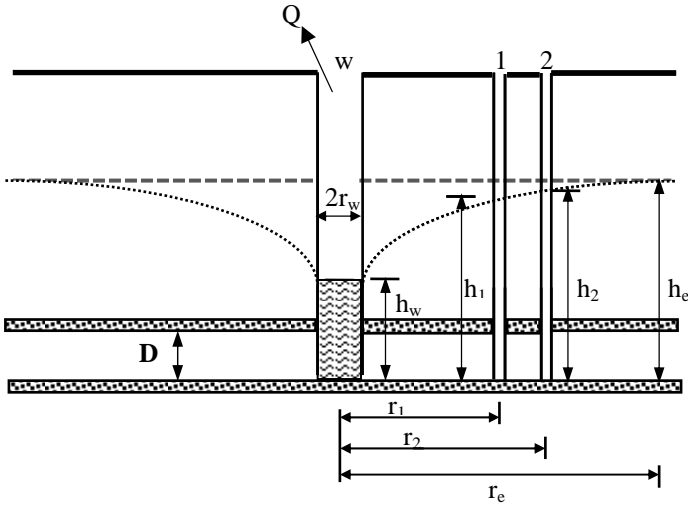


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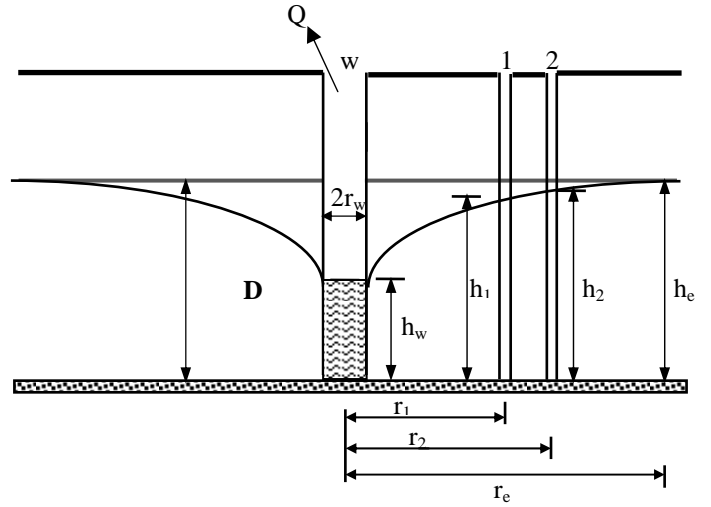


$$Q = \frac{2 \pi k D (h_e - h_w)}{\ln \frac{r_e}{r_w}}$$

$$Q = \frac{2 \pi k D (h_2 - h_1)}{\ln \frac{r_2}{r_1}}$$

$$T = K D$$

$$h_w = D$$



$$Q = \frac{\pi k (h_e^2 - h_w^2)}{\ln \frac{r_e}{r_w}}$$

$$Q = \frac{\pi k (h_2^2 - h_1^2)}{\ln \frac{r_2}{r_1}}$$

$$T = K h_e$$

$$h_w = \text{zero}$$

$$Q_R = \frac{\pi k}{\ln \frac{r_e}{r_w}} \left[(h_e^2 - h_w^2) + \frac{R}{2k} (r_e^2 - r_w^2) \right]$$

$$Q_s = 2 \pi k r_w (h_e - h_w)$$

$$\frac{Q_s}{Q} = \frac{r_w}{D} \cdot \ln \frac{r_e}{r_w}$$

$$Q_p = \left[\frac{2 \pi k h_s (h_e - h_w)}{\ln \frac{r_e}{r_w}} \right] \times \left[1 + 7 \sqrt{\frac{r_w}{2h_s}} \cdot \cos \frac{\pi h_s}{2D} \right]$$

$$h_{2he} - h_w = \frac{Q_p}{4 \pi k} \times \left[\frac{1}{h_s} \cdot \ln \frac{\pi h_s}{2r_w} + \frac{0.1}{D} + \frac{1}{D} \cdot \ln \frac{r_e}{2D} \right]$$

$$Q_p = \left[\frac{\pi k (h_s^2 - h_w^2)}{\ln \frac{r_e}{r_w}} \right] \times \left[1 + 7 \sqrt{\frac{r_w}{2h_s}} \cdot \cos \frac{\pi h_s}{2h_e} \right]$$

$$h_{2he} - h_w = \frac{Q_p}{4 \pi k} \times \left[\frac{2}{h_s} \cdot \ln \frac{\pi h_s}{2r_w} + \frac{0.2}{h_e} \right]$$

