



INTISARI

Informasi tentang aliran sedimen suspensi seringkali sangat dibutuhkan, terutama untuk keperluan perencanaan pekerjaan keteknik-sipil. Untuk mendapatkan informasi tersebut sangat sulit dan membutuhkan biaya yang mahal. Informasi tersebut banyak dijumpai berdasarkan hasil penelitian sebelumnya pada saluran lurus, sedangkan pada saluran lurus masih terbatas. Tujuan dilakukan penelitian ini adalah untuk mengetahui karakteristik aliran sedimen suspensi pada saluran menikung, kemudian hasil yang diperoleh dibandingkan dengan hasil pada saluran lurus. Sehingga dapat menjawab sebagian permasalahan untuk mendapatkan informasi tentang aliran sedimen suspensi.

Penelitian ini menggunakan metode penelitian lapangan yang dilaksanakan di 6 (enam) titik lokasi saluran menikung pada ruas saluran irigasi Mataram Yogyakarta. Untuk mendapatkan data aliran, pada setiap lokasi dilakukan pengukuran kecepatan aliran menggunakan alat *propeler current meter*, dan pengukuran konsentrasi sedimen suspensi menggunakan alat *opcon probe*. Data penunjang didapat dari pengambilan sampel sedimen suspensi dan sedimen dasar. Apabila seluruh data yang diperlukan sudah diperoleh maka dilanjutkan dengan analisa dan pembahasan hasil penelitian. Sub bab yang dianalisa dan dibahas adalah metode pengukuran dan pengambilan sampel, kecepatan, dan konsentrasi aliran sedimen suspensi pada saluran menikung.

Berdasarkan hasil pembahasan penelitian, dapat diambil kesimpulan bahwa, nilai kecepatan rata-rata tampang di *inner bank* lebih besar dari pada di *outer bank* untuk arah transversal. Dan sebaliknya nilai konsentrasi sedimen suspensi rata-rata tampang di *outer bank* lebih besar dari pada di *inner bank* untuk arah transversal. Penggunaan Metode Clauser untuk mendapatkan nilai kecepatan geser tidak sepenuhnya dapat digunakan, karena keterbatasan data di *inner region*. Nilai konsentrasi sedimen suspensi rata-rata tampang dapat ditentukan berdasarkan nilai rata-rata vertikal kedalaman aliran dengan lokasi pengambilan sampel $0,50 B$ arah transversal atau dari *inner bank* ke arah *outer bank*. Metode 1, 2 dan 3 titik, masih dapat digunakan untuk mendapatkan nilai konsentrasi sedimen suspensi rata-rata kedalaman dan memberikan hasil cukup baik. Perbandingan antara profil distribusi konsentrasi sedimen suspensi data pengukuran dengan profil distribusi konsentrasi sedimen suspensi persamaan Rouse dan Tanaka Sugimoto untuk posisi di tengah saluran atau $0,5B$ mempunyai kecenderungan nilai yang sama. Faktor koreksi parameter Rouse, β' nilainya berkurang dari *inner bank* ke *outer bank* pada arah transversal. Persamaan Rouse dapat diandalkan untuk memprediksi distribusi sedimen suspensi untuk posisi di tengah saluran. Untuk posisi selain di tengah saluran dan di awal tikungan, persamaan Rouse perlu dikoreksi.

Kata kunci: distribusi kecepatan, konsentrasi sedimen suspensi, saluran menikung



ABSTRACT

Information about the suspended sediment flow often is necessary, especially for planning, civil works. To obtain this information needs much more times and cost to collect data sampling. Such information is often found based on the results of previous studies on a straight channel, while the curved channel is still limited. The purpose of this study was to determine the characteristics of the suspended sediment flow in the curved channel, then the results obtained were compared with the results in a straight channel. So as to answer some of the problems to obtain information about the flow suspended sediment.

This study uses the method of field research conducted in 6 (six) points curved channel location on segment irrigation channels Mataram Yogyakarta. To obtain the velocity data, at any location measurement using a propeller current meter, and the measurement of the concentration of suspended sediment using the opcon probe. Supporting data obtained from sampling suspended sediment. If all the necessary data has been obtained then followed by analysis and discussion of research results. Sub-chapters are analyzed and discussed is the method of measuring and sampling, velocity, and concentration of the suspended sediment flow in the curved channel.

Based on the results of the discussion of the research, it can be concluded that, the value of the average velocity at the inner bank looks bigger than in the outer banks for transversal direction. And conversely the value of suspended sediment concentration average looks at the outer banks is greater than in the inner bank to the transverse direction. Clauser method use to get the value of the shear velocity is not fully usable, because of data limitations in the inner region. Although the trend curves of \bar{C}_y $\bar{I}\bar{C}$ for field data are relatively equals, however the positions where, $\bar{C}_y \bar{I}\bar{C} = 1$, are almost the same, i.e., at $z/B \approx 0,5$. This results mean that the cross-section averaged of suspended sediment concentration can be obtained from the sampling of suspended sediment concentration at a point of $z \cong 0.50 B$, where B is the channel width.

The results of the analyzed data show that the depth-averaged suspended sediment concentration, \bar{C}_y , can be determined from 1, 2 and 3 points of measurement. Methods 1, 2 and 3 points, still can be used to obtain a suspension of sediment concentration values depth-averaged suspended sediment concentration and gives quite good results. Comparison between the suspension of sediment concentration distribution profile measurement data with sediment concentration distribution profile suspension and Tanaka Sugimoto Rouse equation for position in the centre of the channel or trend $0,5B$ still have the same value. Rouse parameter correction factor, β' value decreases from the inner to the outer banks of banks in the transverse direction. Rouse equation can be relied upon to predict the distribution of sediment suspension for a position in the center of the channel. For other positions than in the centre of the channel and at the beginning of the bend, Rouse equation needs to be corrected.

Keywords: depth-averaged suspended sediment concentration, depth and cross-section averaged suspended sediment concentrations., curved channel