

UNIT-III

DIVERSION HEAD WORKS

- Types of diversion head works
- Diversion and storage head works
- weirs and barrages
- Layout of diversion head works, components
- Bligh's creep theory, Khosla's theory, determination of uplift pressure
- Impervious floors using Bligh's and Khosla's theory
- Exit gradient

Diversion Headworks



Introduction:

Any hydraulic structure which supplies water to the off-taking canal is called a headwork.

(Or)

The works which are constructed at the head of the canal, in order to divert the river water towards the canal, so as to ensure a regulated continuous supply of silt-free water with a certain minimum head into the canal, are known as diversion head works.



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TYPES OF HEADWORKS



Fig1: DIVERSION HEADWORK



Fig 2: STORAGE HEADWORK

Types of diversion head works

Headworks may be divided into two classes:

1. Diversion headwork
2. Storage headwork

Diversion headwork:

To divert required supply to canal from the river. They are two types.

- a) Temporary spurs or bunds: which are temporary and constructed every year after floods
- b) Permanent weirs and barrages

Storage headwork:

A storage headwork comprises the construction of a dam across the river. It stores water during the period of excess supplies in the river and releases it when demand overtakes available supplies.

Weir:

The weir is a solid obstruction put across the river to raise its water level and divert the water into the canal. If a weir also stores water for tiding over small periods of short supplies, it is called a storage weir.

The main difference between a storage weir and a dam is only in height and the duration for which the supply is stored.

Barrage:

The function of a barrage is similar to that of weir, but the heading up of water is effected by the gates alone. No solid obstruction is put across the river.

The crest level in the barrage is kept at a low level.

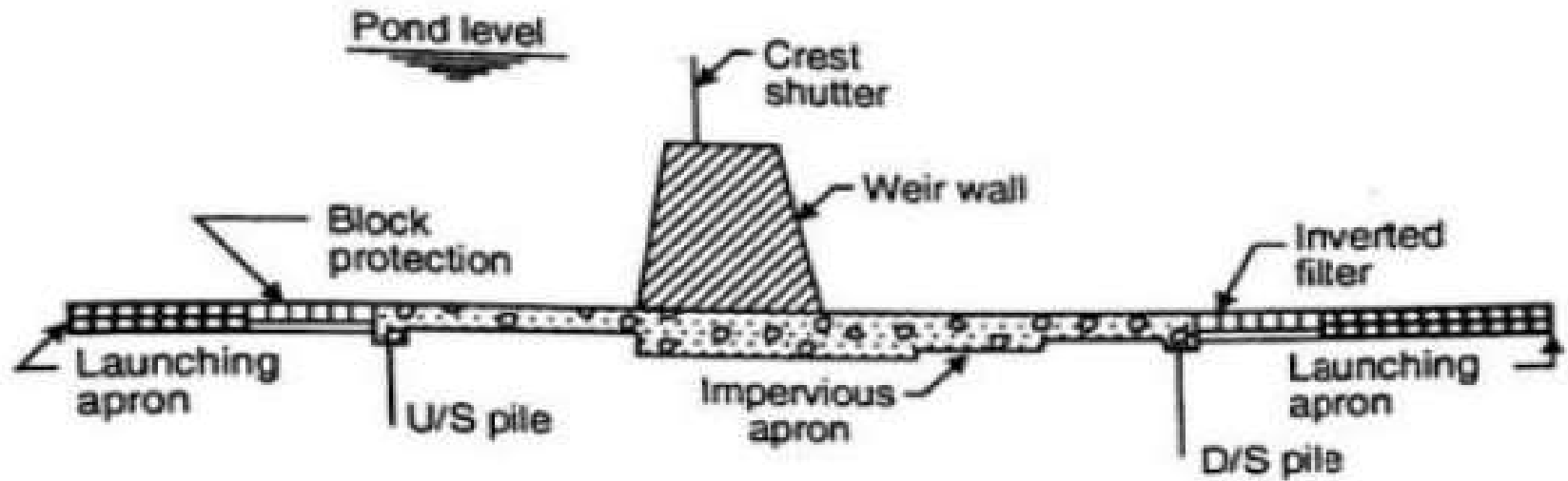


FIG. 12.1. VERTICAL DROP WEIR.

