

Impact of Bidirectional Interaction between Sewer and Surface flow on 2011 Urban Flooding in Sadang stream watershed, Korea

Mary Pakdimanivong*, Yeonsu Kim**, Kwansue Jung***, Heng Li****

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Abstract

The frequency of urban floods is recently increased as a consequence of climate change and haphazard development in urban area. To mitigate and prevent the flood damage, we generally utilized a numerical model to investigate the causes and risk of urban flood. Contrary to general flood inundation model simulating only the surface flow, the model needs to consider flow of the sewer network system like SWMM and ILLUDAS. However, this kind of model can not consider the interaction between the surface flow and drainage network.

Therefore, we tried to evaluate the impact of bidirectional interaction between sewer and surface flow in urban flooding analysis based on simulations using the quasi-interacted model and the interacted model. As a general quasi-interacted model, SWMM5 and FLUMEN are utilized to analyze the flow of drainage network and simulate the inundation area, respectively. Then, FLO-2D is introduced to consider the interaction between the surface flow and sewer system. The two method applied to the biggest flood event occurred in July 2011 in Sadang area, South Korea. Based on the comparison with observation data, we confirmed that the model considering the interaction the sewer network and surface flow, showed a good agreement than the quasi-interacted model.

Keywords : Urban flooding, Drainage system, Interaction, SWMM5, FLO-2D, FLUMEN

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* Member · Graduate student, Dept. of Civil Eng., Chungnam National University · E-mail : Mary.pdmv@hotmail.com

** Member · Researcher, Dept. of Civil Engineering, Chungnam National University · E-mail : yeonsu0517@gmail.com

*** Member · Professor, Dept. of Civil Eng., Chungnam National University · E-mail : ksjung@cnu.ac.kr

**** Member · Graduate student, Dept. of Civil Eng., Chungnam National University · E-mail : lihengloveearth@gmail.com