

HIDRAULIKA

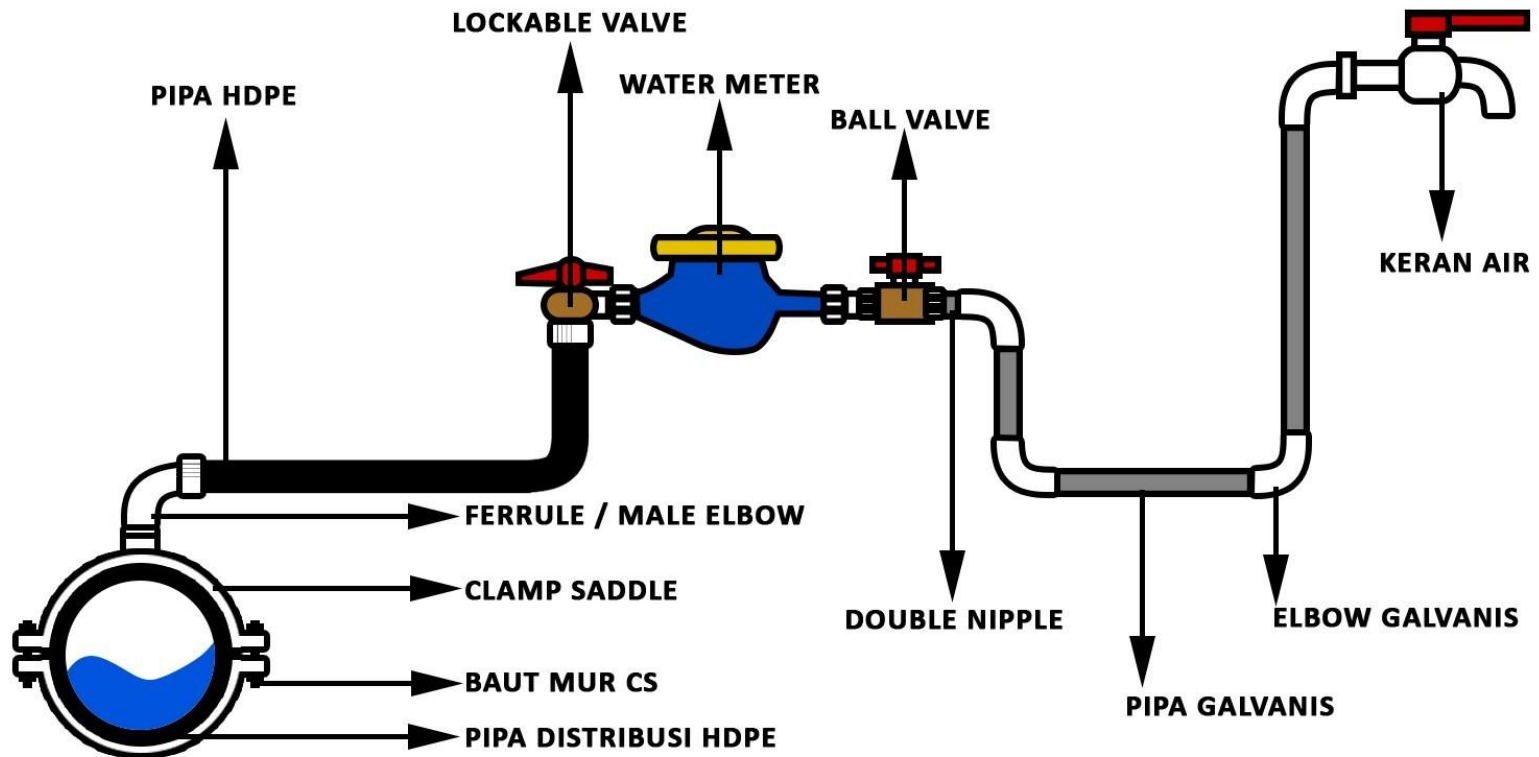
TKS22226

BAHAN-KULIAH-MINGGU-KE – 5
ALIRAN MELALUI PIPA

Disusun oleh:
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Prodi S1 Teknik Sipil
FT-UNS

