

8.00 ESTIMATION OF BEARING CAPACITY

The bearing capacity has been calculated for open foundations. The safe bearing capacity of the soil has to be calculated from two considerations. First, there must be adequate factor of safety against the total bearing capacity failure (total collapse). Second, the settlement which the structure will develop when loaded, will have to be within permissible limits so as not to endanger its stability.

8.01 Formulae used:

a) From shear failure considerations:

The following equation as per IS: 6403-1981, for net ultimate bearing capacity was used.

$$q_{nu} = C N_c S_c d_c i_c + q (N_q - 1) S_q d_q i_q + 0.5 B \gamma N_\gamma S_\gamma d_\gamma i_\gamma W'$$

Where:

q_{nu}	=	Net Ultimate bearing capacity based on shear considerations.
C	=	Cohesion (t/m^2)
ϕ	=	Angle of shearing resistance of soil in degrees.
N_c, N_q, N_γ	=	Bearing Capacity factors.
S_c, S_q, S_γ	=	Shape factors.
i_c, i_q, i_γ	=	Inclination factors.
d_c, d_q, d_γ	=	Depth factors.
d_c	=	$1 + 0.2 (D_f / B) \sqrt{N_\phi}$
$d_q = d_\gamma$	=	$1 + 0.1 (D_f / B) \sqrt{N_\phi}$
N_ϕ	=	$\tan^2 (\pi/4 + \phi/2)$
W'	=	Correction factor for location of water table.
q	=	Effective surcharge at the base of footings. ($\gamma * D_f$)