

# POS. 4.13: ZUSATZDRUCK AUS GEBR. BOESCHUNG

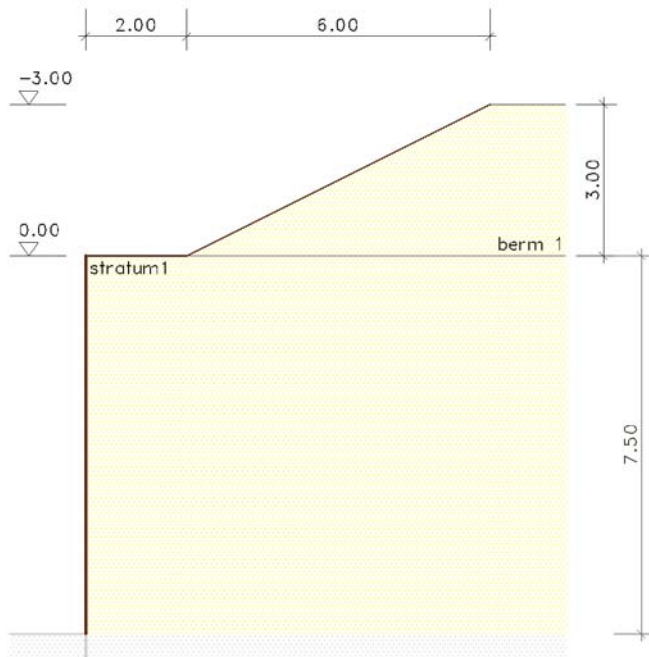
## calculation of earth pressures

According to DIN 4084:2017-08 and associated standard specifications

## calculation of the active earth pressure

### 1. system

scale 1:150



### wall friction

for a smooth wall surface, angle of wall friction  $\delta = 0$ .

### Oberfläche

broken course

berm	x m	a m	l m	h m	$\beta$ °	$\gamma$ kN/m <sup>3</sup>
1	0.00	2.00	6.00	3.00	26.6	16.00

a - distance l - length h - height  $\beta$  - inclination angle  $\gamma$  - unit weight of soil

### soil strata

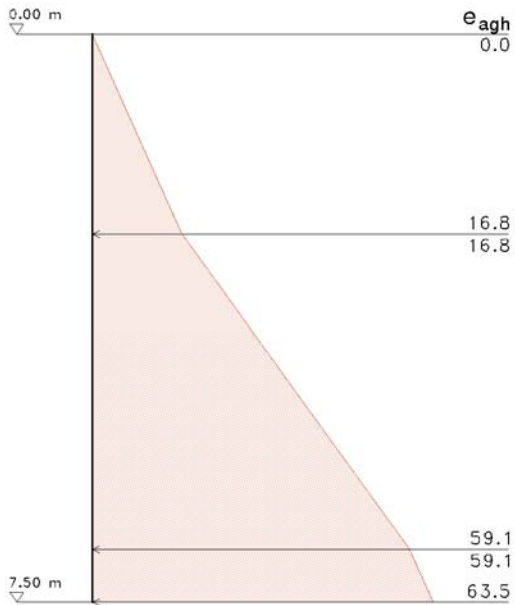
stratum	notation	soil type	d m	$\gamma$ kN/m <sup>3</sup>	$\gamma'$ kN/m <sup>3</sup>	$\phi'$ °	$c'$ kN/m <sup>2</sup>
1	stratum1	non-cohesive	---	19.00	9.00	30.00	---

d - stratum thickness  $\gamma$  - unit weight of soil  $\gamma'$  - unit weight of submerged soil  $\phi'$  - angle of internal friction of drained soil  
 $c'$  - cohesion of the drained soil

## 2. active earth pressure

### 2.1. from dead load of the soil

$e_{agh}$  horiz. earth pressure due to soil weight



### soil

$\Sigma(\gamma \cdot h)$  total soil weight at the depth considered  
 $\Sigma(\gamma \cdot h)_{cal}$  total soil weight at the depth considered plus influence of slope  
 $K_{agh}$  coefficient of earth pressure acc. to [1] section 6.2.1, eqn.(7) (approach acc. to Müller-Breslau)  
 $e_{ah}/e_{av}$  horiz. and vertical ordinate of earth pressure  
 $e_{ares}$  res. ordinate of earth pressure from horizontal and vertical proportion

z m	$\Sigma(\gamma \cdot h)$ kN/m <sup>2</sup>	$\Sigma(\gamma \cdot h)_{cal}$ kN/m <sup>2</sup>	$K_{agh}$ -	$e_{ah}$ kN/m <sup>2</sup>	$e_{av}$ kN/m <sup>2</sup>	$e_{ares}$ kN/m <sup>2</sup>
0.00	0.00	0.00	0.333	0.00	0.00	0.00
2.65	50.27	50.27	0.333	16.76	0.00	16.76
2.65	50.27	31.27	0.536	16.76	0.00	16.76
6.80	129.25	110.25	0.536	59.08	0.00	59.08
6.80	129.25	177.25	0.333	59.08	0.00	59.08
7.50	142.50	190.50	0.333	63.50	0.00	63.50

horizontal component of the earth pressure force  $E_h = 222.54$  kN/m  
 vertical component of the earth pressure force  $E_v = 0.00$  kN/m  
 earth pressure force  $E = 222.54$  kN/m  
 point of application of the earth pressure force  $z_E = 5.17$  m

## 3. summary

kind of earth pressure	earth pressure force			
	$E_h$ kN/m	$E_v$ kN/m	$E$ kN/m	$z_E$ m
soil	222.54	0.00	222.54	5.17

literature and standard specifications:

[1] DIN 4085: Baugrund, Berechnung des Erddrucks, August 2017