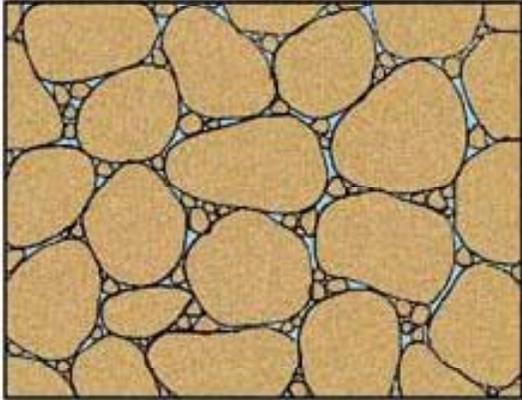


토양 수분의 기본 특성

● 공극률(Porosity)



$$\eta = \frac{V_v}{V}$$

● 토양함수비(soil moisture content)

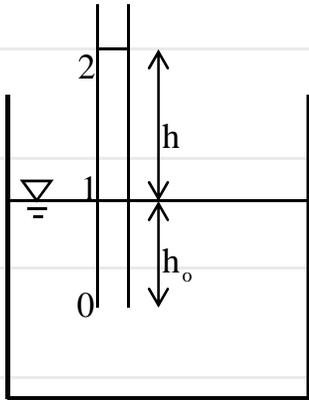
$$\theta = \frac{V_w}{V}$$

포화상태라면, $V_w = V_v \rightarrow \theta_s = \eta$

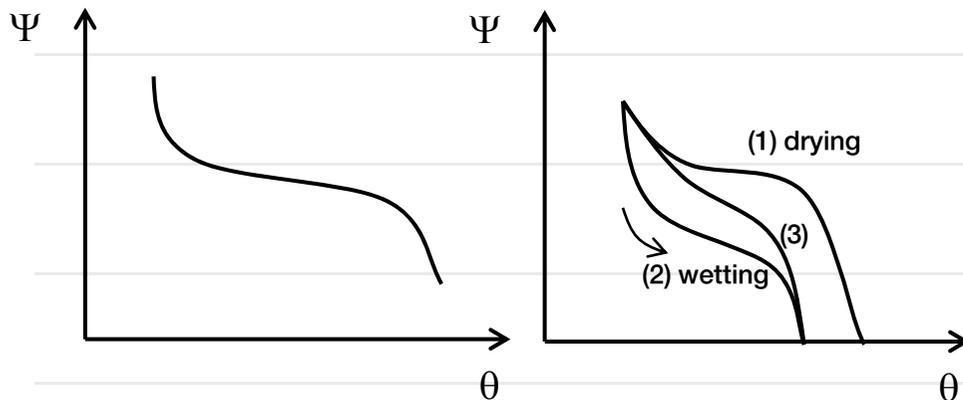
일반적으로, $\theta < \eta$

토양 수분의 기본 특성

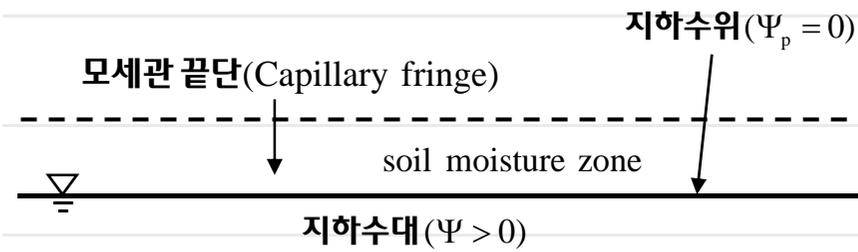
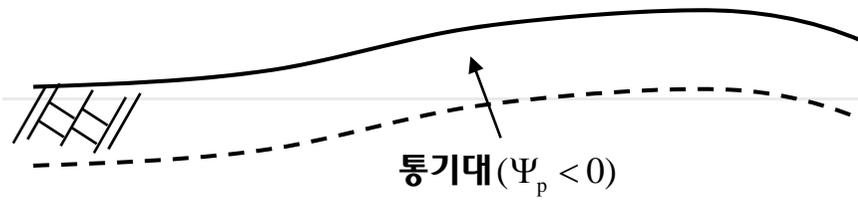
- 모관흡인수두(Capillary potential ; soil moisture tension)



