



ASSOCIAZIONE INTERCOMUNALE AREA BAZZANESE
Comuni di Bazzano, Castello di Serravalle, Crespellano, Monte
San Pietro, Monteveglio, Savigno, Zola Predosa
Provincia di Bologna



**PIANO STRUTTURALE DEI COMUNI
DELL'AREA BAZZANESE**

**MICROZONAZIONE SISMICA DEL COMUNE DI SAVIGNO
Allegati**

Adozione: Del. C.C. n. ... del

Approvazione: Del. C.C. n. ... del

ASSOCIAZIONE INTERCOMUNALE AREA BAZZANESE
Presidente del comitato di Pianificazione Associata: ALFREDO PARINI

	Sindaci	Assessori
<i>Bazzano</i>	Elio RIGILLO	Moreno PEDRETTI
<i>Castello di Serravalle</i>	Milena ZANNA	Cesare GIOVANARDI
<i>Crespellano</i>	Alfredo PARINI	Alfredo PARINI
<i>Monte San Pietro</i>	Stefano RIZZOLI	Pierluigi COSTA
<i>Monteveglio</i>	Daniele RUSCIGNO	Daniele RUSCIGNO
<i>Savigno</i>	Augusto CASINI ROPA	Augusto CASINI ROPA
<i>Zola Predosa</i>	Stefano FIORINI	Stefano FIORINI

Responsabile dello studio

dr. geol. Samuel Sangiorgi

Ufficio di Piano

Marco LENZI (Coordinamento)

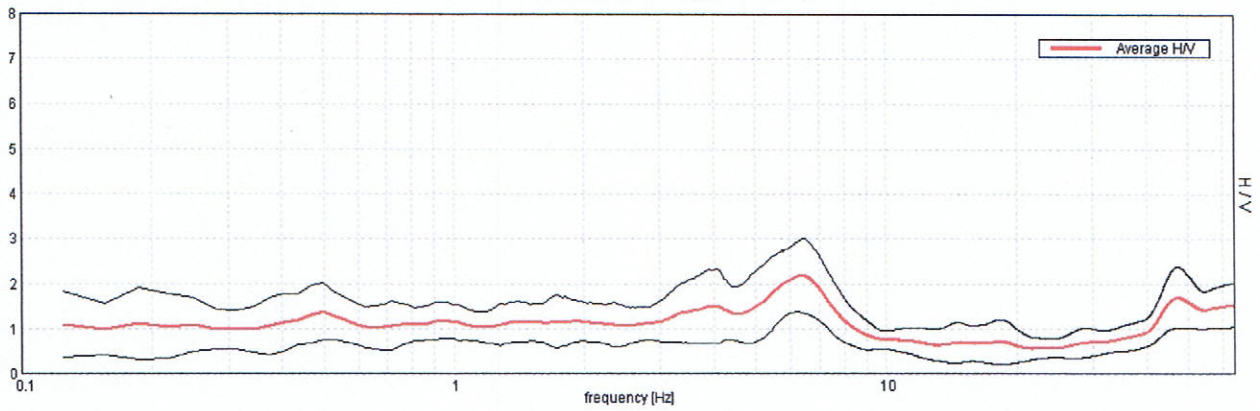
OTTOBRE 2013

SAVIGNO, 037058P1HVSUR1

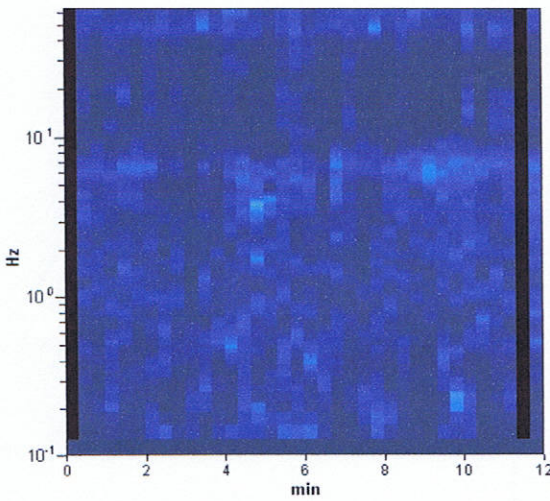
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 09:38:50 End recording: 03/05/13 09:50:51
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 94% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

