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EXPERIMENTAL STUDY ON LOCAL SCOUR AT DOWNSTREAM USING RECTANGULAR END SILL

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Abstract

The detailed experimental studies were conducted to understand the physic of downstream side of the Bridge pier scour action using End sill. It has been further observed that the effect of end sill for prediction scour play very essential role. The numerous studies were conducted with different position of end sill and its effect on present model study.

I. INTRODUCTION

In the present scenario, use or various countermeasures around the bridge pier with different shape and sizes of pier as well as location of pier. The sediment transport problem play very crucial rule while design a bridge and pier. Now a day's many research have performs experimental studies on the flow alteration and bed armoring concept to reduce the scour action around a hydraulic structure. To reduce the scour depth or minimize the scour in and around the hydraulic structure we have selected an end sill and conducted the experimental studies. The analysis of flow in the river is an complex and challenges task for the hydraulic engineers, but still research keen to interest explore the possibility of research.

II. EXPERIMENTAL PROGRAMME

The experimental studies were conducted in Open Channel Flume to analysis the flow behaviour and predicting of Local Scour around a Bridge Pier of Trapezoidal Pier at Downstream Side. Initially, scour is very high without any sill but after installation of end sill this may tremendous reduced as also show the effectiveness of the sill. It is also stated that the local scour depth increases progressively w.r.t. time and reaches up to a equilibrium depth.

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III. RESULT ANAYSIS

In the experimental study, it shows that the use of end sill show effective scour depth in terms of Flow profile characteristics. The graphs directly show the trends to reduce local scour around and hydraulic structure.

Experiment Notation	Position of sill
D_0	At zero distance downstream of pier
D_b	At distance "**b**" downstream of pier
$D_{1.5b}$	At distance "1.5**b**" downstream of pier

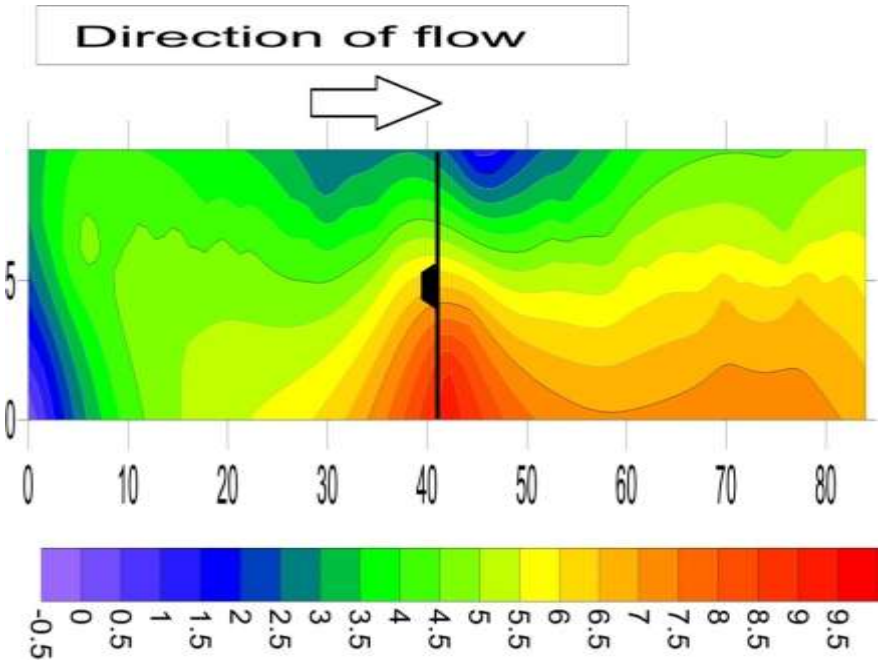

Fig. 1: Contour of scour profile, for D_0

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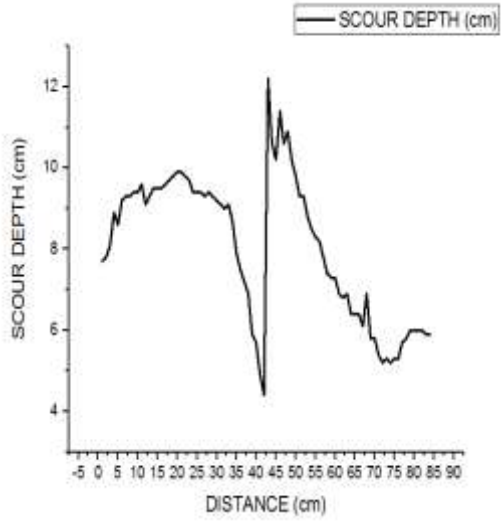

