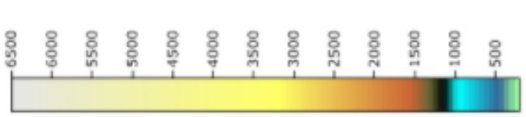
Tabelle fuori testo

Analisi Geomeccanica Dataset Sismico 2007





Q=10[(Vp-3500)/1000] (Barton N. 1992
Iv= (Vs/Vl)^2
RMR=9*LNq+44

VELOCITA'	***V_affioramento***	***Jv***	***Iv***	***Iv***	***RQD***	***RMR***
Media		917				
	+/-	57				
Massimo		1143	18	14	19	20	49

	RQD	***Jv***		N	λ
RQD (Palmstrom 1975)	***20***	28.6			
RQD (CERTUM 1980)	***-14***	28.6			
RQD (Priest-Hudson 1981)	***22***	28.6		0.1	29

DATASET RICOSTRUITO DA RIFRAZIONE E LABORATORIO (ultrasuoni)

Vp m/s	RMR	Q	Jv	Jv	RQD - Iv	RQD	***c[kPa]***	***Φ [°]***	***E[Gpa]***
2596	25	0.125	1.77	0.246	67		***126***	***18***	***2***
2500	23	0.100	1.97	0.251	67		***116***	***17***	***2***
2500	23	0.100	1.97	0.251	67	65	***116***	***17***	***2***
2328	20	0.067	2.40	0.260	58	62	***99***	***15***	***2***
2300	19	0.063	2.49	0.262	57	62	***96***	***15***	***2***
2200	17	0.050	2.82	0.268	52	50	***85***	***14***	***2***
1143	**0**	**0.004**	**17.63**	**0.371**	**14**	**0**	***0***	***5***	***1***

2224	**18**	**0.073**	**0.273**	**54.405**	**48**	**Media**	
1143	**49**	determinato da affioramento				**Roccia di riferimento ***	

	Velocità Sismica	*RMR*	*Q*	RQD - Iv	RQD	*Valori anomali*
	2596	25	0.125	67		*45*
2596 MAX ASSOLUTO MISURE ULTRASUONI 2	2500	23	0.100	67		*85*
4907 MAX ASSOLUTO MISURE 2006	2500	23	0.100	67	65	
3058 MAX 2° STRATO MISURE 2006	2328	20	0.067	58	62	
1655 MEDIA 2° STRATO MISURE 2006	2300	19	0.063	57	62	
473 MIN 2° STRATO MISURE 2006	2200	17	0.050	52	50	
	1143	0	0.004	14	0	

2224	**18**	**0.073**	**54**	**48**	**Velocità**
496	**9**	**0.040**	**19**	**27**	**Dev. St.**
				0.989	**Correlazione**

