geotesting®
STUDII GEOTEHNICE ŞI GEOFIZICE

Profilul ~~Santului~~ Forajului Nr. S4-FP-22
~~Pit~~ Borehole Profile

REZULTATELE ANALIZELOR DE LABORATOR
LABORATORY TEST RESULTS

LUCRAREA / DESIGN	Studiu geotehnic pentru revizuirea Studiului de fezabilitate Autostrada Sibiu-Pitesti - Sectiunea 4 (Valeni-Curtea de Arges)
AMPLASAMENT / LOCATION	Autostrada Sibiu-Pitesti X : 464703.90 Y: 411913.68
DATA / DATE	27.08.2016

Cota fata de: 0.00 Foraj / Level vs: 0.00 Bore-hole (pit)

Tip proba / Type of samples: ☐ Borcan / Jar; ☒ Stut / Tube; ■ Carota / Core

Stratificatia / Stratification

Adancimea (m) / Depth	Grosimea stratului (m) / Stratum thickness	Adancimea apei subterane (m) / Underground water depth	Denumirea stratului (conform Stas 1243-88 si SR EN ISO 14688/2-2005) / Stratum description (according to Stas 1243-88 and SR EN ISO 14688/2-2005)
0.10	0.10		Pamant vegetal.
1.45	1.35		Nisip cafeniu.
2.90	1.45	1.80	Pietris cu nisip galbui si rar bolovanis.
6.00	3.10		Argila cafenie, tare.
10.00	4.00		Nisip argilos, galbui - cenusiu, indesat.
13.20	3.20		Argila cafenie - cenusie, tare, cu intercalatii subtiri de nisip cenusiu.
14.40	1.20		Nisip argilos, galbui - cenusiu.
			Argila prafoasa, cafenie - cenusie, tare.

Rezultatele analizelor de laborator / Laboratory test results

Compozitie granulometrica (d. in mm) SR EN ISO 14688/2-2005 / Particle size distribution SR EN ISO 14688/2-2005; Limitele Atterberg / Atterberg's limits

Numarul probei / Number and type of samples	Adancimea (m) / Depth	Argila / Clay <0.002	Praf / Silt 0.063	Nisip fin / Fine sand 0.2	Nisip mediu / Medium sand 0.63	Nisip mare / Coarse sand 2	Coef. de neuniformitate / Non-uniformity coefficient Un	W_L Limita de curgere / Liquid limit	W_P Limita de plasticitate / Plastic limit	I_P Indicele de plasticitate / Plasticity index	w % Umiditatea / Water content	I_C Indicele de consistenta / Consistency index
1 ☒	4.0-4.2	39	58	3				58.1	18.3	39.8	15.8 17.7 17.2	>1
2 ☒	8.0-8.2	8	31	38	22	1	>15				14.6 14.5 15.4	
3 ☒	12-12.2	41	59					62.4	19.0	43.5	17.9 16.8	>1

Proba / Sample	γ Greutatea volumica / Unit weight (kN/m³)	γ_d Greutatea volumica in stare uscata / Unit dry weight (kN/m³)	n % Porozitatea / Porosity	e Indicele porilor / Void ratio	Sr Gradul de umiditate / Degree of saturation	U_L Umflarea libera / Unconfined swelling	Pu Presiunea de umflare / Swelling pressure (kPa)
1	21.3 21.4	18.1 18.3	33.30 32.78	0.50 0.49	0.96 0.96		78
2	20.7 20.8	18.1 18.0	29.92 29.99	0.43 0.43	0.88 0.93		
3	21.3	18.1	33.49	0.51	0.96	231.7	

Compresibilitatea / Compressibility

Proba / Sample	$M_{200-300}$ Modulul de deformatie edometrica / Oedometer deformation modulus (kPa)	ε_{200} Tasare specifica la 200 kPa / Specific settlement at 200 kPa (%)	a_v Coeficientul de compresibilitate / Coefficient of compressibility (1/kPa)	im_{200} Sensibilitatea la umezire / Susceptibility to wetting (%)
1	11284.7 7142.9	3.30 3.00	0.00013 0.00020	-0.22
2	18181.8	3.40	0.00008	
3				

