CANAL FALL / DROP

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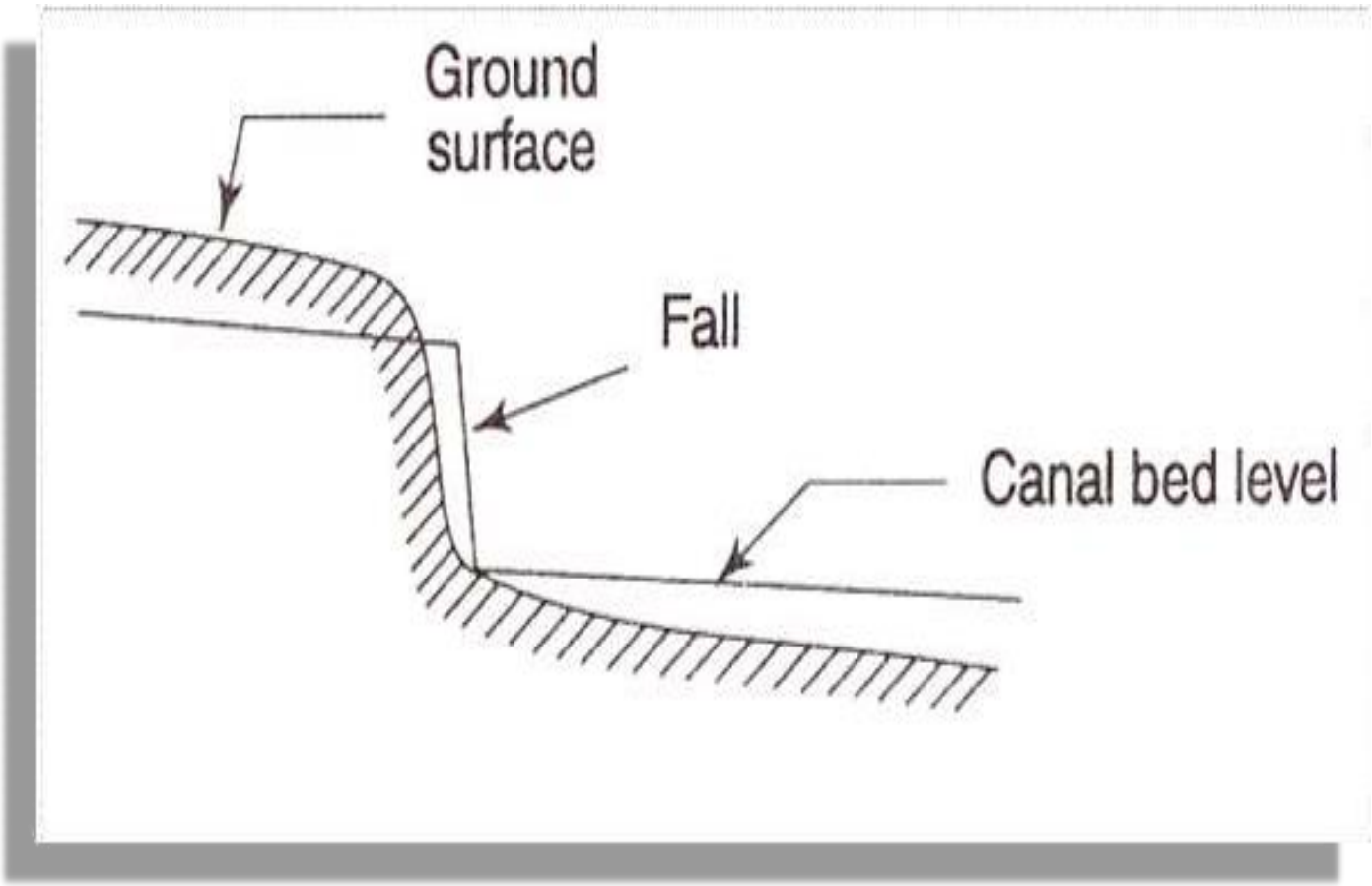
Canal : An artificial waterway constructed to allow the passage of boats or ships or to convey water for irrigation provided with permissible slope.