Sintesi Rilevamenti 2016 raffrontati 2007

Stazioni	Giunto	Dir. °	Imm °	σ [Mpa]	RMR	Spaziatura [m]	RMR	RQD	RMR	Persistenza [m]	RMR (A4 v1)	H2O	RMR	JRC	RMR (A4 v3)	Apertura [mm]	RMR (A4 v2)	Alterazione	RMR (A4 v4)	Riempimento	RMR (A4 v5)
ARS 1/2016	J1 scist	180	30	14.7	3.5	0.03	5.0	22.0	3.0	5.0	2.0	No	15.0	5.0	1.0	0.0	6.0	*mediamente alterate*	6.0	assente	6.0
micascisti	J1 scist	180	30	12.0	3.3	0.03	5.0	22.0	3.0	5.0	2.0	No	15.0	5.0	1.0	0.0	6.0	*mediamente alterate*	6.0	assente	6.0
	J2	10	55	6.8	2.5	0.03	9.0	22.0	20.0	3.0	4.0	No	15.0	8.0	1.0	5.0	1.0	*mediamente alterate*	5.0	soffice	0.0
	J2	10	60	4.9	2.1	0.03	9.0	22.0	20.0	3.0	4.0	No	15.0	8.0	1.0	5.0	1.0	*mediamente alterate*	5.0	soffice	0.0
	J3	110	65	8.9	2.9	0.03	8.0	22.0	20.0	3.0	4.0	No	15.0	10.0	3.0	5.0	1.0	*mediamente alterate*	5.0	soffice	0.0
	J3	115	70	5.2	2.1	0.03	8.0	22.0	20.0	3.0	4.0	No	15.0	10.0	3.0	5.0	1.0	*mediamente alterate*	5.0	soffice	0.0
	J4	150	75	4.5	2.0	0.03	9.8	22.0	20.0	2.0	4.0	No	15.0	5.0	1.0	5.0	1.0	*mediamente alterate*	3.0	soffice	0.0
	J4	140	70	4.5	2.0	0.03	9.8	22.0	20.0	2.0	4.0	No	15.0	5.0	1.0	5.0	1.0	*mediamente alterate*	3.0	soffice	0.0
	J4	10	55	12.0	3.3	0.0	5.0	22.0	3.0	5.0	2.0	No	15.0	5.0	1.0	0.0	6.0	*mediamente alterate*	6.0	assente	6.0
ARS 2/2016	J1 scist	190	25	4.5	2.0	0.04	5.0	22.0	3.0	5.0	2.0	No	15.0	12.0	3.0	10.0	0.0	*mediamente alterate*	1.0	soffice	0.0
micascisti	J2	50	90	7.8	2.7	0.04	9.0	22.0	20.0	2.0	4.0	No	15.0	12.0	3.0	0.0	6.0	*mediamente alterate*	5.0	soffice	2.0
	J2	50	90	0.0	0.0	0.04	9.0	22.0	20.0	2.0	4.0	No	15.0	12.0	3.0	0.0	6.0	*mediamente alterate*	5.0	soffice	2.0
	J3	250	70	4.5	2.0	0.04	13.0	22.0	20.0	0.0	0.0	No	0.0	0.0	0.0	0.0	0.0	*mediamente alterate*	0.0	0	0.0
	J3	80	90	12.6	3.3	0.04	13.0	22.0	20.0	5.0	2.0	No	15.0	8.0	1.0	0.0	6.0	*mediamente alterate*	6.0	assente	6.0
ARS 1/2007	J1 scist	180	35	4.0	1.8	0.03	0.0	0.0	0.0	5.0	2.0	No	15.0	16.0	5.0	1.0	4.0	*mediamente alterate*	3.0	soffice	2.0
micascisti	J2	150	65	5.9	2.3	0.03	5.0	22.0	3.0	5.0	2.0	No	15.0	8.0	1.0	1.0	4.0	*mediamente alterate*	0.0	soffice	2.0
	J3	208	90	0.0	0.0	0.03	14.4	22.0	20.0	0.0	0.0	No	0.0	0.0	0.0	0.0	0.0	*mediamente alterate*	0.0	0	0.0
	J4	240	35	9.1	2.9	0.03	8.0	22.0	20.0	0.0	0.0	No	0.0	0.0	0.0	0.0	0.0	*mediamente alterate*	0.0	0	0.0

