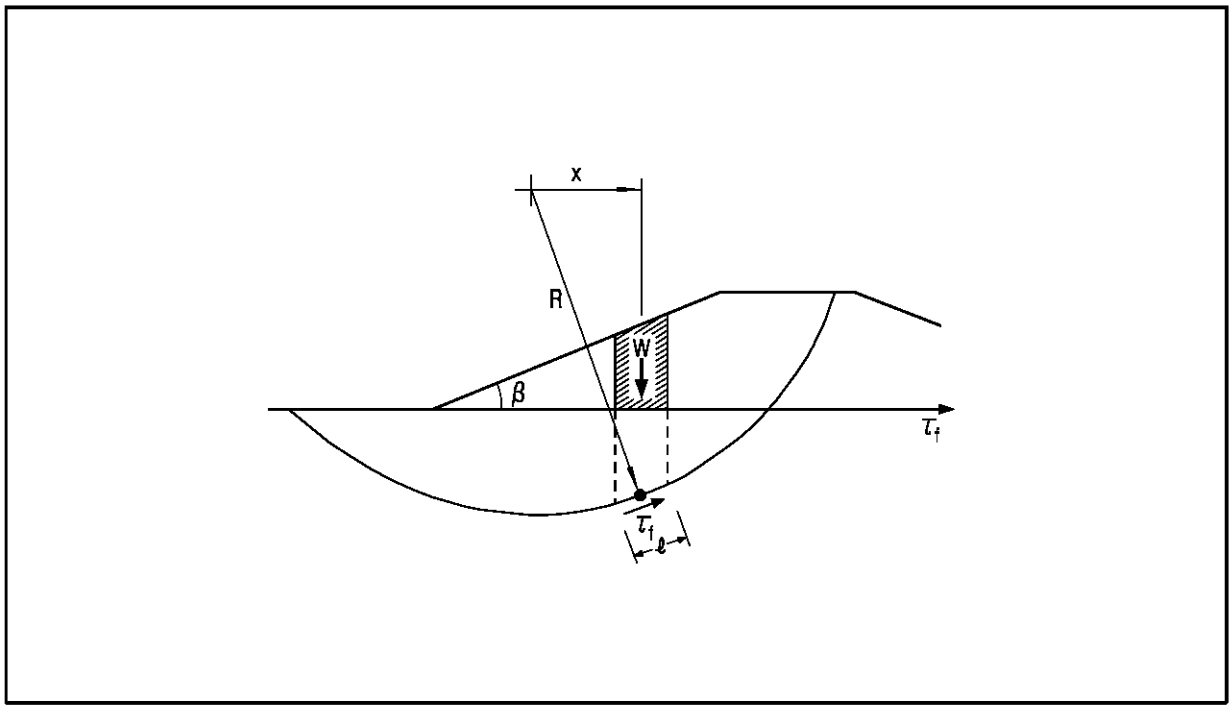


Figure 5 – Method of Calculation of Stability of an Embankment on Clay