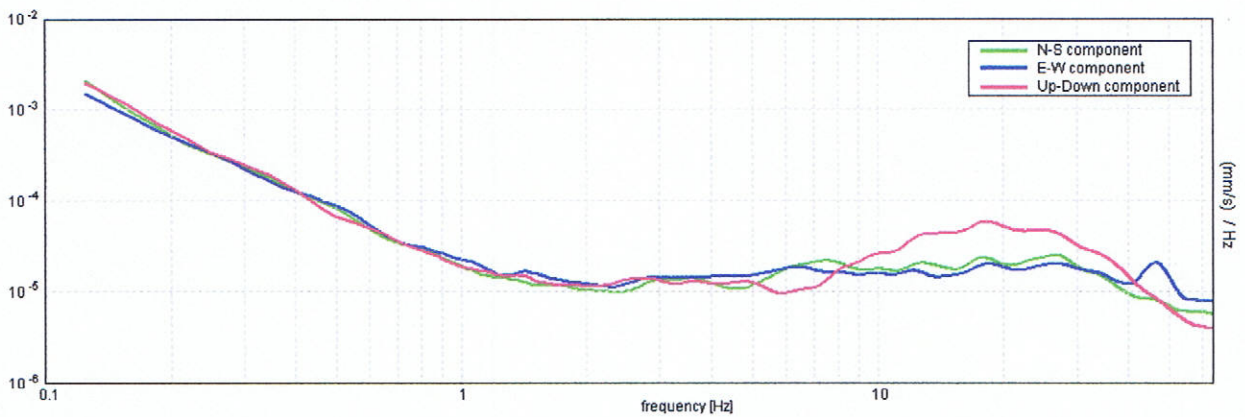
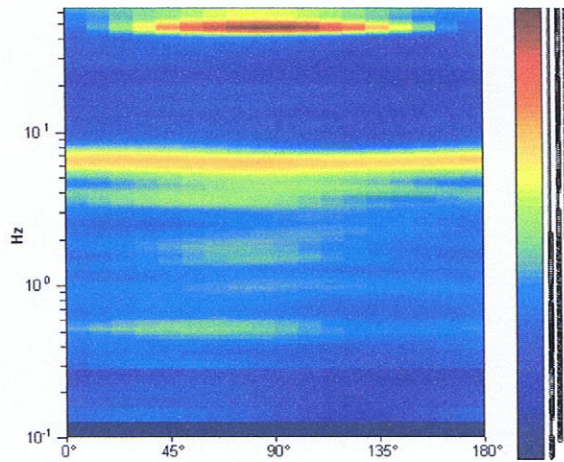
Max. H/V at 6.41 ± 0.2 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V



SAVIGNO, 037058P2HVSR2

Instrument: TRZ-0108/01-10

Start recording: 03/05/13 10:04:02 End recording: 03/05/13 10:16:03

Channel labels: NORTH SOUTH; EAST WEST; UP DOWN

Trace length: 0h12'00". Analyzed 94% trace (manual window selection)

