EVALUATION OF DESIGN CRITERIA FOR SAMANALAWEWA CHUTE SPILLWAY FLIP BUCKET

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Samanalawewa project forms a part of a comprehensive plan of the Ceylon Electricity Board to develop the hydropower potential of the Walawe Ganga basin which has a catchment area of 342 sg. km. and an annual mean flow of 598 MCM (=19.0 cumecs) at the dam site. The reservoir has a 217 m. long chute spillway ending up with a flip bucket whose design discharge is 3600 cumecs, the drop from the reservoir pool to the bucket invert being 81.7 m.

The flip bucket (also known as ski jump bucket) is a device employed to throw the jet of water as far away as possible from the structure subject to the scour patterns in the plunge pool, so that there will be no erosion of the river bed that would be considered dangerous to the stability of the structure.

At Samanalawewa there was a special problem of possible damaging scours in the riverbed particularly close to the left bank of the river. The solution of this problem was attempted in two ways. First, various bucket shapes were tested out to evaluate the reletive scour tendencies. Next different buckets were tested to evaluate their jet deviation characteristics (impact on the left bank) and resulting scour. Four different types of buckets - Straight lip, Circular lip, Angular lip and slotted lip - were tested two different modelling criteria ie. fully mobile bed and a restricted mobile bed.

The best finding through this series of model tests was the establishment of a bucket with a lip circular in plan as the one that gives by far the least scour in the plunge pool. This is a new finding.