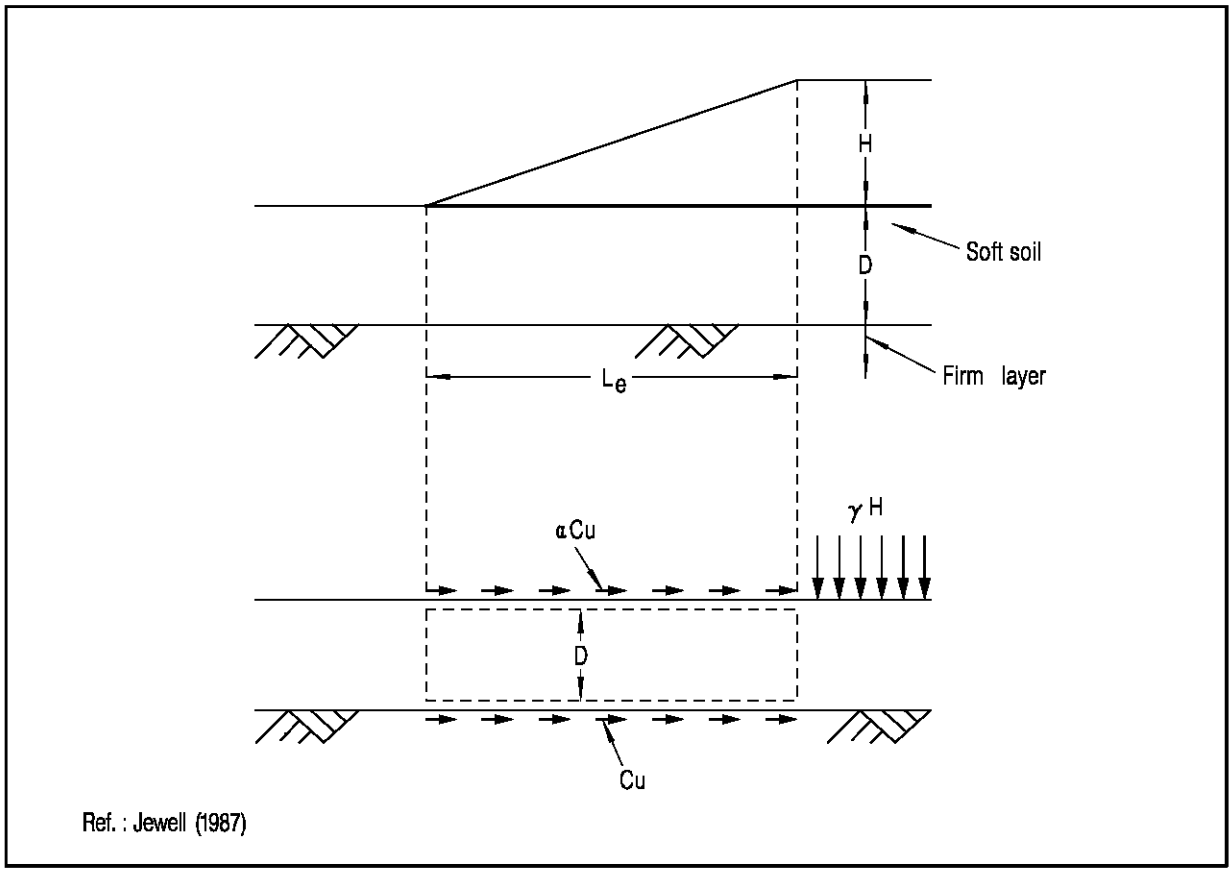


Figure 6 – Foundation Soil of Limited Depth and