ABSTRAK

PERBANDINGAN PERHITUNGAN VOLUME BANGUNAN MENGGUNAKAN *TOTAL STATION* DAN *TERRESTRIAL LASER SCANNER (LOW COST)*
(Studi Kasus : BAZNAS Provinsi Lampung)

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Volume material sangat penting dalam aplikasi teknik, terutama untuk pengukuran volume bangunan dalam konstruksi dan rekonstruksi pasca-bencana. Alat ukur seperti *Total Station* dan *Terrestrial Laser Scanner (Low Cost)* digunakan untuk tujuan ini. Meskipun *Terrestrial Laser Scanner (Low Cost)* menawarkan kemajuan teknologi, penggunaannya masih terbatas. Tugas Akhir ini bertujuan menganalisis efektivitas *Terrestrial Laser Scanner (Low Cost)* dalam mengukur volume bangunan dibandingkan dengan Total Station, dengan studi kasus di kantor Baznas Provinsi Lampung. Data yang diperlukan untuk mengetahui volume dan bentuk bangunan adalah koordinat dan *point clouds* bangunan.

Metode yang digunakan dalam Tugas Akhir ini adalah pengukuran langsung dengan *Total Station* dan pemindaian dengan *Terrestrial Laser Scanner (Low Cost). Detailing* dilakukan dengan pengamatan non-prisma, sementara *scanning* menghasilkan data *point cloud* melalui pemindaian di sekitar bangunan.

Hasil Tugas Akhir ini menunjukkan bahwa Total Station menghasilkan volume 1133,893 m^3, sementara Terrestrial Laser Scanner (Low Cost) menghasilkan volume 1233,734 m^3, dengan selisih 99,841 m^3. Perbedaan signifikan disebabkan oleh keterbatasan Terrestrial Laser Scanner (Low Cost), seperti noise yang mempengaruhi akurasi point cloud. Meskipun demikian, scanner ini tetap memberikan hasil yang cukup baik dengan waktu pengukuran lebih cepat, meski kurang cocok untuk aplikasi yang membutuhkan ketelitian tinggi. Sebaliknya, Total Station lebih akurat namun memakan waktu lebih lama. Pemilihan alat tergantung pada kebutuhan akurasi dan efisiensi waktu.

Kata kunci: Volume Bangunan, *Total Station*, *Terrestrial Laser Scanner (Low Cost)*, *Point Cloud*, Koordinat

ABSTRACT

COMPARISON OF BUILDING VOLUME CALCULATION USING TOTAL STATION AND TERRESTRIAL LASER SCANNER (LOW COST)
(Case Study: BAZNAS Lampung Province

By

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Material volume is crucial in engineering applications, especially for measuring building volumes in construction and post-disaster reconstruction. Measuring tools such as Total Station and Terrestrial Laser Scanner (Low Cost) are used for this purpose. Although Terrestrial Laser Scanner (Low Cost) offers technological advancements, its usage remains limited. This thesis aims to analyze the effectiveness of the Terrestrial Laser Scanner (Low Cost) in measuring building volumes compared to the Total Station, with a case study at the Baznas office in Lampung Province. he data required to determine the volume and shape of a building are its coordinates and point clouds. The method used in this thesis involves direct measurements with a Total Station and scanning with a Terrestrial Laser Scanner (Low Cost). Detailing is performed through non-prism observations, while scanning generates point cloud data by scanning around the building. The results of this thesis show that the Total Station measured a volume of 1133.893 m^3, while the Terrestrial Laser Scanner (Low Cost) measured a volume of 1233.734 m^3, with a difference of 99.841 m^3. This significant difference is due to the limitations of the Terrestrial Laser Scanner (Low Cost), such as noise that affects the accuracy of the point cloud. However, the scanner still provides reasonably good results with faster measurement times, although it is less suitable for applications that require high precision. In contrast, the Total Station is more accurate but requires more time for measurements. The choice of tool depends on the need for accuracy and time efficiency.

Keyword: Building Volume, Total Station and Terrestrial Laser Scanner (Low Cost), Point Cloud, and Coordinates