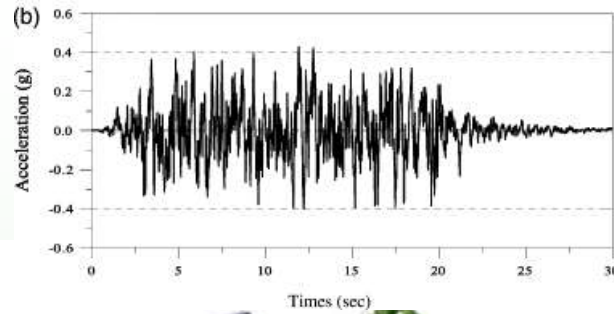
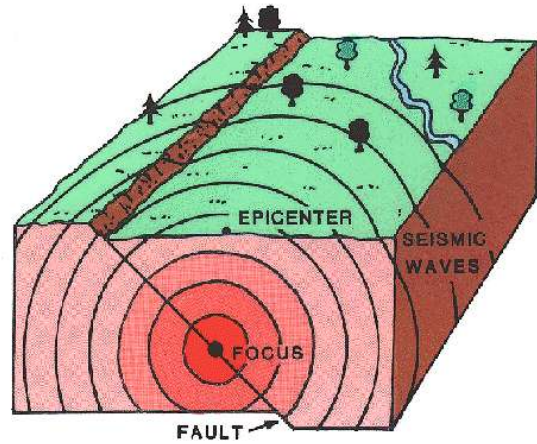

GEOTEHNIČKO INŽENJERSTVO

(XIII . vježbe)

- POTRESNO DJELOVANJE I SEIZMIČKI PRORAČUN U GEOTEHNICI

POTRES



POJAVA POTRESA I UČINA NJEGOVOG DJELOVANJA

DJELOVANJE I UČINAK POTRESA



SLOM KONSTRUKCIJE



DEFORMACIJA KONSTRUKCIJE

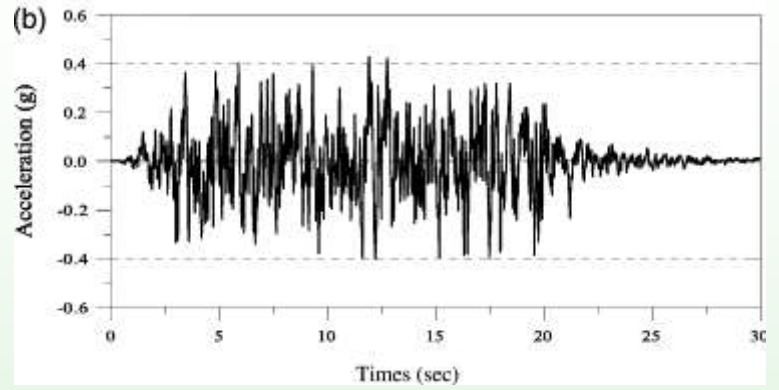
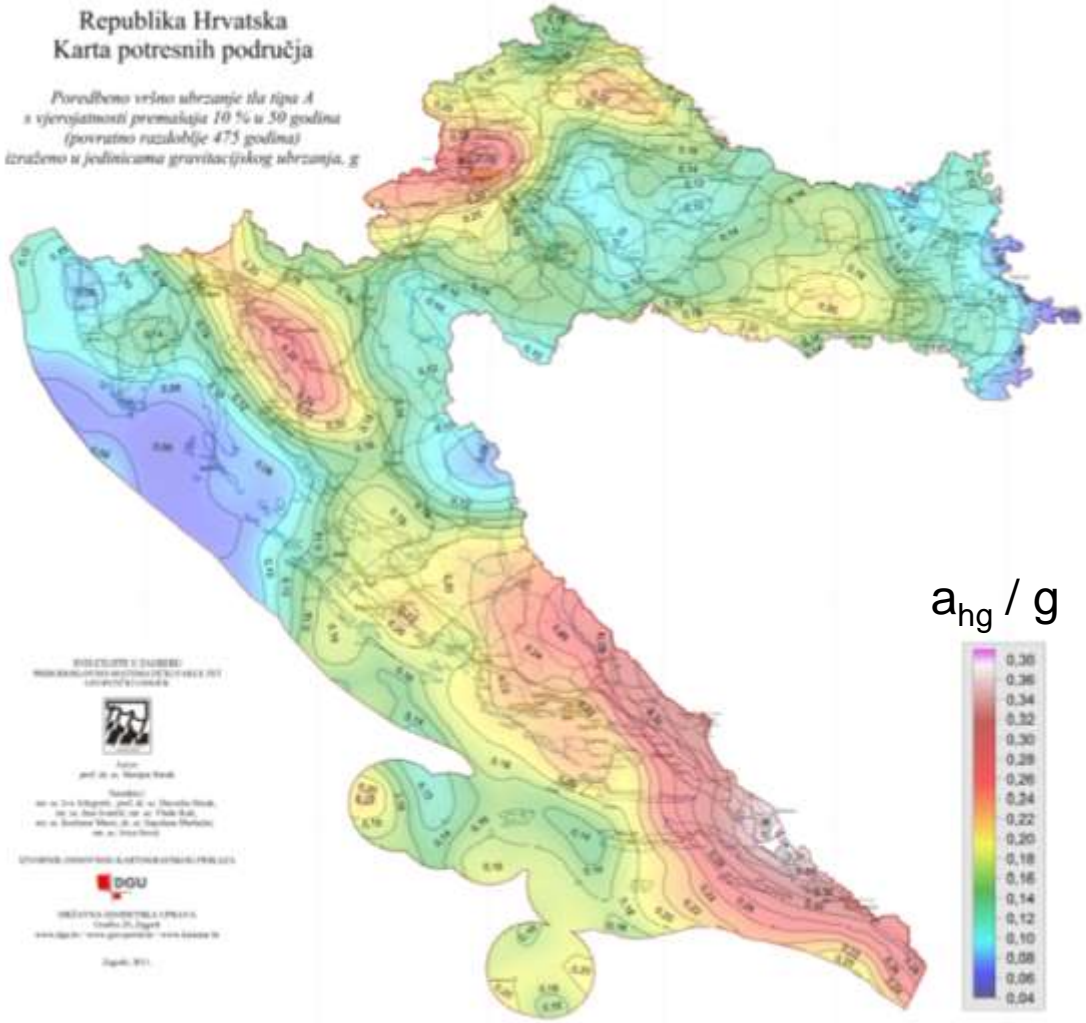


