

## An Application of Terrestrial Laser Scanning for the Inventory of Archaeological Monuments for the Use of Architectural Aspects

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This study explores the implication of Terrestrial Laser Scan (TLS) technology in the field of archaeological monument inventory, particularly for architectural utilization. Traditional methods of data collection, such as tape measurements and simple instruments, are often laden with errors and are labor-intensive. TLS is a faster, accurate, and non-invasive data collection technique, which can act as a substitution for traditional methods that might pose risks to the user during spatial data acquisition, especially in structurally compromised sites. Its ability to generate detailed three-dimensional (3D) data has transformed spatial data collection. Light Detection and Ranging (LiDAR) technology, integral to this process, shows immense potential in gathering high-density information crucial for the architectural conservation and renovation of ancient buildings. The study investigated the specific data formats required by architects in the renovation of ancient buildings. The preference in data formats by the architects were obtained via a questionnaire survey. The point cloud data was analyzed to furnish accurate architectural data on ancient buildings, facilitating their renovation. The study provides the facade drawings required for renovations, three-dimensional models, and dimensions required for architectural renovation in the selected site. In conclusion, the findings confirm the extensive application of TLS in digitally documenting ancient buildings. Moreover, the study contributes significantly to the field by providing architects and conservationists with a reliable, accurate, and efficient tool for heritage preservation.

**Keywords:** *archaeological monument, architectural conservation, heritage preservation, LiDAR Technology, TLS*