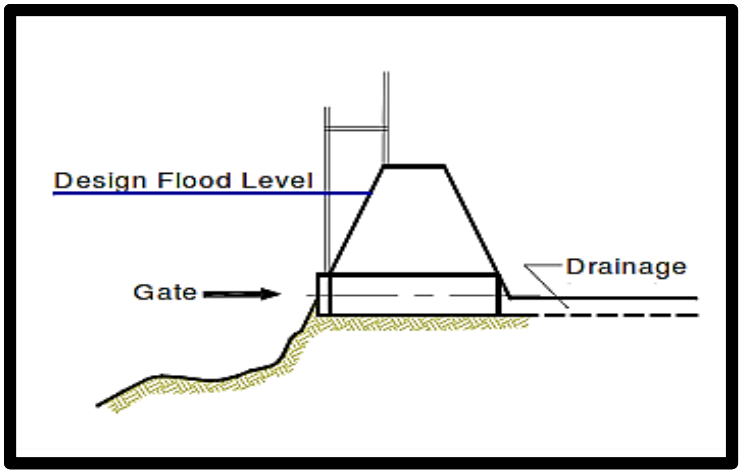
Chapter

Basic Concept of Sluiceway & Conduit

***Sluiceway** is a **flood control structure** that connects the culvert passing through the dikes and its gate. **Sluiceway** is categorized into **two (2)** types according to its purpose: one is to drain the inland water into river, and the other is to draw the water (as an intake structure) from the river for irrigation use or some other purposes.*

Sluiceway for drainage

When the drainage area is so big, the drainage way might be considered as a tributary. Generally in this case, the profile of the confluence should be an open-type river channel. When the drainage area is small and the height of dike is high, sluiceway (culvert) is planned. Of course, sluiceway is not planned in non-diked rivers.

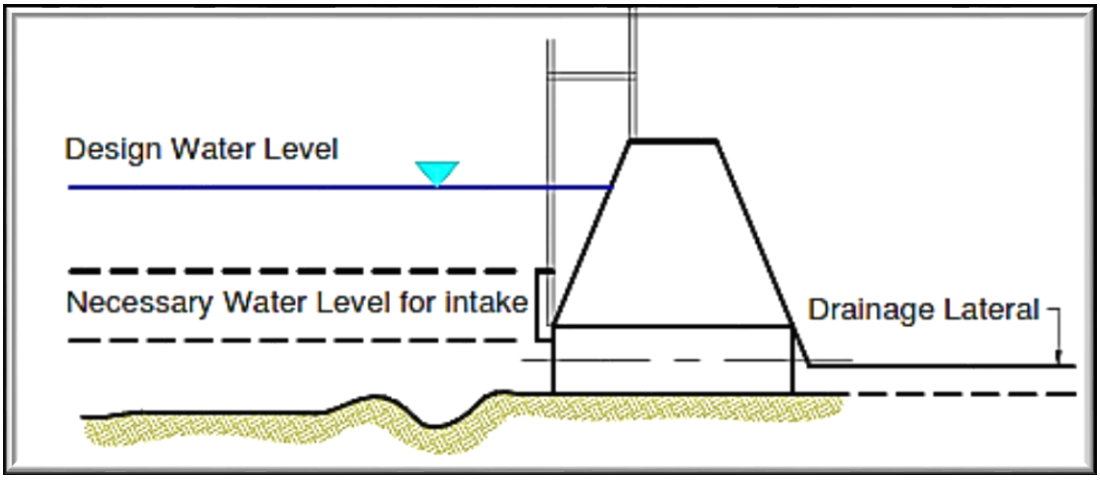


The gate of sluiceway is usually opened even during rainy days to drain the inland water. When the water level of river rises and is about to flow out through the sluiceway, then the gate should be closed. So this facility always require a person to operate the gate.

Sluiceway for water intake

Generally there is a dam structure (weir) at the downstream reach of the intake sluiceway to draw water easily. During water intake, the gate is opened. On the other hand, the gate should be closed when it is not necessary to take water. However, when the water level of the river rises due to flood, then the gate should be closed. Moreover, this facility also requires a person to operate the gate always.

Sluiceways shall be carefully planned and so designed to conform to the river improvement plan and other relevant plans to meet with the functional and safety requirements for the dikes/levees.



Selection of Location

The location of a sluiceway shall be selected according to its intended purpose. However, the sluiceway is not recommended in cases where sections of the river which the dike is constructed has unstable river regime. Furthermore, the number of construction places shall be limited as much as possible so as to promote integration with the dike structure.

Sluiceways are constructed for the purposes of irrigation, drainage and combination of both. A sluiceway structure tends to make the dike weak. Considering the operation and maintenance cost, the number of sluiceway should be limited as much as possible for its full integration.

Since the construction of a sluice gate poses a weak point in the dike, its direction is specified to avoid the complication of the structure and to ensure the intended function. However, if an oblique arrangement is inevitable due to the form of confluence with a tributary which is distant to the other side of the main river, sufficient measures should be taken for securing the safety of the structure and execution of work.

Direction

The direction of a sluiceway shall be at right angles to the dike alignment in principle. Since the construction of a sluice gate poses a weak point in the dike, its direction is specified to avoid the complication of the structure and to ensure the intended function. However, if an oblique arrangement is inevitable due to the form of confluence with a tributary which is distant to the other side of the main river, sufficient measures should be taken for securing the safety of the structure and execution of work.

Opening Level

The opening level of a sluiceway for the purpose of irrigation shall be decided according to the purpose of its respective intake, but bed variations in the future shall also be taken into account. For the purpose of drainage, the opening level shall be decided, considering the height of the riverbed or the foundation height of the channel to be connected.

There are cases where water intake for irrigation becomes difficult due to bed drop. For the construction of a sluiceway, it is necessary to examine the trend of bed variation in the past, and to sufficiently discuss the possibility of bed drops in the future. However, if the opening level is too low, the volume of intake might be more than the water demand, and therefore the volume of intake must be adjusted.

As for the drainage sluiceway, if the opening height is too low, then sedimentation is induced, thus decreasing the effective sectional area. On the other hand, if the foundation height is too high, the drainage capacity decreases, requiring much cost for the maintenance of the outfall. The relationship with the bed height of the river, or opening height (level) of the channel to be connected with a conduit must be sufficiently studied and evaluated in order to decide the opening level of the sluiceway.