Canal Fall : A Structure constructed to achieve the object of lowering the bed level of a canal suitably

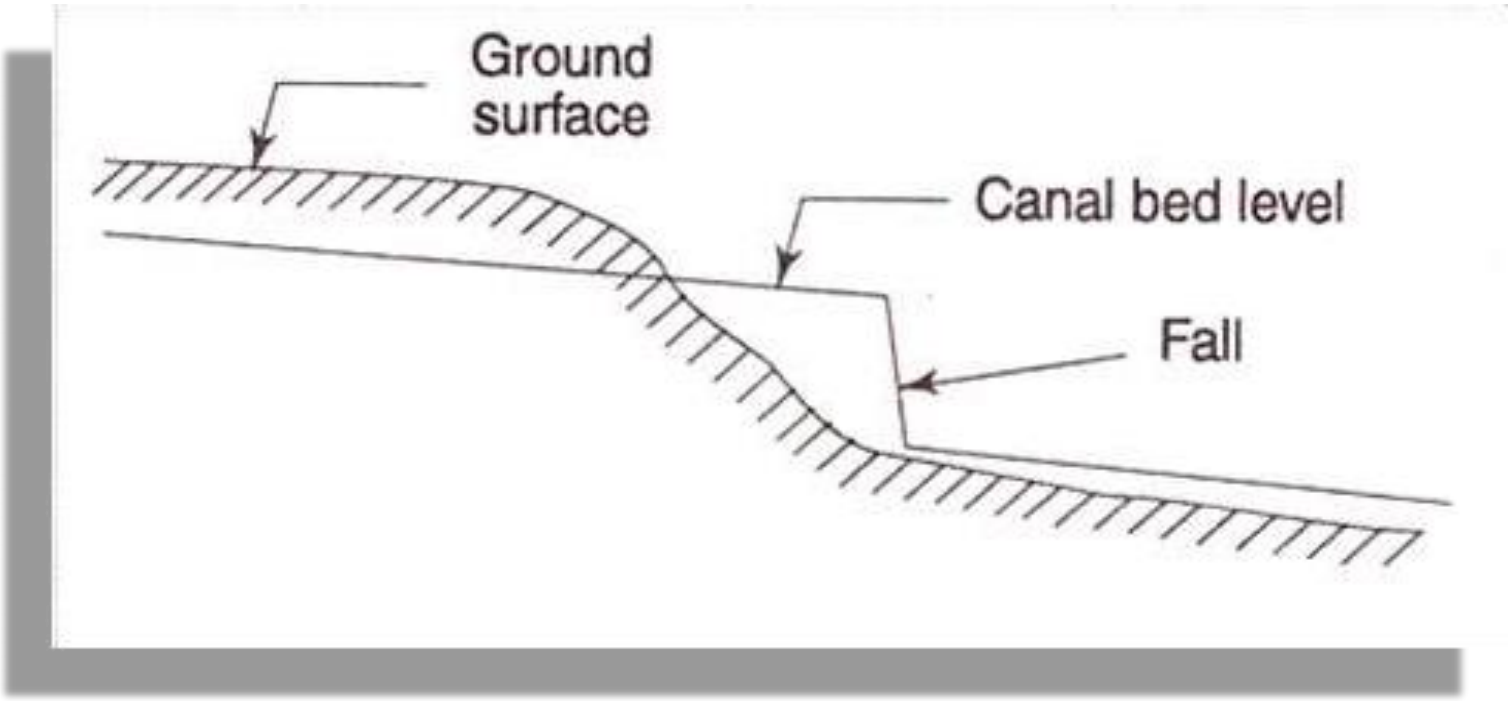
INTRODUCTION

- Canals are constructed with some permissible bed slopes so that there is no silting in the canal bed
- Ground surface may be steep and sometimes it may be very irregular with abrupt change of grade.

Necessity: When the slope of the ground suddenly changes to steeper slope.



- When the slope of the ground is more or less uniform and the slope is greater than the permissible bed slope ofcanal



CONSIDERATIONS IN SELECTING TYPE OF FALL :

- The height of fall of water
- The discharge passing over the fall
- Topography of site location
- Type of soil in upstream and downstream of structure
- Economy

TYPES

- Ogee fall
- Rapid fall
- Trapezoidal fall
- Stepped fall
- Montague fall
- Vertical drop fall
- Straight Glacis fall

OGEE FALL

An ogee curve (a combination of convex curve and concave curve) is provided for carrying the canal water from higher level to lower level.

