

ABSTRAK

Bandara *Yogyakarta International Airport* (YIA) dibangun untuk menambah beberapa maskapai penerbangan domestik dan Internasional akibat Bandara Adisutjipto yang sudah melebihi kapasitas penumpang dan ruang untuk penumpang sudah tidak sesuai dengan standar Kementerian Perhubungan. Bangunan *underpass* sangat diperlukan dalam menunjang lalu lintas di dalam Bandara YIA agar dapat mengurangi kemacetan. *Underpass* merupakan jalur lalu lintas atau disebut sebagai jalan melintang di bawah jalan lain yang dibangun di bawah tanah, berbentuk terowongan dan berfungsi untuk mengurangi kemacetan pada jalan.

Tujuan dari penelitian ini adalah melakukan analisis stabilitas dinding penahan tanah *underpass* bandara YIA dengan perhitungan manual dengan beban statis dan dinamis, serta analisis kestabilan *underpass* bandara YIA berdasarkan simulasi numeris *Rockscience 3 (RS3)* dengan beban statis dan dinamis. Peneliti ini menggunakan 3 titik bor, yaitu bor BH 06, bor BH 10 dan bor BH 11.

Hasil analisis SF (*safety factor*) dinding penahan tanah Bandara YIA akibat kondisi statis dan dinamis masing- masing titik bor aman terhadap gaya geser dan gaya guling. Hasil penurunan yang terjadi pada masing – masing titik bor memenuhi batas maksimum yang disyaratkan, yaitu 51 – 76 mm atau 0,51 – 0,76 m, yang berarti struktur *underpass* Bandara YIA aman terhadap penurunan.

Kata Kunci : *underpass*, dinding penahan tanah, *Rockscience (RS3)*

ABSTRACK

The Yogyakarta International Airport (YIA) was built to expand flight capacity due to limited capacity at Adisucipto Airport. The underpass building is needed to anticipate traffic jams to YIA Airport due to the existing road above it. Underpass is a transverse road under another road that is built underground and in the form of a tunnel.

The purpose of this study is to analyze the stability of the underpass building in terms of analytical and numerical 3D. The purpose of this research was to conduct analysis on the stability of the retaining wall of the YIA underpass, with manual calculation on the static and dynamic load, as well as by using Rocscience 3 (RS3) numerical simulation with static and dynamic load. This research used three drill points, which are the BH 06, BH 10, and BH 11. The drill point of BH 06 is on the edge of the underpass, precisely at the entrance of the underpass from Yogyakarta; BH 10 represents the zone in the middle of the underpass and BH 11 is at the edge of the underpass.

Based on the static and dynamic load of each drill points, the analysis result on the safety factor (SF) of YIA retaining wall is safe from the sliding force and overturning force. The settlement occurred on each drill points met the maximum required limit, which is 51-76 mm or 0.51-0.76 m, which means the YIA underpass structure is safe against settlement.

Keyword : retaining wall, underpass stability, numerical 3D, safety factor, displacement