

# **GIS – Enabled Residential Layout Design and Quantity Estimation using Civil 3D**

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**Abstract:** *This project outlines a comprehensive, technology-driven approach to land development planning, combining advanced surveying methods, geospatial data analysis, and civil engineering design. Focusing on a 4082.451 m<sup>2</sup> parcel of land within the CJITS campus, the study aims to transform the area into a well-structured residential layout in compliance with Directorate of Town and Country Planning (DTCP) standards. The methodology integrates drone-based aerial surveying and Differential Global Positioning System (DGPS) for precise topographical data acquisition. This high-resolution spatial data was processed using Geographic Information Systems (GIS) tools and imported into AutoCAD Civil 3D for detailed design and drafting.*

*The planning phase involved the creation of an efficient road network, allocation of residential plots, demarcation of open spaces, provision for utility infrastructure, and inclusion of designated green zones. A uniform and regulation-compliant residential building plan was applied to all plots to maintain consistency in development. Furthermore, the project includes a comprehensive quantity estimation of materials and resources needed for implementation.*

*By leveraging terrain modeling, civil design software, and urban planning principles, this project demonstrates a real-world engineering solution that is both practical and scalable. It serves as a model for smart and sustainable land development that aligns with current urban planning guidelines and technological trends..*

**Keywords:** land development