Uniform Strength

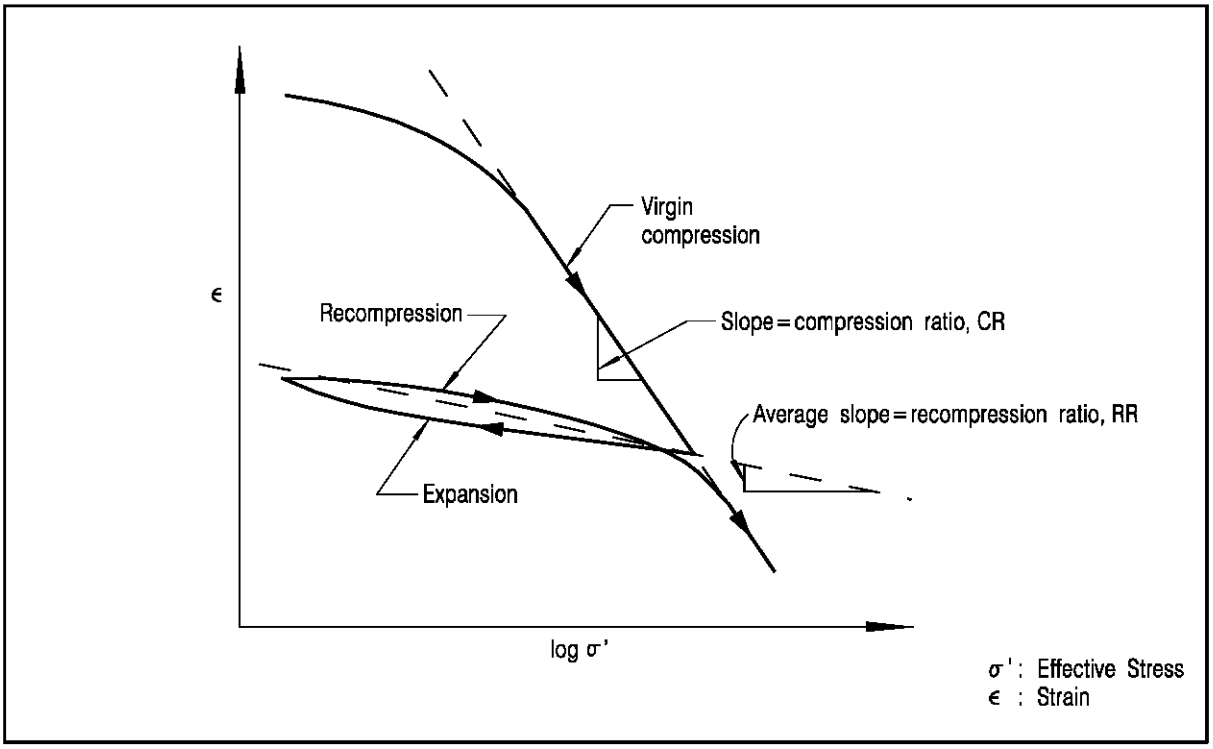
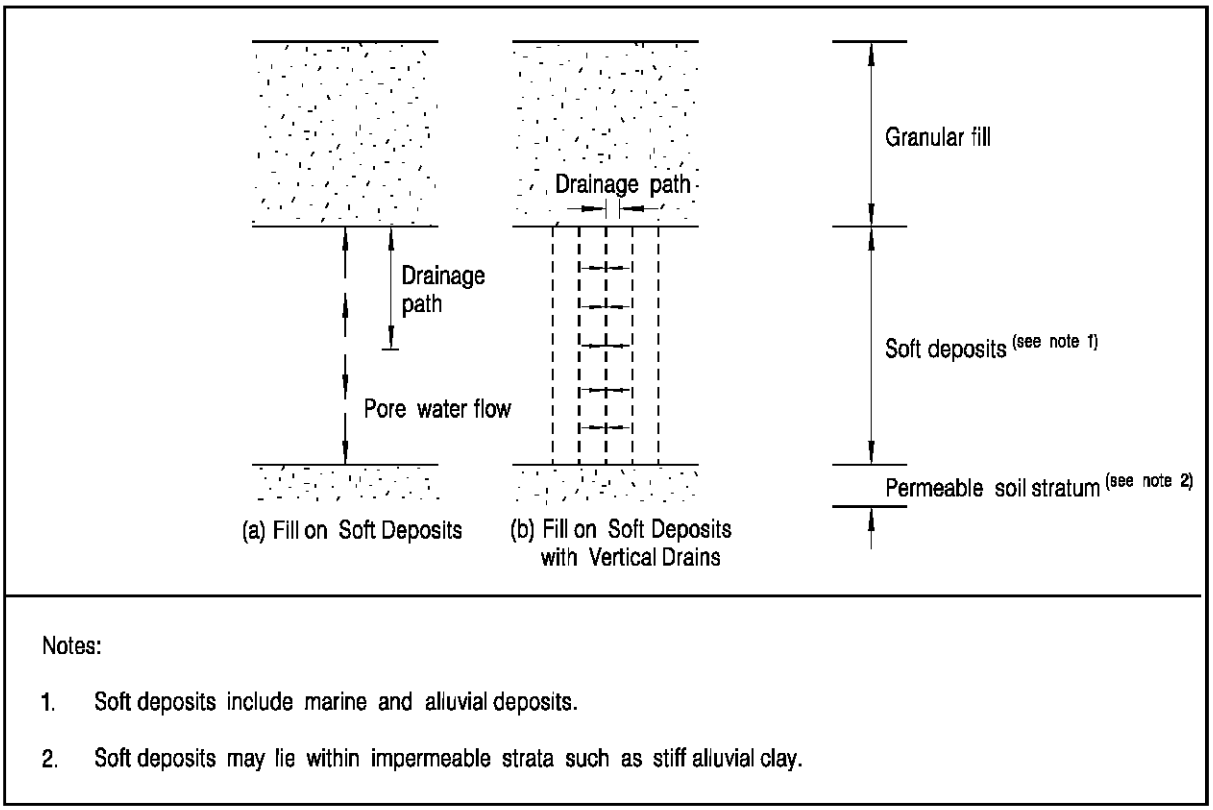


