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

1. Altura, H_{vr}.

$$H_{vr} = \left(\frac{Q}{1.848b}\right)^{\frac{3}{2}} \implies H_{vr} = \left(\frac{0.08 m^3/s}{1.848 \cdot 0.5\ m}\right)^{\frac{3}{2}} \implies \boxed{H_{vr} = 0.0255\ m}$$

2. Distância entre vertedor e seção inicial do ressalto L_m, profundidade crítica y_c, e altura da lâmina d'água no início do ressalto y_1.

$$y_c = \sqrt[3]{\frac{Q^2}{gb^2}} \implies y_c = \sqrt[3]{\frac{0.08^2\ (m^3/s)^2}{9.81 m/s^2\ 0.5^2 m^2}} \implies \boxed{y_c = 0.1377\ m}$$

$$L_m = H_{vr}\left(\frac{P_{vr}}{H_{vr}}\right)^{0.54} \implies L_m = 0.0255m\left(\frac{1.6926m}{0.0255m}\right)^{0.54} \implies \boxed{L_m = 0.3561\ m}$$

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

3. Velocidade do escoamento no inicio do ressalto, v_1.

$$v_1 = \frac{Q}{y_1 b} \implies v_1 = \frac{0.08 m^3/s}{0.0505m\ 0.5m} \implies \boxed{v_1 = 3.1677\ m/s}$$

4. Número de Froude na seção 1, F_1.

$$F_1 = \frac{v_1}{\sqrt{g y_1}} \implies F_1 = \frac{3.1677 m/s}{\sqrt{9.81 m/s^2\ 0.0505m}} \implies \boxed{F_1 = 4.5}$$

5. Altura da lâmina d'água no final do ressalto y_2.

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

6. Perda de energia E_n, comprimento do ressalto L_r, e velocidade no final do ressalto v_2.

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

$$v_2 = \frac{Q}{y_2 b} \implies v_2 = \frac{0.08 m^3/s}{0.2972m\ 0.5m} \implies \boxed{v_2 = 0.5384\ m/s}$$

$$L_r = c\,(y_2 - y_1) \implies L_r = 5.0\,(0.2972m - 0.0505m) \implies \boxed{L_r = 1.2334\ m}$$

7. Velocidade média, U_m.

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

8. Tempo médio de mistura, T_m.

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

9. Gradiente de velocidade médio, G_m.

$$Gm = \sqrt{\frac{\gamma E_n}{\mu T_m}} \implies Gm = \sqrt{\frac{9781.0207N/m^3 \cdot 0.25m}{0.0009N{\cdot}s \cdot m^{-2}\ 0.6656s}} \implies \boxed{G_m = 2031.1054\ s^{-1}}$$