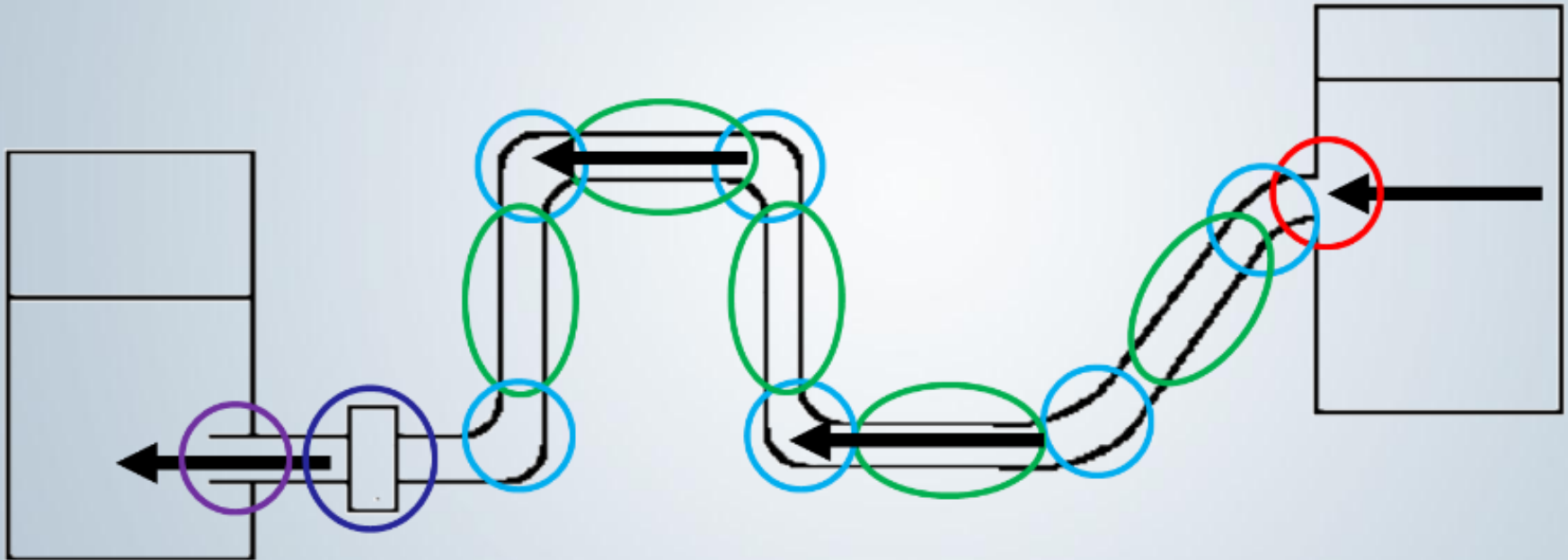


Sistem Pipa

