$$Q = 1.848 b H_{vr}^{\frac{3}{2}} \implies H_{vr} = \left(\frac{Q}{1.848 b}\right)^{\frac{3}{2}}$$

1. Dados: Q = 0.08 $m^3/s$, T = 25.0°C, g = 9.81 $m/s^2$, $\gamma$ = 9781.0207 FaltaUnidade, $\mu$ = 0.0009 FaltaUnidade, $P_{vr}$ = 1.6926 m, b = 0.5 m.

2. Calculo da velocidade e da profundidade da água na seção de medição (seção 0):

$$y_c = \sqrt[3]{\frac{Q^2}{gb^2}} \implies y_c = \sqrt[3]{\frac{0.08^2}{9.81 \cdot 0.5^2}} \implies \boxed{y_c = 0.1377 \text{ m}}$$

$$y_1 = \frac{1.414 y_c}{\sqrt{2.56 + \frac{P_{vr}}{y_c}}} \implies y_1 = \frac{1.414 \cdot 0.1377}{\sqrt{2.56 + \frac{1.6926}{0.1377}}} \implies \boxed{y_1 = 0.0505 \text{ m}}$$

$$v_1 = \frac{Q}{y_1 b} \implies v_1 = \frac{0.08}{0.0505 \cdot 0.5} \implies \boxed{v_1 = 3.1677 \text{ m/s}}$$

$$F_1 = \frac{v_1}{\sqrt{g y_1}} \implies F_1 = \frac{3.1677}{\sqrt{9.81 \cdot 0.0505}} \implies \boxed{F_1 = 4.5}$$

$$y_2 = \frac{y_1}{2}\left(\sqrt{1 + 8F_1^2} - 1\right) \implies y_2 = \frac{0.0505}{2}\left(\sqrt{1 + 8 \cdot 4.5^2} - 1\right) \implies \boxed{y_2 = 0.2972 \text{ m}}$$

$$E_n = \frac{(y_2 - y_1)^3}{4 y_1 y_2} \implies E_n = \frac{(0.2972 - 0.0505)^3}{4 \cdot 0.0505 \cdot 0.2972} \implies \boxed{E_n = 0.25 \text{ m}}$$

$$v_2 = \frac{Q}{y_2 b} \implies v_2 = \frac{0.08}{0.2972 \cdot 0.5} \implies \boxed{v_2 = 0.5384 \text{ m/s}}$$

$$U_m = \frac{v_1 + v_2}{2} \implies U_m = \frac{3.1677 + 0.5384}{2} \implies \boxed{U_m = 1.853 \text{ m/s}}$$

$$L_r = 5(y_2 - y_1) \implies L_r = 5(0.2972 - 0.0505) \implies \boxed{L_r = 1.2334 \text{ m}}$$

$$T_m = \frac{L_r}{U_m} \implies T_m = \frac{1.2334}{1.853} \implies \boxed{T_m = 0.6656 \text{ s}}$$

$$Gm = \sqrt{\frac{\gamma E_n}{\mu T_m}} \implies Gm = \sqrt{\frac{9781.0207 \cdot 0.25}{0.0009 \cdot 0.6656}} \implies \boxed{G_m = 2031.1054 \text{ s}^{-1}}$$