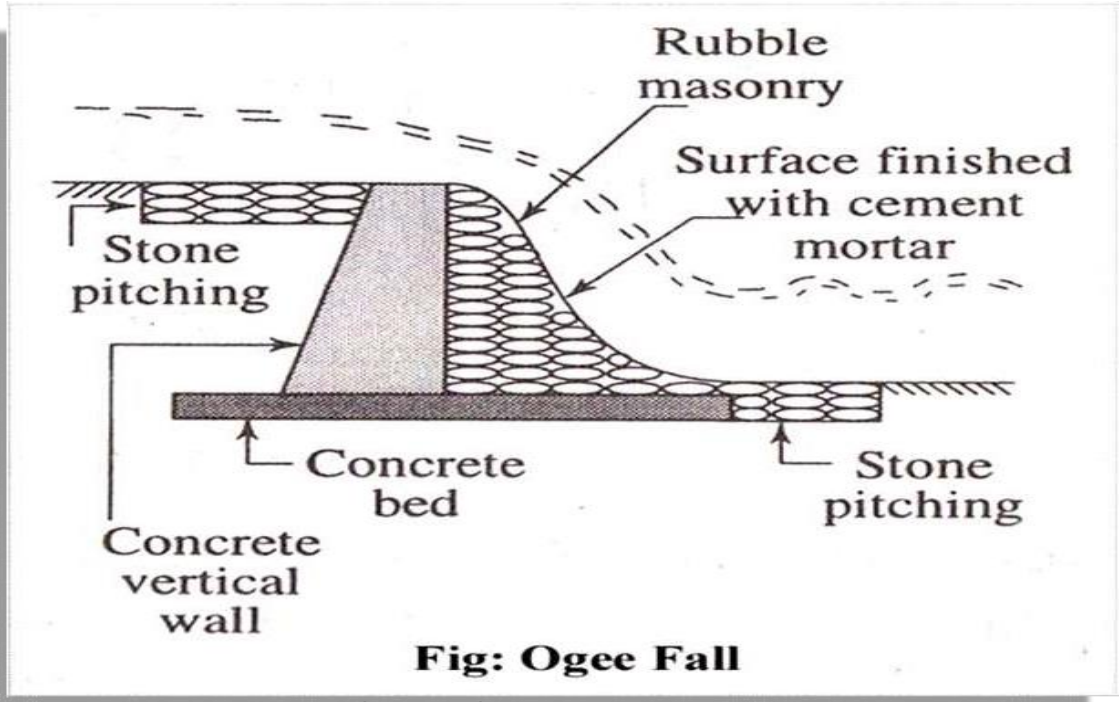


Fig: Ogee Fall

- It is limited to low depths
- Due to smooth transition, velocity of flow is not reduced since it may cause erosion in down stream
- It has high discharging efficiency

RAPID FALL

- It is suitable when the slope of the natural ground surface is even and long. It consists of a gentle longitudinal slope which varies from 1 in 10 to 1 in 20.

