

## ABSTRACT

Semarang city has been suffering from floods damage since 1973 as the consequence of climate and topography changing following by the population growth, the industrialization and urbanization. The northern part of the city including Banger Polder area was severely affected by tidal floods from Java Sea as well as floods caused by direct extreme rainfall. The insufficient of drainage system and low laying topography caused flood frequency relatively high.

The gravity polder system had been selected to challenge with the various flood conditions of the study area. This study objective aims to develop the hydrology and hydraulic model based on the polder system concept for solving the various flood inundation of the Banger Polder. Flow and uniform lateral inflow hydrograph are the input of hydraulic model calculated by HEC-HMS according to SCS Unit Hydrograph method. The ten year design rainfall was used to estimate the flood occurrence to Banger polder. The secondary of geometry data was used as input data in hydraulic model for performing of 1-D unsteady flow analysis by HEC-RAS version 5.0.1 software. The first scenario of flood routing model computed with the existing geometry data while the normalization geometry was input to analysis the design scenario. The tidal of Semarang coast line was input as downstream boundary condition for both scenarios.

From the output result, it can be conclude that the normalization of drainage system operated with the pump capacity of  $6\text{m}^3/\text{s}$  and 33 ha of the retarding basin can control the flood inundation of 10 year design rainfall at Banger Polder.

Key words: polder, hydrology and hydraulic flood simulation.