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**EFFECTS OF CYLINDRICAL FOUNDATION ON**  
**BRIDGE PIER SCOUR**

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## **SYNOPSIS**

An experiment investigation at local scour at non-uniform cylindrical pier. A non-uniform pier is one of which the cross-sectional dimension varies over the length of the pier. The pier comprise a cylinder of diameter,  $D$  founded on a largest cylinder of diameter,  $D^*$  call the foundation.

The project aims to make a comparison on the estimation of local scour depth at foundation on bridge pier by using a data that observed from an experiment and the design method.

Test were carried out on the models cylindrical foundation on bridge pier using wave flume situated at the hydraulics Laboratory department of Civil Engineering Mara Institute of Technology, Shah Alam, Selangor, Malaysia. A data taken including a depth of scour, width of scour, discharge and depth of flow. A design method applies to determine an equilibrium scour depth.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 General

A *foundation* of a pier always consist of a base projecting beyond the shaft, which is always set either directly on the ground or on piles. The vertical shaft is relatively slender. When sited on land it is made up of these parts alone. In a river it is also almost invariably provided with projections called cutwaters, the function of which is hydrodynamic.

*Scour* is a natural phenomenon caused by the erosive action of flowing water on the bed and banks of alluvial channels. In coastal regions scour can also occur as a result of the passage of waves. At a bridge site scour of channel boundaries introduces the possibilities of a reduction in the support given to the bridge foundations or an abutment being undermined.

Failure of bridges due to scouring at their supports is a common occurrence. The scouring may occur at piers, at abutments or at riverbanks. Major scouring usually occurs during floods which are unsteady flows, and may even have different flow directions from normal flows.