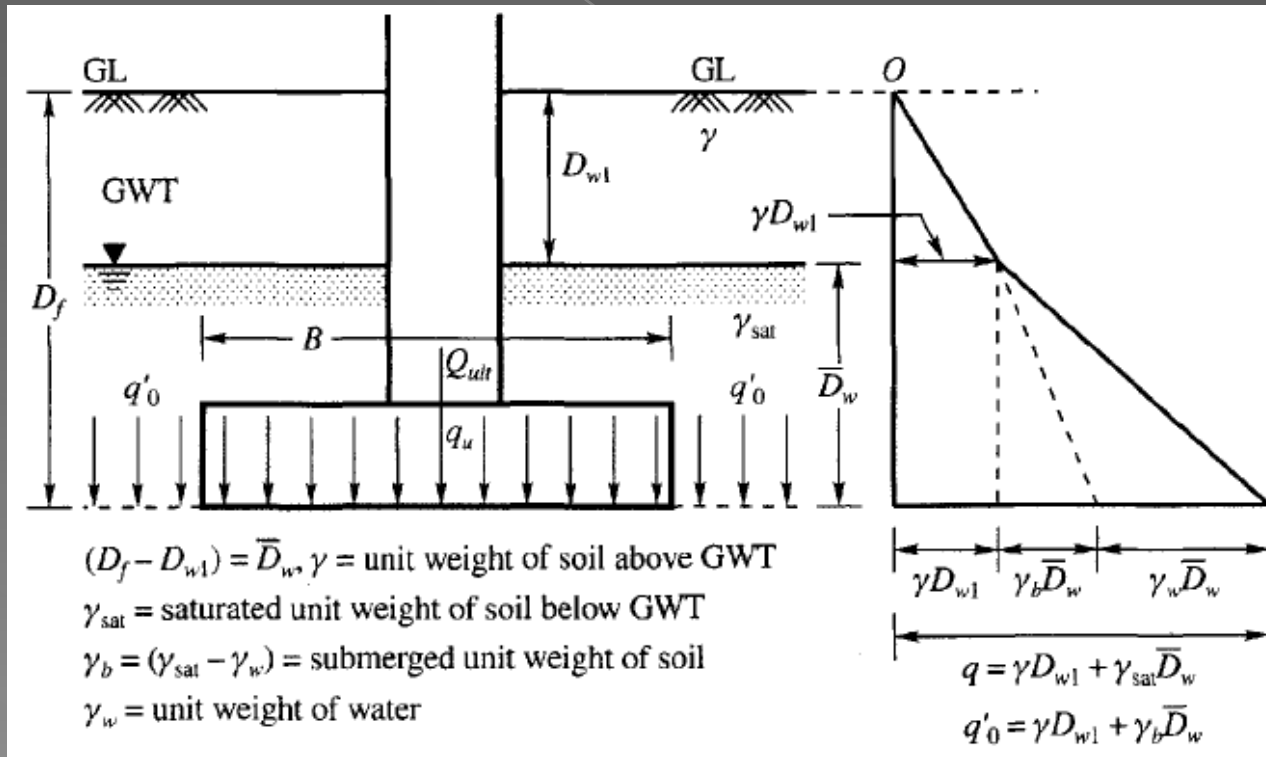# PERTEMUAN – 2/16
DAYA DUKUNG TANAH DAN KAPASITAS DUKUNG PONDASI

ISTILAH-ISTILAH

(a) Total Overburden Pressure q_o

q_o is the intensity of total overburden pressure due to the weight of both soil and water at the base level of the foundation.

$$q_o = \gamma D_{w1} + \gamma_{sat} \overline{D}_w \qquad (12.1)$$

$(D_f - D_{w1}) = \overline{D}_w$, γ = unit weight of soil above GWT
γ_{sat} = saturated unit weight of soil below GWT
$\gamma_b = (\gamma_{sat} - \gamma_w)$ = submerged unit weight of soil
γ_w = unit weight of water

$$q = \gamma D_{w1} + \gamma_{sat} \overline{D}_w$$
$$q'_0 = \gamma D_{w1} + \gamma_b \overline{D}_w$$

ISTILAH-ISTILAH

(b) Effective Overburden Pressure q'_0

q'_0 is the effective overburden pressure at the base level of the foundation.

$$q'_0 = \gamma D_{w1} + \gamma_b \overline{D}_w$$

when $\overline{D}_w = 0$, $q'_0 = \gamma D_{w1} = \gamma D_f$.

