Basic Considerations for Retaining Wall Stability

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Summary

This paper presents some of the fundamental features of stability for ideal retaining wall with a simple rectanglar section in simplified form. From the stability analysis for sliding, overturning, the middle third and the bearing capacity at the toe point, it is recognized that all the conditions for wall stability can be evaluated in terms of the dimension ratio, B/H where B is the width and H is the height of retaining wall. Retaining wall is resting on cohesionless foundation. Two types of backfills of 1) $\phi>0$, $c=0$ and 2) $\phi=0$, $c>0$ are considered separately. Rankin's earth pressure is used. Surcharge and seismic force are not taken into consideration. The relationship between the dimension ratio, B/H and the earth pressure coefficient K_a, the stability number m, the friction coefficient μ of base and foundation soil, the factors of safety F_s(sliding), F_0(overturning), F_b(bearing capacity) are calculated and plotted on graphs.

Key words: active earth pressure, angle of internal friction, *backfill,* cohesive soil, *earth pressre, retaining wall,* sandy soil, shear strength (IGC: H2)

1. Introduction

It is well known that structures must be stable against disturbing forces and designed for safety. This is referred to safety design and is explained in detail in usual manuals. This paper presents some of the fundamental features of stability for ideal retaining wall in simplified form. Retaining walls are quite often used civil engineering projects. Thus a fundamental knowledge of stability for retaining walls is very important to soil engineers.

Typical retaining walls are classified as the L-type, inverted T type, buttress type and etc. In this paper, a simple rectanglar section of retaining wall is used as shown in Fig. 1. This

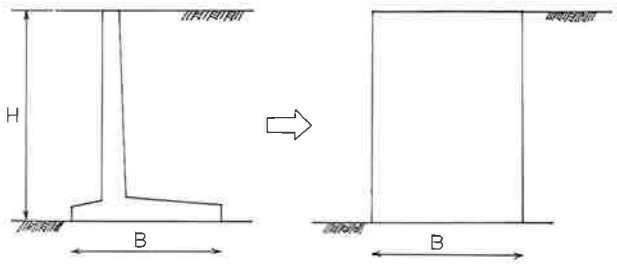

Fig. 1 Ideal wall section.

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