

**PEMANFAATAN SISTEM INFORMASI GEOGRAFIS (SIG)
DALAM INSPEKSI PEMELIHARAAN DRAINASE DAN PELENGKAP DRAINASE
JALAN
(Studi Kasus: Jalan Tandun, Kecamatan Bengkalis)**

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ABSTRAK

Penelitian ini dilatar belakangi oleh pentingnya keberfungsian sistem drainase dalam mencegah genangan, banjir lokal, serta kerusakan infrastruktur jalan. Jalan Tandun, Kecamatan Bengkalis, menunjukkan berbagai permasalahan seperti sedimentasi, penyumbatan inlet, serta kerusakan elemen pelengkap drainase. Kajian teori yang digunakan meliputi konsep Sistem Informasi Geografis (SIG), karakteristik sistem drainase perkotaan, tipe kerusakan, metode inspeksi, serta perhitungan Indeks Kondisi Drainase Permukaan (IKDP). Penelitian ini menggunakan metode inspeksi visual berbasis pedoman Kementerian PUPR, pengukuran *cross section*, serta pemetaan kondisi drainase memanfaatkan perangkat lunak ArcGIS. Data primer diperoleh melalui survei lapangan selama lima hari, meliputi pengukuran dimensi, dokumentasi kerusakan, serta penentuan koordinat.

Hasil penelitian menunjukkan bahwa kondisi drainase ruas kiri tergolong rusak ringan dengan persentase kerusakan 46,53% (IKDP 4), sedangkan ruas kanan tergolong rusak berat dengan nilai 68,04% (IKDP 5). Identifikasi menggunakan ArcGIS menemukan 4 titik kerusakan batu andesit, 17 titik kerusakan penutup manhole, 10 titik batu sikat, dan 3 titik kerb. Penelitian ini juga menghasilkan rencana pemeliharaan berupa pembersihan sedimentasi serta perbaikan struktural, dengan estimasi kebutuhan biaya sebesar Rp53.100.000,00. Secara keseluruhan, penelitian menegaskan bahwa SIG efektif dalam mendukung inspeksi, dokumentasi, dan perencanaan pemeliharaan drainase.

Kata kunci: Bengkalis, Drainase, Inspeksi, IKDP, SIG.

UTILIZATION OF GEOGRAPHIC INFORMATION SYSTEMS (GIS)
IN THE INSPECTION AND MAINTENANCE OF ROAD DRAINAGE AND DRAINAGE
FACILITIES

(Case Study: Tandun Street, Bengkalis District)

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ABSTRACT

This study is motivated by the crucial role of drainage systems in preventing waterlogging, localized flooding, and infrastructure deterioration. The drainage system along Tandun Road, Bengkalis District, exhibits various issues such as sediment accumulation, clogged inlets, and damage to drainage components. The theoretical framework of this research includes Geographic Information Systems (GIS), urban drainage characteristics, types of damage, inspection methods, and the calculation of the Surface Drainage Condition Index (IKDP). The study employs a visual inspection method based on the guidelines of the Ministry of Public Works, cross-section measurements, and spatial mapping of drainage conditions using ArcGIS. Primary data were collected through a five-day field survey involving dimensional measurements, damage documentation, and coordinate acquisition.

*The findings indicate that the left drainage segment is categorized as lightly damaged with a deterioration percentage of 46.53% (IKDP 4), while the right segment falls into the **severely** damaged category with 68.04% (IKDP 5). GIS-based identification recorded 4 damaged andesite blocks, 17 damaged manhole covers, 10 damaged brush stones, and 3 damaged curbs. The study also proposes maintenance actions such as sediment removal and structural repairs, with an estimated cost of Rp53,100,000. Overall, the research demonstrates that GIS is highly effective in supporting drainage inspection, documentation, and maintenance planning.*

Keywords: Bengkalis, drainage, GIS, inspection, IKDP

