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DESIGN OF CANTILEVER TYPE ANALYSIS PROGRAM USING THE *PYTHON* LANGUAGE

Nama Mahasiswa : Andi Bau Risky Al' qadri

NIM : 07191005

Dosen Pembimbing : Ir. Dyah Wahyu Apriani, S.T.,M.Eng.

ABSTRACT

Landslides commonly occur on slopes due to increased shear stress or a decrease in soil shear strength, leading to the soil's inability to withstand the applied load. To address this issue, a Retaining Wall Structure (RWS) is constructed to stabilize the unstable slope conditions. Planning the dimensions of the RWS typically takes a long time because it is often done through trial and error methods. This method is time-consuming due to the possibility of calculation errors, especially considering the numerous reinforcement variations in cantilever-type RWS that require significant planning time.Therefore, the Python programming language can serve as an analytical tool for cantilever-type RWS. This research aims to develop a Python-based analysis program for cantilever-type RWS. The program can produce output such as RWS dimensions, RWS reinforcement requirements, and a cost estimate (Budget Plan). RWS dimensions require input data such as slope height (H), internal friction angle (ø), and soil unit weight ("γ"). Meanwhile, cantilever RWS reinforcement calculations require input data such as the diameter of the reinforcement to be used. The cost estimate calculation (Budget Plan) requires input data such as labor and material prices.Based on the modeling in the program, it provides the smallest dimensions that meet safety requirements for RWS stability. In the calculation of cantilever RWS dimensions, the slope height (H) significantly influences the cost. This is because the height of the slope is directly proportional to the resulting dimensions; the higher the slope, the larger the dimensions required, and consequently, the higher the cost. Cantilever RWS stability is substantial and meets safety requirements because the resisting moment depends on RWS properties, dimensions, and materials. Increasing dimensions and material volume will enhance the resisting moment, but large dimensions need to consider RWS stability. RWS stability is influenced by the internal friction angle (ø), and a larger ø value leads to greater stability.The design of this program can assist in determining dimension values, reinforcement diameters, and budget estimates for cantilever-type RWS.

Keywords: Cantilever, Python, Retaining Wall , Slope, , Slide.