

ABSTRAK

Perkembangan teknologi konstruksi mendorong penerapan *Building Information Modeling* (BIM) dalam proses perencanaan, termasuk untuk perhitungan *Quantity Take-Off* (QTO). Pada proyek Pembangunan Jalan Baru Kretek–Girijati, khususnya pekerjaan jembatan di STA 1+940 – STA 1+991, QTO berperan penting dalam menentukan kebutuhan material. Penelitian ini menyajikan hasil perhitungan QTO struktur jembatan menggunakan metode konvensional dan BIM dengan perangkat lunak Autodesk Revit.

Pemodelan struktur jembatan dilakukan berdasarkan gambar kerja (*shop drawing*) proyek. Perhitungan QTO dengan metode konvensional dilakukan melalui pengukuran gambar 2D dan pengolahan data menggunakan Microsoft Excel. Sementara itu, perhitungan berbasis BIM dilakukan pada Autodesk Revit dengan memanfaatkan fitur *Schedule/Quantities*. Material yang dihitung dalam penelitian ini meliputi beton dan baja tulangan.

Berdasarkan pemodelan dan analisis yang dilakukan, perhitungan volume beton menghasilkan nilai sebesar 1.596,151 m³ dengan metode konvensional dan 1.595,981 m³ menggunakan Revit, dengan selisih sebesar 0,011%. Untuk baja tulangan, metode konvensional menghasilkan berat sebesar 222.482,302 kg (volume 28,342 m³), sedangkan Revit menghasilkan berat sebesar 220.798,013 kg (volume 28,127 m³), dengan selisih sebesar 0,757%. Selisih yang relatif kecil ini menunjukkan bahwa penggunaan Autodesk Revit efektif dalam mendukung proses perhitungan QTO, karena mampu menyajikan data secara otomatis melalui pemodelan, dengan hasil yang sebanding dengan metode konvensional.

Kata kunci: BIM, *Quantity Take-Off*, Autodesk Revit, Struktur Jembatan.

ABSTRACT

The development of construction technology has encouraged the implementation of Building Information Modeling (BIM) in project planning processes, including Quantity Take-Off (QTO) calculations. In the Kretek-Girijati New Road Construction Project, particularly the bridge construction between STA 1+940 and STA 1+991, QTO plays a crucial role in determining material requirements. This study presents the QTO results of the bridge structure using both conventional methods and BIM-based methods with Autodesk Revit.

The bridge structure was modeled based on the project shop drawings. The conventional QTO was performed by measuring 2D drawings and processing the data using Microsoft Excel. In contrast, the BIM-based QTO was conducted in Autodesk Revit using the Schedule/Quantities feature. The materials calculated in this study include concrete and reinforcement.

Based on the modeling and analysis, the concrete volume calculated using the conventional method was 1,596.151 m³, while Revit produced a volume of 1,595.981 m³, with a difference of 0.011%. For reinforcement, the conventional method yielded a weight of 222,482.302 kg (volume 28.342 m³), while Revit produced a weight of 220,798.013 kg (volume 28.127 m³), with a difference of 0.757%. These small differences indicate that Autodesk Revit is effective in supporting the QTO process by automatically generating quantity data through modeling, with results that are comparable to the conventional method.

Keywords: *BIM, Quantity Take-Off, Autodesk Revit, Bridge Structure.*