Rezistenta la forfecare / Shear strength

Proba / Sample	Efort / Effective stress σ/τ 1	2	3	Φ Unghiul de frecare int. / Angle of int. friction	c Coeziunea / Cohesion (kPa)	Felul determinarii / Type of test	$CaCO_3$ Continutul in $CaCO_3$ / $CaCO_3$ content (%)
2	150 91.7	250 106.3	350 188.5	25°49'	7.9	FCU i.	3.37
3	200 86.8	300 89.4	400 119.9	9°24'	49.0	FCU i.	

Other columns of the form (empty on this page): Bolovanis / Cobbles, Pietris mic / Small gravel, Pietris mediu / Medium gravel, Pietris mare / Coarse gravel, Densitatea scheletului mineral / Skeletal mineral density, Suctiunea 15 bari / Suction 15 bars, Contractia volumica / Volume shrinkage, Limita de contractie / Shrinkage limit, Coef. compresibilitate volumica / Coefficient of volume change, Efort / Stress, Indice de recompresiune / Recompression index, Coeficientul de consolidare / Coefficient of consolidation, Rezistenta la compresiune cu deformatie laterala libera / Unconfined compressive strength, Coeficient de permeabilitate / Permeability coefficient.

Penetrarea dinamica standard / Standard penetration test (N/30 cm)

Adancimea (m) / Depth	SPT
2.00	R
6.00	R
10.00	R
14.50	R

Forajul continua

geotesting®
STUDII GEOTEHNICE ŞI GEOFIZICE

Profilul ~~Forajului~~ ~~Santului~~ Nr. S4-FP-22
~~Borehole~~ ~~Pit~~ Profile continuare

REZULTATELE ANALIZELOR DE LABORATOR
LABORATORY TEST RESULTS

LUCRAREA / DESIGN: Studiu geotehnic pentru revizuirea Studiului de fezabilitate Autostrada Sibiu-Pitesti - Sectiunea 4 (Valeni-Curtea de Arges)

AMPLASAMENT / LOCATION: Autostrada Sibiu-Pitesti
X : 454703.90 Y: 411913.68

DATA / DATE: 27.03.2016

Cota fata de: 16.0 Foraj

Level vs: 16.0 Bore-hole (pit)

Grosimea stratului / Stratum thickness	Adancimea apei subterane / Underground water depth	Stratificatia / Stratification	Formatiunea geologica / Geological formation	DENUMIREA STRATULUI (conform Stas 1243-88 si SR EN ISO 14688/2-2005) / STRATUM DESCRIPTION (according to Stas 1243-88 and SR EN ISO 14688/2-2005)
m	m			
Stratum thickness	Underground water depth	Stratification	Geological formation	
3.60				Argila prafoasa, cafenie - cenusie, tare.
5.00				Argila prafoasa, marnoasa, cafenie - cenusie, tare.
4.80				Nisip argilos in alternanta cu nisip, cenusiu - galbui, indesat.
1.20				Praf nisipos, cenusiu.
				Nisip cenusiu - galbui, indesat.

Borcan / Stut / Carota
Jar / Tube / Core

Numarul probelor / Number and type of samples	Adancimea / Depth
m	
4	16.2-16.4
5	20-20.25
6	24-24.22
7	28-28.25

Compozitie granulometrica (d. in mm) SR EN ISO 14688/2-2005 / Partide size distribution SR EN ISO 14688/2-2005

Argila / Clay	Praf / Silt	Nisip fin / Fine sand	Nisip mediu / Medium sand	Nisip mare / Coarse sand	Pietris mic / Small gravel	Pietris mediu / Medium gravel	Pietris mare / Coarse gravel	Bolovanis / Cobbles	Coeficientul de neuniformitate / Non-uniformity coefficient
<0.002	0.063	0.2	0.63	2	6.3	20	63	200	U=d60/d10
28	72								55.6
39	60	1							62.4
6	19	12	19	38	8			>15	
5	54	32	8		1			9.0	