Stazioni	Giunto	RMRb	*c[kPa]*	*Φ*		*F1*	*F2*	*F3*	*F4*	SMR	*c[kPa]*	*Φ*	*E[Gpa]*	*GSI*
ARS 1/2016	J1 scist	48				**0.85**	**0.85**	**-25**	**0**	30				*25*
micascisti	J1 scist	47				**0.85**	**0.85**	**-25**	**0**	29				
	J2	57	*287*	*34*		**0.70**	**0.70**	**-25**	**0**	45	*226*	*28*	*8*	
	J2	57	*285*	*34*		**0.70**	**0.70**	**-25**	**0**	45	*224*	*27*	*7*	
	J3	59	*294*	*34*		**0.70**	**0.70**	**-25**	**0**	47	*233*	*28*	*8*	
	J3	58	*291*	*34*		**0.70**	**0.70**	**-25**	**0**	46	*229*	*28*	*8*	
	J4	56	*279*	*33*		**0.70**	**0.70**	**-25**	**0**	43	*217*	*27*	*7*	
	J4	56	*279*	*33*		**0.70**	**0.70**	**-25**	**0**	43	*217*	*27*	*7*	
	J4	47	*236*	*29*		**0.70**	**0.70**	**-25**	**0**	35	*175*	*23*	*4*	
ARS 2/2016	J1 scist	31				**0.85**	**0.85**	**-25**	**0**	13				
micascisti	J2	67	*333*	*38*		**0.85**	**0.85**	**-25**	**0**	49	*243*	*29*	*9*	
	J2	64	*320*	*37*		**0.7**	**0.7**	**-25**	**0**	52	*259*	*31*	*11*	
	J3	35	*175*	*22*		**0.7**	**0.7**	**-25**	**0**	23	*114*	*16*	*2*	
	J3	72	*362*	*41*		**0.7**	**0.7**	**-25**	**0**	60	*300*	*35*	*18*	
ARS 1/2007	J1 scist	33				**0.85**	**0.85**	**-25**	**0**	15				
micascisti	J2	34	*172*	*22*		**0.7**	**0.7**	**-25**	**0**	22	*111*	*16*	*2*	
	J3	34	*172*	*22*		**0.7**	**0.7**	**-25**	**0**	22	*111*	*16*	*2*	
	J4	31	*154*	*20*		**0.7**	**0.7**	**-25**	**0**	19	*93*	*14*	*2*	
	MEDIA	*49*	*260*		*31*					*35*	*197*	*25*	*7*	
	max	*72*	*362*		*41*					*60*	*300*	*35*	*18*	
	min	*31*	*154*		*20*					*13*	*93*	*14*	*2*	

Classificazioni

c[kPa]	*Φ*
228	**28**
331	38
124	17

coesione c (kPa) = 5 RMRb

angolo di attrito Φ = 0,5 RMRb + 5

Sintesi indagini Pregresse

2006 ROCCE

		densità	*Vp Ultrasuoni*
		24.77 kN/mc	2200 m/s
		25.48	2692
		24.6	2489
		26.3	1988
		25.08	1501
		26.95	713
		26.56	2328
		26.53	2058
		26.79	2596
media		**25.90** kN/mc	
	+ / -	**0.86**	

Compressione Monoassiale

S1	C0	2.62 Mpa	S5	C0	3.47 Mpa
15 mt	Mod Tang 50%	2410 Mpa	13.5 mt	Mod Tang 50%	518 Mpa
	Mod sec 50%	2835 MPa		Mod sec 50%	442 MPa
S3	C0	10.82 Mpa	S5	C0	14.86 Mpa
19.5 mt	Mod Tang 50%	7583 Mpa	15 mt	Mod Tang 50%	5728 Mpa
	Mod sec 50%	8756 MPa		Mod sec 50%	4253 MPa
S3	C0	2.7 Mpa	S7	C0	11.65 Mpa
20 mt	Mod Tang 50%	4474 Mpa	11.5 mt	Mod Tang 50%	3720 Mpa
	Mod sec 50%	2741 MPa		Mod sec 50%	3433 MPa
S4	C0	1.28 Mpa	S7	C0	19.88 Mpa
10 mt	Mod Tang 50%	561 Mpa	15 mt	Mod Tang 50%	7075 Mpa
	Mod sec 50%	534 MPa		Mod sec 50%	7272 MPa
S4	C0	5.35 Mpa			
12.5 mt	Mod Tang 50%	2929 Mpa			
	Mod sec 50%	2078 MPa			

