The above diagram illustrates a partial free body diagram for an element of fluid. The element is initially at position ac, and, at a time t later, has moved to position bd. The force acting on the lower portion of the element resulting from the fluid behind the given element is represented equivalently by the pressure $p_1$ (since $p_1 = \frac{F_1}{A_1}$). Similarly, the force acting on the upper portion of the element resulting from the fluid ahead of the given element is represented equivalently by the pressure $p_2$ (since $p_2 = \frac{F_2}{A_2}$). The weight is not drawn in. We shall neglect friction along the sides of the path. A fluid in which friction may be neglected is called a (an) **ideal** fluid. The normal force has not been drawn in. The work done by the normal force is **zero**. The work done by the force on the lower portion of the element is $\frac{1}{2} F_1 \Delta S_1$. The work done by the force on the lower portion of the element is $\frac{1}{2} F_1 \Delta S_1$. The change in kinetic energy is $\frac{1}{2} \rho \Delta V (v_2^2 - v_1^2)$. The change in gravitational potential energy is $\Delta V g (y_2 - y_1)$. The work done by the force on the upper portion of the element is $-F_2 \Delta S_2$. The work–energy theorem, when applied to the previously described element of fluid is: $(\rho_1 - \rho_2) \Delta V = \frac{1}{2} \rho \Delta V (v_2^2 - v_1^2) + \rho g (y_2 - y_1)$.