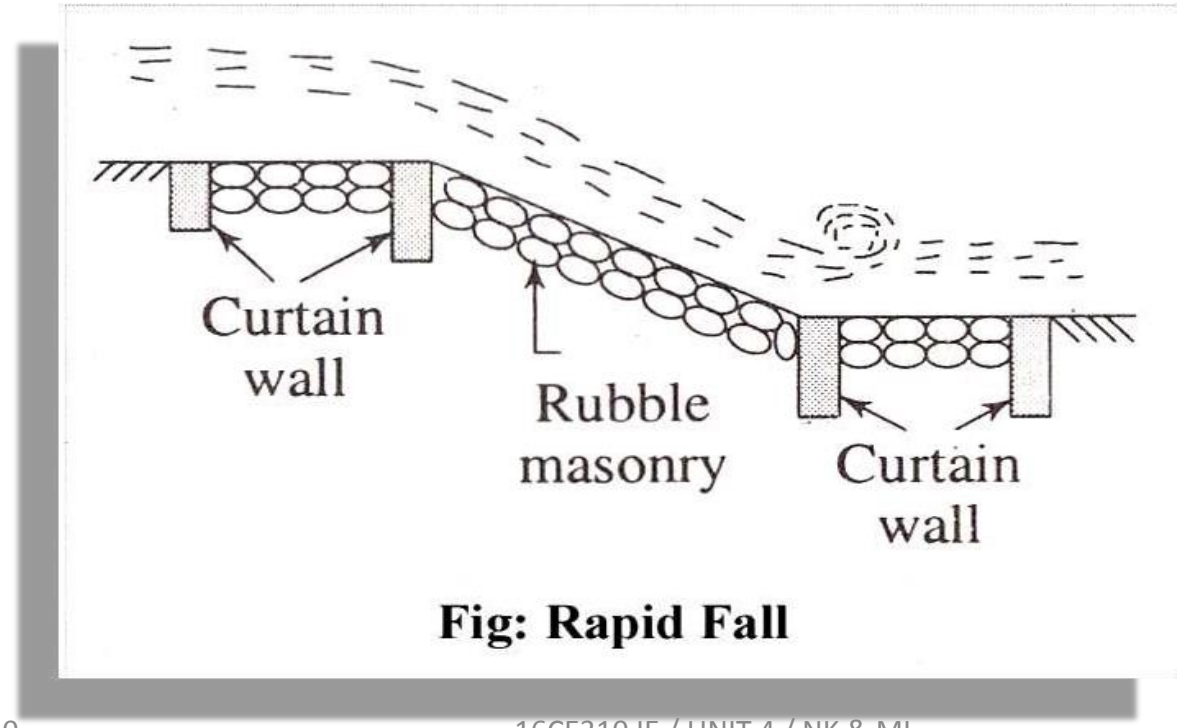


Fig: Rapid Fall

- These are expensive compared to others
- Commonly used at West Yamuna canal

TRAPEZOIDAL FALL

- In this the body wall consists of several trapezoidal notches between the side piers and the intermediate piers.
- The sills of the notches are kept at the upstream bed level of the canal.

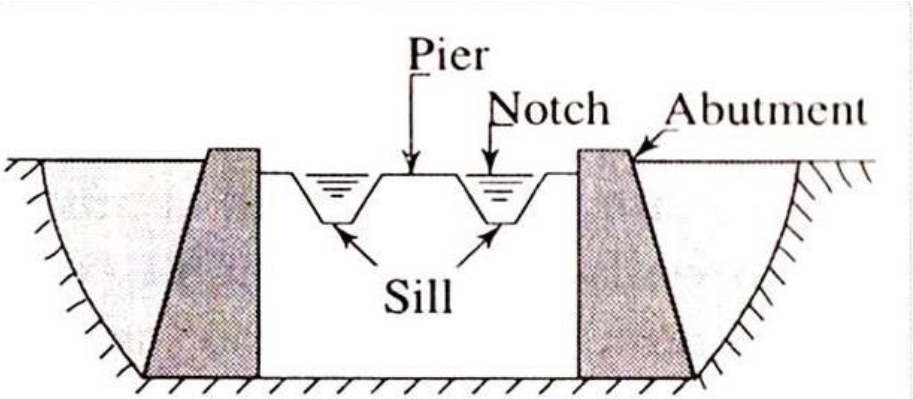


Fig: Trapezoidal Notch Fall

- It may of Singular or number of openings constructed at high crested wall providing smooth entrance to downstream
- With this the depth to discharge value are less affected
- These are quite common and economical

STEPPED FALL

- It consists of a series of vertical drops in the form of steps.