$$P_1 = P_2 + \gamma h$$



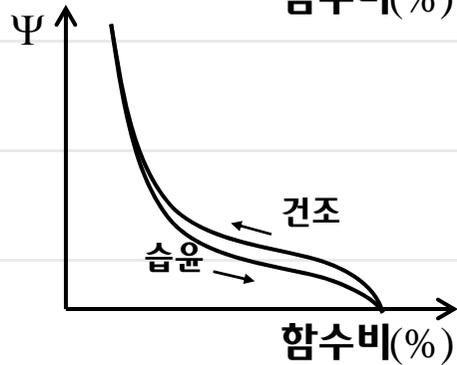
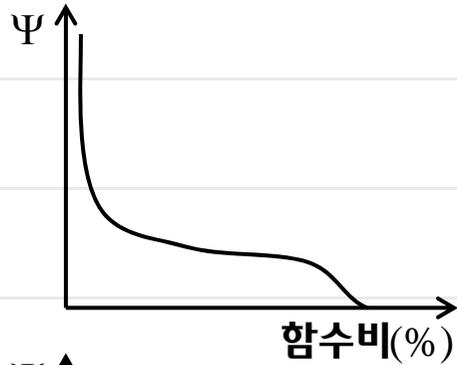
침투



$$\Psi = \Psi_z + \Psi_p$$

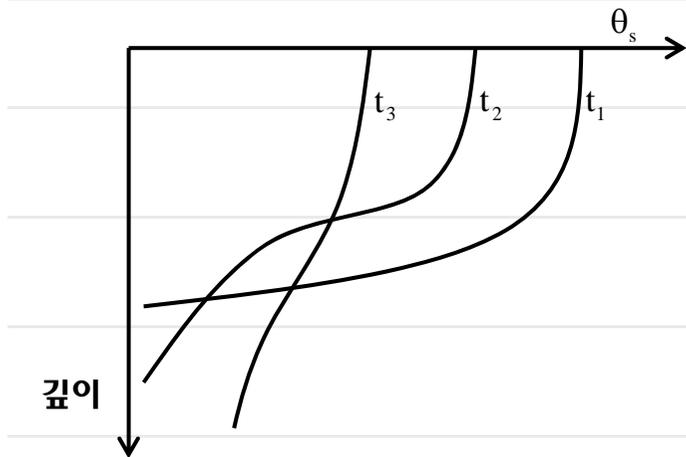
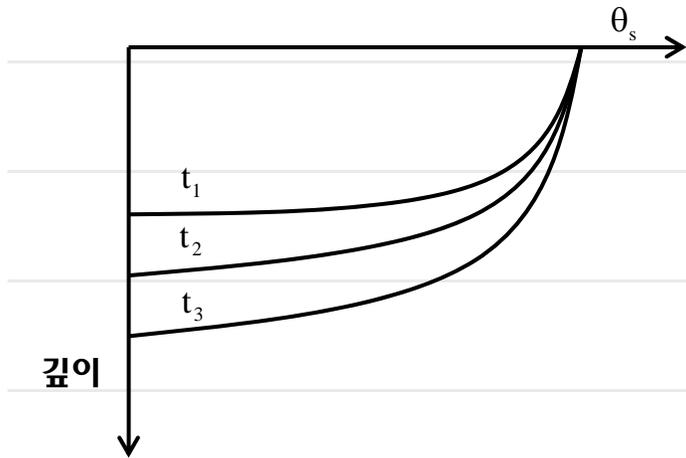
침투

● 토양수 특성 곡선(soil water characteristic curve)



