

ABSTRACT

EFFECTIVENESS STUDY OF RETENTION PONDS AS FLOOD MITIGATION IN PAMULANG ASRI 2 RESIDENTIAL AREA

Joses Aristo Kristofer ¹⁾, Tri Nugraha Adi Kesuma ²⁾

¹⁾ Student of Civil Engineering Department, Universitas Pembangunan Jaya

²⁾ Lecturer of Civil Engineering Department, Universitas Pembangunan Jaya

High rainfall that is evenly distributed in the South Tangerang City area can cause flooding, one of which is in the Pamulang Asri 2 Housing area. The flood was triggered by overflowing drainage flow due to rainwater discharge that exceeds the capacity of the channel. Therefore, mitigation efforts are needed in the form of retention ponds to reduce peak runoff discharge. This research aims to determine the effective capacity of retention ponds as a means of flood control. The methods used include the calculation of the planned flood discharge using the Nakayasu Synthetic Unit Hydrograph (HSS) with a return period of 10, 25, and 50 years, hydraulics modeling using EPA SWMM to determine the discharge before and after the retention pond, and hydraulics simulation of flood runoff using the HEC-RAS 1D-2D combined model. The retention pond is designed in the form of a pyramid with a base area of 2100 m², a depth of 5 m, and a cliff slope of 2. The analysis results show that the effective capacity of the retention pond of 16166.7 m³ is able to reduce the peak discharge significantly. After the retention pond, the peak discharge for the 10 year return period decreased to 22.12 m³/s, the 25 year return period to 24.93 m³/s, and the 50 year return period to 25.67 m³/s, so that the potential runoff in the Pamulang Asri 2 Housing area can be minimized.

Keywords: Flood, Mitigation, Retention Basin, EPA SWMM, HEC-RAS 1D-2D, Flood Runoff

Libraries : 28

Publication Years : 1999 – 2024