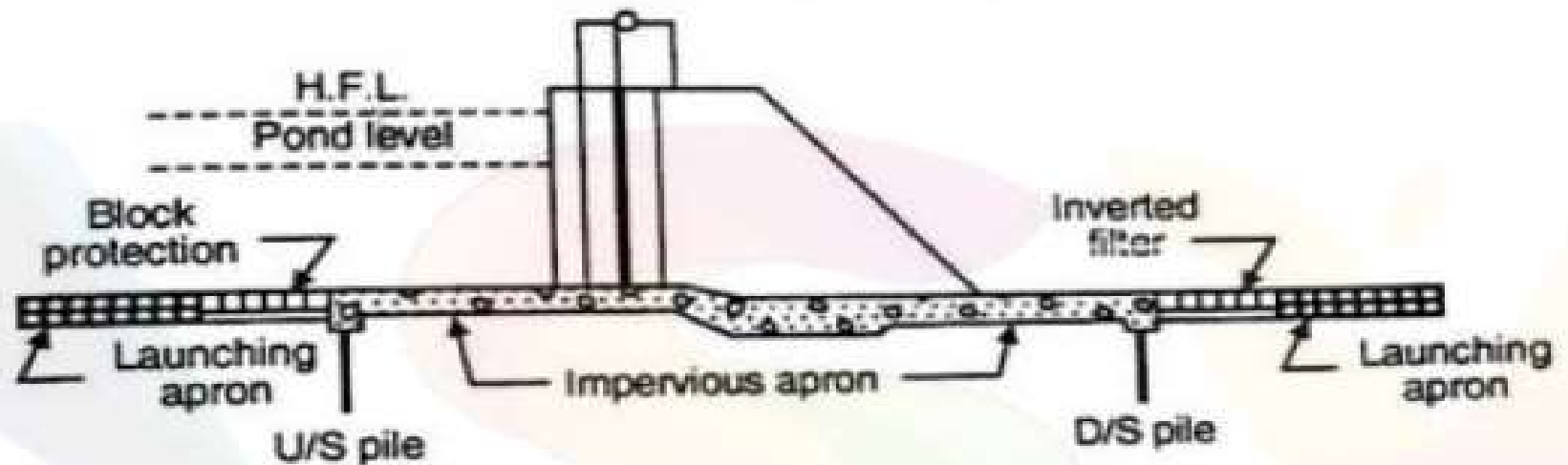
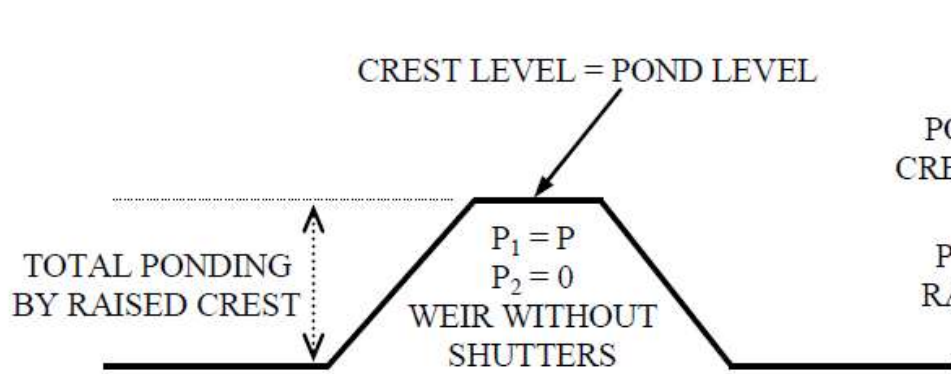
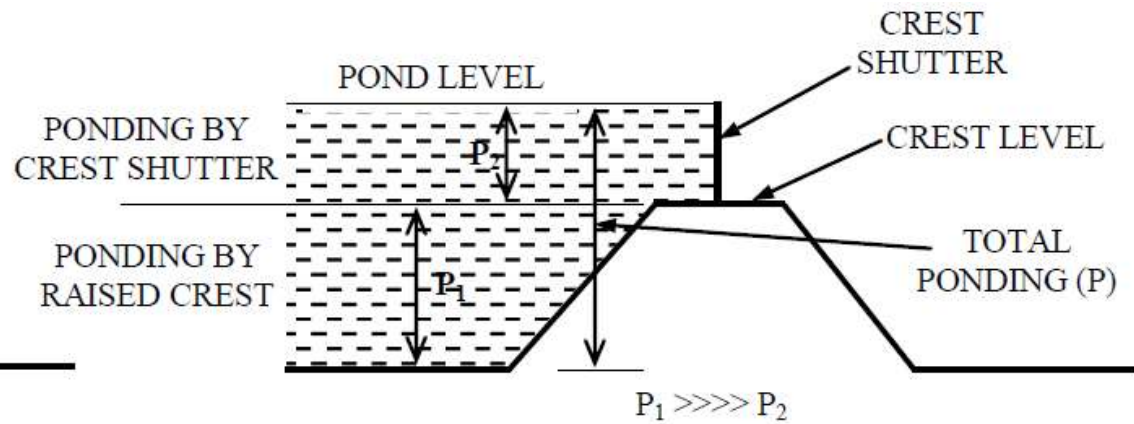


