ABSTRAK

Tanah longsor adalah suatu peristiwa geologi yang terjadi karena pergerakan tanah dengan berbagai tipe yang disebabkan oleh dua faktor yaitu faktor pendorong dan pemicu. Di Indonesia banyak jalur transportasi yang melalui daerah lereng pegunungan yang rawan terjadi tanah longsor.

Salah satu solusi untuk mencegah tanah longsor adalah dengan membangun dinding penahan tanah. Peneliti ingin mendesain ulang dinding penahan tanah pada Proyek Pulung – Kesugihan Ponorogo. Struktur dinding penahan tanah pada Proyek Pulung – Kesugihan Ponorogo pada STA 2+700 dibangun menggunakan tipe kantilever. Peneliti ingin mengetahui stabilitas eksternal, stabilitas internal dan keamanan terhadap gaya dalam yang terjadi jika menggunakan dinding penahan tanah tipe gravitasi pada kondisi tanpa muka air tanah, muka air tanah posisi -6,9m dan -2,9m

Perbedaan muka air tanah akan mempengaruhi faktor keamanan dan stabilitas dinding penahan tanah. Dari hasil perhitungan stabilitas eksternal didapat faktor keamanan pada kondisi tanpa muka air tanah $FS_{(sliding)}$ = 2,26 > 1,5 , $FS_{(overturning)}$ = 2,58 > 2 dan $FS_{(bearing\ capacity)}$ = 3,18 > 3, pada kondisi muka air tanah -6,9m $FS_{(sliding)}$ = 2,5 > 1,5 , $FS_{(overturning)}$ = 2,89 > 1,5 dan $FS_{(bearing\ capacity)}$ = 3,23 > 3, pada kondisi muka air tanah -2,9m $FS_{(sliding)}$ = 1,51 > 1,5 , $FS_{(overturning)}$ = 2,08 > 1,5 dan $FS_{(bearing\ capacity)}$ = 3,12 > 3 . Stabilitas internal pada desain dinding penahan tanah didapat , pada kondisi muka air tanah -6,9m σdesak pasangan = 397,7 kN/m^2 < 1500 kN/m^2, σtarik pasangan = -139,56 kN/m^2 < 300 kN/m^2, τgeser pasangan = 34,67 kN/m^2 < 150 kN/m^2 , pada kondisi muka air tanah -2,9m σdesak pasangan = -92,31 kN/m^2 <1500 kN/m^2 , σtarik pasangan = 177,47 kN/m^2 < 300 kN/m^2 , τgeser pasangan = 13,59 kN/m^2 < 150 kN/m^2. Tinjauan stabilitas internal dinding penahan tanah menggunakan program plaxis 8.6 terhadap potongan M-M' didapat tegangan desak, σdesak = 700,19 kN/m^2 < desak pasangan 1500 kN/m^2 (aman), Tegangan geser τ = 63,72 kN/m^2 < geser pasangan 150 kN/m^2 (aman), dan tinjauan terhadap potongan N-N' didapat tegangan desak, σdesak = 299,19 kN/m^2 < desak pasangan 1500 kN/m^2 (aman), Tegangan geser τ = 74,99 kN/m^2 < geser pasangan 150 kN/m^2 (aman). Pembacaan dari SAP2000 menunjukkan bahwa desain aman terhadap gaya dalam yang terjadi. Nilai terbesar tegangan desak/tarik 211,4 kN/m^2 < 1500 kN/m^2 (desak) dan 300 kN/m^2 (tarik),sedangkan nilai tegangan geser didapat 86,26 kN/m^2 < 150 kN/m^2 , sehingga struktur dinyatakan aman terhadap gaya dalam yang terjadi.

Kata kunci :dinding penahan tanah, dinding gravitasi, stabilitas internal,stabilitas eksternal

ABSTRACT

Landslides are a geological phenomenon that occurred because of ground movement with various types caused by two factors: the stimulant factors and triggers. In Indonesia many transport links through mountain slopes prone to landslides.

One solution to prevent soil landslide review is to build a retaining wall. Researchers Want to redesign the retaining wall on the Project Pulung - Kesugihan Ponorogo. The structure of the soil retaining walls ON Pulung Project - Kesugihan Ponorogo IN STA 2 + 700 is built using a cantilever type. Researchers want to know the external stability, internal stability and safety against the internal force that occurs if using gravity type retaining wall on condition without water level, water level on position -6,9m And -2,9m.

Differences in ground water level will affect the safety factor and stability of the retaining wall .From the result of the external stability calculations safety factor on without water level condition FS (sliding) = 2.26> 1.5 , FS (overturning) = 2.58> 1.5 And FS (bearring capacity) = 3.18> 3 , water level condition e -6,9m FS (sliding) = 2.5> 1.5, FS (overturning) = 2.89> 2 And FS (bearring capacity) = 3.243> 3, water level condition -2,9m FS (sliding) = 1.51> 1.5, FS (overturning) = 2.08> 1.5 And FS (bearring capacity) = 3.12> 3. Internal stability on retaining wall design is declared safe.Internal stability in the design of the retaining wall is obtained, under groundwater conditions -6.9m σ press forces = 397,7 kN / m^2 <1500 kN / m^2, σ stress forces = -139.56 kN / m^2 <300 kN / m^2, τ shear forces = 34.67 kN / m^2 <150 kN / m^2, under groundwater conditions -2.9m σ press forces = -92.31 kN / m^2 <1500 kN / m^2, σ stress forces = 177.47 kN / m^2 <300 kN / m^2, τ shear forces = 13.59 kN / m^2 <150 kN / m^2 Overview of internal stability of retaining wall using Plaxis 8.6 againts M-M' section obtained press stress, σ = 700,19 kN/m^2 < 1500 kN/m^2 (safe), τ = 63,72 kN/m^2 < 150 kN/m^2 (safe), and againts N-N' section obtained σ = 299,19 kN/m^2 < 1500 kN/m^2 (safe), τ = 74,99 kN/m^2 < 150 kN/m^2 (safe).The reading of SAP2000 shows that the design is safe against internal forces. The largest value of press/stress forces 211.4 kN / m^2 <1500 kN / m^2 (press) and 150 kN / m^2 (stress), and also thlargest value of shear forces 86.26 kN / m^2 <150 kN / m^2 so that the structure is declared safe to the internal force that occurs.

Keywords : retaining wall, gravity wall, safety factor,internal stability,eksternal stability