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HYDRODYNAMIC MODELLING OF SUNGAI SKUDAI

BY

ZULKIFLI BIN AB. HALIM

(96093985)

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ABSTRACT

The aim of the study is to obtain the hydrodynamic characteristic of the Sungai Skudai. It will assist in assessing the impact of development along the downstream stretch of the river. With a knowledge of the existing water levels, velocity and discharge along any cross section of the river the Mike21 modeling software is able to predict future changes in its flow. The objective of the modeling is to simulate flow patterns in the specified area during one tidal cycle with the inputs of water levels at all open boundaries and consequently the model is able to produce a variation of levels and velocities with time at any position within the boundaries. The data collected from field observation were used to further calibrate and verify this model to ensure it is predicting the existing conditions accurately.

1.0 INTRODUCTION

1.1 GENERAL

Hydrodynamics of a river is concerned with the water levels, its flow velocity, discharge and at the downstream stretch of the river's course its effect due to tidal influences. Its study is usually associated with bed sediment transport, water quality etc. For assessing the impact of development along the rivers course and its estuaries a knowledge of the river's flow velocity together with water levels at certain cross sections initially and its forecasted changes are required. Due to this, data is available to do hydrodynamics modeling of Sungai Skudai extending to the sea within the specified boundaries using the Mike21 software at the Faculty of Civil Engineering Computer Laboratory, ITM Shah Alam. In this work, the study area is the Sungai Skudai located near Johor Baharu as shown in Fig. 1.1.

1.2 SCOPE OF WORK

The study is limited to the hydrodynamics of the lower stretch of Sungai Skudai. It involves simulating the hydrodynamic conditions using the Mike21 programming software and calibrating the results. All data to do simulation of hydrodynamic model are available but there is no data to do the sediment transport model to study the effects of civil works on the sediment transport patterns.

1.3 OBJECTIVE

The purpose of the study is to model the existing river flow characteristic of the Sungai Skudai estuary. It involves computer simulation of the hydrodynamics of Sungai Skudai using the Mike21 software. The input requirement is the water levels at the river boundaries, tidal range for the open sea and the bathymetry. The

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