

LOCK

Lock is an navigation and hydraulic structure used to overcome the difference of water level between two positions, it consist of entrance ,lock chamber , outlet , gates or orifices .

Length and Width of Lock

The size of the lock depends on the size of the largest boat pass through it with clearances to allow the boat to enter the lock .

Filling and Emptying the Lock

This prosses is done by :-

1. Gates
2. Orifices through the gates
3. Orifices at the side and lower walls of the lock

Time of Filling and Emptying the Lock

$$\text{Time of filling}(t_f) = \frac{A(H + h)}{C_d a_1 \sqrt{2gh}}$$

$$2AH$$

$$\text{Time of emptying}(t_e) = \frac{2AH}{C_d a_2 \sqrt{2gh}}$$

Let A= area of the lock chamber

a_1 = area of the upper sluice .

H = difference of water level in the two canals .

h = hight of the water surface in the upper canal above the upper sluice G

a_2 = area of the lower sluice.

C_d =coefficient.