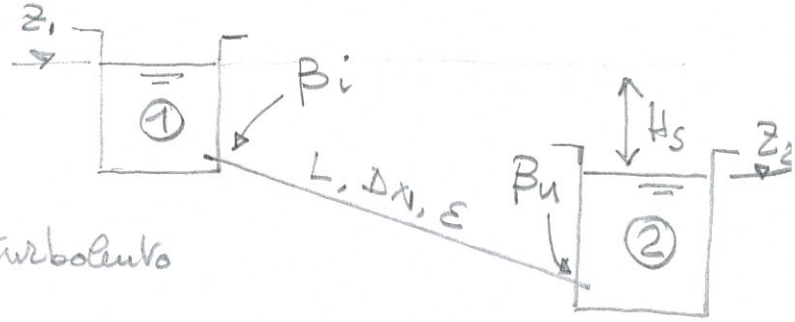
$L = 20\ m$ $\quad z_1 = 12{,}0\ m$

DN20 (costante) $\quad z_2 = 3{,}0\ m$

$\varepsilon = 0{,}3\ mm$



Ipotesi di moto assolutamente turbolento

$\beta_i = 0{,}5$

$\beta_u = 1{,}0$

$(T = 20°)$

+ Calcolare la portata volumetrica nel collettore
+ Verificare il moto turbolento
+ Prevalenza della pompa da ② a ① a parità di portata

$$\frac{1}{\sqrt{\lambda}} = -2 \lg\left(\frac{\varepsilon}{3{,}71 D}\right) \Rightarrow \lambda = 0{,}04365$$

Bernoulli:

$$z_1 = z_2 + \underbrace{\frac{\lambda}{D}\frac{U^2}{2g} \cdot L}_{\Delta H_d} + \underbrace{\sum_i \beta_i \frac{U^2}{2g}}_{\Delta H_s}$$

$$\frac{U^2}{2g}\left(\frac{\lambda}{D} \cdot L + \sum_i \beta_i\right) = H_s$$

$$U = \sqrt{\frac{2g H_s}{\frac{\lambda}{D} L + \sum_i \beta_i}}$$

($\frac{\lambda}{D} L$: distribuita; $\sum_i \beta_i$: concentrate)

$$= \sqrt{\frac{2 \cdot 9{,}81 \cdot 9}{43{,}65 + 1{,}5}} = 1{,}978\ m/s$$

(43,65: grande; 1,5: piccolo)

$$Q = \Omega \cdot u = \frac{\pi D^2}{4} \cdot u \doteq 6{,}21\ l/s$$

$$Re = \frac{\rho u D}{\mu} \approx 10^6 \cdot 1{,}978 \cdot 0{,}02 = 39553$$

↑ Sostanzialmente verificato

$$H_p = H_s + \Delta H_d + \Delta H_c = z_1 - z_2 + \frac{\lambda}{D}\frac{U^2}{2g} \cdot L + \sum_i \beta_i \frac{U^2}{2g}$$

$$= 18\ m$$