

POS. 4.14: ZUSATZDRUCK AUS MEHRFACH GEBR. BOESCHUNG

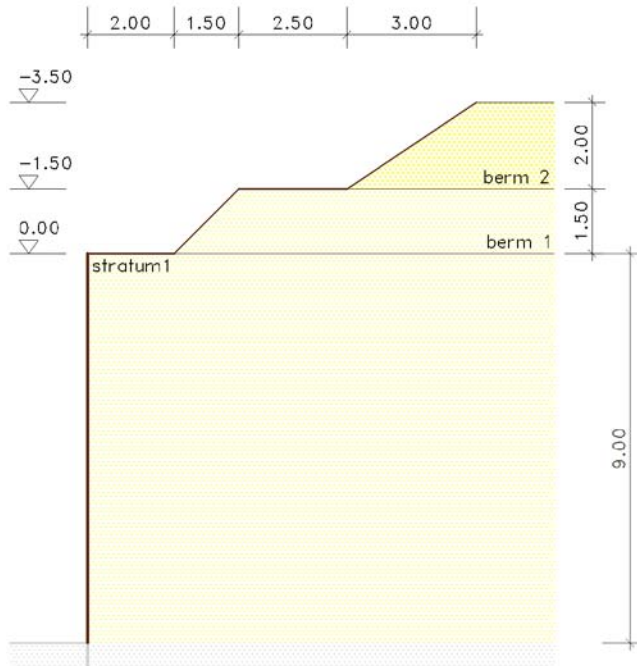
calculation of earth pressures

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

calculation of the active earth pressure

1. system

scale 1:175



wall friction

for a rough wall surface, angle of wall friction $\delta = 2/3 \cdot \phi'_k$

Oberfläche

broken course

berm	x m	a m	l m	h m	β °	γ kN/m ³
1	0.00	2.00	1.50	1.50	45.0	19.00
2	3.50	2.50	3.00	2.00	33.7	19.00

a - distance l - length h - height β - inclination angle γ - unit weight of soil

soil strata

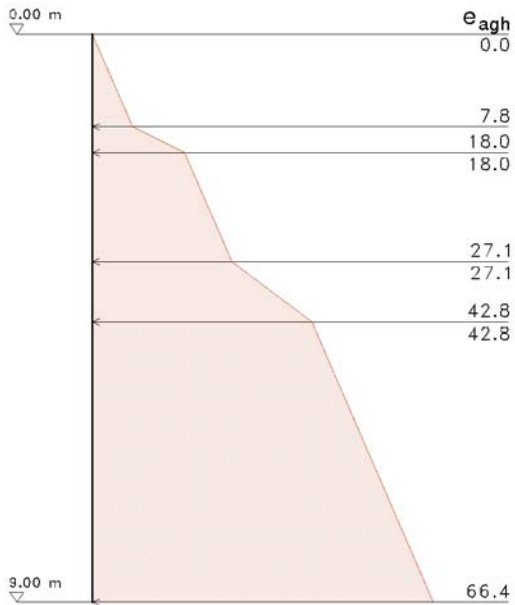
stratum	notation	soil type	d m	γ kN/m ³	γ' kN/m ³	ϕ' °	c' kN/m ²
1	stratum1	non-cohesive	---	19.00	9.00	30.00	---

d - stratum thickness γ - unit weight of soil γ' - unit weight of submerged soil ϕ' - 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/m²	$\Sigma(\gamma \cdot h)_{cal}$ kN/m²	K_{agh} -	e_{ah} kN/m²	e_{av} kN/m²	e_{ares} kN/m²
0.00	0.00	0.00	0.279	0.00	0.00	0.00
1.47	27.95	27.95	0.279	7.81	2.84	8.31
1.47	27.95	6.01	0.750	7.81	2.84	8.31
1.88	35.76	13.82	0.750	17.95	6.53	19.11
1.88	35.76	64.26	0.279	17.95	6.53	19.11
3.61	68.66	97.16	0.279	27.15	9.88	28.89
3.61	68.66	31.35	0.750	27.15	9.88	28.89
4.57	86.76	49.44	0.750	42.82	15.58	45.57
4.57	86.76	153.26	0.279	42.82	15.58	45.57
9.00	171.00	237.50	0.279	66.35	24.15	70.61

horizontal component of the earth pressure force $E_h = 325.42$ kN/m

vertical component of the earth pressure force $E_v = 118.44$ kN/m

earth pressure force $E = 346.31$ kN/m

point of application of the earth pressure force $z_E = 5.97$ 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	325.42	118.44	346.31	5.97

literature and standard specifications:

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