(c) The Ultimate Bearing Capacity of Soil, q_u

q_u is the maximum bearing capacity of soil at which the soil fails by shear.

(d) The Net Ultimate Bearing Capacity, q_{nu}

q_{nu} is the bearing capacity in excess of the effective overburden pressure q'_0, expressed as

$$q_{nu} = q_u - q'_0$$

ISTILAH-ISTILAH

(e) **Allowable Bearing Pressure, q_a**

q_a is expressed as

$$q_a = \frac{q_u}{F_s}$$

where F_s = factor of safety.

Untuk pondasi dangkal, faktor keamanan (FK, Fs, FoS) = 2.5 – 4
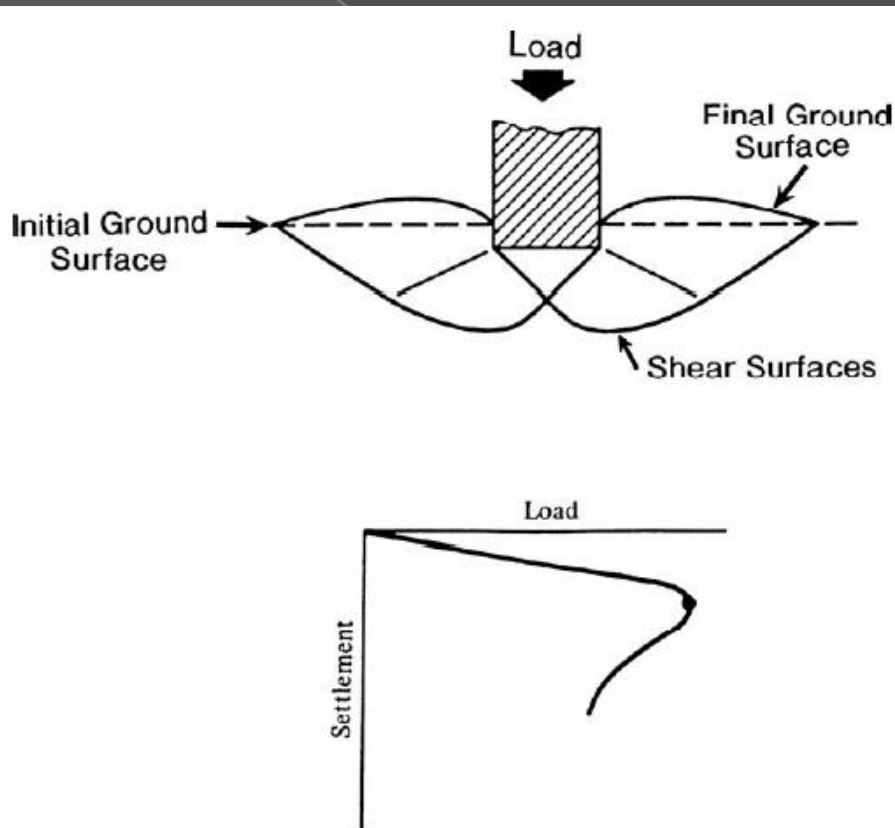Biasanya diambil sebesar 3

