

## CROSS DRAINAGE WORKS

- **A cross drainage work is a structure constructed for carrying a canal across a natural drain (or) river intercepting the canal so as to dispose the drainage water without interrupting the continuous canal supplies.**
- **These are unavoidable in any type of canal system.**
- **In order to minimize the no. of cross drainage works, the alignment of canals should be generally along the watershed so that we have less no. of natural drains.**

# TYPES OF CROSS DRAINAGE WORKS

## 1. Cross drainage works carrying the canal over the natural drain

### i. AQUEDUCT

- An Aqueduct is a hydraulic structure which carries a canal (through a trough (or) a duct) across and above the drainage similar to a bridge in which instead of road (*or*) a railway, a canal is carried over a natural drain.
- In the case of an aqueduct, HFL (Highest flood level) of the drainage should main lower than the level of the underside of the canal trough.
- The canal water is taken across the drain in a trough supported on piers

# TYPES OF CROSS DRAINAGE WORKS

## 1. Cross drainage works carrying the canal over the natural drain

### ii. **SYPHON AQUEDUCT**

- A syphon aqueduct is a cross drainage structure similar to an aqueduct except that the stream bed is depressed locally where it passes under the trough of the canal and the barrels discharges the stream flow under pressure.
- A syphon aqueduct is constructed where the water surface level of the train at high flood is higher than the canal bed.

# TYPES OF CROSS DRAINAGE WORKS

## 2. Cross drainage works carrying the natural drain over canal

### i. SUPER PASSAGE

- A super passage is also similar to a bridge in which the natural drain is carried over the canal.
- A super passage is reverse of an aqueduct.

### ii. SYPHON

- A syphon is similar to a syphon aqueduct with the difference that in the case of a syphon, the canal water is carried through the barrels-under the drain.
- The barrels in this case also act as inverted syphons through which the canal water flows under pressure.

## TYPES OF CROSS DRAINAGE WORKS

### 3. Cross drainage works admitting the drain water into the canal

- In this type of cross drainage works, the canal water and the drain water are allowed to intermingle with each other.
- This may be achieved by the following two types of the Cross-drainage works:
  - i. Level Crossing
  - ii. Inlet and Outlet

# TYPES OF CROSS DRAINAGE WORKS

## 3. Cross drainage works admitting the drain water into the canal

### i. Level Crossing –

- A level crossing is a cross drainage work in which the drainage and the canal meet each other at approximately the same level.
- It consists of a regular with quick falling shutters across the drain at its downstream junction with the canal.
- Such an arrangement is adopted when both the canal and the drainage carry considerable discharge, the latter during the high flood season when syphoning either the canal (*or*) the stream proves to be extremely costly or else the head loss through the syphon barrels is very high. Arrangement is practically similar to that provided on a canal head work.
- In this arrangement, the perennial discharge is used advantageously in order to increase the canal supplies.

# TYPES OF CROSS DRAINAGE WORKS

## 3. Cross drainage works admitting the drain water into the canal

### ii. Inlet And Outlet -

- An inlet is an open cut (*or*) a pipe which is provided in a canal bank suitably protected by pitching to pass the drain water into the canal.
- This arrangement is provided only where the silt load of the drainage is suitable.
- An inlet may be provided for a small drain coming across a canal if the bed level of drain is slightly higher (*or*) lower than the canal F.S.L
- It is not necessary that the no of inlets & outlets should be the same.
- Inlet is a non-regulating structure
- Outlet is another open cut in the canal bank with bed & sides of the cut properly pitched.