침투

- 깊이에 따른 습윤선(wetting front)의 형성



침투

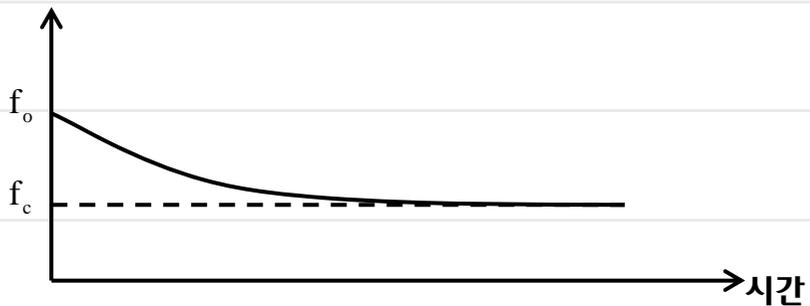
● 침투능 및 누가 침투량

$$f(t) = \frac{dF}{dt}$$

$$F(t) = \int_0^t f(t)dt$$

● Horton의 공식

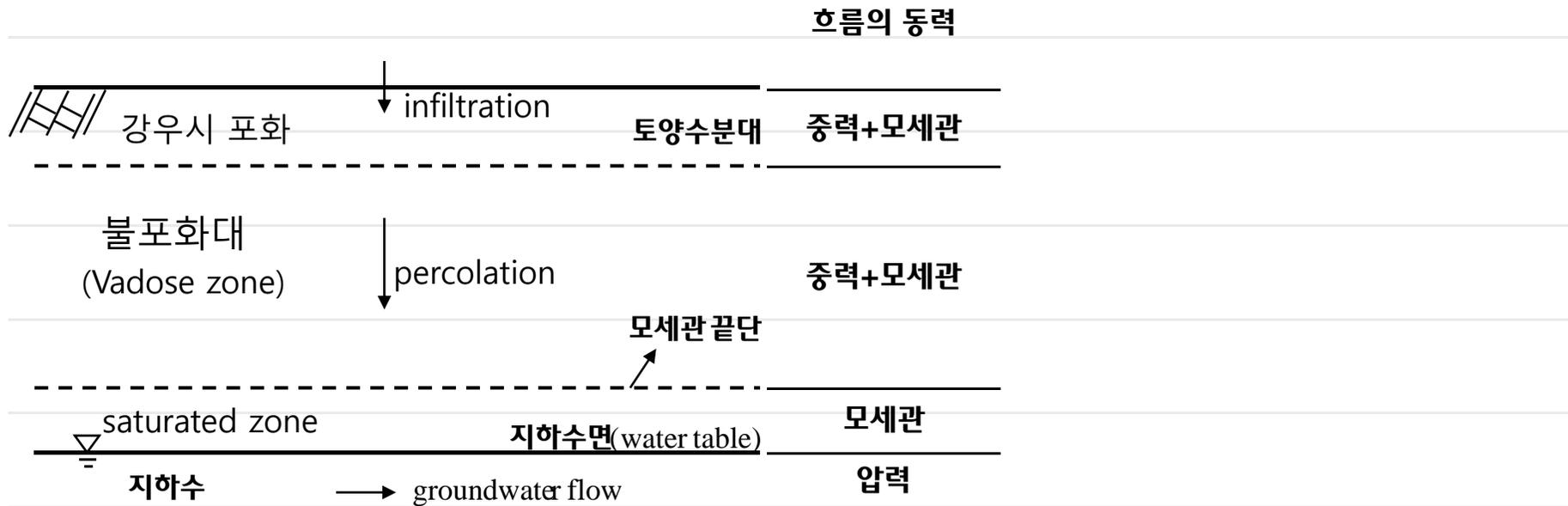
$$f(t) = f_c + (f_o - f_c)e^{-kt}$$



침투와 토양 수분 Infiltration and soil moisture

