ASSESSMENT OF FLOOD FLOW CONVEYANCE FOR AN URBAN STREAM USING XP-SWMM

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In recent, increasing of the impervious area gives rise to short concentration time and high peak discharge comparing with natural watershed and it is a cause of urban flood damage. Therefore, we have made the structural and non-structural plans to reduce the damage from inundation.

The Gulpo-cheon basin had been frequently inundated and damaged due to the water level of Han river, Korea. So, the diversion channel or floodway of the Gulpo-cheon which is a tributary of Han river was constructed with the width of 20 meters for flood control in the basin but it was not enough for our expectation and now we have a plan to expand the floodway to 80 meters.

We use a XP-SWMM model developed based on EPA-SWMM version for analyzing the capacity of flood conveyance by the expansion of Gulpo-cheon floodway with the same 100 years return period design storm and the same tidal conditions of the Yellow sea. The flood conveyance after the expansion of floodway becomes three times comparing it with before the expansion.

Also we simulate the flood discharge at the diversion point of Gulpo-cheon for the expanded condition of floodway and know that the discharge of about $300m^3/sec$ is flowing backward to the expanded floodway. Therefore we may need some kinds of hydraulic structures to prevent the back water. As the backward from down stream of Gulpo-cheon is prevented, we can see lower water level and smaller discharge in the case of draining runoff to floodway. In this case, however, water level of detention pond in Singok pump station is higher and the pump operation hours is increased about 9 hours. So it is required drainage systems from Western arterial channel to Gulpo-cheon floodway to reduce flood risk in down stream of Golpo-cheon with hydraulic structures to prevent backward to the floodway.

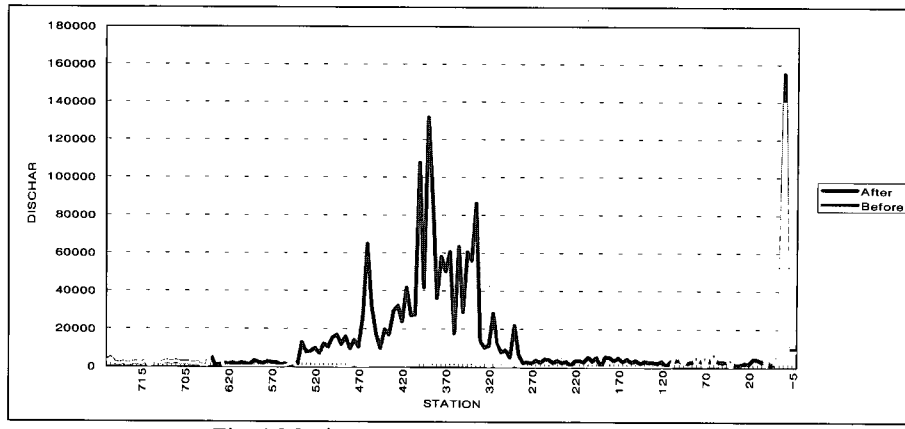

Fig. 1 Maximum Conveyance at Each Reach Point