ANALISIS PERBANDINGAN *QUANTITY TAKE-OFF* BERBASIS BIM 5D TERHADAP METODE KONVENSIONAL PADA PEKERJAAN STRUKTUR *CANAL LINING* BENDUNGAN KARANGNONGKO PAKET II

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ABSTRACT

This study examines the calculation of quantity take-off on the right *intake canal lining* structure of the Karangnongko Package II Dam. The structure of the water building has a complex geometric level, so the process of extracting quantities using conventional methods is still prone to human error and takes quite a long time. This study aims to compare the results of estimating work volume, cost plans, as well as the accuracy and deviation levels between conventional methods and 5D Building Information Modeling (BIM) methods, as well as identifying the factors causing the difference. The research method used is a quantitative-comparative method by juxtaposing manual calculations using Microsoft Excel based on 2D working drawings with automatic extraction results from parametric 3D modeling using Autodesk Revit 2024 software.

The results showed that the volume of concrete of the conventional method was 1254.76 m^3 and the BIM method was 1253.67 m^3 (accuracy of 99.91%). The weight of conventional method reinforcing iron reaches 81119.43 kg and BIM 80386.84 kg (99% accuracy). Conventional cost estimates require IDR 2,942,518,102.85 while BIM is more efficient, namely IDR 2,929,837,389.21 (savings of 0.43%). In conclusion, the 5D BIM method provides precise, consistent and effective estimation to overcome the difficulty of interpreting the dimensions of the curved area. The main difference in results is due to the automation of BIM calculations based on actual geometry which is more accurate than the simplification of formulas in conventional methods.

Keywords: Dam, BIM 5D, Canal Lining, Quantity Take-Off, Cost Budget Plan.