

Flood is one of the most important social problem which usually occurs in the urban area, especially in the city located in the low lying plain near the river. Flood problem becomes more severe with the urbanization of city. The simple drainage system in the city then gradually changed to be a more complicated one. The simulation of hydrologic and hydraulic processes by mathematical model becomes more necessary to tackle flood problem.

In this study, SWMM (RUNOFF and EXTRAN Block) was applied as a tool to improve drainage scheme and the zone of Central Hall and Auditorium Hall in the east campus of Chulalongkorn University was selected as the study area with the total area of 90,927 sq.m. and average drainage channel slope of 1:500. Field data i.e. rainfall, water level and flow rate in the drainage channel and infiltration rate were collected to be a basic data for model calibration.

From the field data investigation, hydrological characteristics of the study area were analysed. The runoff coefficient of the study area was found to be 0.08-0.18 with the range of rainfall intensity of 17.0-99.0 mm/hr and average time of concentration was found to be 23.9 minutes.

Sensitivity tests of each parameters in the model were conducted and it is found that the depression storage of the impervious and pervious land were the most sensitive parameters to the water balance. The characteristic width and Manning coefficient of the drainage channel were the most sensitive parameters to the change of water level and peak flow in the channel. The calibration results show that the depression storage and the Manning coefficient of the impervious and pervious land equal 34.0, 37.0 mm and 0.05, 0.30 respectively. The Manning coefficient of drainage channel was found to be 0.038.

The drainage improvement scheme of the study area was considered by adopting 2 hours design storm with 2 and 5 years return period and three possible alternatives: (i) retention pond only (ii) retention pond and pipe linkage (iii) retention pond, pipe linkage and pipe size enlargement, were studied and the third alternative was found to be the most effective. The problems in model application to study drainage improvement scheme from the study were also summarized for future study.