KRITERIA KERUNTUHAN

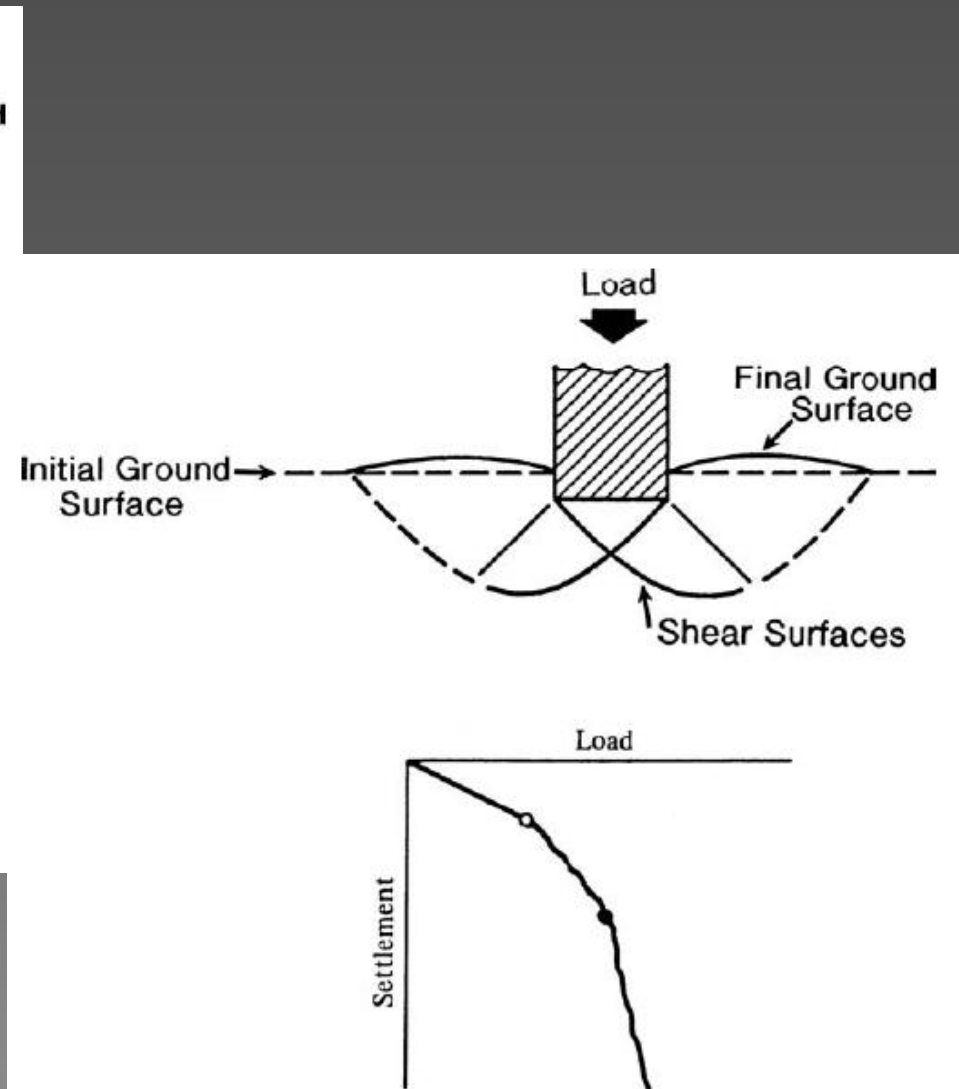FIGURE 6.1 General shear foundation failure. (*After Vesić, 1963.*)

FIGURE 6.2 Local shear foundation failure. (*After Vesić, 1963.*)
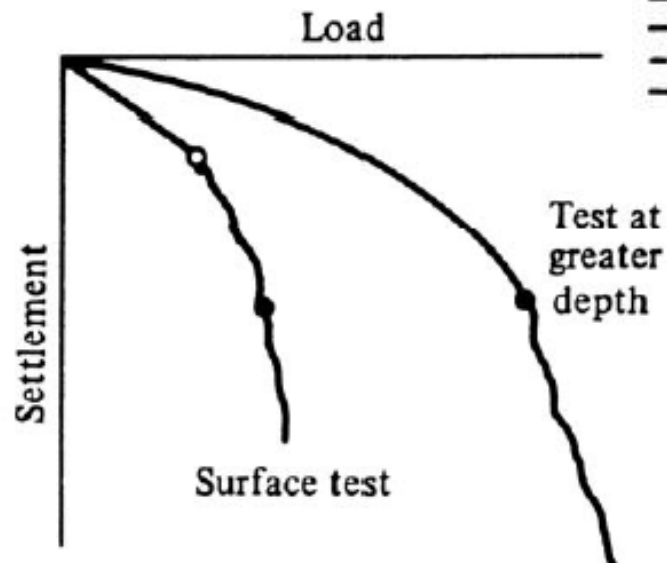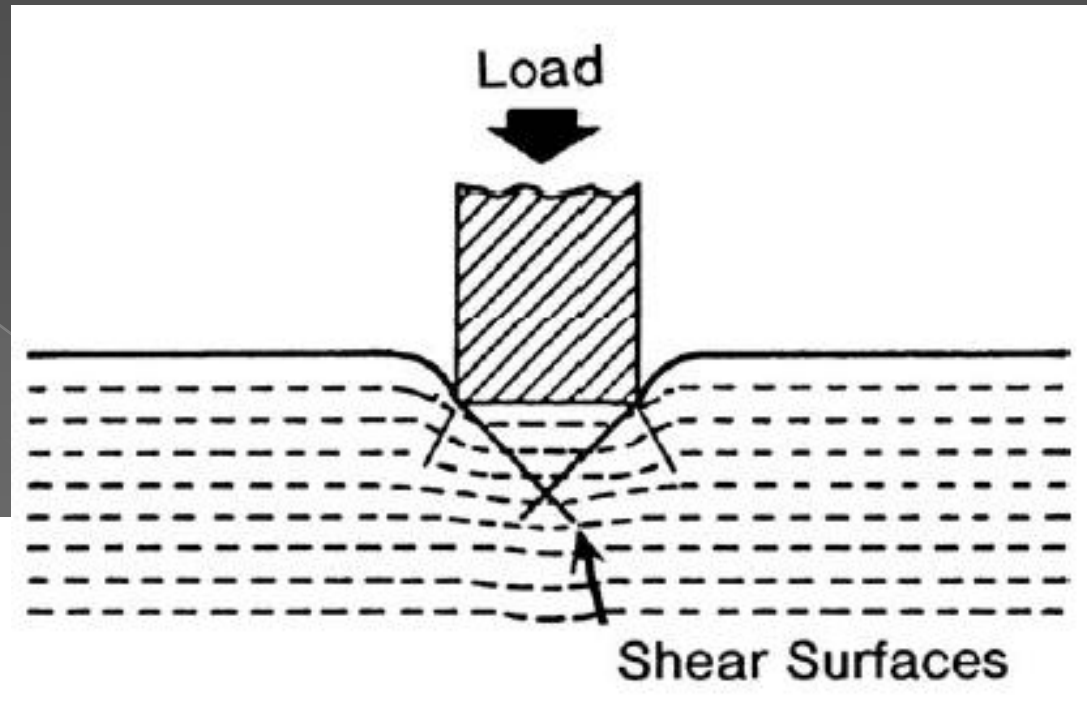
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Load

