

ABSTRACT

EVALUATION OF DRAINAGE CHANNEL ELEVATION TO MINIMIZE FLOW DECELERATION (CASE STUDY: DRAINAGE OF JL. POROS SUNGAI ALAM)

Name : Haikel Pangaribuan
Student ID Number : 4103230040
Supervisor : Ir.Zulkarnain, ST., MT

This study was conducted to evaluate the condition of the drainage channel bed elevation along Jalan Poros Sungai Alam, Bengkalis District, and to examine the relationship between channel slope and flow velocity. Elevation measurements were carried out in the field using an Auto Level with a spacing of 15 m between measurement points over a total length of 2,700 m. The measurement results were then used to determine changes in elevation at each point, create a longitudinal profile (long section), and determine the channel slope. Furthermore, the flow velocity was calculated using the Manning equation with a roughness coefficient of 0.030 according to the condition of the soil channel. Based on the data processing results, 179 channel segments were obtained, with channel slopes ranging from -0.0820 to 0.0803. A total of 95 segments had positive slopes, while 84 segments had negative slopes. The calculated flow velocity ranged from 0.3443 m/s to 5.4717 m/s. The analysis showed that changes in channel slope affected the flow velocity. In segments with greater positive slopes, the flow velocity tended to increase, while very small slopes could cause the flow to become slower. The presence of negative slopes and irregular elevation changes also indicated that the channel bed condition was not uniform and could potentially cause flow retardation, sedimentation, and water ponding. Based on these conditions, the recommended improvements include adjusting the channel bed elevation, normalizing sections experiencing slow flow, and installing drop structures at several segments with high slopes and flow velocities. These measures are expected to help maintain a more controlled flow, reduce the risk of erosion along the channel bed, and improve the function of the drainage channel in conveying surface water more effectively under existing field conditions.

Keywords: *drainage channel, channel elevation, channel slope, flow velocity, longitudinal profile (long section).*