Point Load

				C0
Carico	15.96	Is (50) perpendicolare	0.76 Mpa	10.64 Mpa
Carico	9.45	Is (50) parallelo	0.45 Mpa	6.3 Mpa
Carico	13.44	Is (50) perpendicolare	0.64 Mpa	8.96 Mpa
Carico	13.01	Is (50) parallelo	0.62 Mpa	8.68 Mpa

2006 TERRE

ghiaia: 15,02%
sabbia: 28,30%
limo: 26,47%
argilla: 30,22%.
Indice di Plasticità: 11,6

Densità umida ottimale (Proctor standard): 18,85 kN/m3
Densità secca ottimale (Proctor standard): 16,51 kN/ m3
Permeabilità (provino ricostruito al 90% della Compattazione Proctor): 1,87E-06 cm/sec
Coesione C': 16,24 kPa
Angolo di attrito F': 28,6

2011 ROCCE

Taglio su giunto

				criterio LINEARE	*criterio Barton Choubey*		*JRC*	*3*
			σ		τ	σ	*JCS*	*1000*
JRC	8		1000	Kpa	KPa	KPa	*ϕ*	*30*
TAU picco	560	Kpa	**70**	c [Kpa]	577.35	1000		
TAU residuo	460	Kpa	**25**	PHI °				
JRC	8		2000	Kpa				
TAU picco	1092	Kpa	**104**	[Kpa]	1045.21	2000		
TAU residuo	600	Kpa	**17**	PHI °				
JRC	14		500	Kpa	339.98	500		
TAU picco	389	Kpa		[Kpa]				
TAU residuo		Kpa		PHI °				
JRC	10		1500	Kpa	805.61	1500		
TAU picco	1046	Kpa	**100**	[Kpa]				
TAU residuo	600	Kpa	**22**	PHI °				

Taglio in roccia

Carico normale [Kpa]	Tau Max [Kpa]	Tau res [Kpa]		
1000	560		PHI	**28** °
2000	1092		c	**28** Kpa
500	392	295	PHI picco	**33** °
			c	**65** Kpa
1500	1046	880	PHI residuo	**30** °
			c'	**2.5** Kpa

030-006R03E01 TAB3

Figure fuori testo

copertura rigida - manto stradale

vasche cisterne

corpo lento
detrito poco consolidato

vasche cisterne

1300

1300

1600

1600

1600

corpo veloce
substrato lapideo o detrito con frazione grossolana abbondante

0 -2 -4 -6 -8 -10 -12 -14 -16 -18 -20

0 10 20 30 40 50 60

Velocità onde P [m/s]

2100 2000 1900 1800 1700 1600 1500 1400 1300 1200 1100 1000 900 800 700 600

Resistività Elettrica [Ω m]

250. 188. 125. 62.6 0.130

corpo conduttivo
detrito poco consolidato con frazione fine o impregnazione idrica

strutture artificiali in c.a.

massi?