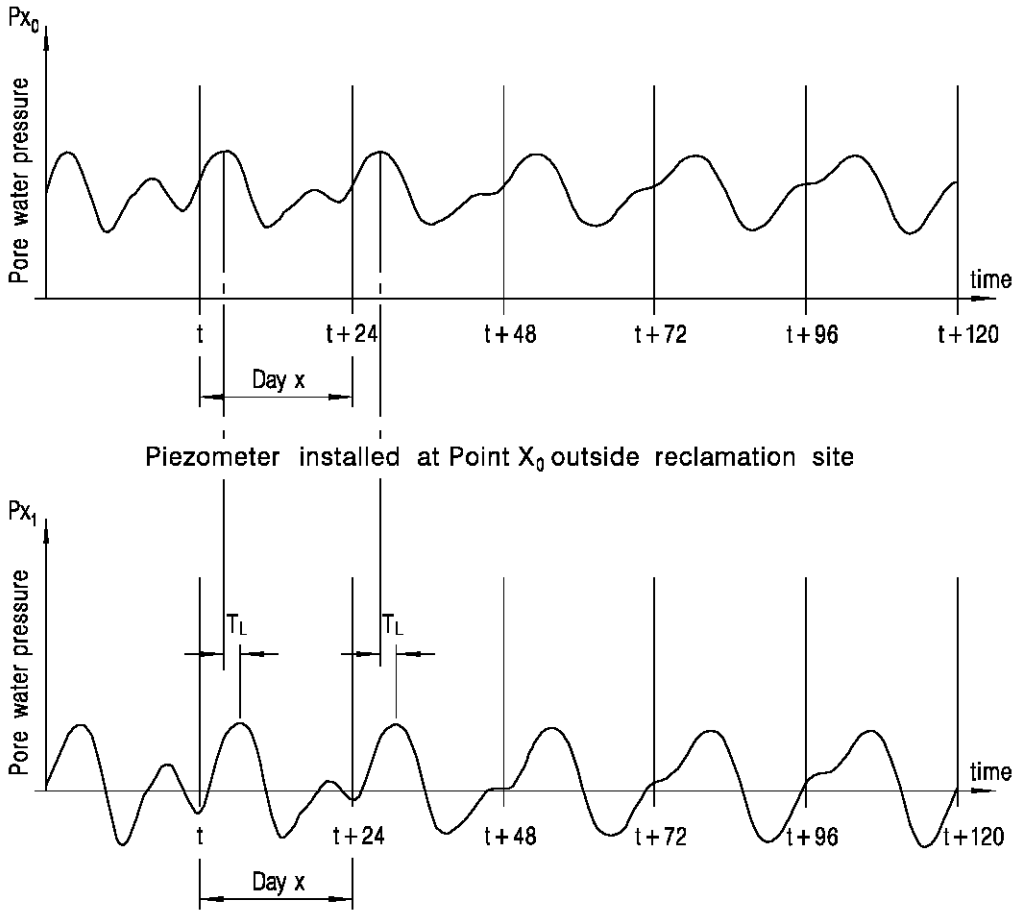
Figure 7 – Definition of Compressibility Parameters



