

Civil Engineer's Solutions Suite

Platform: Windows
Includes Mathcad Engine
Available for ground shipment



This Mathcad electronic book is a rendering of selections from *Hick's Standard Handbook of Engineering Calculations* by McGraw-Hill. Solve hundreds of applied problems in civil engineering with this practical electronic resource which contains 165 relevant formulas and equations from the book, as well as text, tables, graphs and diagrams. This fully-interactive CD-ROM supplies you with all the tools you need to find the right equation and solve a problem in an instant.

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STABILITY OF A RETAINING WALL

Determine the factor of safety (FS) against sliding and overturning of the concrete retaining wall in Fig. 10. The concrete weight 150 lb/ft^3 (23.56 kN/m^3), the earth's coefficient of active earth pressure is 0.333.

Calculation Procedure:

1. Compute the vertical loads on the wall. Select a 1-ft (304.8-mm) length of wall as b , linearly with the depth and is represented by

Figure 10

Diagram of a retaining wall with dimensions and forces. The wall is 10 ft high. The top width is 1 ft. The bottom width is 4 ft. The wall is subjected to a horizontal force H at the top. The weight of the wall is W . The weight of the soil behind the wall is W_1 . The weight of the soil in front of the wall is W_2 . The weight of the soil in front of the wall is W_3 . The diagram shows the wall, the soil, and the forces acting on it.

Mathcad Engine - (Civil Eng. Solutions Suite: Statics Equations)

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1. Compute the vertical loads on the wall.

$W_1 := h \text{ top unit } \rho$	$+ W_1 = 2250\text{-lb}$
$W_2 := \frac{1}{2} h (b - \text{top}) \text{ unit } \rho$	$W_2 = 5625\text{-lb}$
$W_3 := \frac{1}{2} h (b - \text{top}) \text{ unit } \rho$	$W_3 = 3750\text{-lb}$
$W := W_1 + W_2 + W_3$	$W = 11625\text{-lb}$
$x_1 := \frac{1}{2} \text{ top}$	$x_1 = 0.5\text{-ft}$
$x_2 := \text{top} + c (b - \text{top})$	$x_2 = 2.67\text{-ft}$
$x_3 := \text{top} + (1 - c) (b - \text{top})$	$x_3 = 4.34\text{-ft}$

The Civil Engineer's Solutions Suite includes topics such as statics, stress and strain, steel beams and plate girders, steel columns and tension members, timber engineering, reinforced and pre-stressed concrete, fluid mechanics, surveying, and soil mechanics.

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