ABSTRACT

The Effectiveness of Retention Basin as A Flood Mitigation Effort in Urban Residential Areas (Case Study of Perumahan Graha Mas Serpong)

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High and evenly distributed rainfall causes flooding in the South Tangerang City area, especially in the Graha Mas Serpong housing estate, Jelupang. The flooding is caused by the overflowing of Angke river tributary located behind the residence. Therefore, flood mitigation is needed. This study aims to determine the capacity of retention basin as a flood mitigation in reducing peak discharge that causes runoff. The methods used in this research are Nakayasu Synthetic Unit Hydrograph (HSS) to determine flood discharge with a return period of 10, 25, and 50 years, hydraulics analysis using EPA SWMM application to find discharge after the retention basin, and hydraulics simulation with HEC-RAS 1D-2D coupled model application. The results of the hydraulics simulation used a scenario of the total capacity of the retention pond by entering a pyramid shape with a retention pond base area of 2400 m2 and a cliff slope of 2. The effective capacity for the retention pond is 18166.7 m^3 with a depth within 5 m which can store the peak flood debit so that no runoff occurs at Graha Mas Serpong Housing. The peak flood debit after the retention pond for the 10-year return period is 28.11 m^3/s, the 25-year return period is 32.02 m^3/s, and the 50-year return period is 46.5 m^3/s.

Keywords**:** *Flood, Mitigation, EPA SWMM, HEC-RAS 1D-2D Coupled Model, QGIS, Retention Basin, Return Periods*

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