SLOM TEMELJNOG TLA



REDUKCIJA ČVRSTOĆE TLA - LIKVEFAKCIJA

SEIZMIČKI GEOTEHNIČKI PRORAČUN



VREMENSKI ZAPIS POTRESA (a – t)

Decimalni stupnjevi	Stupnjevi	Decimalne minute	Stupnjevi	Minute	Decimalne sekunde
x: 16.00685103	16	0.41106173	16	0	24.6637038
y: 45.83070089	45	49.84205321	45	49	50.5231926

očitajte rezultat na karti → **Prikaži**



SEIZMOLOŠKA KARTA HRVATSKE

<http://seizkarta.gfz.hr/karta.php>

SEIZMIČKI GEOTEHNIČKI PRORAČUN – EC8

Ground type	Description of stratigraphic profile	Parameters		
		$v_{s,30}$ (m/s)	N_{SPT} (blows/30cm)	c_u (kPa)
A	Rock or other rock-like geological formation, including at most 5 m of weaker material at the surface	> 800	–	–
B	Deposits of very dense sand, gravel, or very stiff clay, at least several tens of m in thickness, characterised by a gradual increase of mechanical properties with depth	360 – 800	> 50	> 250
C	Deep deposits of dense or medium-dense sand, gravel or stiff clay with thickness from several tens to many hundreds of m	180 – 360	15 - 50	70 - 250
D	Deposits of loose-to-medium cohesionless soil (with or without some soft cohesive layers), or of predominantly soft-to-firm cohesive soil	< 180	< 15	< 70
E	A soil profile consisting of a surface alluvium layer with v_s values of type C or D and thickness varying between about 5 m and 20 m, underlain by stiffer material with $v_s > 800$ m/s			
S_1	Deposits consisting – or containing a layer at least 10 m thick – of soft clays/silts with high plasticity index (PI > 40) and high water content	< 100 (indicative)	–	10 - 20
S_2	Deposits of liquefiable soils, of sensitive clays, or any other soil profile not included in types A – E or S_1			

