4.1 FLOW OF WATER IN THE UNSATURATED ZONE

- Neglect osmotic pressures
  (flow due to concentration gradients)
- Neglect electrochemical processes

$$h = \psi(\theta) + z + \frac{v^2}{2g}$$

($\frac{v^2}{2g} \to 0$; $\psi(\theta) = \frac{p}{\gamma_w}$)

h = total head
z = elevation head
$\psi(\theta)$ = matric potential
i.e. wetting fluid pressure
θ = moisture content

$$\psi(\theta) = \frac{P(\theta)}{\gamma_w}$$

Matric pressure, $P(\theta)$ is a unique function of moisture content, θ.

Two popular relations (empirical) for $P(\theta)$-vs-θ
or $P(S_w)$-vs-S_w

1. Brooks and Corey (1966).
2. van Genuchten (1980).