Shear Surfaces

Load

Settlement

Test at greater depth

Surface test

FIGURE 6.3 Punching shear foundation failure. (*After Vesić, 1963.*)
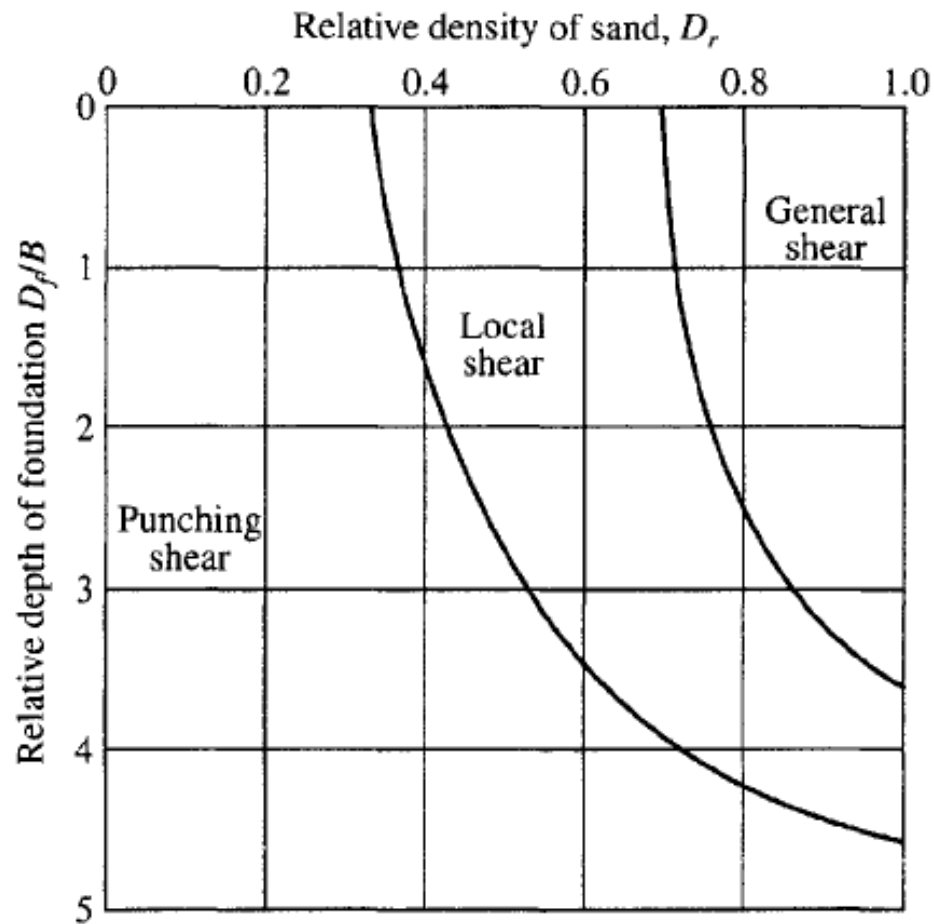
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Figure 12.5 Modes of failure of model footings in sand (after Vesic, 1963)