ABSTRAK

Analisis stabilitas lereng dilakukan untuk mengetahui keamanan suatu lereng. Peningkatan stabilitas lereng dapat dilakukan dengan beberapa cara, salah satunya adalah *soil nailing*. *Soil nailing* adalah metode perbaikan *in-situ* dengan cara menancapkan batang-batang baja, bamboo dan *mini pile*. Penelitian ini bersifat teoritis dan dimodelkan dengan menggunakan program *geoslope*.

Analisis menggunakan program *geoslope* akan dibandingkan dengan perhitungan manual metode *fellenius* dan Bishop pada lereng tanpa perkuatan. Sedangkan untuk lereng dengan perkuatan *soil nailing*, analisis menggunakan program *geoslope* akan dibandingkan dengan perhitungan manual metode baji (wedge). Dalam analisis perhitungan manual juga dilakukan perhitungan stabilitas internal dan eksternal, untuk stabilitas internal dilakukan terhadap putus dan cabut tulangan, sedangkan untuk stabilitas eksternal dilakukan terhadap penggeseran.

Hasil yang diperoleh dalam penelitian ini adalah perhitungan manual metode *fellenius* didapatkan $SF = 0,9292 < 1,3$ (tidak aman) dan metode bishop didapatkan $SF = 1,125 < 1,3$ (tidak aman). Sedangkan analisis program *geoslope* metode *fellenius* didapatkan $SF = 0,933 < 1,3$ (tidak aman) dan metode bishop didapatkan $SF = 1,125 < 1,3$ (tidak aman). Untuk perhitungan *soil nailing* metode baji (*wedge*), pada sudut *nail* 10° didapatkan $SF = 1,5391 > 1,3$ (aman) dan program *geoslope* didapatkan SF tanpa beban gempa $2,294 > 1,3$ (aman) dan SF dengan beban gempa $1,278 > 1,1$ (aman). Pada sudut *nail* 20° didapatkan $SF = 1,5977 > 1,3$ (aman) dan program *geoslope* didapatkan SF tanpa beban gempa $= 2,944 > 1,3$ (aman) dan SF dengan beban gempa $1,503 > 1,3$ (aman). Pada sudut *nail* 30° didapatkan $SF = 1,6051 > 1,3$ (aman) dan untuk program *geoslope* didapatkan SF tanpa beban gempa $= 3,253 > 1,3$ (aman) dan SF dengan beban gempa $= 1,653 > 1,3$ (aman). Dari hasil analisis ditemukan perbedaan nilai SF antara metode baji (*wedge*) dengan program *geoslope,* disebabkan karena metode baji (*wedge*) menggunakan bidang gelincir longsor planar dan *geoslope* menggunakan bidang gelincir longsor lingkaran.

Kata Kunci: Analisis stabilitas lereng, Perkuatan Lereng, *soil nailing*, *fellenius*, bishop yang disederhanakan.

ABSTRACT

Slope stability analysis is carried out to find out safety of a slope. Improvement of the stability of slope can be done in several ways, one of which is using soil nailing. Soil nailing is a natural method of soil improvement by way of plugging steel rods, bamboo, and mini pile. This research is theoretical and is modeled using the geoslope program.

Analysis using the geoslope program will be compared with manual calculations using the method of fellenius and bishop on slope without reinforcement. As for the slope with reinforcement of soil nailing, the analysis carried out using the manual wedge method will be compared with the geoslope program. In the manual calculation analysis internal and external stability calculations are also carried out, for internal stability performed on breaking and pulling out, while for external stability is carried out on shifting.

The results obtained in this study are the manual calculation of the fellenius method obtained SF = 0.9292 <1.3 (unsafe) and the bishop method obtained SF = 1.125 <1.3 (unsafe). While the analysis of the fellenius method geoslope program obtained SF = 0.933 <1.3 (unsafe) and the bishop method obtained SF = 1.125 <1.3 (unsafe). For the calculation of the soil nailing wedge method, at the nail 10º, SF = 1.5391> 1.3 (safe) and the geoslope program obtained SF without earthquake load = 2,294> 1.3 (safe) and SF with earthquake load 1,278> 1.1 (safe). At the nail 20º, SF = 1.5977> 1.3 (safe) and the geoslope program obtained SF without earthquake load = 2.944> 1.3 (safe) and SF with earthquake load = 1.503> 1.3 (safe). At the nail 30º, SF = 1.6051> 1.3 (safe) and for the geoslope program SF without earthquake load = 3.253> 1.3 (safe) and SF with earthquake load = 1.653> 1.3 (safe). From the results of the analysis it was found that the difference in the SF value between the wedge method and the geoslope program was due to the wedge method using planar and geoslope landslide fields using a circle landslide slip plane.

Keywords: analysis of slope stability, slope reinforcement, soil nailing, fellenius, simplified bishop.