Notes:

1. Soft deposits include marine and alluvial deposits.
2. Soft deposits may lie within impermeable strata such as stiff alluvial clay.

Figure 8 – Shortening of Drainage Path by Vertical Drains



Average excess pore water pressure at Point X_1 on Day x = Average of the pore water pressure recorded by piezometer at x_1 between time $(t+T_L)$ and $(t+24+T_L)$ – Average of the pore water pressure recorded by piezometer at x_0 between time t and $(t+24)$

Legend:

Px_0 = Pore water pressure recorded by piezometer at Point x_0 outside reclamation.

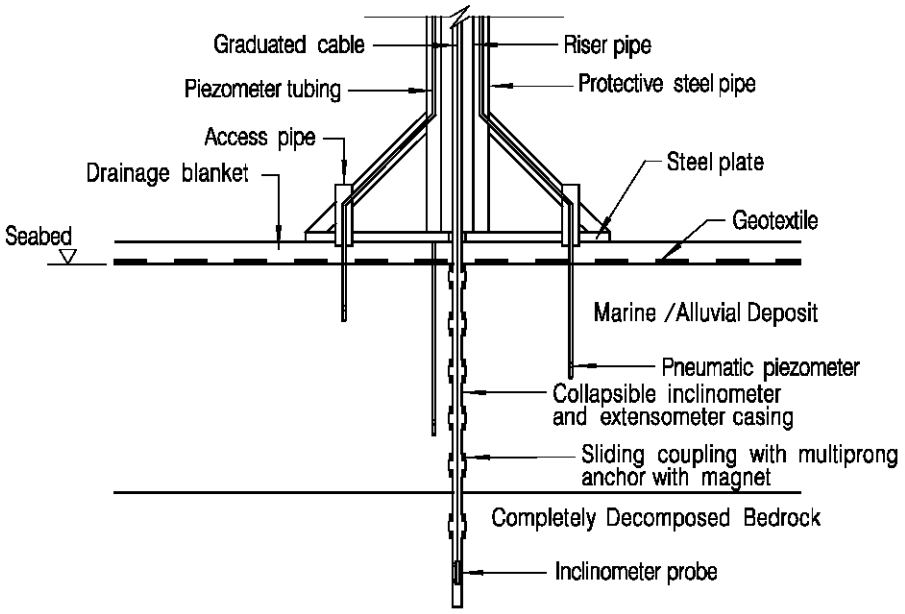
Px_1 = Pore water pressure recorded by piezometer at Point x_1 within reclamation.

T_L = Time lap of response between piezometers at Points x_0 and x_1.

