

PERBANDINGAN VOLUME BETON RENCANA BERBASIS *BUILDING INFORMATION MODELING* DAN METODE KONVENSIONAL TERHADAP VOLUME AKTUAL PADA PEKERJAAN PENGECORAN PELAT LANTAI *IN-SITU*

(Studi Kasus: Proyek Pembangunan Gedung C FIB UGM)

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ABSTRAK

Estimasi volume beton yang presisi sangat krusial dalam proyek konstruksi, namun kerap terjadi selisih antara rencana dan realisasi. Penelitian ini bertujuan mengkaji perbandingan dan besaran deviasi perhitungan volume beton rencana menggunakan *Building Information Modeling* (BIM) Cubicost TAS dan metode konvensional terhadap volume aktual. Studi kasus dilakukan pada pekerjaan pengecoran pelat lantai *in-situ* (lantai 1-6) Proyek Pembangunan Gedung C Fakultas Ilmu Budaya UGM. Penelitian ini menggunakan metode kuantitatif komparatif. Pengumpulan data diperoleh dari ekstraksi *Quantity Take-Off* (QTO) model BIM, perhitungan konvensional kontraktor, serta rekapitulasi data aktual dari Berita Acara Pengecoran lapangan. Hasil penelitian menunjukkan total volume rencana BIM sebesar 2.032,51 m³ dan konvensional 2.033,96 m³. Dibandingkan realisasi aktual sebesar 2.301,00 m³, kedua metode menghasilkan perhitungan *under-estimate* (kekurangan volume). Deviasi metode BIM terhadap volume aktual mencapai 13,21% (selisih 268,49 m³), sedangkan metode konvensional sebesar 13,13% (selisih 267,04 m³). Dapat disimpulkan bahwa QTO berbasis BIM sangat presisi menerjemahkan gambar kerja dan efektif meminimalkan *human error*. Meski demikian, simpangan deviasi sekitar 13% menegaskan bahwa BIM dan konvensional saat ini murni menghasilkan volume bersih teoretis. Perhitungan tersebut belum mengakomodasi dinamika riil lapangan.

Kata Kunci: Building Information Modeling (BIM), Quantity Take-Off (QTO), Deviasi Volume, Pelat Lantai In-situ.

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ABSTRACT

Precise concrete volume estimation is crucial in construction projects, yet discrepancies between planned and actual quantities frequently occur. This study aims to examine the comparison and magnitude of deviation between planned concrete volume calculations using Building Information Modeling (BIM) Cubicost TAS and conventional methods against actual volumes. The case study was conducted on the in-situ floor slab casting works (floors 1-6) of the Building C Development Project, Faculty of Cultural Sciences, Universitas Gadjah Mada. This research employs a comparative quantitative method. Data collection was obtained from Quantity Take-Off (QTO) extraction of the BIM model, the contractor's conventional calculations, and recapitulation of actual field data from the Casting Minutes of Meeting (Berita Acara Pengecoran). The results show that the total planned BIM volume was 2,032.51 m³ and the conventional method was 2,033.96 m³. Compared to the actual realization of 2,301.00 m³, both methods produced under-estimated calculations (volume deficits). The deviation of the BIM method from the actual volume reached 13.21% (a difference of 268.49 m³), while the conventional method showed a deviation of 13.13% (a difference of 267.04 m³). It can be concluded that BIM-based QTO is highly precise in translating working drawings and effective in minimizing human error. Nevertheless, the deviation of approximately 13% confirms that both BIM and conventional methods currently produce purely theoretical net volumes. These calculations have not yet accommodated real field dynamics.

Keywords: Building Information Modeling (BIM), Quantity Take-Off (QTO), Volume Deviation, In-situ Floor Slab