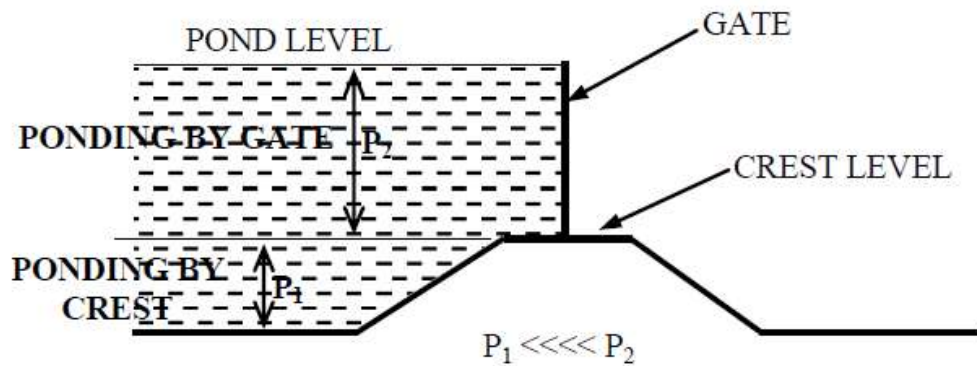
FIG. 12.2. BARRAGE.



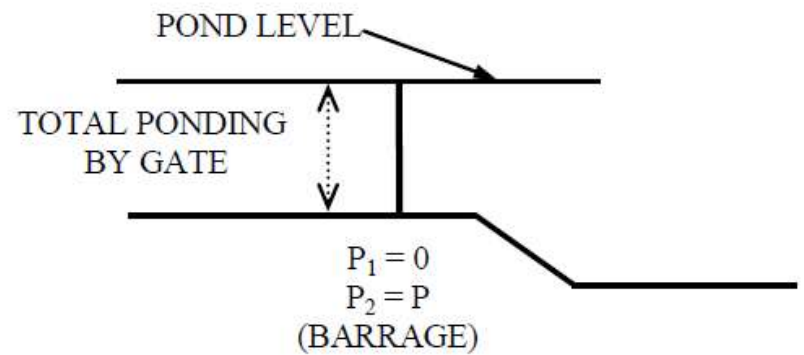
(a) Fig: Weir without shutters



(b) Fig: Weir with shutters



(c) Fig: Barrage with a small raised crest



(d) Fig: Barrage without any raised crest