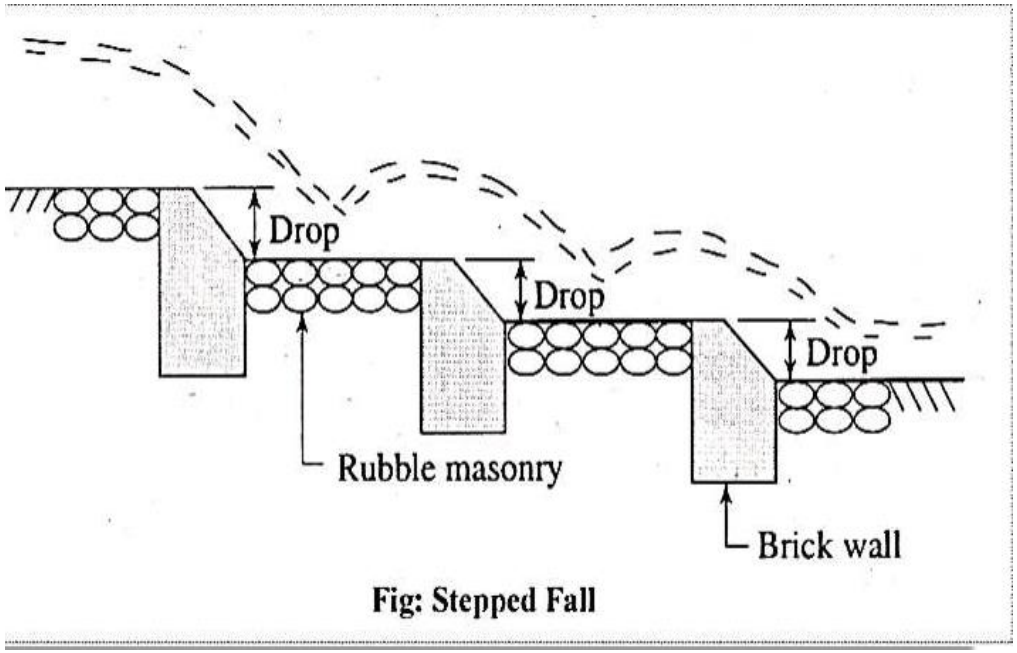


Fig: Stepped Fall

- This steps is suitable in places where sloping ground is very long and require a long gentle slope to connect the higher bed level at u/s with lower bed level at d/s.

VERTICAL DROP FALL

- In this Canal u/s bed is on the level of upstream curtain wall, canal d/s bed level is below the crest of curtain wall. In both the cases, a cistern is formed to act as water cushion.

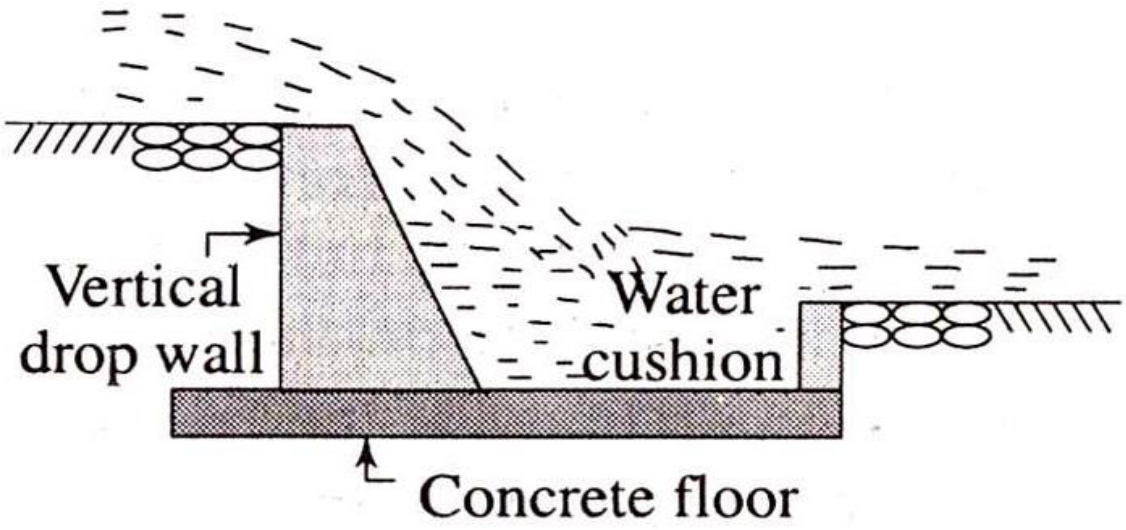
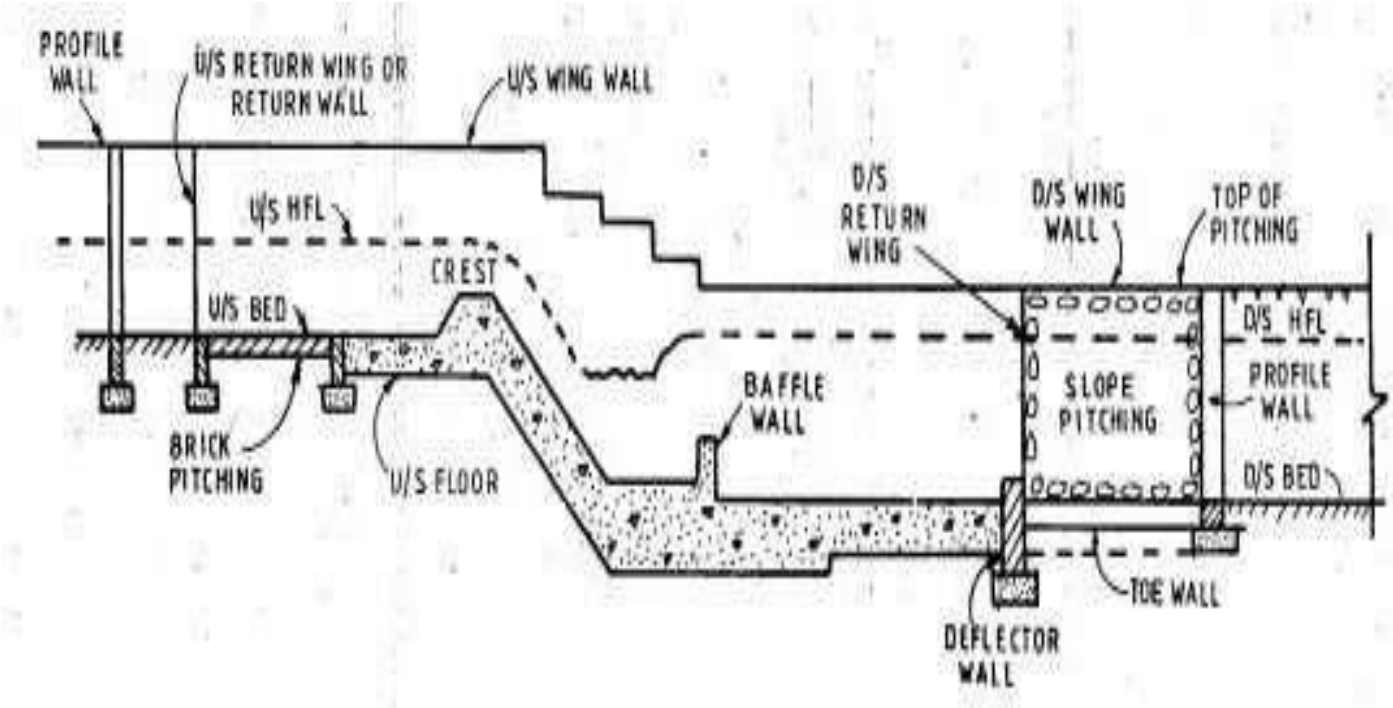


