BARRAGE ENGINEERING

RIVERBED PROTECTION IN THE VICINITY OF BARRAGE & DAMS

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In the downstream of Barrages beyond the glacis there are friction blocks and just after F.B. cut off walls are provided. In case of passing discharge through the Barrage Gates, the Gate-openings or the vent-way are provided in such a way that hydraulic jump is contained within the cistern. Just beyond the Cut-off walls, flexible apron is provided to some distance. It is a cause of headache for the Barrage and engineers to protect the flexible apron both up and down stream of Barrage because continuous discharge through the Barrage-Gates, especially in high flood season causes deep scouring in the riverbed vis-à-vis in the flexible apron area.

The riverbed scours in this area is not unusual but at the same time causes anxiety concerning safety of Barrage since, very deep scours may cause seepage from upstream to downstream resulting in exposure of Sheet-piles and in extreme cases piping may start from up stream to downstream resulting into tilting of Barrage.

To prevent such damage to Barrage in alluvium for protection work in riverbed in flexible apron area, dumping of boulders and crated boulders are resorted to. Cost of boulders and crates including labour charge is enormous. But there is no other alternative except dumping of boulders to fill up the scours pockets in flexible apron area for which riverbed contour map is prepared taking soundings from the surface. Such expenditure causes loss of vital national exchequer.

To minimise such expenditure, as well as to keep the Barrage safe, the following pattern of Gate regulation of Barrage can be restored to. Moreover in some occasions it is observed that if the river is very turbulent at the time of dumping of boulders, the boulders dropped from river surface is carried away by the velocity of river water flow to a great distance, defeating the very purpose of filling of scours pockets. In such cases, a portion of deep scours area may be selected where the Gate-openings of the Barrage should be dampened resulting into siltation of the scours pockets. If the freeboard allows then Barrage Gate should be completely closed in that area causing enormous siltation in that area by which the scours pockets are filled up with river silt free of cost. Of course,

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the total Barrage length cannot be brought to such dampening of Gate-opening because proper vent way for passing out river discharge has to be kept.

Siltation is very much predominant in the falling flood season, as such; dampening of gates in the said scoured zone is quite effective in falling flood season. Keeping the affected area closed or dampened, as the situation deserves the flood discharge may be routed through the other remainingates maintaining Lacy's criteria of safe scour depth.

Resorting to such activities I have strong feeling that the expenditure of riverbed protection work can be minimised to a large extent saving precious national exchequer.

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