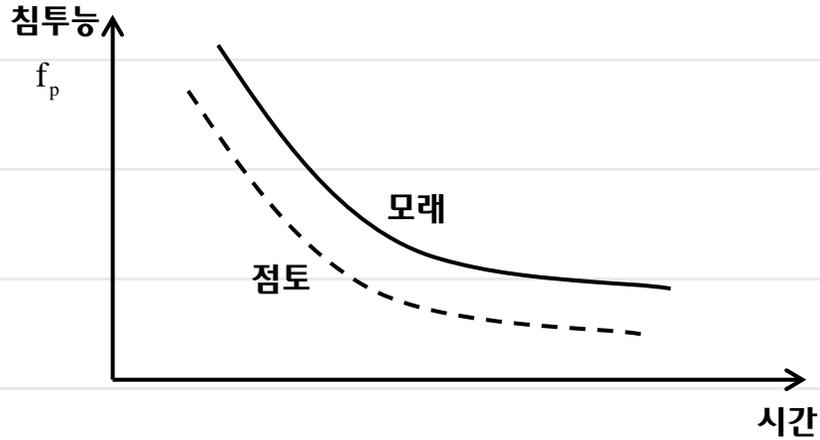
물을 토양속으로 이동시키는 힘

: 중력, 모세관 흡인력

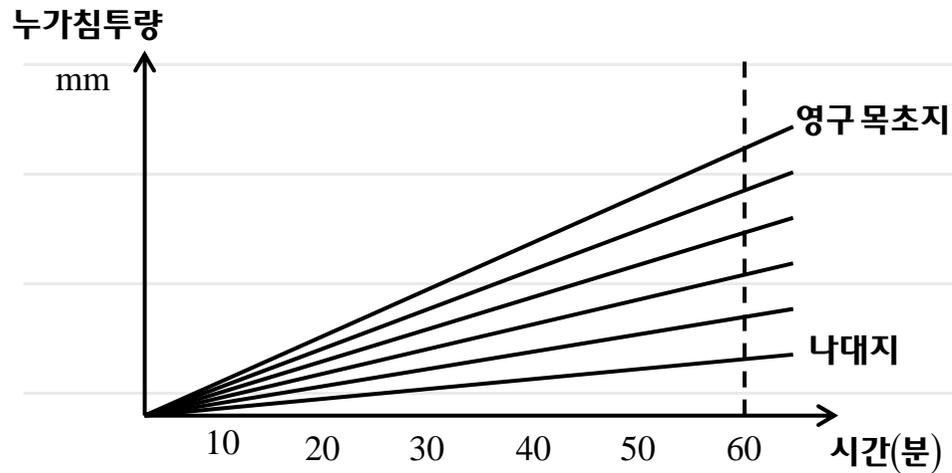


침투와 토양 수분 Infiltration and soil moisture

투수성

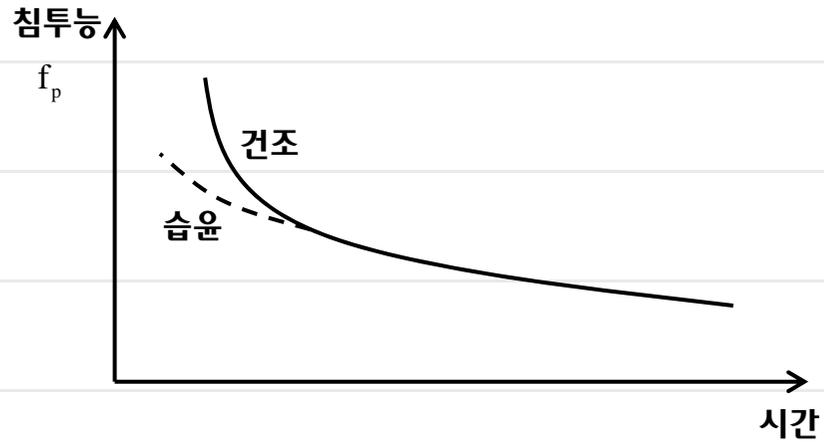


식생 및 지표이용



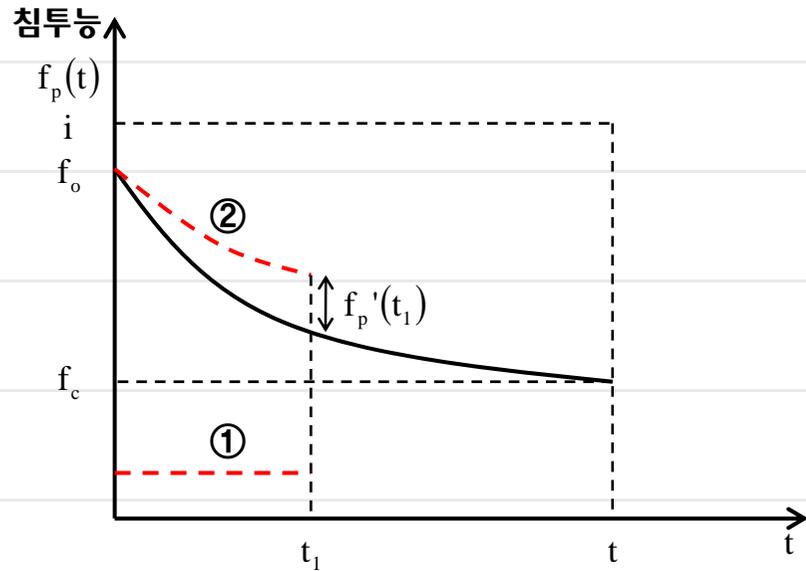
침투와 토양 수분 Infiltration and soil moisture

