

INTISARI

Waduk Kadumalik direncanakan terletak di Kabupaten Majalengka dan Kabupaten Sumedang, Provinsi Jawa Barat, membendung Sungai Cilutung yang merupakan anak Sungai Cimanuk. Waduk Kadumalik dibangun untuk memenuhi kebutuhan air irigasi DI Cilutung 9414 ha, air baku Kabupaten Majalengka dan Kabupaten Cirebon $1.5 \text{ m}^3/\text{s}$ dan *duty flow* $2.75 \text{ m}^3/\text{s}$. Pelimpah Waduk Kadumalik berjenis pelimpah samping. Bangunan peredam energi pelimpah Waduk Kadumalik dirancang dengan menggunakan *flip bucket* dan *plunge pool*. Uji model hidraulik diperlukan untuk menguji keandalan pelimpah terhadap debit banjir Q_{100} , Q_{1000} dan Q_{PMF} .

Model yang diuji merupakan model tiga dimensi dengan skala 1:70 ($n_L=70$) tanpa distorsi. Uji model dilakukan dengan aliran permanen. Analisis dan pembahasan pada tugas akhir ini difokuskan pada bangunan peredam energi. Uji model bertujuan untuk menguji keandalan desain bangunan peredam energi pelimpah Waduk Kadumalik. Debit rencana bangunan peredam energi adalah debit banjir kala ulang 100 tahun (Q_{100}).

Hasil pengujian menunjukkan bahwa kedalaman aliran untuk Q_{1000} dan Q_{PMF} melebihi kapasitas dinding *plunge pool* yaitu 32.50 m. Sehingga air meluap keluar dan berpotensi mengikis daerah samping *plunge pool*. Ujung *trajectory* aliran dari *flip bucket* jatuh pada lantai hilir *plunge pool*. Air terdorong menuju hilir *plunge pool* sehingga membahayakan dasar sungai di hilir *plunge pool*. Oleh karena itu perlu dilakukan modifikasi dengan cara memperpanjang *plunge pool* dan memperbesar kedalaman *plunge pool* sehingga air yang terlempar dari *flip bucket* akan jatuh pada *plunge pool* dan loncat air akan terjadi pada *plunge pool*.

Kata kunci: model, peredam energi, *flip bucket*, *plunge pool*, Kadumalik

ABSTRACT

Kadumalik reservoir was planned to be located in Majalengka District and Sumedang District, West Java Province, stems Cilutung River which is a tributary of Cimanuk River. Kadumalik reservoir is built to supply the water needs of irrigation in Cilutung 9414 ha, raw water in Majalengka District and Cirebon District $1.5 \text{ m}^3/\text{s}$, and duty flow is $2.75 \text{ m}^3/\text{s}$. Kadumalik reservoir has side spillway. Energy dissipator of Kadumalik reservoir spillway designed using flip bucket and plunge pool. To test the reliability of the spillway, hydraulic model test is necessary.

The tested model is a three-dimensional model with scale 1:70 ($n_L=70$) without distortion and executed with steady flow. Analysis and discussion in this final assignment is focused on the energy dissipator of Kadumalik Spillway. The model test aims to test the performance of energy dissipator of Kadumalik Spillway. Designed discharge of energy dissipator is 100-year flood discharge (Q_{100}).

The result shows that the scour depth in plunge pool for 1000-year flood discharge (Q_{1000}), and Probable Maximum Flood (Q_{PMF}) exceeds the capacity of the wall plunge pool which is 32.50 m. So water overflows and potentially erodes the side area of plunge pool. The end of the trajectory flow from flip bucket falls on downstream of plunge pool. Water pushed toward the downstream of plunge pool, endangering the riverbed in downstream of plunge pool. Therefore, it needs to be modified by extending the plunge pool and enlarging the depth of plunge pool. So the water that thrown from flip bucket will fall on the plunge pool and the hydraulic jump will occur in the plunge pool.

Keywords : model, energy dissipators, flip bucket, plunge pool, Kadumalik.