Fig: Vertical Drop Fall

- Easy to construct and economical
- Losses may be high in case of higher depths
- For discharges upto 15cumecs vertical drop fall is used

STRAIGHT GLACIS FALL

- It consists of a straight glacis provided with a crest wall. For dissipation of energy of flowing water, a water cushion is provided



- Generally sloping will be 2:1
- These have Good performance
- Suitable upto 60cumecs and drop of 1.5m

MONTAGUE TYPE FALL

- In the straight steep type profile, energy dissipation is not complete. Therefore, montague developed this type of profile where energy dissipation takes place

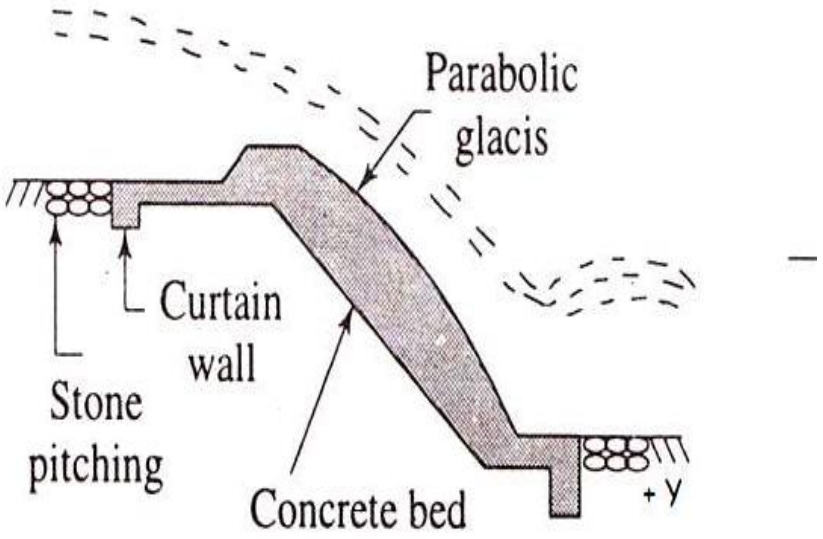


Fig: Montague Type Fall