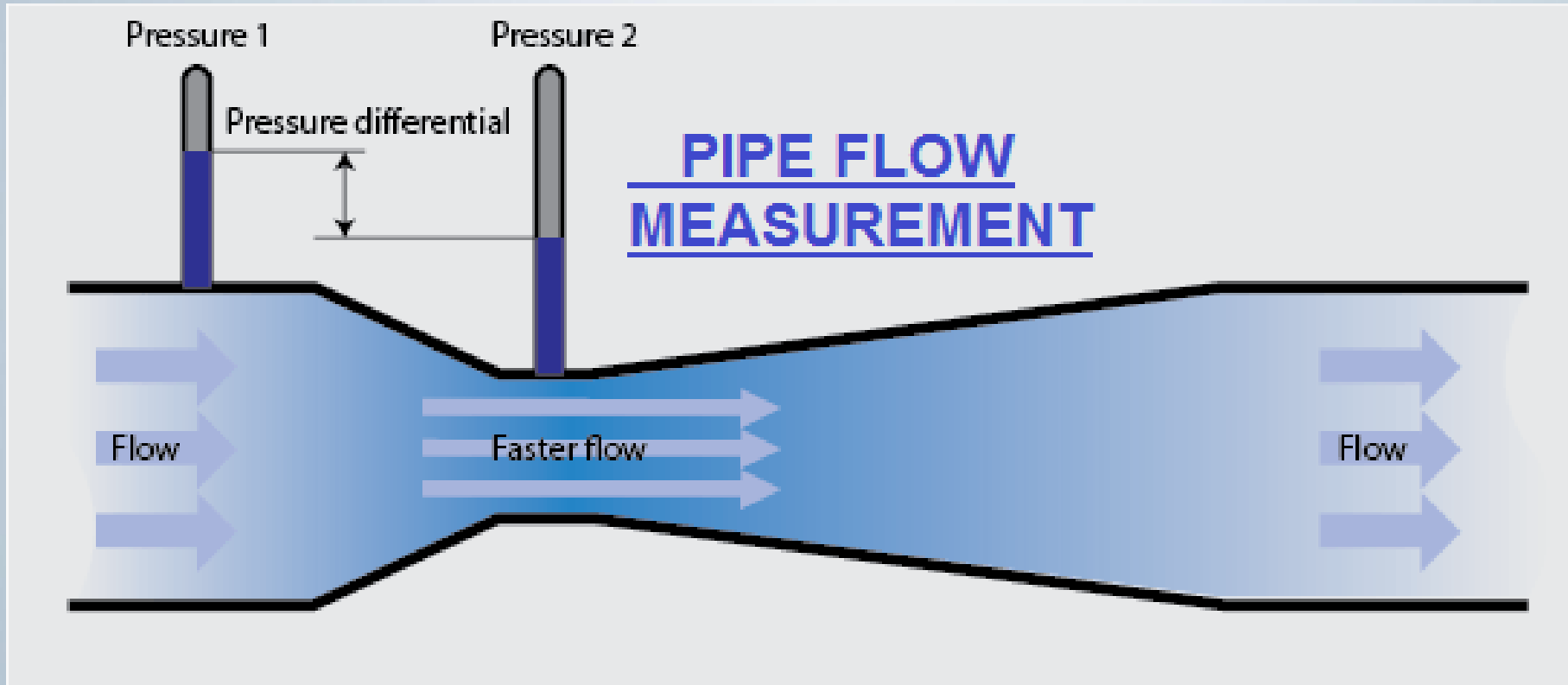


GAMBAR SAMBUNGAN RUMAH (SR)

