INTISARI

Perhitungan volume diperlukan untuk menghitung biaya, sumber daya, dan perkiraan durasi. Perhitungan volume dilakukan pada semua komponen bangunan termasuk pekerjaan baja tulangan. Baja tulangan mempunyai nilai biaya yang cukup besar sehingga perlu dioptimasikan. Penelitian ini bertujuan untuk menghitung volume baja tulangan dari studi kasus pada Proyek Pembangunan Gedung Bedah Sentral Terpadu RSUD Banyumas. Selain itu, dilakukan pula optimasi pemotongan baja tulangan agar diperoleh *waste* yang minimum.

Perhitungan volume baja tulangan dilakukan dengan cara manual berdasarkan Gambar DED, pembuatan *bar bending schedule*, dan penggunaan *software* Autodesk Revit. Optimasi pemotongan baja tulangan menggunakan Solver Add-in pada Microsoft Excel dan *software* Cutting Optimization Pro. Analisis dilakukan dengan membandingkan hasil perhitungan *software* BIM dengan volume kontrak dan perhitungan manual. Hasil optimasi pemotongan baja tulangan dibandingkan antara menggunakan Solver Add-in dan *software* Cutting Optimization Pro.

Hasil perhitungan mendapatkan volume baja tulangan secara manual sebesar 173.123,17 kg, sedangkan perhitungan berdasarkan *bar bending schedule* manual sebesar 197.945,48 kg, dan perhitungan *software* BIM sebesar 193.982,57 kg. Hasil perhitungan ini menunjukkan selisih perhitungan metode BIM dengan volume kontrak sebesar 14,92%, selisih perhitungan metode BIM dengan perhitungan manual sebesar 10,75% dan selisih perhitungan metode BIM dengan perhitungan *bar bending schedule* manual sebesar 2,37%. Adapun hasil optimasi menggunakan Solver Add-in dan *software* Cutting Optimization Pro menghasilkan w*aste* sebesar 17,61% dan 16,97%. Efisiensi atau penghematan kebutuhan baja tulangan dari optimasi pemotongan baja tulangan menggunakan Solver Add-in pada Microsoft Excel dan *software* Cutting Optimization Pro sebesar 10,39% dan 11,08%.

Kata kunci: Optimasi, Revit, waste, Solver Add-in, Cutting Optimization Pro

ABSTRACT

Quantity take-off is required to calculate costs, resources, and estimated durations. Volume calculations are carried out on all building components, including rebar work. Rebar has a reasonably significant cost value, so it needs to be optimized. This study aims to quantity take-off of rebar from a case study on the Integrated Central Surgical Building Construction Project at the RSUD Banyumas. In addition, optimization of rebar cutting is also carried out to obtain minimum waste.

The quantity take-off of rebar will calculate manually based on DED drawings, making a bar bending schedule, and using Autodesk Revit software. Optimizing rebar cutting using Solver Add-in in Microsoft Excel and Cutting Optimization Pro software. Analysis was done by comparing the results of the calculation of the BIM software with the contract volume and manual calculations. The results of the optimization cutting rebar are compared between using the Solver Add-in and Cutting Optimization Pro software.

The result of analysis volume of rebar manually is 173.123,17 kg, based on the calculation of manual bar bending schedule is 197.945,48 kg, and based on quantity take-off using BIM software is 193.982,57 kg. This calculation shows the difference in the analysis of the volume of rebar from the BIM method with contract volume at RAB is 14,92%, the BIM method with manual calculations is 10,75%, the BIM method with the manual bar bending schedule is 2,37%. The optimization results using Solver Add-in and Cutting Optimization Pro software produce 17,61% and 16,97% waste, respectively. Using Solver Add-in in Microsoft Excel and Cutting Optimization Pro software, efficiency or savings in rebar needs from optimizing rebar cutting are 10,39% and 11,08%, respectively.

Keywords: Revit, optimization, waste, Solver Add-in, Cutting Optimization Pro