

**FIELD DETERMINATION OF TIME OF CONCENTRATION
FOR DIFFERENT URBAN CONDITIONS
IN THE HUMID TROPICS**

BY

HAMZAH BIN DAHLI

**A Report Submitted To the Faculty of Civil Engineering
In Partial Fulfillment of the Requirement for
The award of Bachelor In Engineering (Hons) (Civil)**

ACKNOWLEDGMENT

My sincere thanks are directed to my project supervisors, Puan Rmlah Bt Mohd Tajuddin and En. Turahim Abd. Hamid for their supports, guidance, suggestions, and understandings during the course of this project.

Thanks are also to staffs in the Hydrology Branch, Department of Irrigation and Drainage Malaysia, especially Ir. Chong Sun Fatt, Puan Norlida Bt Mohd Dom, En. Megat Ahmad Tarmizi, En Mohd Fawzi Chek Nen, En. Azlan and Puan Lailan for their helps in providing necessary material, information and suggestion relevant to this project.

TABLE OF CONTENTS

	PAGE
DEDICATION	i
ACKNOWLEDGMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	viii
LIST OF FIGURES	viii
ABSTRACT	ix
CHAPTER 1	
1.0 INTRODUCTION	
1.1 GENERAL	1
1.2 STATEMENT OF PROBLEM	2
1.3 STUDY AREA	2 - 3
1.4 OBJECTIVES OF STUDY	3
1.5 METHODOLOGY	
1.5.1 INTRODUCTION	7
1.5.2 PRELIMINARY STUDY	8
1.5.3 COLLECTION OF HYDROLOGICAL DATA	8
1.5.4 ANALYSIS OF DATA	8
1.5.5 SCOPE OF WORK	9

ABSTRACT

Urban Hydrology Study in Taman Mayang sub-catchment is considered as a model study in Malaysia for urban catchment. The main objective of this study is to determine the time of concentration based on for different urban conditions in the humid tropics, in particular commercial, housing and open spaces. This finding of this study may be useful for Malaysian engineers in the designing of urban drainage system.

Taman Mayang is selected as the study area because it is instrumentation at suitable locations in order to get reliable data under different urban conditions. The data include water level, velocity and rainfall are obtained either from direct measurement in the field or from Drainage and Irrigation Department (DID). Most of field measurement activities cannot be done during the study period due to dry weather condition.

1.0 INTRODUCTION

1.1 GENERAL

The hydrology of urban areas is dominated by two distinct characteristics:(1) the preponderance of impervious surfaces(e.g., pavements ,roads, roofs, etc) and (2) the presence of man-made or hydraulically "improved" drainage systems(e.g. sewerage system).Thus the response of an urban catchment to rainfall is much faster than that of a rural catchment of equivalent area, slope and soils condition. In addition, the runoff volume from an urban catchment is larger because there is less pervious area available for infiltration. The engineering problem in urban hydrology usually consists of the need to control peak flows and maximum depths throughout the drainage system. If the hydraulic grade line is too high, sewer may surcharge that is the water level may rise above the crown (top) of the sewer conduit, leading occasionally to basement flooding or discharge to streets or surrounding area.

Most hydrological designs require some measurements of flood discharges. Various watershed and hydrometereological characteristics can be used to reflect the volume of flood runoff, for example, the product of the drainage area, and the depth of rainfall intensity give a volume of water discharge that is potentially available for runoff. But volume alone is not adequate for many design problems. As the dimension of discharge indicates, time is an important element in hydrological design. A given volume of water may not present hazard, as hazard will depend on the time distribution of the flood runoff or the **time of concentration.**