vasche cisterne

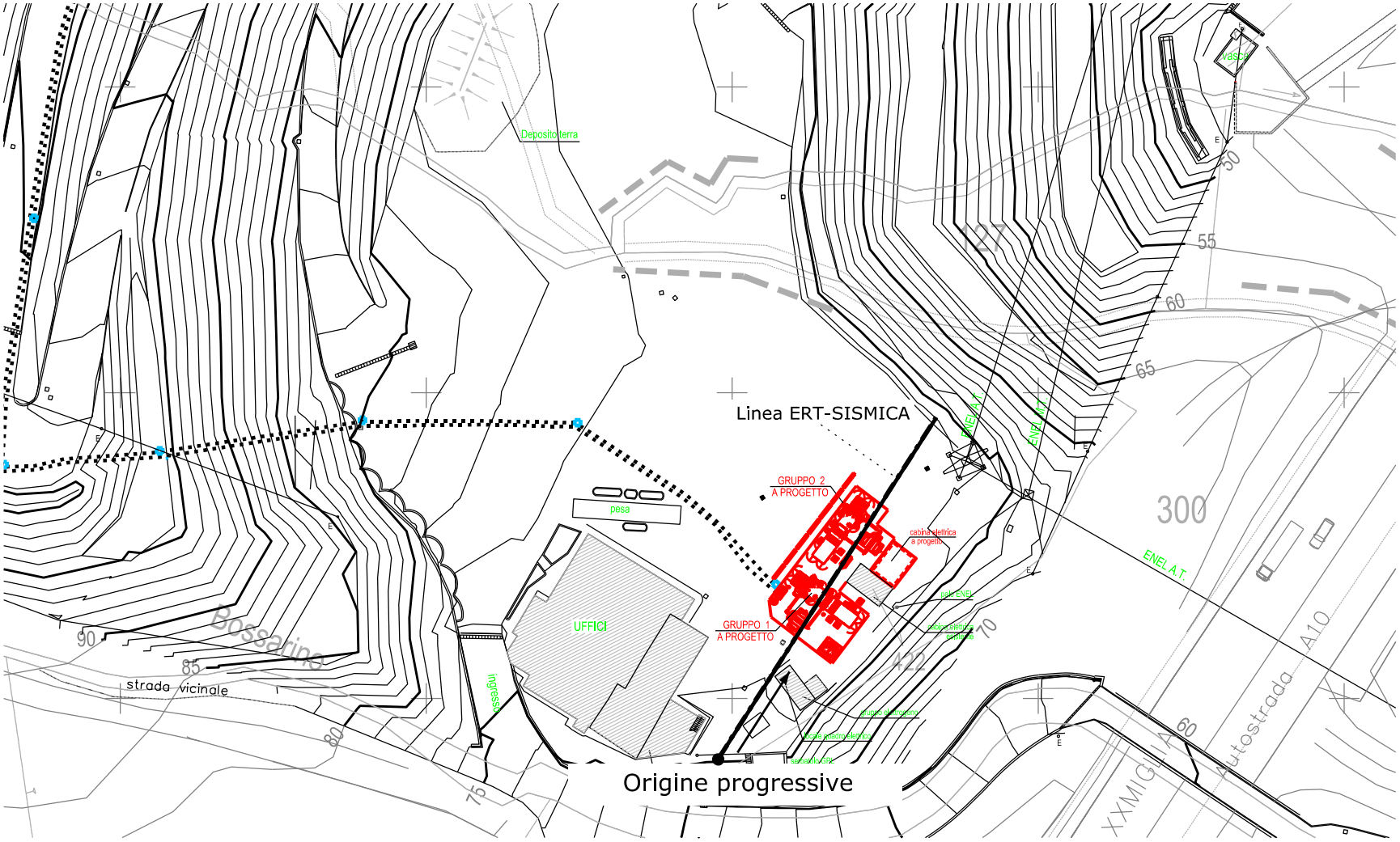
vasche cisterne

corpo resistivo
substrato lapideo o detrito con frazione grossolana abbondante

0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11

4 20 37 54 70

SEZIONI LONGITUDINALE	COMMITENTE BOSSARINO s.r.l. gruppo GEOTEA	*Studio Progea* ~ *Dott. Sergio AICARDI - Geologo* ~	Via G. Leopardi n° 35 r 17100 Savona tel. / fax 019.825956Q Studio.Progea@libero.it	TAV. 1
SCALA 1:200		Provincia: Savona	Comune: Vado Ligure	Località: Bossarino



PLANIMETRIA	COMMITENTE BOSSARINO s.r.l. gruppo GEOTEA	*Studio Progea* *~ Dott. Sergio AICARDI - Geologo ~*	Via G. Leopardi n° 35 r 17100 Savona tel. / fax 019.825956Q Studio.Progea@libero.it	TAV. 2
SCALA 1:1000		Provincia: Savona	Comune: Vado Ligure	Località: Bossarino