Ground type	S	T_B (s)	T_C (s)	T_D (s)
A	1,0	0,15	0,4	2,0
B	1,2	0,15	0,5	2,0
C	1,15	0,20	0,6	2,0
D	1,35	0,20	0,8	2,0
E	1,4	0,15	0,5	2,0

Vrijednosti parametara elastičnog spektra odziva tipa 1

horizontalni seizmički koeficijent:

$$k_h = \alpha S/r$$

α – a_{hg} / g

a_{hg} – proračunska horizontalna akceleracija tla

S – parametar ovisno o tipu tla

r – parametar ovisno o dozvoljenom pomaku konstrukcije

Type of retaining structure	r
Free gravity walls that can accept a displacement up to $d_t = 300 \alpha \cdot S$ (mm)	2
Free gravity walls that can accept a displacement up to $d_t = 200 \alpha \cdot S$ (mm)	1,5
Flexural reinforced concrete walls, anchored or braced walls, reinforced concrete walls founded on vertical piles, restrained basement walls and bridge abutments	1

$$k_v = \pm 0.5 k_h \text{ (za } a_{vg} / a_g > 0.6)$$

$$k_v = \pm 0.33 k_h \text{ (ostalo)}$$

TIPOVI TLA

SEIZMIČKI GEOTEHNIČKI PRORAČUN – EC8

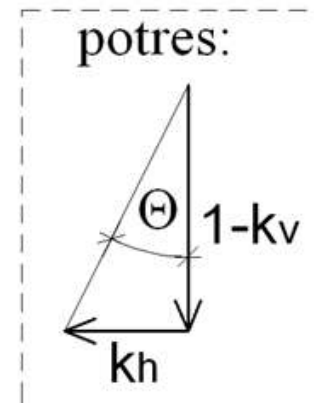
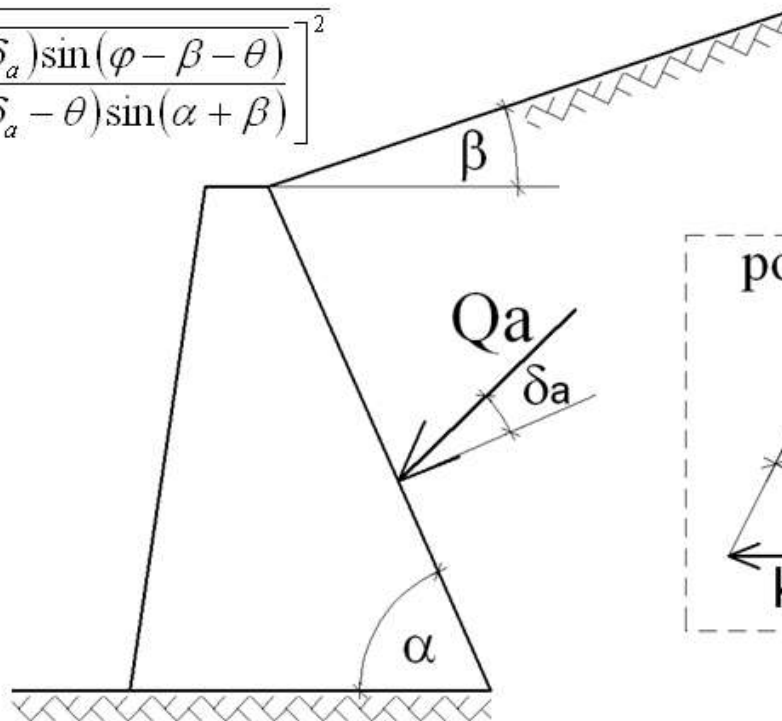
$$K_{AE} = \frac{\sin^2(\alpha + \varphi - \theta)}{\cos \theta \sin^2 \alpha \sin(\alpha - \delta_a - \theta) \left[1 + \sqrt{\frac{\sin(\varphi + \delta_a) \sin(\varphi - \beta - \theta)}{\sin(\alpha - \delta_a - \theta) \sin(\alpha + \beta)}} \right]^2}$$

