REVIEW OF THE PADANG-SICINCIN HIGHWAY BRIDGE CONSTRUCTION PROJECT TOWARDS BATANG ANAI HYDRAULIC SECTION (Study Case: Batang Anai Bridge Sta. 15+870)

FINAL PROJECT

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Abstract

Padang-sicincin highway project that planned to be built as part of Sumatra highway had to cross Batang Anai river on its road alignment design, therefore a bridge design has been made to resolve the problem, however the affect caused by the pillars of the bridge towards Batang Anai river hydraulic section needed to be evaluated to find alteration on the river water current. This investigational study serves the evaluation of hydrological, hydraulic analyses, comparative result of writer's calculation and Wiratman Ltd. (consultant hired to analyze Batang Anai river on behalf of the highway project) and also evaluation of the bridge design toward hydraulic section of the river with BMS 92 as guidelines. Hydrological analysis achieved by utilizing Rational Method, SUH ITB-I and SUH ITB-II method whilst hydraulic analysis performed by using HEC-RAS software. In the sequence of hydrological analysis, required data ware gathered by watershed characteristic, land use diversity and measured rainfall on the watershed itself on purpose to determine peak discharge of the river flow. Hydraulic analysis of the river operated to act the water current behavior of both existing condition and with bridge design condition. Result of peak discharge calculation with Rational Method, SUH ITB-I and SUH ITB-II method for 100 years of design discharge are 2160.71 m^3/s, 1250.17 m^3/s and 3286.50 m^3/s respectively. Batang Anai watershed has 453.27 Km^2 area (bridge as watershed outlet) and 3 rainfall station, as for the hydraulic analysis needs additional geometrical and bridge design input to perform the river water behavior. The results indicate that alteration occur on the downstream of the bridge up to 6 cm on depth of water surface while on the contrary, consultant's report shows that alteration occur on depth of water surface up to 5 cm at downstream and 1 cm at the upstream side, either way the bridge design met the safety requirement for vertical clearance and horizontal clearance according BMS 92.

Keywords : *Hydrology, River Hydraulic, Rational Method, Synthetic Unit Hydrograph, HEC-RAS*

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