Fig. 2 Graph of scour depth v/s distance, for D0

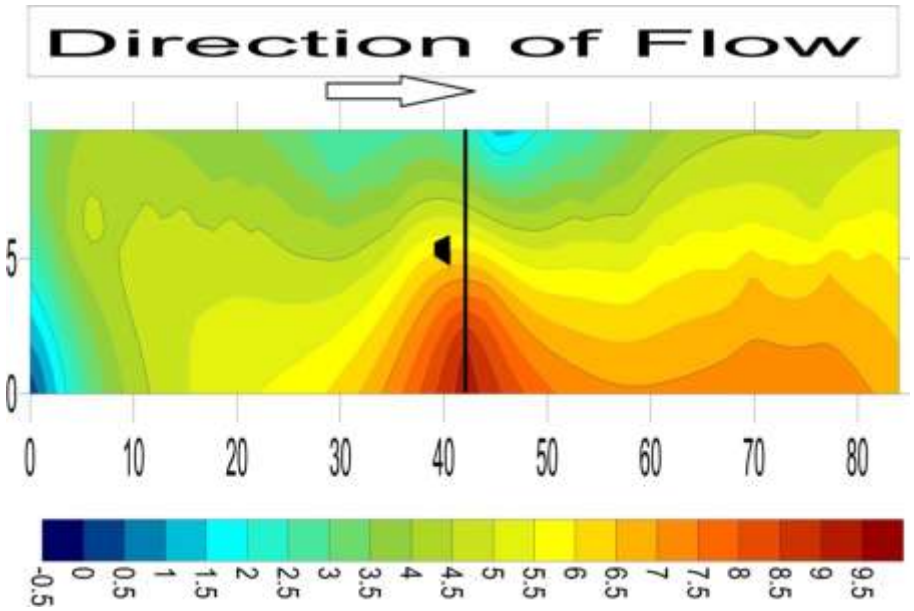

Fig. 3: Contour of scour profile, for D_b

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Fig. 4 Graph of scour depth v/s distance, for D_b