● 선형함수조건



침투량 산정

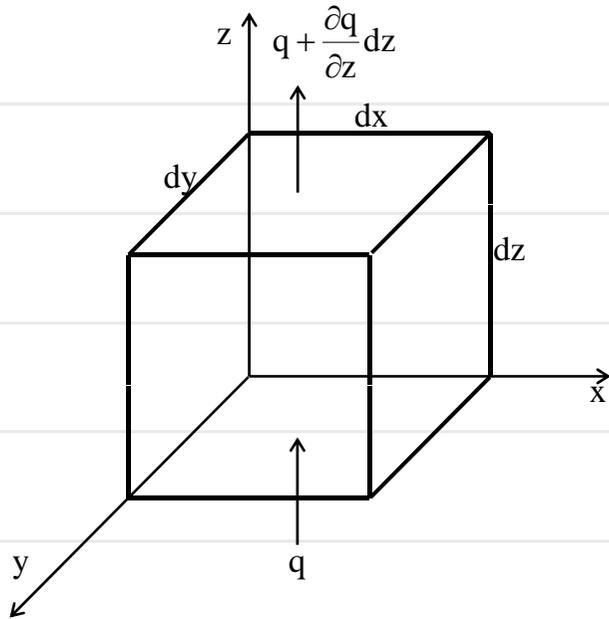
● Horton의 법칙



침투에서의 부호 이해

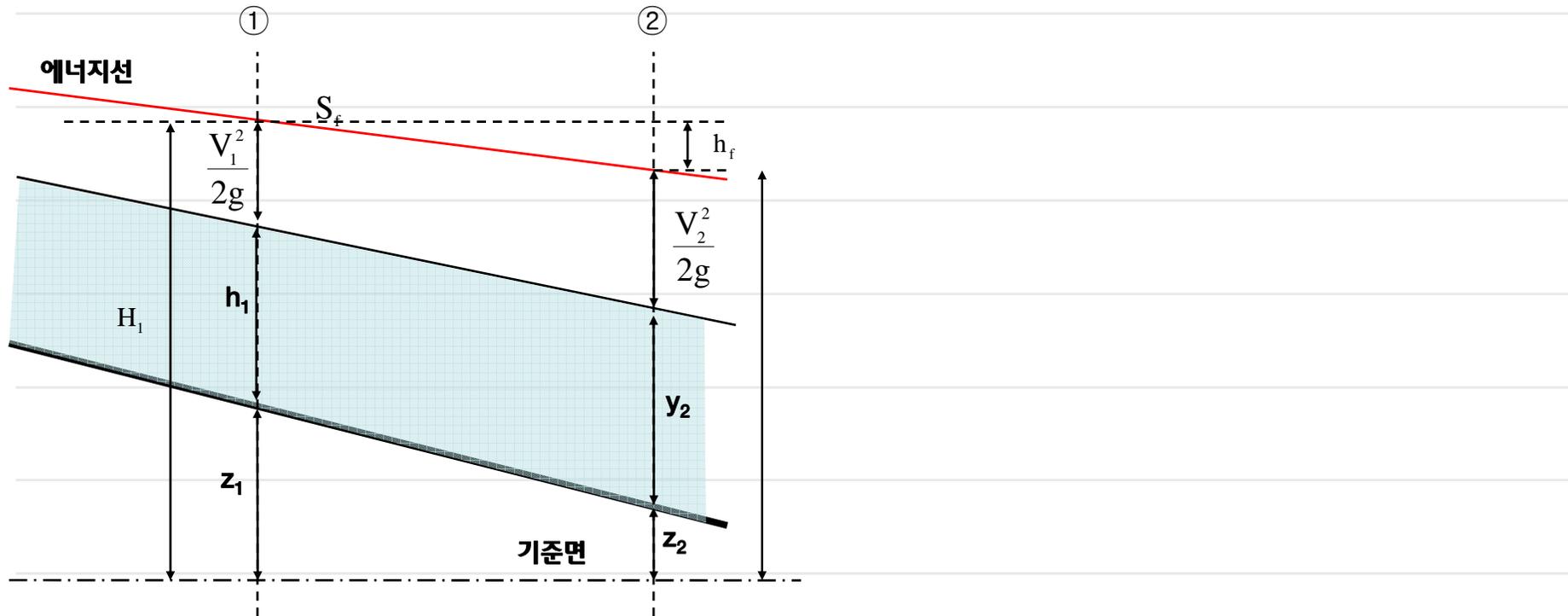
● Darcy의 법칙

$$q = K \cdot S_f$$



침투에서의 부호 이해

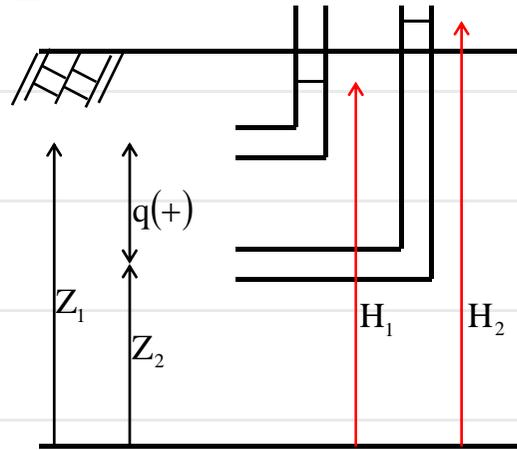
● Darcy의 법칙



