

SEDIMENT TRANSPORT STUDIES ON HOMOGENEOUS SOIL BASE MATERIAL

STUDI ANGKUTAN SEDIMEN TERHADAP BAHAN DASAR TANAH HOMOGEN

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ABSTRACT

Sediment transport is the movement of sediment granular material/non cohesive by water flow. Sediment is carried by the flow of water constantly, which can be distinguished as floating sediment (suspended load) and bed load sediment. Sediment transport from upstream to down stream will affect some areas that experienced scour and deposition (sedimentation). This will cause a variety of problem shence it is needed to know the amount of sediment transport since it always moves with the flow.To minimize its negative effects, it is necessary to study the amount of sediment transport with homogeneous base material composed of sand and gravel. This study aimed to determine the effect of water discharge(Q) and the number of stream sediment transported (T) and to knowthe basic condition of the channel due to sediment transport after discharge flowed. The experiment was conducted at the glass channel of Laboratory of Hydrology/Hydraulics, Faculty of Engineering, University of Palangka Raya with dimensions of 400x10x25cm, while the selection of grain grading and inspection of the channel density of the base material such as sand and gravel carried out at the Laboratory of Soil Mechanics, Faculty of Engineering, University of Palangka Raya.The amount of discharge flowed varies with time and the experiment was performed 5 times for each channel base material. The results of the sediment transport studies on materials such as sand and gravel base shows that the greater the flow, the greater also the amount of sediment transported while the smaller debit amounts of sediment transported less. Sand diameter 0.43mm to0.58 mm transported more than the transported gravel with a diameter of2.40mm to 4.75mm, mostly gravel grain rolling and sliding just moves along the baseline. Basic conditions after a transport channel has changed from its original condition with the average basic channels 2.00cm thickness would appear to be a plane bed, washed-out dunes/transition, ripple and dunes.

Keywords: Sediment transport, discharge, homogeneous base material, and the basic condition of the channel.

ABSTRAK

Angkutan sedimen merupakan gerakan perpindahan bahan sedimen granuler/non kohesif oleh aliran air.Sedimen senantiasa terbawa oleh aliran air, yang dapat dibedakan sebagai sedimen melayang (*suspended load*) dan sedimen dasar (*bed load*). Angkutan sedimen dari hulu ke hilir akan memberikan dampak ada daerah yang mengalami penggerusan dan pengendapan (pendangkalan). Hal ini akan menimbulkan berbagai masalah sehingga perlu diketahui besarnya angkutan sedimen yang senantiasa bergerak selama ada aliran sehingga dampak yang merugikan dapat diminimalisir, maka perlu dilakukan penelitian besar angkutan sedimen dengan bahan dasar saluran tanah homogen terdiri dari pasir dan kerikil. Penelitian ini bertujuan untuk mengetahui pengaruh debit (Q) aliran dan banyaknya sedimen yang terangkut (T) serta mengetahui kondisi dasar saluran akibat adanya angkutan sedimen setelah debit dialirkan.Penelitian dilaksanakan pada saluran kaca Laboratorium Hidrologi/Hidraulika, Fakultas Teknik, Universitas Palangka Raya dengan dimensi 400x10x25 cm, sedangkan pemilihan gradasi butiran dan pemeriksaan berat jenis bahan dasar saluran berupa pasir dan kerikil dilaksanakan di Laboratorium Mekanika Tanah, Fakultas Teknik, Universitas Palangka Raya. Besarnya debit bervariasi yang dialirkan dengan waktu berbeda dan dilakukan sebanyak 5 kali percobaan terhadap masing-masing bahan dasar saluran. Hasil penelitian angkutan sedimen terhadap bahan dasar berupa pasir dan kerikil menunjukkan bahwa semakin besar debit, jumlah sedimen yang terangkut semakin banyak sedangkan semakin kecil debit jumlah sedimen yang terangkut semakin sedikit pula. Pasir diameter 0,43 mm sampai 0,58 mm lebih banyak terangkut daripada kerikil dengan diameter 2,40 mm sampai 4,75 mm, sebagian besar butiran kerikil hanya bergerak menggelinding dan menggeser di sepanjang dasar saluran. Kondisi dasar saluran setelah terjadi angkutan mengalami perubahan bentuk, semula kondisi dasar saluran rata dengan ketebalan 2,00 cm akan tampak menjadi *plane bed*, *washed-out dunes/transition*, beriak-riak (*ripple*) dan *dunes*.

Kata kunci: Angkutan sedimen, debit, bahan dasar homogen, dan kondisi dasar saluran.