ABSTRACT

Toll-road construction project of Surabaya-Mojokerto (SUMO) is a toll-road construction planning which will connect two cities - Surabaya and Mojokerto in East Java Province, Indonesia. This project is divided into 5 (five) sections i.e. Section IA, Section IB, Section II, Section III and Section IV. However, this study will only discuss Section IA located in Waru-Sepanjang area.

The decrease of rain absorption area in a certain location due to the construction project will automatically increase the volume of water run-off. On a highway project, this case could happen as the rigid pavement or asphalt covers the absorption area.

To overcome this problem, drainage system planning which enables to shift water run-off from road surface to the outlet is badly needed. This drainage system must be in accordance with the existing ones so that these drainage
systems can be useful continually to reach to the outlet. In this planning, Kali Menanggal in Menanggal sub-village and Kali Buntung in Bungurasih are used as the outlets.

The first step of this drainage system planning is to make a sketch of drainage canal. This sketch is made by considering the surface area elevation so that the water in the canal can run well due to its gravity. The water level in the canal must also be thoroughly counted to observe whether the water flow can run perfectly to the outlets. In addition, backwater that occurs in the outlet canal must also be reckoned well.

In this drainage system planning, the drainage sketch is divided into 13 (thirteen) drainage zones and 8 (eight) primary canals which directly go to the outlets. The result of the backwater in the outlet canals shows that 1,35 m backwater is created in the outlet O7 (Zone 13) – which its flow comes from primary canal S13 H. This backwater consequently overflows its canal which only has 2,00 m × 1,30 m dimension. Therefore, to accomplish this overflow in this canal S13H, the water pump of 0,268 m³/s must be used. It is in line with the volume of discharge in the canal.

**Keywords**: drainage, toll-road, backwater.