

# EFEKTIVITAS PEREDAM ENERGI *GRID TRIANGLES* PADA *SPILLWAY* CURAM

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## ABSTRAK

Masalah gerusan sering kali terjadi pada bagian hilir suatu bangunan hidrolik sebagai akibat dari kecepatan air, loncatan hidrolik dari saluran curam, serta turbulensi yang melampaui daya tahan dari material dasar. Penelitian ini mengamati panjang loncatan hidrolik, kedalaman gerusan, dan panjang gerusan di hilir *spillway* aliran, sebelum dan setelah dipasang peredam energi *grid triangles*. Kemiringan hilir *spillway* menggunakan sudut  $50^0$  dan  $70^0$ , sedangkan peredam energi *grid triangles* berupa grid-grid segitiga dengan tiga variasi model. Penelitian ini mengalirkan air melalui *spillway* dengan menggunakan empat variasi debit yang berbeda, yaitu  $Q_1 = 1533,22 \text{ cm}^3/\text{s}$ ,  $Q_2 = 3205,67 \text{ cm}^3/\text{s}$ ,  $Q_3 = 8729,95 \text{ cm}^3/\text{s}$  dan  $Q_4 = 10612,36 \text{ cm}^3/\text{s}$ . Hasil uji model untuk empat variasi debit yang berbeda, menunjukkan bahwa uji model peredam energi *grid triangles* terbukti memiliki pengaruh sebesar 57,4% dalam meminimalisir kedalaman gerusan, 77,48% dalam meminimalisir panjang gerusan, dan 85,22% dalam meminimalisir loncatan hidrolik. Hasil kompilasi dan analisis data didapatkan design peredam energi yang paling efektif untuk digunakan yaitu peredam energi *grid triangles* tipe 3 karena memiliki ruang kosong berbentuk segitiga lebih banyak dan tajam.

**Kata kunci** : *Spillway* curam, peredam energi *grid triangles*, loncatan hidrolik, gerusan,

**EFFECTIVNESS GRID TRIANGLES OF ENERGY DISSIPATOR ON STEEP  
SPILLWAY**

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**ABSTRACT**

*Scouring problems occurring frequently in the downstream part of a hydraulic buildings as a result of flow velocity, hydraulic jumps from the steep channel, and turbulence that goes beyond the durability of the base material. This research aim to observing hydraulic jumping length, scouring deep, and scouring length in the downstream part of velocity spillway, before and after installed grid triangle energy dissipator. The downward slope of the spillway using 50 and 70 degree, while the grid triangles energy dissipator are formed by triangles grids with three model variations. This research drain off water through a spillway with four different discharge variations that  $Q_1 = 1533,22 \text{ cm}^3/\text{s}$ ,  $Q_2 = 3205,67 \text{ cm}^3/\text{s}$ ,  $Q_3 = 8729,95 \text{ cm}^3/\text{s}$  dan  $Q_4 = 10612,36 \text{ cm}^3/\text{s}$ . The result of four discharge variations showed that the grid triangle energy dissipator proven to have 57,4% to minimaliz the scouring deep, 77,48% to minimaliz scouring length, nd 85,22% to minimaliz hydraulic jumps. From the compilation result and dat analys obtained the most effective design of energy dissipator is the 3 types of grid triangle cause this models have most empty space of triangle and sharp.*

**Key words** : steep spillway, grid triangles energy dissipator, hydraulic jump, scouring