ABSTRAK

Riski,2026 “Drainase merupakan komponen penting infrastruktur perkotaan yang berfungsi mengalirkan kelebihan air hujan agar tidak menimbulkan genangan maupun banjir. Perubahan tata guna lahan dan berkurangnya daerah resapan meningkatkan limpasan permukaan sehingga kapasitas saluran perlu dievaluasi. Penelitian ini bertujuan menganalisis kapasitas saluran drainase eksisting di Kawasan Kampus Universitas Dharma Andalas, Kota Padang, menghitung debit banjir rencana, mengevaluasi kemampuan saluran dalam menampung debit limpasan, serta mengidentifikasi faktor penyebab genangan. Data primer berupa dimensi, kemiringan, dan kondisi fisik saluran diperoleh melalui survei lapangan, sedangkan data sekunder berupa curah hujan harian maksimum 10 tahun terakhir dari tiga stasiun hujan terdekat (Stasiun Kantor PU Khatib Sulaiman, Stasiun Parak Kopi, dan Stasiun Meteorologi Maritim Teluk Bayur), peta topografi, dan tata guna lahan. Curah hujan rencana dianalisis dengan distribusi frekuensi yang diuji kecocokannya menggunakan Chi-Square dan Smirnov-Kolmogorov, intensitas hujan dihitung dengan metode Mononobe, dan debit banjir rencana dihitung dengan Metode Rasional ($Q = 0{,}278 \cdot C \cdot I \cdot A$). Kapasitas saluran eksisting dihitung dengan persamaan Manning dan dibandingkan dengan debit rencana; apabila tidak mencukupi, dimensi saluran direncanakan ulang berdasarkan penampang hidrolis optimum. Hasil penelitian menunjukkan bahwa [isi hasil utama: jumlah segmen mencukupi/tidak mencukupi, debit rencana, kapasitas saluran, dan dimensi rencana]. Hasil ini diharapkan menjadi dasar perbaikan dan pengembangan sistem drainase kawasan kampus.

Kata kunci: drainase, metode rasional, debit banjir rencana, kapasitas saluran, persamaan Manning

Abstract

Riski ,2026 "Drainage is an essential component of urban infrastructure that conveys excess rainwater to prevent inundation and flooding. Changes in land use and the loss of infiltration areas increase surface runoff, so the capacity of existing channels must be evaluated. This study aims to analyze the capacity of the existing drainage channels in the Universitas Dharma Andalas campus area, Padang, to calculate the design flood discharge, to evaluate the channels' ability to accommodate runoff, and to identify the causes of waterlogging. Primary data, namely channel dimensions, slope, and physical condition, were collected through field surveys, while secondary data comprised maximum daily rainfall over the last 10 years from three nearby rainfall stations (Khatib Sulaiman PU Office, Parak Kopi, and Teluk Bayur Maritime Meteorological stations), topographic maps, and land-use data. Design rainfall was analyzed using frequency distributions tested with the Chi-Square and Smirnov-Kolmogorov goodness-of-fit tests, rainfall intensity was calculated using the Mononobe method, and design flood discharge was computed using the Rational Method (Q = 0.278·C·I·A). The capacity of the existing channels was calculated with the Manning equation and compared with the design discharge; where capacity was insufficient, the channel dimensions were redesigned based on the optimum hydraulic section. The results show that [insert main findings: number of adequate/inadequate segments, design discharge, channel capacity, and redesigned dimensions]. These findings are expected to serve as a basis for improving and developing the campus drainage system.

Keywords: *drainage, rational method, design flood discharge, channel capacity, Manning equation*