ABSTRAK

Amrullah M. Studi Model Perubahan Morfologi Dasar Saluran Tanah Akibat Bangunan Krib (Dibimbing oleh **Mary Selintung, Muhammad Saleh Pallu, dan Mukhsan Putra Hatta**).

Krib permeable sebagai hambatan aliran untuk mengatur dan mengurangi dampak kecepatan aliran. Hambatan aliran ini menyebabkan penomena perubahan morfologi dasar sungai sebagai dampak dari fluktuasi kecepatan aliran secara tiba-tiba. Model penelitian menggunakan metode eksperimental dengan melakukan pengamatan secara visual, untuk mempelajari karakteristik aliran dan pergerakan sedimen sebagai salah satu parameter perubahan marfologi dasar saluran. Media penelitian menggunakan lebar saluran (b) 35 cm, tinggi (h) 45 cm dan panjang (L) 900 cm. Variasi penelitian digunakan; debit pengaliran (Q) dan kemiringan dasar saluran (S_o) masing-masing tiga variasi, kerapatan krib (k_{k1}=0,09 cm, k_{k2}=0,12 cm), (Jarak krib (L_{k1}= 60 cm, L_{k2}= 90 cm), diameter krib (d_{k1}= 0,09 cm, d_{k2}= 0,17 cm) masing-masing dua variasi. Pengukuran kecepatan aliran dengan current meter pada empat segmen dengan metode lima titik kedalaman dan sebelas titik berdasarkan arah lebar saluran. Pengambilan sampel volume angkutan sedimen dan pola gerusan dilakukan sebelum dan setelah ada krib permeabel. Penelitian ini menganalisis perubahan karakteristik aliran, perubahan morfologi dasar saluran dan persamaan empiris akibat bangunan krib permeabel serta divalidasi dengan persamaaan empiris sebelumnya. Ditemukan karakteristik aliran dengan turbulen dan mengurangi kecepatan aliran sebesar 8,55%. Perubahan gerusan dasar saluran berbanding lurus dengan semakin besar jarak krib permeable (L_k), kerapatan krib (k_k) dan diameter krib (d_k), menunjukkan semakin besar angkutan sedimen dengan kountur semakin renggang, sedangkan semakin kecil jarak krib (L_k), kerapatan krib (k_k), dan diameter krib (d_k) permeable angkutan sedimen semakin kecil dengan kountur semakin rapat. Ditemukan persamaan empris angkutan sedimen (q_b) akibat krib permeable. Hambatan kecepatan dan energi aliran cukup tinggi secara tiba-tiba menyebabkan penomena resistensi turbulensi aliran dan gerusan di sekitar area krib permeable.

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Kata Kunci: *Bangunan krib, resistensi aliran, angkutan sedimen, perubahan morfologi dasar*

ABSTRACT

Amrullah M. *Model Study of Morphological Changes in the Base Morphology of Soil Channels Due to Groyne Structure*
(Supervised by **Mary Selintung, Muhammad Saleh Pallu, dan Mukhsan Putra Hatta**)

The impact of flow velocity is effectively regulated and mitigated by permeable groynes, which also induce changes in riverbed morphology due to abrupt fluctuations in flow velocity. Therefore, this research investigated the effects of permeable groynes on flow characteristics, channel bottom morphology, and derived empirical equations to quantify their influence. The research media uses a channel width (b) of 35 cm, height (h) of 45 cm and length (L) of 900 cm, respectively, was utilized in the experimental setup. Several research variations were implemented, which involved three variations each of flow rate (Q) and channel bottom slope (S_o). Moreover, two variations of groyne density (k_{k1}=0.09 cm, k_{k2}=0.12 cm), distance (L_{k1}= 60 cm, L_{k2}= 90 cm), and diameter (d_{k1} = 0.09 cm, d_{k2} = 0.17 cm) were considered. t_o measure flow velocity, a current meter was employed at three segments, with five points each, to determine the flow depth in the vertical dir. Before and after the introduction of the permeable groyne, flow velocity measurements and sampling of sediment transport volume and scour patterns were conducted. This research analyzes changes in flow characteristics, changes in channel bed morphology and empirical equations due to permeable groin structures and is validated with previous empirical equations. The result showed that the flow characteristics were turbulent and reduced the flow velocity by 8.55% due to the presence of permeable groyne. Changes in channel bottom scour are directly proportional to the greater the distance of permeable groyne (L_k), the density of the groyne (k_k) and the diameter of the groyne (d_k), indicating that the greater the transport of sediment with the more tenuous the contour, while the smaller the groyne distance (L_k), the density of the groyne (k_k), and the diameter of the groyne (d_k) permeable sediment transport becomes smaller with the contour getting denser. The resulting empirical equations are the sediment transport equation (q_b) in permeable groynes. The relatively high resistance to flow velocity causes resistance to flow turbulence and scour and around the permeable groyne area.

Keywords*: Groyne Structure, Flow resistance, Sediment transport, Base changes morphology.*