Limitele Atterberg / Atterberg's limits

Limita de curgere / Liquid limit	Limita de plasticitate / Plastic limit	Indicele de plasticitate / Plasticity index
w_L	w_P	I_P
		38.9
19.0	43.5	

Umiditatea / Water content	Indicele de consistenta / Consistency index
w %	I_C
15.6	>1
20.4	
19.7	>1
19.1	
15.6	
15.3	
19.6	
19.7	

Densitatea scheletului mineral / Skeletal mineral density
ρ_s

Greutatea volumica / Unit weight	Greutatea volumica in stare uscata / Unit dry weight	Porozitatea / Porosity	Indicele porilor / Void ratio	Gradul de umiditate / Degree of saturation
kN/m³ γ	kN/m³ γ_d	n %	e	Sr
20.0	16.8	38.07	0.62	0.82
20.1	17.1	37.14	0.59	0.80
21.2	17.6	32.00	0.47	1.00
21.2	17.8	31.08	0.45	1.00
21.8	18.9	30.41	0.44	0.95
20.6	17.2	35.07	0.54	0.96

Contractilitatea / Shrinkage-swelling

Umflarea libera / Unconfined swelling	Sucsiunea 15 bari / Suction 15 bars	Contractia volumica / Volume shrinkage	Tulb. / Netulb.	Limita de contractie / Shrinkage limit	Presiunea de umflare / Swelling pressure
U_L	w_{15}	C_v		w_s	Pu kPa
					64

Compresibilitatea / Compressibility

Modulul de deformatie edometrica / Oedometer deformation modulus	Tasare specifica la 200 kPa / Specific settlement at 200 kPa	Coef. compresibilitate volumica / Coefficient of volume change	Coeficientul de compresibilitate / Coefficient of compressibility	Sensibilitatea la umezire / Susceptibility to wetting	Efort / Stress	Indice de recompresiune / Recompression index	Coeficientul de consolidare / Coefficient of consolidation
$M_{200-300}$ kPa	c_{200} %	m_v X_v/kPa	$a_{v\ 200-300}$ 1/ kPa	Im_{300} %	σ kPa	RSC	c_v cm²/ sec
10232.2	3.77		0.00016	1.2			
5435.4	4.10		0.00029				
			0.00013				

Rezistenta la forfecare / Shear strength

Efort σ/τ / Effective stress σ/τ 1	2	3	Unghiul de frecare int. / Angle of int. friction	Coeziunea / Cohesion
			Φ °	c kPa
350	450	550	6°21'	77.8
119.8	122.0	142.1		
500	600	700	21°9'	6.5
197.9	242.6	275.3		

Fisul determinarii / Type of test	Rezistenta la compresiune cu confinare laterala libera / Unconfined compressive strength	Coeficient de permeabilitate / Permeability coefficient	Continutul in CaCO3 / CaCO3 content	Penetrarea dinamica standard / Standard penetration test
	p_u kPa	k m/s	CaCO3 %	N / 10 cm
				18.00 R
FCUI.			5.46	
				22.00 R
FCUI				26.00 R

Forajul continua

geotesting®
STUDII GEOTEHNICE ȘI GEOFIZICE

Profilul ~~Forajului~~ ~~Santului~~ / ~~Borehole~~ ~~Pit~~ Profile Nr. S4-FP-22 continuare

REZULTATELE ANALIZELOR DE LABORATOR
LABORATORY TEST RESULTS

LUCRAREA / DESIGN: Studiu geotehnic pentru revizuirea Studiului de fezabilitate Autostrada Sibiu-Pitesti - Sectiunea 4 (Valeni-Curtea de Arges)