$$Q_{AE} = \frac{1}{2} \gamma H^2 K_{AE}$$

$$Q_{AE,h} = Q_{AE} \cos(90 - \alpha + \delta_a)$$

$$Q_{AE,v} = Q_{AE} \sin(90 - \alpha + \delta_a)$$

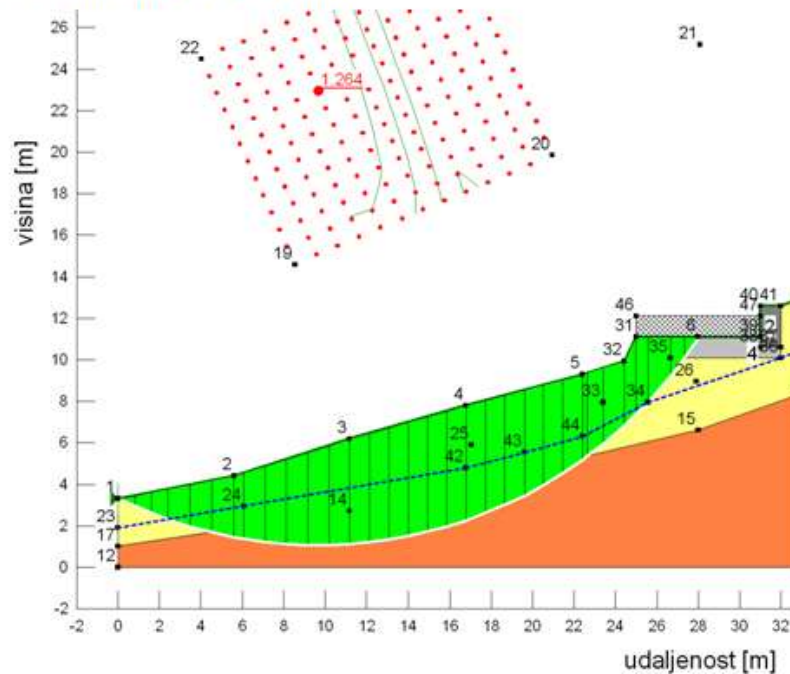
δ_a – koeficijent trenja na kontaktu zida i tla
 = φ (za zid betoniran na terenu)
 = $2/3 \varphi$ (za montažni bet. element
 ili naknadno zasipavanje tla)
 = β (na virtualnoj poledini 'L' zida)



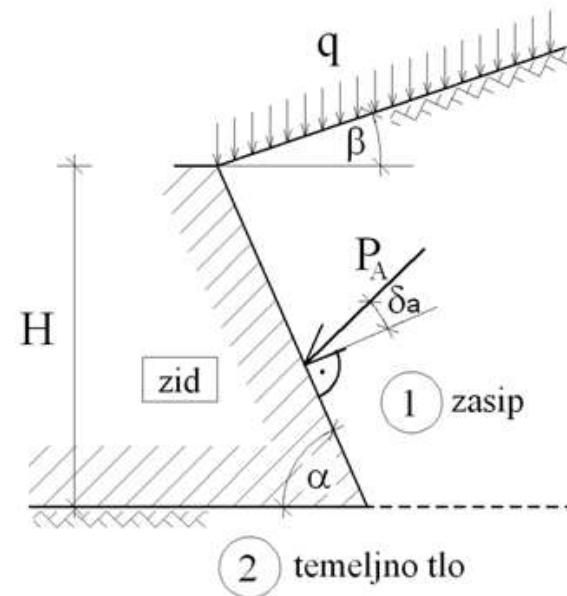
Proračun pritiska tla na potporne zidove prema Monanobe & Okabe
 (vrsta tla zasipa iza zida – NEKOHERENTNO TLO)

6. PROGRAM – zadatak

skica: kosina (2. program)



skica: potporni zid (3. program)



ZADATAK:

*seizmički proračun provesti za lokaciju (adresa stanovanja):

ahg (475)=

a) za seizmičko djelovanje provjeri stabilnost kritične klizne plohe kosine iz 2. programa (tip tla B)

tip tla = A

dozvoljen pomak tla klizišta manji od $d_r < 200 \alpha S$

b) za seizmičko djelovanje provjeri stabilnost potpornog zida iz 3. programa (tip tla A)

tip tla = B

dozvoljen pomak tla klizišta manji od $d_r < 300 \alpha S$