EXPERIMENTAL STUDY ON INFLUENCE OF LEVEE BREACH WIDTH ON FLOODWAVE PROPAGATION IN FLOODPLAIN

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To minimize the flood damages by inundation, it is necessary to develop non-structural measures as well as structural measures. The non-structural measures include the establishment of evacuation plans, the provision of information to the public by distribution of hazard maps which are drawn by analyzing the flooded area in the past and by conducting the numerical and experimental simulation. This study was carried out to provide the fundamental data for establishing the evacuation system against the flood inundation due to levee breach. Hydraulic experiments were conducted basically to investigate the floodwater behavior in floodplain. The relation of levee breach with the flood wave velocity, the maximum water depth in floodplain and free surface profiles are described in this paper.

In this study, the experimental results were described for the flood wave propagation due to the river levee breach. In order to investigate these phenomena, the experiments were conducted on conditions of the several levee breach widths such as 0.5, 1.0, 1.5, 2.0 and 3.0m. To find the only the influence of the levee breach width, the conditions of the initial water depth and the slope and roughness of flood plain etc. were fixed.

It was found that the wave front velocity has little concern with the levee breach width. It has known widely through the previous study that the wave front velocity has a strong relation with the initial water level in the reservoir or channel.

The maximum water depth become lower as the distance from breach point is far and decreasing abruptly near the breach point of levee. In relation to levee breach width, the wider the width of breach was, the deeper the water depth became. But, the deepest depth in each measurement point is not likely to be affected by discharge of the channel

The free surface profiles were influenced by breach width B. The free surface profiles were similar to each other as time passes in the case of B=0.5 m, on the other hand the profiles became different as the time elapses in the condition of B=3.0 m. These results mean that the free surface profiles have a strong relationship with the levee breach width B, that is, the water depth can be shallow near levee breach point if the breach width is very narrow.

The non-dimensional flow depth h/B is the exponential function of the non-dimensional time T for each breach width B (Fig. 1) and C_1 and C_2 can be determined as a function of the non-dimensional breach width B/h_o.

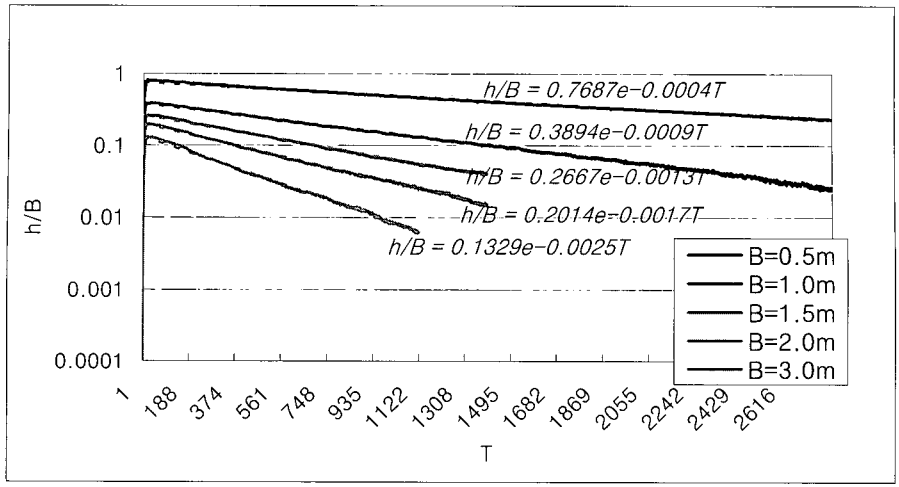

Fig. 1 Non-dimensional flow depth for non-dimensional time T

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