

ANALYSIS OF FLOW CHARACTERISTICS IN JUNCTION USING HYDRAULIC MODEL

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The natural stream is analyzed through simplification and assumption because the shape of cross sections and the angle between main stream and tributaries are not unified and the stream reach is not straight. Specially, in the analysis for the flood elevation and the junction, the average elevation is usually used which is not concerning about the difference of left and right elevation in the cross sections. Also in the analysis, complicated hydraulic characteristics are not concerning. At the natural channel, the approaching angle of channel and/or flow direction could be not fixed, so in the modeling or numerical analysis it is very difficult. Than most of studies are assumption and simplification for analysis.

In this paper it would be defined flow behavior through variation of discharge ratio and hydraulic structures. The model area is in near Youngwol, Korea(Fig.1), and discharge boundary condition was 12,090m³/sec after junction and the discharge ratio between main channel and lateral channel was 0.99, 0.85, 0.72, 0.67, 0.57. The water depth was slowly up closed at the junction but after the junction the water depth was rapidly down. At that time, according to decrease discharge ratio the increased water depth was moved to downstream and the gap of water depth was smaller. Also, the variation ratio of water elevation was decreasing at the upstream of junction but it was increasing at the downstream of junction. The average velocity was decreasing toward junction from the most upstream, but at the junction area the velocity was increasing, so that the maximum velocity was represented at the right downstream section of the central junction area. The variation ratio of the maximum velocity was represented as bigger at the upstream of junction than at the downstream of junction. The main flow zone in junction area was moved to downstream and it was increasing the width according as increasing the discharge ratio.

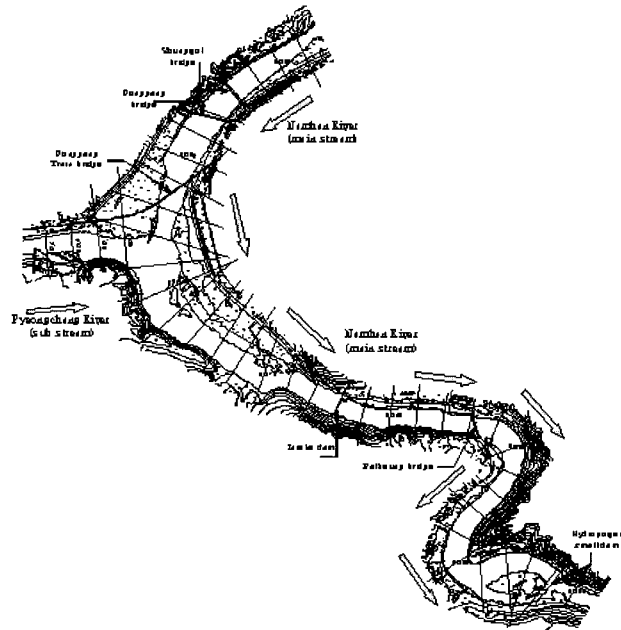


Fig. 1 Plane view of prototype channel for hydraulic model

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