

Functioning Principle of Fusegate

The Fusegate System is based on the following concept:

- o Fusegates are free-standing units installed side by side on a spillway sill to form a watertight barrier.
- o They bear against small abutment blocks set in the sill to prevent them from sliding before they are required to rotate (under extreme flood conditions).

There is a chamber in the base of each Fusegate, with drain holes to discharge incidental inflow (due to leaking seals for example).

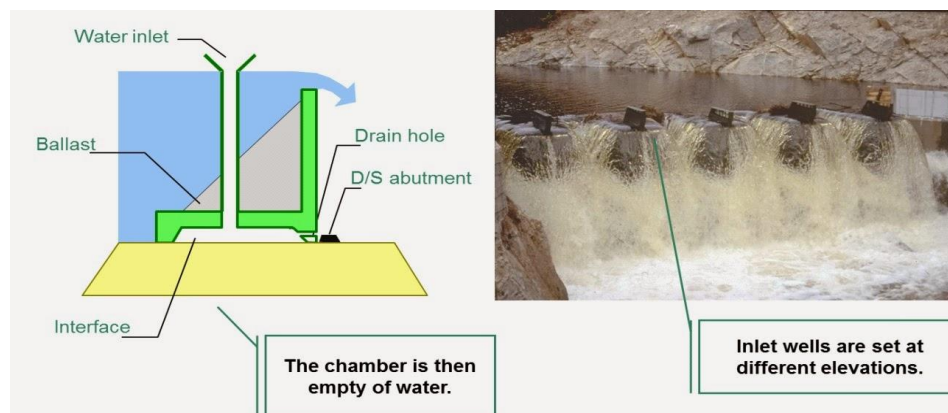


Figure 1: C/S through a fusegate with moderate overspill.

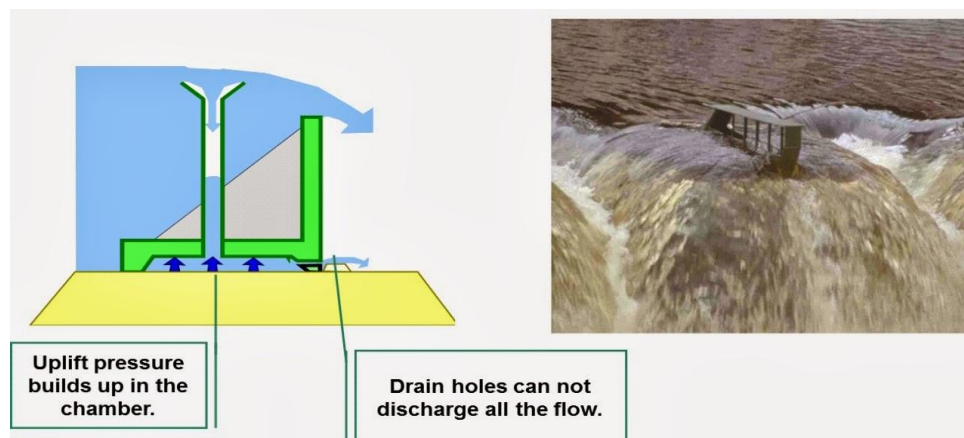


Figure 2: C/S through a fusegate with inlet well being fed.

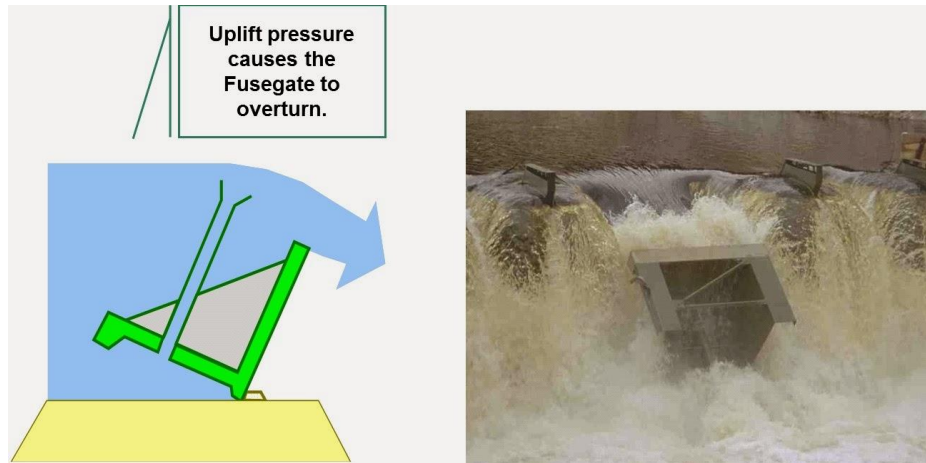


Figure 3: Uplift pressure cause the fusegate to overturn

An inlet well on the upstream side of the Fusegate crest discharges water into the chamber when the headwaters reaches a predetermined level. (Well lips on individual Fusegates are actually set at different levels).

During very large floods, water entering the chamber over the inlet well causes an uplift pressure to develop in the chamber.

The uplift pressure, combined with the hydro-static pressure (acting from left to right on the adjacent diagram) is sufficient to overcome the restraining forces and the imbalance causes rotation of the unit off the spillway. The Fusegate is then washed away clear of the spillway by the flood.

If the water level continues to rise after the first breach more Fusegates can rotate, all according to pre-determined upstream water levels until eventually there are no more units remaining and the spillway is free to pass the original maximum design flood. Until rotation of the first Fusegate, (for floods of extremely low risk of occurrence), the user has the benefit of the additional storage.

Each Fusegate has a different overturning level, precisely determined by the height of the water inlet and its own unique stability.

Source: <http://hydropedia.blogspot.in/search/label/Flood>