

## INTISARI

Bendungan merupakan struktur hidraulik yang dibangun pada aliran sungai dengan tujuan membendung aliran sungai sehingga menciptakan waduk atau tampungan. Salah satu bangunan pelengkap pada bendungan adalah bangunan pelimpah yang berfungsi untuk mengalirkan debit air banjir dari waduk pada saat muka air di dalam waduk sudah mencapai titik maksimal. Salah satu bagian dalam bangunan pelimpah adalah mercu bangunan pelimpah. Tipe mercu bangunan pelimpah dapat mempengaruhi debit banjir yang dapat dialirkan oleh bangunan pelimpah. Perancangan bangunan pelimpah yang baik sangat krusial agar struktur dapat mengalirkan debit air banjir secara aman.

Perancangan mercu bangunan pelimpah mempertimbangkan beberapa alternatif tipe mercu, yaitu *Ogee*, *Broad-crested*, dan Labirin pada bangunan pelimpah Bendungan Jragung, Kabupaten Semarang. Perancangan dimulai dengan pengolahan data topografi untuk mengetahui luas dan karakteristik DAS Jragung. Kemudian dilakukan analisis hidrologi untuk menentukan debit banjir yang digunakan dalam perancangan. Pemilihan tipe mercu didasarkan pada hasil penelusuran banjir dari setiap alternatif mercu. Hasil perancangan mercu kemudian diuji kestabilannya terhadap geser, guling, dan rembesan. Kemudian dilakukan analisis biaya pembangunan mercu bangunan pelimpah yang didasarkan pada pekerjaan beton K-300.

Berdasarkan hasil analisis hidrologi, didapatkan debit banjir PMF (*Probable Maximum Flood*) yang digunakan untuk perancangan adalah sebesar  $Q_{PMF} = 1570,72 \text{ m}^3/\text{s}$ . Pemilihan tipe mercu didasarkan pada hasil penelusuran banjir, yang menghasilkan tipe mercu terbaik berupa *Ogee* 3:2. Hasil pengujian analisis stabilitas menunjukkan nilai aman terhadap geser sebesar 4,6 (aman), terhadap guling sebesar 14 (aman), dan aman terhadap rembesan. Hasil analisis biaya menunjukkan bahwa biaya pembangunan mercu bangunan pelimpah sebesar Rp9.695.994.152,37.

Kata kunci: bangunan pelimpah, *Ogee*, bendungan, mercu.

## ABSTRACT

*A dam is a structure built across a river or stream that consists of a solid barrier that obstructs the natural flow of the water, creating a reservoir or lake behind it. One of the complementary buildings on the dam is the spillway which functions to drain flood water from the reservoir when the water level has reached its maximum point. One part of the spillway building is the crest. The type of spillway crest can affect the flood discharge that can be drained by the spillway. The design of a spillway is crucial so that the structure can safely drain the flood water discharge.*

*The design of the spillway is carried out by considering several alternative types of spillway crest, namely Ogee, broad-crested, and labyrinth on the spillway of Jragung Dam, Semarang Regency. The design begins with topographic data processing to determine the area and characteristics of the Jragung watershed. Then a hydrological analysis was conducted to determine the flood discharge used in the design. The selection of the type of crest is based on the flood tracking results of each lighthouse alternative. The results of the lighthouse design were then tested for stability against shear, overturning and seepage. Then the cost analysis of the construction of the spillway lighthouse is based on K-300 concrete work.*

*Based on the results of the hydrological analysis, the PMF (Probable Maximum Flood) flood discharge used for design was obtained as  $Q_{PMF} = 1570.72 \text{ m}^3/\text{s}$ . The selection of the type of spillway crest is based on the results of flood routing, which results in the best type of crest in the form of Ogee 3: 2. The stability analysis test results show a safe value against shear of 4.6 (safe), against rolling of 14 (safe), and safe against seepage. The results of the cost analysis show that the cost of building a lighthouse overflow building is Rp9,695,994,152.37.*

*Keywords: spillway, Ogee, dam, crest.*