



Modelling of municipal drainage and urban channel flooding in coastal city

Xiyan Ren¹, Yingxia Xie¹, Wenjia Wang², Sicheng Zhu¹, Jinyan Lv¹, Yu Song³, Qianming Lv², Zhengyu Yang²

¹China Academy Urban Planning & Design, renxiyan@126.com

²Danish Hydraulic Institute, yzy@dhigroup.com

³Management Committee of Caofeidian Industrial District, bbsy6@qq.com

ABSTRACT

A numerical model has been set up including the tidal variations, the storm water network, the urban channels, the brakes, and the pumps by the software MIKE FLOOD which coupled MIKE URBAN, MIKE 11 and MIKE 21. The different scenarios have been simulated. Several conclusions have been drawn as follows: (1) The flooding warning water level of the urban channel is low to the spring tide height, when the precipitation of 20-year return period meets the ocean tide of 5-year return period, the rain flood should be stored in the urban channel, waiting for the ocean tide height decrease from 3.0meter, then open the brake to discharge the rain flood. (2)In China, the average impervious surface in the urban area is usually about 55% to 70%, and the impervious surface in the commercial central area is usually about 75%-90%.(3) Compare to pipe and channel plans, the results show that the water logging of initial plan is very heavy, the maximum water level will be over 1.5 meter and will last for about 10 hours, the water logging of optimization plan is relieved, the maximum water level will be as low as 1.0 meter, and the water logging time was reduced to 6 hours comparing to the initial plan.

KEYWORDS

Urban storm, rain flooding, rain drainage, modelling, coastal