

ABSTRAK

“ANALISIS STABILITAS LERENG DI BANTARAN SUNGAI WINONGO KOTA YOGYAKARTA DENGAN PERKUATAN GEOTEKSTIL MENGGUNAKAN PROGRAM *GEOSLOPE*”

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Kondisi lereng dengan beban yang besar dan kemiringan yang curam dapat menyebabkan terjadinya kelongsoran sehingga diperlukan sebuah perkuatan lereng, salah satunya yaitu dengan geotekstil. Geotekstil sering digunakan karena memiliki beberapa keunggulan, antara lain mudah dalam pelaksanaan, murah dan dapat meningkatkan stabilitas lereng secara efektif.

Analisis stabilitas lereng dapat dilakukan secara manual maupun menggunakan program komputer seperti *Geoslope*. Penelitian ini bertujuan untuk mengetahui faktor keamanan (SF) lereng sebelum longsor, lereng kondisi eksisting, dan lereng dengan perkuatan geotekstil menggunakan program *Geoslope*. Masing-masing tinjauan menggunakan dua variasi beban vertikal (10 kN/m^3 dan 20 kN/m^3), dua variasi muka air tanah (-19 m dan -16 m), dan gempa.

Berdasarkan hasil penelitian diperoleh faktor keamanan (SF) lereng sebelum longsor variasi beban vertikal 1 (10 kN/m^3) sebesar 1,055, variasi beban vertikal 2 (20 kN/m^3) sebesar 1,040, variasi muka air tanah 1 (-19 m) sebesar 1,039, variasi muka air tanah 2 (-16 m) sebesar 0,981, dan gempa sebesar 0,861. Lereng kondisi eksisting diperoleh faktor keamanan (SF) variasi beban vertikal 1 (10 kN/m^3) sebesar 1,070, variasi beban vertikal 2 (20 kN/m^3) sebesar 1,044, variasi muka air tanah 1 (-19 m) sebesar 1,053, variasi muka air tanah 2 (-16 m) sebesar 0,952, dan gempa sebesar 0,832. Sedangkan untuk lereng dengan perkuatan geotekstil diperoleh faktor keamanan (SF) variasi beban vertikal 1 (10 kN/m^3) sebesar 1,662, variasi beban vertikal 2 (20 kN/m^3) sebesar 1,653, variasi muka air tanah 1 (-19 m) sebesar 1,623, variasi muka air tanah 2 (-16 m) sebesar 1,567, dan gempa sebesar 1,252. Dari perencanaan lereng dengan perkuatan geotekstil, faktor aman (SF) $\geq 1,25$ yang berarti lereng stabil dan longsor jarang terjadi.

Kata Kunci : Stabilitas Lereng, Geotekstil, *Geoslope*

ABSTRACT

“SLOPE STABILITY ANALYSIS IN WINONGO RIVERBANK YOGYAKARTA CITY WITH GEOTEXTILE REINFORCEMENT USING GEOSLOPE PROGRAM”

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The condition of a slope with a heavy load and a steep slope can cause the landslide therefore it requires a reinforcement, one of them is with geotextile. Geotextile is often used because it has several advantages, such as simple in installation, inexpensive, and can increase the stability of slope effectively.

Slope stability analysis can be done manually or using a computer program such as Geoslope. This study aims to determine the safety factor (SF) of the slope before landslide, slope of existing condition, and slope with geotextile reinforcement using Geoslope program. Each review use two variations of vertical load (10 kN/m³ and 20 kN/m³), two groundwater variations (-19 m and -16 m), and earthquakes.

Based on the result of the research, it is found that the safety factor (SF) of the slope before the landslide variation of vertical load 1 (10 kN/m³) is 1,055, the variation of vertical load 2 (20 kN/m³) is 1,040, groundwater variation 1 (-19 m) is 1,039, groundwater variation 2 (-16 m) is 0,981, and an earthquake of 0,861. The slope of existing condition was obtained by security factor (SF) variation of vertical load 1 (10 kN/m³) is 1,070, the variation of vertical load 2 (20 kN/m³) is 1,044, groundwater variation 1 (-19 m) is 1,053, groundwater variation 2 (-16 m) is 0,952, and an earthquake of 0,832. As for slope with geotextile reinforcement obtained a safety factor (SF) vertical load variation 1 (10 kN/m³) of 1,662, variation of vertical load 2 (20 kN/m³) of 1,653, groundwater variation 1 (-19 m) of 1,623, groundwater variation 2 (-16 m) of 1,567 and an earthquake of 1,252. From slope planning to geotextile reinforcement, it is found that the value of the safety factor (SF) is $\geq 1,25$ which means stable slopes and small amount of landslides occur.

Keyword : *Slope Stability, Geotextile, Geoslope*