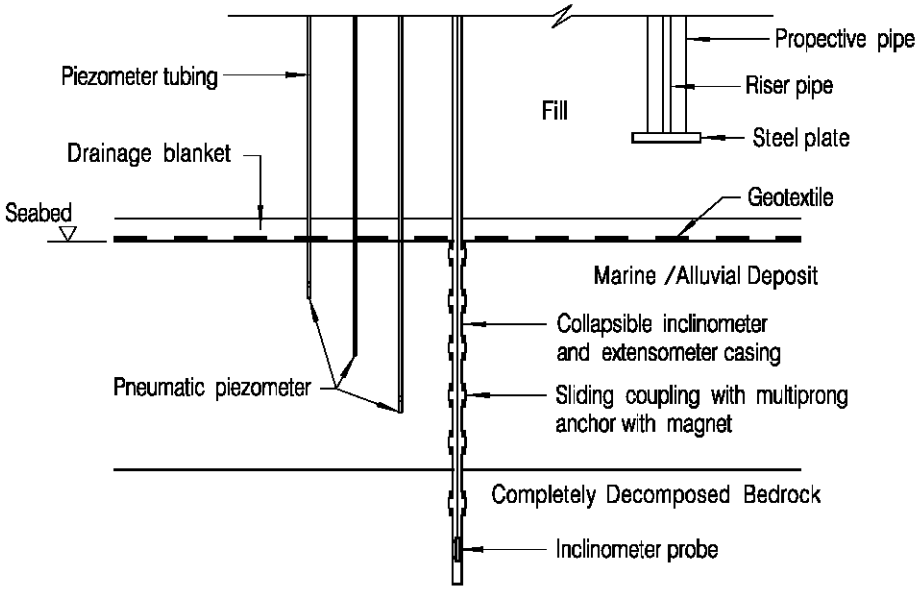
Notes:

1. Automatic electronic device should be used to facilitate recording of pressure data.
2. Pressure reading should be logged continuously with time.
3. Piezometer outside the reclamation is installed for the purpose of eliminating the tidal effect on the piezometer reading taken inside the reclamation.

Figure 9 – Tidal Effect on Pore Water Pressure Measurement



(a) Installed by Marine Plant (before Commencement of Filling)



(b) Installed by Land Plant (after Filling to Above Water Level)

