

Stabilité sismique des ouvrages de soutènement

Coefficients de poussée et de butée sismiques

tan(θ)=0 ($\theta=0$)						
φ (°)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	0,840	1,191	0,820	1,227	0,803	1,262
10	0,704	1,420	0,674	1,519	0,652	1,621
15	0,589	1,698	0,556	1,901	0,533	2,131
20	0,490	2,040	0,458	2,414	0,438	2,888
25	0,406	2,464	0,377	3,124	0,361	4,079
30	0,333	3,000	0,308	4,143	0,297	6,105
35	0,271	3,690	0,251	5,680	0,244	9,962
40	0,217	4,599	0,202	8,147	0,200	18,717
45	0,172	5,828	0,160	12,466	0,162	46,087

tan(θ)=0.1 ($\theta=5.71^\circ$)						
φ (°)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	0,809	1,280	0,789	1,344	0,776	1,410
15	0,678	1,556	0,651	1,711	0,634	1,888
20	0,569	1,888	0,541	2,197	0,525	2,587
25	0,476	2,300	0,450	2,866	0,438	3,684
30	0,397	2,821	0,373	3,829	0,366	5,550
35	0,328	3,493	0,309	5,283	0,306	9,107
40	0,268	4,380	0,254	7,621	0,256	17,193
45	0,217	5,583	0,206	11,723	0,212	42,504

tan(θ)=0.2 ($\theta=11.31^\circ$)						
φ (°)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	0,811	1,369	0,798	1,470	0,795	1,586
20	0,672	1,712	0,653	1,950	0,647	2,252
25	0,564	2,119	0,543	2,589	0,539	3,264
30	0,473	2,629	0,454	3,500	0,454	4,975
35	0,396	3,285	0,380	4,873	0,384	8,235
40	0,328	4,152	0,317	7,084	0,326	15,653
45	0,270	5,330	0,263	10,970	0,276	38,908

tan(θ)=0.3 ($\theta=16.70^\circ$)						
φ (°)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	0,831	1,481	0,831	1,637	0,847	1,837
25	0,680	1,910	0,672	2,276	0,683	2,801
30	0,569	2,418	0,559	3,146	0,572	4,371
35	0,478	3,063	0,469	4,445	0,486	7,340
40	0,400	3,912	0,395	6,533	0,416	14,095
45	0,334	5,066	0,331	10,204	0,357	35,295

tan(θ)=0.4 ($\theta=21.80^\circ$)						
φ (°)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	0,860	1,636	0,879	1,884	0,925	2,241
30	0,697	2,175	0,704	2,753	0,740	3,716
35	0,581	2,820	0,585	3,990	0,622	6,410
40	0,488	3,657	0,493	5,961	0,533	12,508
45	0,409	4,791	0,416	9,423	0,462	31,658

tan(θ)=0.5 ($\theta=26.57^\circ$)						
φ (°)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	-	-	-	-	-	-
30	0,890	1,866	0,933	2,274	1,023	2,946
35	0,716	2,545	0,744	3,493	0,819	5,420
40	0,596	3,381	0,619	5,361	0,693	10,880
45	0,500	4,500	0,522	8,620	0,600	27,988

Stabilité sismique des ouvrages de soutènement

Coefficients de poussée et de butée sismiques

tan(θ)=0.6 ($\theta=30.96^\circ$)						
φ ($^\circ$)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	-	-	-	-	-	-
30	-	-	-	-	-	-
35	0,914	2,207	0,987	2,910	1,141	4,305
40	0,735	3,074	0,789	4,717	0,921	9,183
45	0,611	4,189	0,657	7,787	0,787	24,269

tan(θ)=0.7 ($\theta=34.99^\circ$)						
φ ($^\circ$)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	-	-	-	-	-	-
30	-	-	-	-	-	-
35	1,461	1,520	1,736	1,823	2,256	2,396
40	0,929	2,713	1,038	3,993	1,282	7,353
45	0,751	3,849	0,836	6,911	1,054	20,471

tan(θ)=0.8 ($\theta=38.66^\circ$)						
φ ($^\circ$)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	-	-	-	-	-	-
30	-	-	-	-	-	-
35	-	-	-	-	-	-
40	1,264	2,210	1,507	3,051	2,037	5,129
45	0,935	3,465	1,086	5,964	1,463	16,529

tan(θ)=0.9 ($\theta=41.99^\circ$)						
φ ($^\circ$)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	-	-	-	-	-	-
30	-	-	-	-	-	-
35	-	-	-	-	-	-
40	-	-	-	-	-	-
45	1,206	2,994	1,482	4,872	2,197	12,263

tan(θ)=1 ($\theta=45^\circ$)						
φ ($^\circ$)	δ/φ					
	0		1/3		2/3	
	K_{aE}	K_{pE}	K_{aE}	K_{pE}	K_{aE}	K_{pE}
0	1,000	1,000	1,000	1,000	1,000	1,000
5	-	-	-	-	-	-
10	-	-	-	-	-	-
15	-	-	-	-	-	-
20	-	-	-	-	-	-
25	-	-	-	-	-	-
30	-	-	-	-	-	-
35	-	-	-	-	-	-
40	-	-	-	-	-	-
45	2,000	2,000	2,828	2,828	5,464	5,464

Parement	δ/φ					
	$\varphi < 30^\circ$		$30^\circ \leq \varphi \leq 35^\circ$		$\varphi > 35^\circ$	
	poussée	butée	poussée	butée	poussée	butée
Lisse	0	-1/3	0	-2/3	+1/3	-2/3
Rugueux	0	-1/3	+1/3	-2/3	+2/3	-2/3
Très rugueux	+1/3	-1/3	+2/3	-2/3	+2/3	-2/3