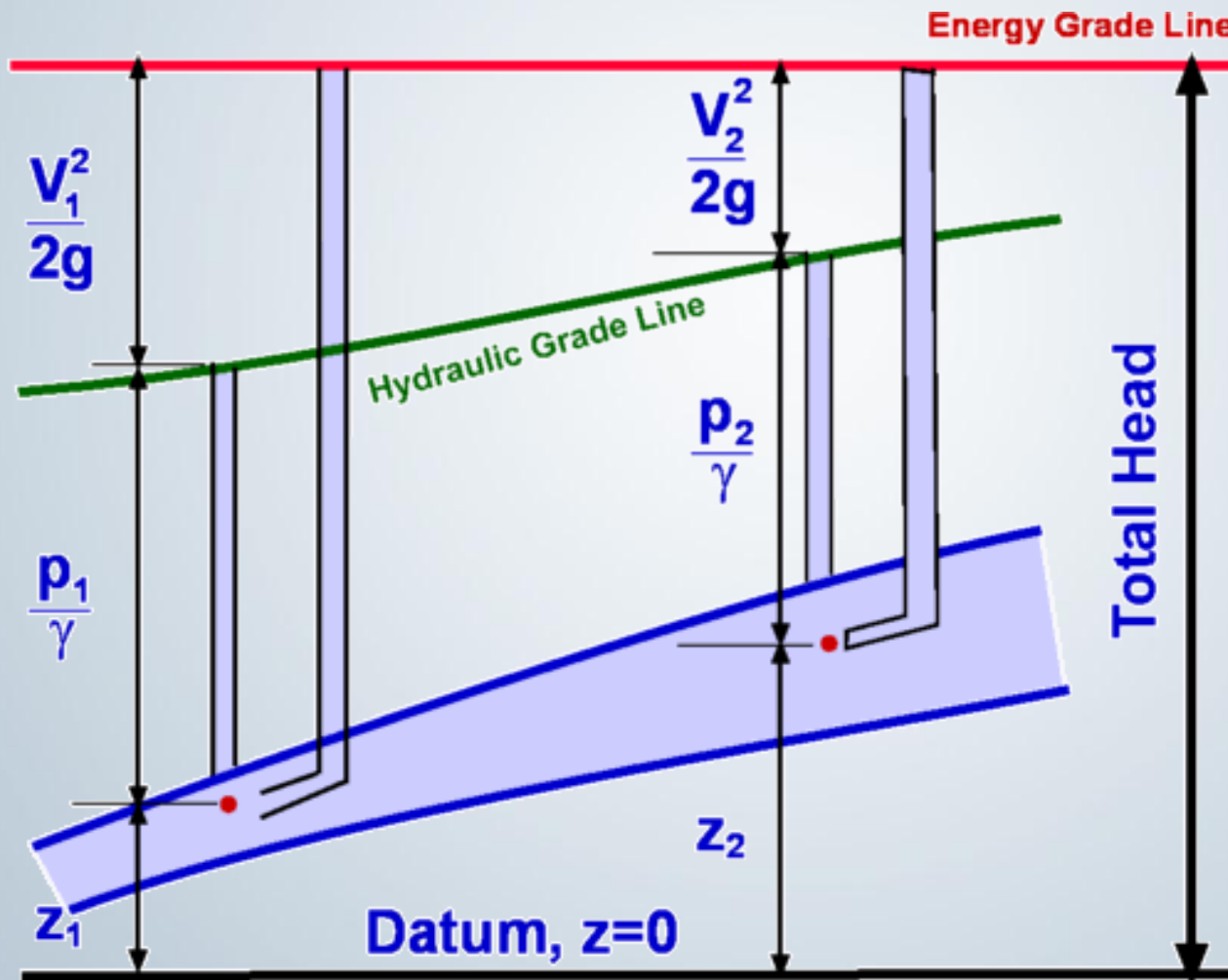
Kehilangan Tenaga



Perubahan Penampang



Garis Tenaga dan Tekanan



Tekanan Negatif

Pipe line with negative Pressure

Solution

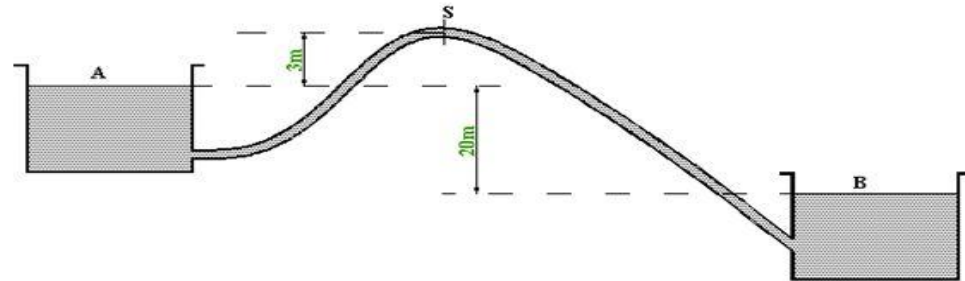
$$D = 0.2 \text{ m}, \quad Z_A - Z_B = 20 \text{ m}, \quad L = 500 \text{ m}, \quad L_{AS} = 100 \text{ m}, \quad f = 0.02$$

$$Z_A - Z_B = h_f = f \frac{L}{D} \frac{V^2}{2g}$$

$$20 = 0.02 \times \frac{500}{0.2} \times \frac{V^2}{2 \times 9.81}$$

$$V = 2.8 \text{ m/s}$$

$$Q = VA = 0.08796 \text{ m}^3/\text{s}$$



$$\frac{V_A^2}{2g} + \frac{P_A}{\gamma} + Z_A = \frac{V_S^2}{2g} + \frac{P_S}{\gamma} + Z_S + h_L$$

$$Z_A - Z_S = \frac{V_S^2}{2g} + \frac{P_S}{\gamma} + h_L$$

$$0 - 3 = \frac{2.8^2}{2g} + 0.02 \frac{100}{0.2} \times \frac{2.8^2}{2g} + \frac{P_S}{\gamma}$$

$$\frac{P_S}{\gamma} = -7.396 \text{ m of water}$$

34