$$+ \frac{2}{r}\frac{\partial}{\partial z}\left(\frac{\partial \psi}{\partial r} - \frac{2\psi}{r}\right)\frac{\partial}{\partial z}\left(\frac{\bar{\sigma}}{\bar{\epsilon}}\right) \tag{23}$$

$$+ 2\frac{\partial}{\partial z}\left(2\frac{\partial \psi}{\partial r} - \frac{\psi}{r}\right)\frac{\partial^2}{\partial r\,\partial z}\left(\frac{\bar{\sigma}}{\bar{\epsilon}}\right) = 0$$

where the operators ∇_1, ∇_2 and ∇_3 are defined as (these operators are equivalent to the standard Laplacian operator, except for the indicated sign changes).

$$\nabla_1^2 = \frac{\partial^2}{\partial r^2} - \frac{1}{r}\frac{\partial}{\partial r} + \frac{\partial^2}{\partial z^2}$$

$$\nabla_2^2 = \frac{\partial^2}{\partial r^2} + \frac{1}{r}\frac{\partial}{\partial r} - \frac{\partial^2}{\partial z^2}$$

$$\nabla_3^2 = \frac{\partial^2}{\partial r^2} - \frac{1}{r}\frac{\partial}{\partial r} - \frac{\partial^2}{\partial z^2}$$

Equation (23) represents the governing equation for determining the displacement function ψ, and is predicated on the existance of proportional straining, equation (4). If the total derivatives had been retained in the flow law equations, and if the velocities $\dot{u}$ and $\dot{w}$, acting in the radial and axial directions, respectively, are defined as