INTISARI

FADILLAH USTMAN, 2022, *Pengelolaan Volume Pekerjaan Beton Bertulang berdasarkan Pemodelan Autodesk Revit (Studi Kasus Penyempurnaan GOR UGM)*. (dibimbing oleh Ir. Bambang Herumanta, M.T.)

Diantara beberapa kegiatan kepengawasan adalah mengawasi penetapan volume pekerjaan. Kegiatan pengawasan penetapan volume pekerjaan di lapangan disebut *mutual check*. Salah satu cara yang dapat digunakan untuk pengawasan penyediaan material adalah penerapan *Building Information Modeling* (BIM). Fitur *Quantity Takeoff* (QTO) pada BIM menampilkan material yang digunakan dalam pemodelan. Volume pekerjaan beton dan pembesian hasil QTO kemudian dibandingkan dengan *Bill of Quantity* saat kontrak dan MC-100 dalam persentase.

Pemodelan didasarkan pada *Detail Engineering Drawing* (DED), *Shop Drawing*, dan beberapa ketentuan yang dijelaskan dalam SNI 2847-2019. Pemodelan diawali dengan pemodelan elemen struktur yang dilanjutkan dengan pendetailan pembesian pada masing – masing elemen struktur. Setelah semua elemen struktur dimodelkan, dilanjutkan dengan *Quantity Take Off* (QTO). Dari QTO didapatkan volume pekerjaan beton (m^3) dan besi tulangan (kg).

Diperoleh volume pekerjaan beton hasil QTO Autodesk Revit senilai 684,49 m^3. Nilai tersebut memiliki selisih 10,94% lebih sedikit daripada perhitungan volume secara manual pada saat tender (768,56 m^3), dan lebih sedikit 13,61% daripada perhitungan volume saat MC - 100 (792,36 m^3). Perbedaan tersebut dikarenakan perhitungan manual memperhitungkan volume beton dari as ke as, sedangkan Autodesk revit memperhitungkan volume berdasarkan bentang bersih elemen struktur. Di sisi lain, perolehan volume pekerjaan pembesian hasil QTO Autodesk Revit senilai 140621,91 kg. Nilai tersebut memiliki selisih 6,62% lebih sedikit daripada perhitungan volume secara manual pada saat tender (150.596,37 kg) dan lebih sedikit 7,21% daripada perhitungan volume saat MC - 100 (151.547,66 kg). Selisih tersebut disebabkan tidak memperhitungkan sambungan lewatan dalam perhitungan volume pekerjaan pembesian secara manual.

Kata kunci : Volume pekerjaan beton bertulang, *Building Information Modeling*, dan *Quantity Take Off*.

ABSTRACT

FADILLAH USTMAN, 2022, *Management of Reinforced Concrete Work Volume based on Autodesk Revit Modeling (Case Study of Completion of GOR UGM)*. (*supervised by* Ir. Bambang Herumanta, M.T.)

Among several supervisory activities is overseeing the determination of the volume of work. The activity of supervising the determination of the volume of work in the field is called a mutual check. One of several way which can be used to supervise the supply of materials is the application of Building Information Modeling (BIM). The Quantity Takeoff (QTO) feature in BIM displays the materials used in the modeling. The volume of concrete and reinforcement works produced by QTO is then compared with the Bill of Quantity at the time of contract and MC-100 as a percentage.

The modeling is based on Detail Engineering Drawing (DED), Shop Drawing, and several provisions described in SNI 2847-2019. Modeling begins with the modeling of structural elements followed by detailed reinforcement on each structural element. After all structural elements are modeled, it is continued with Quantity Take Off (QTO). From the QTO, the volume of concrete work (m^3) and reinforcement steel (kg).

The volume of concrete work produced by Autodesk Revit QTO is 684,49 m^3. This value has a difference of 10.94% less than the manual volume calculation at the time of tender (768,56 m3), and 13.61% less than the volume calculation when MC - 100 (792,36 m^3). The difference happened because manual calculations consider the volume of concrete from each centerline of structural elements, while Autodesk Revit calculates volumes based on the net length of structural elements. On the other hand, the volume of reinforcement work from the QTO Autodesk Revit was valued at 140621.91 kg. This value has a difference of 6,62% less than the manual volume calculation at the time of tender (150.596,37 kg) and 7,21% less than the volume calculation when MC - 100 (151.547,66 kg). The difference is due to not considering the lap slice reinforcing in the manual calculation.

Keywords: Volume of reinforced concrete work, Building Information Modeling, and Quantity Take Off.