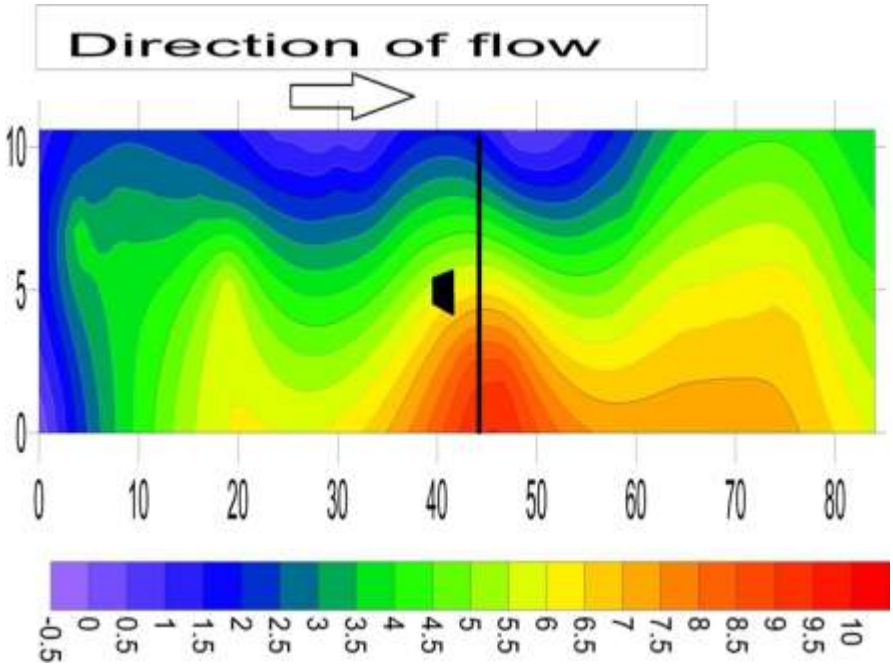

Fig. 5 Contour of scour profile, for $D_{1.5b}$

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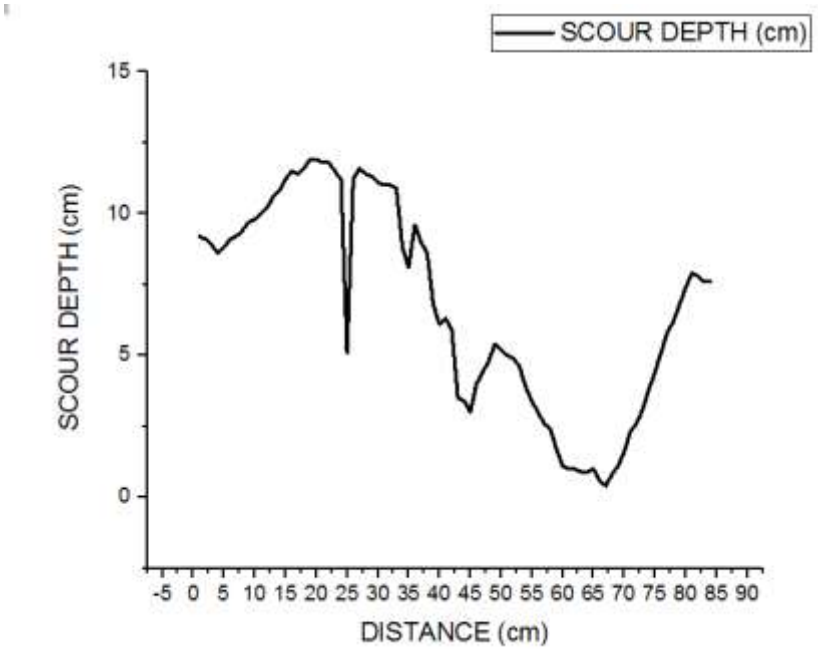

Fig. 6 Graph of scour depth v/s distance, for $D_{1.5b}$

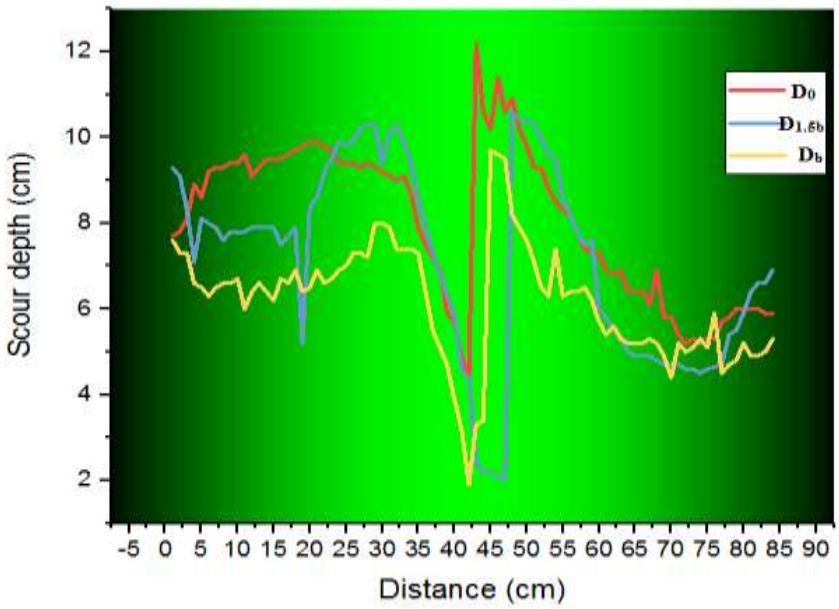

Fig. 7: Graph of scour depth v/s distance, for different experiments downstream of pier

IV. CONCLUSION

The following conclusions were made to from this study as given below:

- Use of Endsill reduce scour action at downstream side,
- Location of Endsill play very critical role for the analysis of local scour.

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