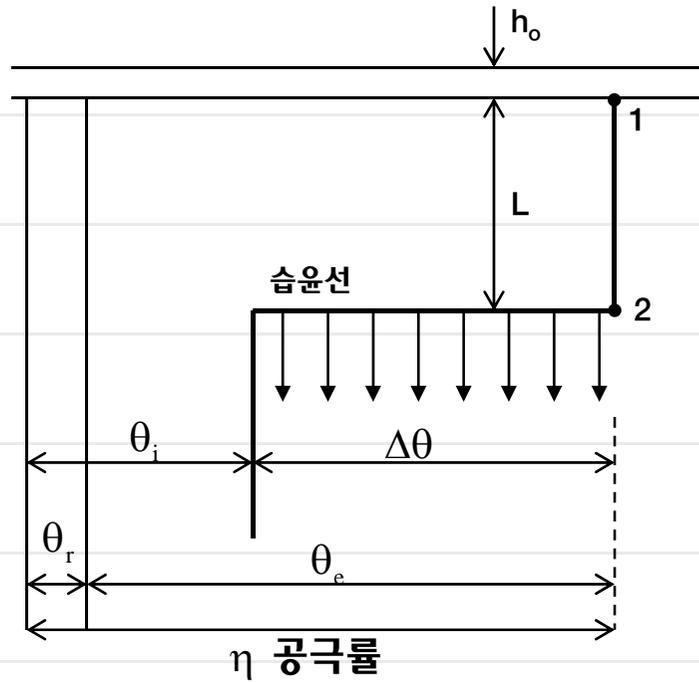
침투에서의 부호 이해

● Darcy의 법칙

< 부호 >



Green-Ampt 식



Green-Ampt 식

● Darcy의 법칙

$$q = -k \frac{\partial h}{\partial z}$$

$$q = -f$$

$$f = k \frac{h_2 - h_1}{z_2 - z_1}$$

만일 , $h_0 \ll \Psi$, L 이라면