

Design of masonry retaining wall

Soil data

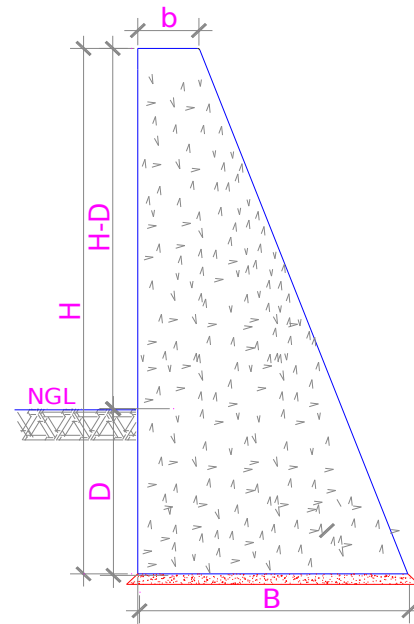
SELECTED GRANULAR MATERIAL

$\phi = 23^\circ$
 $\gamma_{\text{soil}} = 19 \text{ KN/M}^3$
 $C = 0$
 $\gamma_{\text{masonry}} = 27 \text{ KN/M}^3$
 $\phi = 0.52 \text{ radians}$
 $\delta = 15.33$
 $\tan(\delta) = \mu = 0.274$
 Allowable soil pressure = 300 KN/M^2

$K_p = (1 + \sin \phi) / (1 - \sin \phi)$

$K_a = 0.33$
 $K_p = 3.00$

RETAINING WALL SECTION



Retaining wall data

top width of wall = 0.5 M b in put data
 bottom width of wall = 2.5 M B in put data
 embeded depth of wall = 0.9 M D in put data
 total height of wall = 3.35 M H in put data

lever arm

weight of rectangular part of wall = 45.23 KN/M 0.25 M
 weight of triangular part of wall = 90.45 KN/M 1.17 M
 weight of triangular part of soil = 63.65 KN/M 1.83 M
 superimposed load = 2 KN 0.00 M
 Resultant vertical force = 201.33 KN 1.16 M

active earth pressure = $K_a \cdot \gamma \cdot h = 21.21661 \text{ KN/M/M}$
 passive earth pressure = $K_p \cdot \gamma \cdot h = 0 \text{ KN/M/M}$
 Distablizing force = 35.54 KN/M 1.12 M

Overturning

Distablizing moment = 39.68 KN-M
 Stablizing moment = 233.52 KN-M
 Ratio = $5.88 >= 2$ safty factor
 safty factor = 2

the bottom width is safe for overturning

Sliding

Distablizing force = 35.54 KN
 total vertical force = 201.33 KN
 stablizing force = 55.20 KN
 Ratio = 1.55 >= 1.5 safty factor

the bottom width is safe for sliding

Bearing pressure

Min stress Q 25.03 < 300
 Max stress Q 136.03 < 300

Check for tension failure **safe for tension failure**

Check for bearing failure **safe for bearing**

Check for bearing failure **safe for bearing**

Eccentricity

Total horizontal force = 35.54 KN
 Total vertical force = 201.33 KN
 Tan(teta) = 5.67
 Teta = 79.99 °
 Horizontal distance from the toe
 edge where the resultant force acts= 0.96
 Base width/2 = 1.25 M
 Eccentricity = 0.287 M < 0.42
 Required base width of the retaining
 wall = (6*eccentricity) = 1.72 < 2.5

The bottom width is safe

SECTION

In put data: Green Cells
Output data: Orange Cells
Messages: Grey Cells



or

or