

**DAM BREAK SIMULATION FOR  
KLANG GATE DAM**

by  
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**A Report Submitted to the School of Civil Engineering  
in Partial Fulfilment of the Requirements for the award  
of a Degree in Bachelor of Engineering (Honours) (Civil)**

October 1997

## **ACKNOWLEDGMENT**

I am very thankful to the School of Civil Engineering, MARA Institute of Technology for giving me the opportunity to undertake this project which would be of a great help in my future career.

I would like to extend my sincere and heartiest thanks to En. Mohd Najib Bin Abdullah as my Project Advisor, Project Coordinator, Dr. Azmi Bin Ibrahim and En. Ahmad Marzuki Bin Hashim from Puncak Niaga Sdn. Bhd. for whom I am very much indebted for their guidance towards the completion of this project.

I also would like to acknowledge the Department of Drainage and Irrigation, Wilayah Persekutuan, beloved lecturers and all my colleagues for providing the relevant information and their full support and cooperation for this project.

Lastly to my beloved father, mother and family which can see my successfully.

Thanks for everything.

Mohd Nadzri Mohamad.

October 1997.

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## **ABSTRACT**

This project studies the effect of a dam break on the downstream area of the dam. The Klang Gate dam in Ulu Klang Selangor has been chosen for the study.

The dam break simulation is a numerical modelling process using MIKE-21 Hydrodynamic module developed by Danish Hydraulic Institute (DHI). The simulation was conducted based on a digitised topography of Ulu Klang area and simulation was carried out using grid sizes 100 m, 50 m, 10 m and 5 m. However, in this report only the results of the 10 m and 5 m grid sizes are presented.

Three scenarios of dam breaks are simulated corresponding to different extent of possible damages experienced by the affected areas. The calculation of the discharge and velocity is made using the formula for a vee notch.

The results show that the area affected by the flooding is approximately 4.5 km long x 1.0 km wide. The maximum height of flooding is about 45 m at a point 50 m distance from the dam. The time for the height of flooding to reach a danger level of 3 m is 50 seconds from start of the dam break.

# CHAPTER 1

## INTRODUCTION

### 1.1 DAM FAILURE

A dam is the most complex and hazardous of all civil engineering structures. Designing and building a dam successfully relies more on art than on science. There is still continuing debate in the profession as to the places of precedent, theory and judgement in the design of dams. Professor Laurits Bjerrum said engineering judgement and earth dam design go hand in hand and modern dams seldom if ever fail because of incorrect or inadequate analysis...., they fail because inadequate judgement is brought to bear on the problems...". Professor Peck also likes to see that dams are "designed and constructed not to fail, even if a probability of failure is incorporated into the benefit cost analysis". He has warned that the achievement of such an objective "does not depend on the acquisition of new knowledge,.....it depends on our ability to bring the best engineering judgement to bear on problems that are essentially non quantitative, having solutions that are non numerical".