Figure 10 – Settlement Monitoring Instrument Cluster

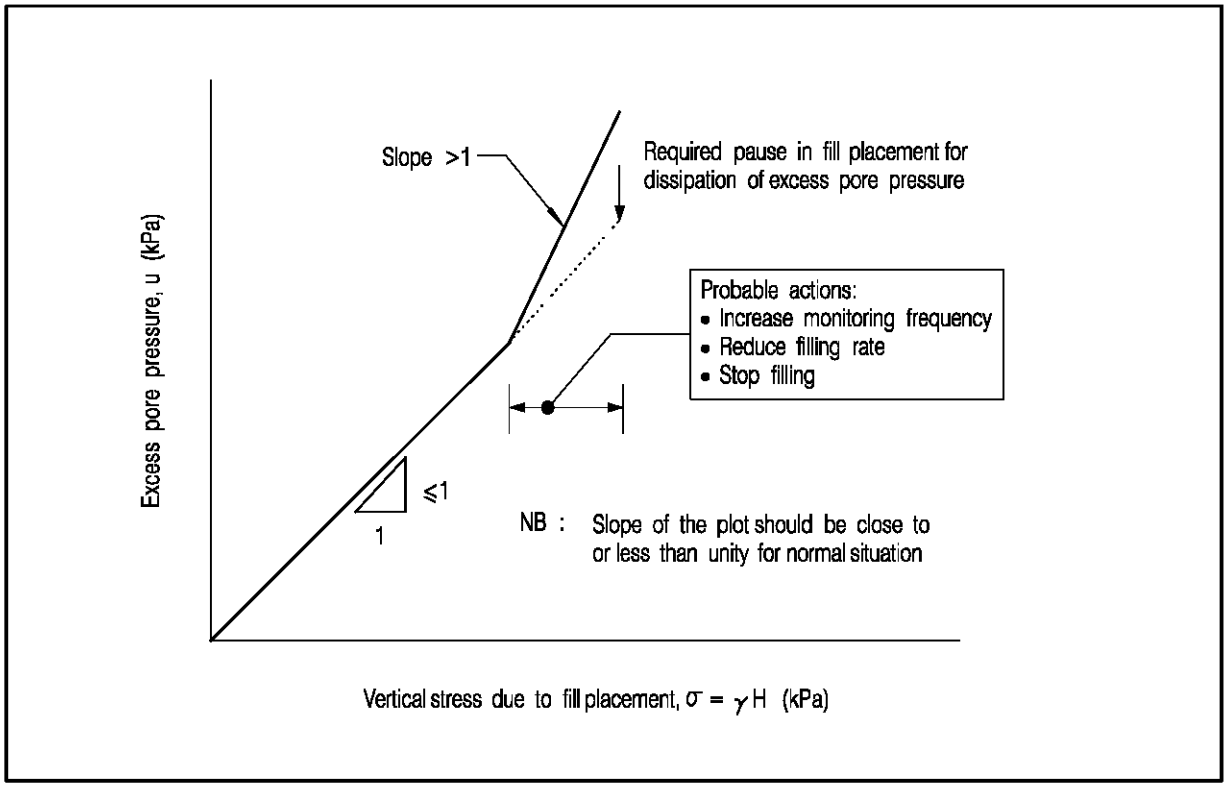


Figure 11 – u–σ Plot

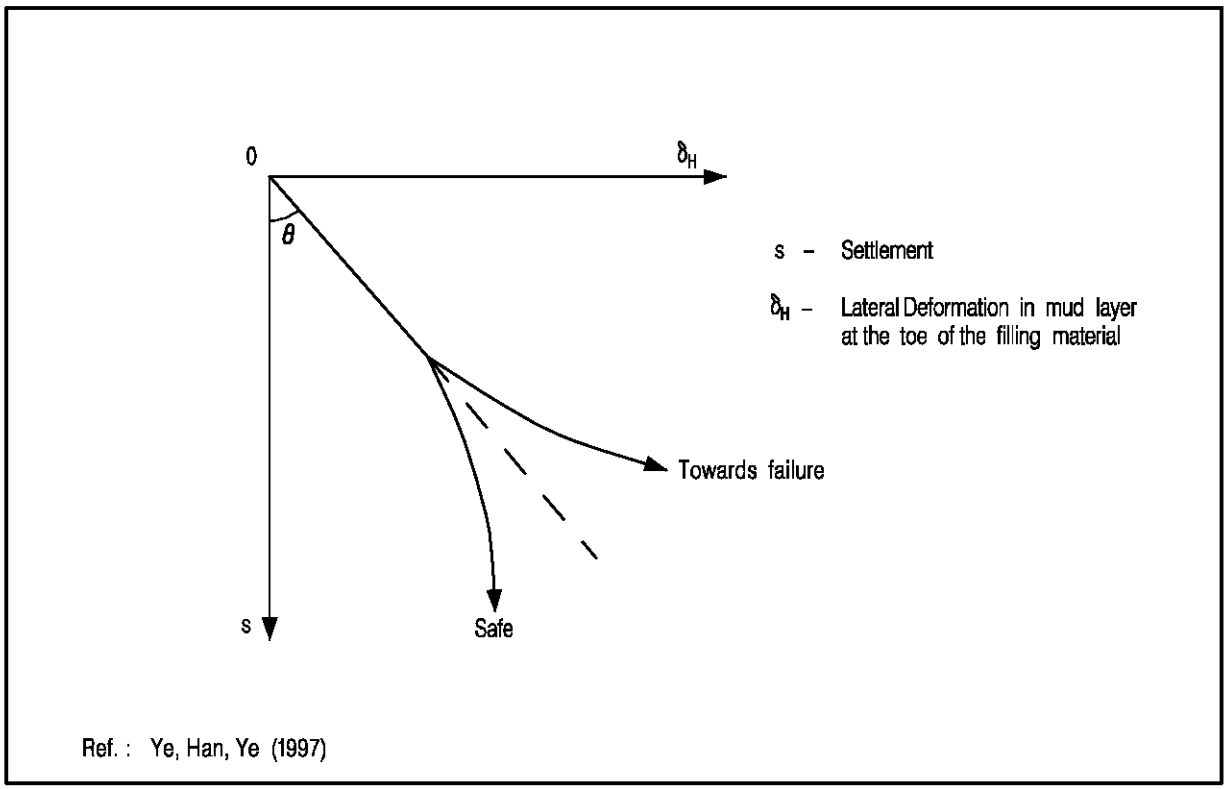
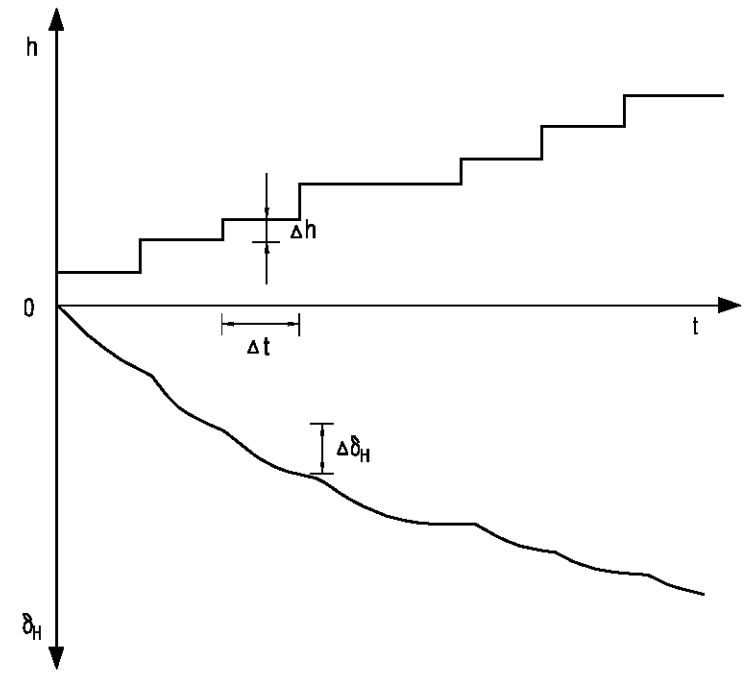
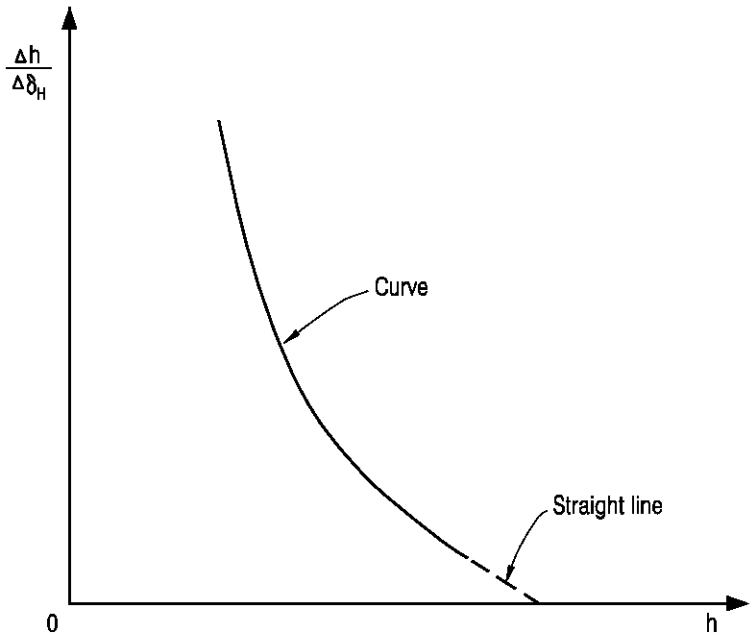


Figure 12 – s–δ_H Plot



(a) δ_H–h–time Plot



(b) $\frac{\Delta h}{\Delta \delta_H}$ –h Plot

Ref. : Ye, Han, Ye (1997)

Figure 13 – Typical Relationship between Height of Filling (h), Time (t) and Lateral Deformation (δ_H)