

APPLICATION OF HEC-RAS FOR SIMULATING SEDIMENT TRANSPORT CHARACTERISTICS : A CASE STUDY IN SIMPANG KIRI RIVER, JOHOR, MALAYSIA

UNDERGRADUATE THESIS

By:



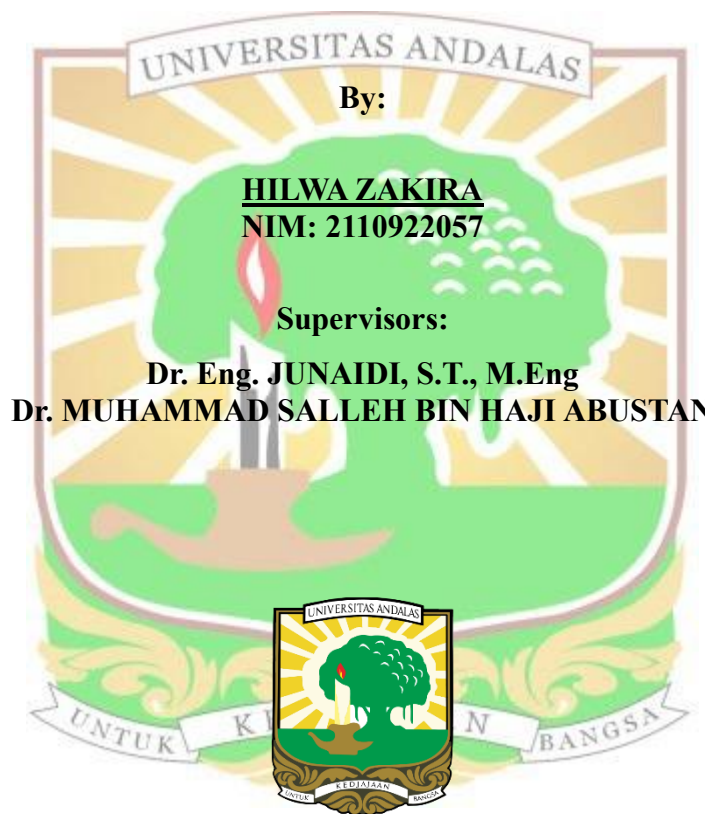
**CIVIL ENGINEERING UNDERGRADUATE STUDY PROGRAM
DEPARTMENT OF CIVIL ENGINEERING
FACULTY OF ENGINEERING
UNIVERSITAS ANDALAS**

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APPLICATION OF HEC-RAS FOR SIMULATING SEDIMENT TRANSPORT CHARACTERISTICS : A CASE STUDY IN SIMPANG KIRI RIVER, JOHOR, MALAYSIA

UNDERGRADUATE THESIS

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ABSTRACT

Seri Medan, located in Batu Pahat, Johor, experiences frequent flooding due to heavy rainfall, sedimentation, and low-lying terrain. This study applies the HEC-RAS software to simulate sediment transport in the Simpang Kiri River, focusing on understanding flow characteristics, sediment deposition, and erosion patterns. Understanding sediment transport dynamics in the Simpang Kiri River is essential for addressing flood risks and river morphology changes in the river. The methodology includes data on river geometry, flow characteristics, and sediment properties, which are integrated into the HEC-RAS model for simulating sediment transport. The study identifies critical sedimentation and erosion areas, evaluates sediment transport rates, and explores the impacts on river morphology. The findings provide insights for sustainable sediment management and effective flood mitigation. The simulation is expected to identify key areas of sediment deposition and erosion, providing data that supports effective flood mitigation and sustainable river management.

Keywords: Sediment transport, HEC-RAS, flood risk, sedimentation, erosion



ABSTRAK

Seri Medan, yang terletak di Batu Pahat, Johor, sering mengalami banjir akibat curah hujan yang tinggi, sedimentasi, dan kondisi topografi yang rendah. Studi ini menggunakan perangkat lunak HEC-RAS untuk mensimulasikan transportasi sedimen di Sungai Simpang Kiri, dengan fokus pada pemahaman karakteristik aliran, deposisi sedimen, dan pola erosi. Pemahaman tentang dinamika transportasi sedimen di Sungai Simpang Kiri sangat penting untuk mengatasi risiko banjir dan perubahan morfologi sungai. Metodologi penelitian mencakup data geometri sungai, karakteristik aliran, dan sifat sedimen, yang kemudian diintegrasikan ke dalam model HEC-RAS untuk mensimulasikan transportasi sedimen. Studi ini mengidentifikasi area kritis sedimentasi dan erosi, mengevaluasi laju transportasi sedimen, serta mengeksplorasi dampaknya terhadap morfologi sungai. Temuan dari penelitian ini memberikan wawasan untuk pengelolaan sedimen yang berkelanjutan dan mitigasi banjir yang efektif. Simulasi ini diharapkan dapat mengidentifikasi area utama deposisi dan erosi sedimen, serta menyediakan data yang mendukung upaya mitigasi banjir dan pengelolaan sungai yang berkelanjutan.

Kata kunci: Transportasi sedimen, HEC-RAS, risiko banjir, sedimentasi, erosi.