AMPLASAMENT / LOCATION: Autostrada Sibiu-Pitesti
X : 464703.90 Y: 411913.68

DATA / DATE: 27.08.2016

Cota fata de: 32.0 Foraj	Grosimea stratului	Adancimea apei subterane	Stratificata	Formatiunea geologica	DENUMIREA STRATULUI (conform Stas 1243-88 si SR EN ISO 14688/2-2005)	Borcan / Stut / Carota	Numarul probelor	Adancimea	Compozitia granulometrica (d. in mm) SR EN ISO 14688/2-2005: Argila	Praf	Nisip fin	Nisip mediu	Nisip mare	Pietris mic	Pietris mediu	Pietris mare	Bolovanis	Coeficientul de neuniformitate	Limitele Atterberg: Limita de curgere	Limita de plasticitate	Indicele de plasticitate	Umiditatea	Indicele de consistenta	Densitatea scheletului mineral	Greutatea volumica	Greutatea volumica in stare uscata	Porozitatea	Indicele porilor	Gradul de umiditate	Contractilitatea: Umflarea libera	Sucsiunea 15 bari	Contracția volumica: Tulb. / Netulb.	Limita de contractie	Presiunea de umflare	Compresibilitatea: Modulul de deformatie edometrica	Taxare specifica la 200 kPa	Coef. compresibilitate volumica	Coeficientul de compresibilitate	Sensibilitatea la umezire	Efort	Indice de recompresare	Coeficientul de consolidare	Rezistenta la forfecare: Efort σ/τ 1	2	3	Unghiul de frecare int.	Coeziunea	Felul determinarii	Rezistenta la compresiune cu deformatie laterala libera	Coeficient de permeabilitate	Continutul in materii organice	Penetrarea dinamica standard
	m	m				Jar / Tube / Core		m	<0.002	0.063	0.2	0.63	2	6.3	20	63	200	$U=\frac{d60}{d10}$	w_L	w_P	I_P	w %	I_C	ρ_s	kN/m³ γ	kN/m³ γ_d	n %	e	Sr	U_L	w_{15}	C_v	w_s	Pu kPa	$M_{200-300}$ kPa	c_{200} %	m_v 1/kPa	$a_{v\ 200-300}$ 1/kPa	Im %	σ kPa	R3C	c cm²/sec	1	2	3	Φ °	c kPa		p_c kPa	k_f	%	$\frac{N}{30\,cm}$
Level vs: 32.0 Bore-hole (pit)	Stratum thickness	Underground water depth	Stratification	Geological formation	STRATUM DESCRIPTION (eccording to Stas 1243-88 anc SR EN ISO 14688/2-2005)		Number and type of samples	Depth	Particle size distribution SR EN ISO 14688/2-2005: Clay	Silt	Fine sand	Medium sand	Coarse sand	Small gravel	Medium gravel	Coarse gravel	Cobbles	Non-uniformity coefficient	Atterberg's limits: Liquid limit	Plastic limit	Plasticity index	Water content	Consistency index	Skeletal mineral density	Unit weight	Unit dry weight	Porosity	Void ratio	Degree of saturation	Unconfined swelling	Suction 15 bars	Volume shrinkage: Dist. / Undist.	Shrinkage limit	Swelling pressure	Oedometer deformation modulus	Specific settlement at 200 kPa	Coefficient of volume change	Coefficient of compressibility	Susceptibility to wetting	Stress	Recompression index	Coefficient of consolidation	Shear strength: Effective stress σ/τ 1	2	3	Angle of int. friction	Cohesion	Type of test	Unconfined compressive strength	Permeability coefficient	Organic matter content	Standard penetration test
32.65	3.65				Nisip cenusiu - galbui, indesat.																																													
					Argila cafenie, tare.		8	34-34.25	44	54	2									69.9	21.2	48.8	16.3	>1		22.0	18.9	32.59	0.31	1.00																600	700	800							
35.00	2.35																					16.5																				206.9	214.9	245.3	10°53'	87.8	FCU i.			3.01	
																						17.1			22.0	18.8	24.03	0.32	1.00						14908.3	2.83		0.00009															

Nota:
FCU i. = Forfecare consolidata nedrenata inundata

Intocmit: ing. V. Marin

Verificat: ing. A. Diaconu