

ANALISIS PRODUKTIVITAS DAN BIAYA OPERASIONAL LANGSUNG ALAT BERAT PADA PEKERJAAN GALIAN MEKANIS PROYEK NORMALISASI SUNGAI WULAN PAKET III

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ABSTRAK

Pekerjaan galian mekanis pada Proyek Normalisasi Sungai Wulan Paket III (STA 383+00–396+00) kedalaman 2–4 meter memakai alat berat sewa untuk mengembalikan kapasitas hidrolis sungai. Riset ini bermaksud mengkaji kapasitas produksi riil, keserasian kerja (Match Factor), Biaya Operasional Langsung (BOL), dan Break Even Point (BEP). Pendekatan kuantitatif dijalankan melalui pengamatan waktu siklus (cycle time) dan pengolahan data teknis-ekonomis sesuai standar Permen PUPR No. 28/PRT/M/2016. Temuan kajian memperlihatkan kapasitas produksi riil 1 unit excavator Kobelco SK200 sebesar 145,84 m³/jam dan Heavy Dump Truck (HDT) Isuzu Giga sebesar 80,35 m³/jam. Untuk menyelesaikan total volume 834.731,14 m³ dalam 90 hari kerja, dibutuhkan kombinasi 10 unit excavator dan 17 unit HDT dengan nilai Match Factor 0,90 (kategori efisien). Harga Satuan Pekerjaan (HSP) galian didapatkan sebesar Rp27.870,10/m³, membuahakan total BOL murni sebesar Rp21.149.125.911,70. Analisis titik impas menunjukkan BEP volume galian sebesar 758.846,49 m³ dengan target produksi minimum 1.204,52 m³/jam, serta Margin of Safety (MOS) sebesar 9,09% (75.884,65 m³). Penelitian ini mengonfirmasi bahwa pengoperasian alat berat proyek telah meraih tingkat efisiensi operasional dan ekonomis yang aman.

Kata Kunci: Galian Mekanis, Produktivitas Alat Berat, Biaya Operasional Langsung, Match Factor, Break Even Point

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ABSTRACT

Mechanical excavation works on the Wulan River Normalization Project Package III (STA 383+00–396+00), at a depth of 2–4 meters, employ rented heavy equipment to restore the river's hydraulic capacity. This study aims to examine the actual production capacity, work compatibility (Match Factor), Direct Operational Cost (DOC), and Break Even Point (BEP). A quantitative approach was applied through cycle time observation and technical-economic data processing in accordance with the standards of Ministerial Regulation of Public Works and Public Housing (Permen PUPR) No. 28/PRT/M/2016. The findings reveal that the actual production capacity of one unit of Kobelco SK200 excavator is 145,84 m³/hour, while that of the Isuzu Giga Heavy Dump Truck (HDT) is 80,35 m³/hour. To complete the total volume of 834.731,14 m³ within 90 working days, a combination of 10 excavator units and 17 HDT units is required, yielding a Match Factor value of 0.90 (classified as efficient). The Unit Price of Work (HSP) for excavation was determined at Rp27.870,10/m³, resulting in a total pure Direct Operational Cost of Rp21.149.125.911,70. The break-even point analysis indicates an excavation volume BEP of 758.846,49 m³ with a minimum production target of 1.204,52 m³/hour, along with a Margin of Safety (MOS) of 9.09% (75.884,65 m³). This study confirms that the operation of heavy equipment on the project has achieved a safe level of operational and economic efficiency.

Keywords: *Mechanical Excavation, Heavy Equipment Productivity, Direct Operational Cost, Match Factor, Break Even Point*