Weir Flow using the Rehbock Equation   Brett Towler, UMass-Amherst

Flow of water over a rectangular weir can be described by the weir equation and the Rehbock Equation.

1. The Rehbock Equation can be used to estimate the coefficient of discharge:

$$C_d(H) := 0.602 + 0.083 \cdot \frac{H}{P}$$

Where: H is the head over the crest of the weir;
                                    P is the height of the weir

2. The weir coefficent is a lumped parameter which includes the discharge coefficient, gravitational acceleration, and other geometric parameters:

$$C(H) := \frac{2}{3} \cdot C_d(H) \cdot \sqrt{2 \cdot g}$$

Where: g is the gravitational accerelation

3. The flow rate over a sharp-crested weir is then described by the weir equation:

$$Q(H) := C(H) \cdot b \cdot H^{\frac{3}{2}}$$

Where: b is the lateral width of the weir

4. Example: Given the following values:

$$g := 9.81 \frac{m}{sec^2}$$

$$b := 2 \, m$$

$$P := 2 \, m$$

$$H := 0.35 \, m$$

$$Q(H) = 0.7539 \frac{m^3}{s}$$ The default units are SI (e.g., meters, kg, Newtons)

$$Q(H) = 26.6254 \frac{ft^3}{sec}$$ The default SI units can be converted to english units by typing the apostrophe (') and entering a new unit type. Note that the normally rectangular cursor changes to a rounded cursor.