KAJIAN TEKNIS PENGENDALIAN BANJIR KOTA SOLO SECARA TERPADU STUDI KASUS KAWASAN PINTU AIR DEMANGAN

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ABSTRACT

City of Surakarta, known as Solo City is one of many cities in Central Java Province passed by the flow of Bengawan Solo river. The heavy rain in upstream area of Bengawan Solo increased high water level in the downstream. Solo City, eventhough located in upstream part of Bengawan Solo, also suffered from the increase of Bengawan Solo water level. The water level in the main river could be higher than water level in drainage system causing backwater flows into the drainage and lands. Since Colonization era, the government have built embankments and floodgates to avoid backwater flow and inundation. One of them was Floodgate Demangan, separating Bengawan Solo river's flow and Pepe river's flow. It was equipped with total 12,3 m^3/s drainage pump. Yet, the inundation was not only caused by the backwater comes from Bengawan Solo river, the rain in the Solo's catchment area cannot be drained gravitationaly to the main river since the floodgate was closed. Therefor, a comperehensive study combining hidrological aspect and hidraulitical aspect is needed. Finally, flood control and flood proofing in Solo area can be more effective than before.

This study is collaborating hydrological aspect and hydraulitical aspect. Hydrological aspect studies overflow hydrograph flowing from catchment area in Solo City to Pepe Downstream river. While hydraulitical aspect investigates hydraulic parameter in Pepe Downstream river's stream which is influenced by Bengawan Solo river's stream. Both studies will be simulated using software HEC-RAS version 4.1.0. The simulations describe the consequences of with and without water level hydrograph of Bengawan Solo river. The simulations are combining studies of drainage stream, floodgate, pump system and embankment in Pepe Downstream river.

Simulation of 10 years return periode precipitation in Solo City catchment area and average annual water level in Bengawan Solo river, informs that the flow in Pepe Downstream river can be passed through Floodgate Demangan, and the highest water level is still below the embankment. Simulation of 10 years return periode precipitation, Bengawan Solo river's water level hydrograf in 10 years return periode and operating Floodgate Demangan and its existing pump, informs that overflow occurs in all embankment long of Pepe Downstream river. Simulation of the need of proper amount of total pump, obtain the total amount of pump as much as 168,3 m^3/s to pass through the 10 years return periode precipitation. Simulation of combination the need of pump and raising embankment reaching elevation +87,63 m, obtain the total amount of pump lesser with 120,3 m^3/s, meanwhile simulation of operating the pump group earlier than before obtain the total amount of 132,3 m^3/s.