NOMENCLATURE

L	=	Width of footing perpendicular to I axis
C	=	Distance from CG to the location under consideration
CG	=	Center of gravity of footing
e	=	Distance from CG to Pt. R
f	=	Stress at location under consideration
I	=	Moment of inertia of a plane about CG axis
ICG	=	Moment of inertia of footing about CG axis
M	=	External moment
Q	=	Vertical component of R = Total vertical load on unit length of strip
Pt. R	=	Point where R strikes bottom of footing
R	=	Resultant of vertical loads and horizontal forces
q	=	Soil pressure

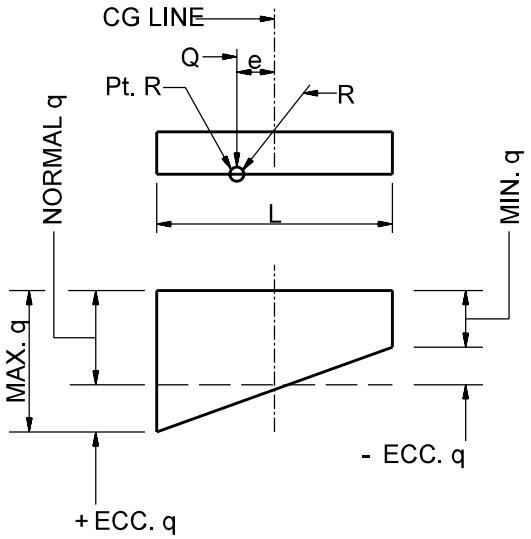
Resultant inside middle third of footing:

Formula for unit length of strip:

$$f = \frac{MC}{I},\ M = Qe,\ C = \frac{L}{2},\ I_{CG} = \frac{L^3}{12}$$

$$\text{NORMAL } q = \frac{Q}{L},\ \text{ECCENTRIC } q = \frac{MC}{I_{CG}} = \frac{\left(Qe\,L/2\right)}{\left(L^3/12\right)} = \frac{6Qe}{L^2}$$

$$\text{TOTAL } q = \frac{Q}{L} \pm \frac{6Qe}{L} = \frac{Q}{L}\left(1 \pm \frac{6e}{L}\right)$$



SOIL PRESSURE FORMULAS

Figure 66-2A