

DESIGN OF EARTHWORKS, ROAD AND DRAINAGE FOR A HOUSING DEVELOPMENT

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ABSTRACT

Earthworks and drainage system are basically the fundamental process in establishing a housing development. The design of earthworks is important for beginning a project like housing development as this provides an adequate platform level for building and constructions to take place. It involves in how to design platform levels based on the existing ground levels in order to minimize the cut and fill earthworks required. The drainage system is also vital for a housing development as it defines how the rainfall will flow out from the development to prevent floods. It involves in designing where the water inlet and outlet are located and the capacity of the drains and culverts to accommodate the rainfall.

During this project, analysis of the development plan and survey contour plan is involved. The knowledge of surveying is applied in the context, such as getting the spot heights and calculating the volume of earthworks. Then, laying out the drains and culverts and allocating the direction of the water flow is conducted. This includes determining where the inlet and outlet water flow are. The Rational method and Manning's equation were applied in computing the water discharge and discharge capacity for the drains and culverts in the development.

By the end of this project, results show that the minimum earthwork obtained was 6102.89m^3 excessive soils. The drainage system designed is able to accommodate the total rainfall in this development. It was found that the capacity designed was $2.16\text{m}^3\text{s}^{-1}$ while the maximum water discharge due to rainfall was only $1.925\text{m}^3\text{s}^{-1}$.

In reality, getting a zero for minimum earthwork required is nearly impossible due to workmanship and certain factors. The drainage system however is best to design as most conservative as there are a lot of uncertainties judging the occurrence of rainfall.