Sampling rate: 128 Hz

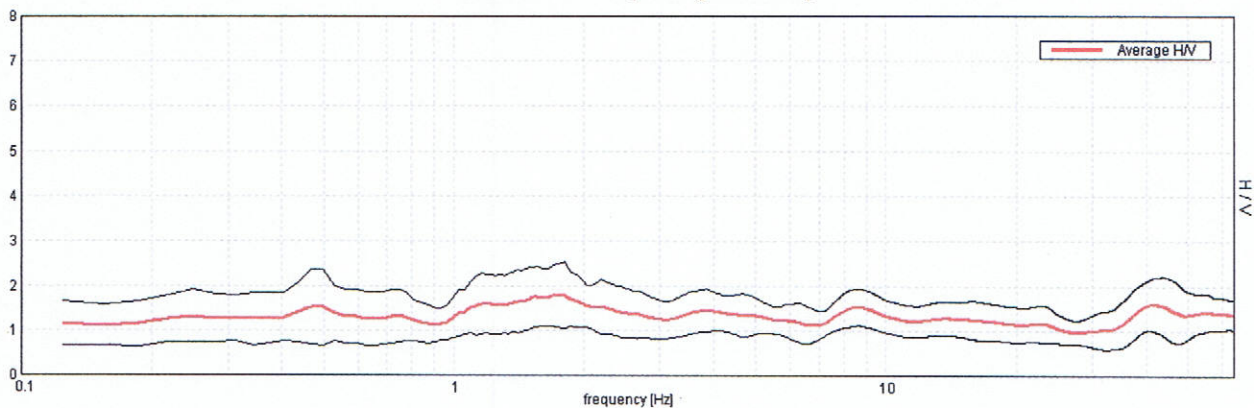
Window size: 20 s

Smoothing type: Triangular window

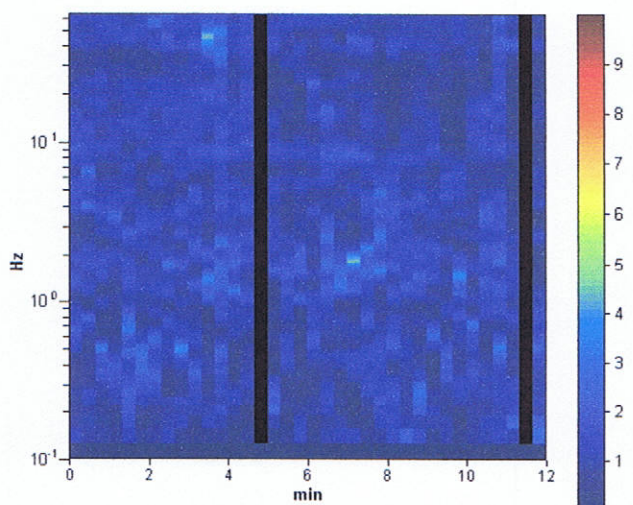
Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

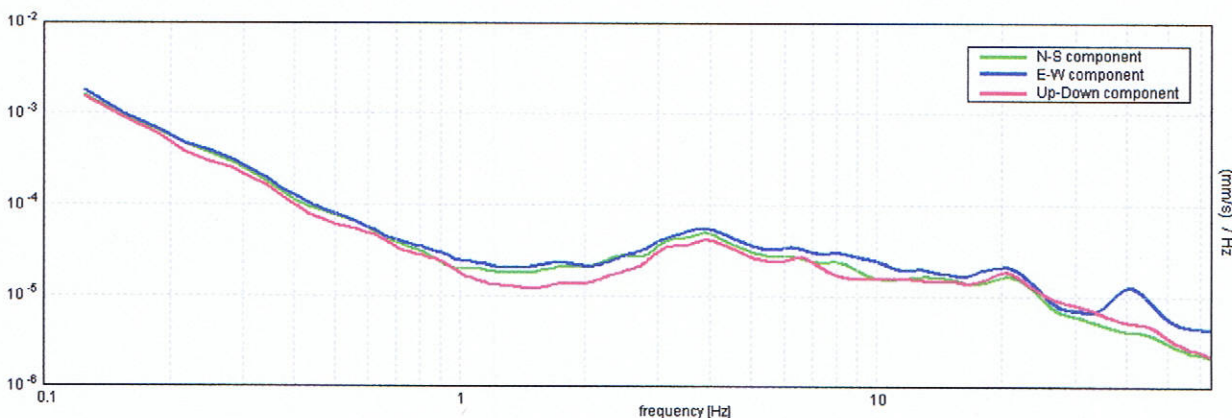
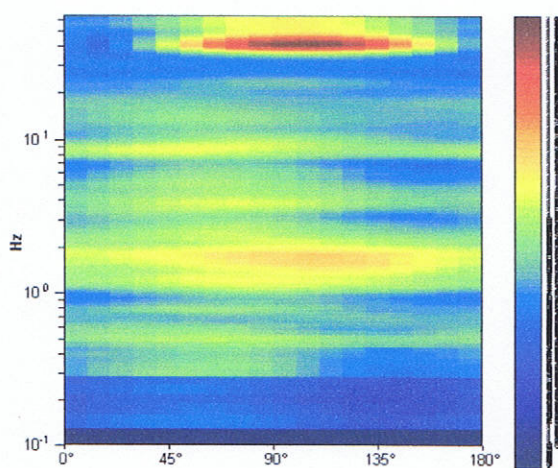
Max. HV at 1.81 ± 6.27 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



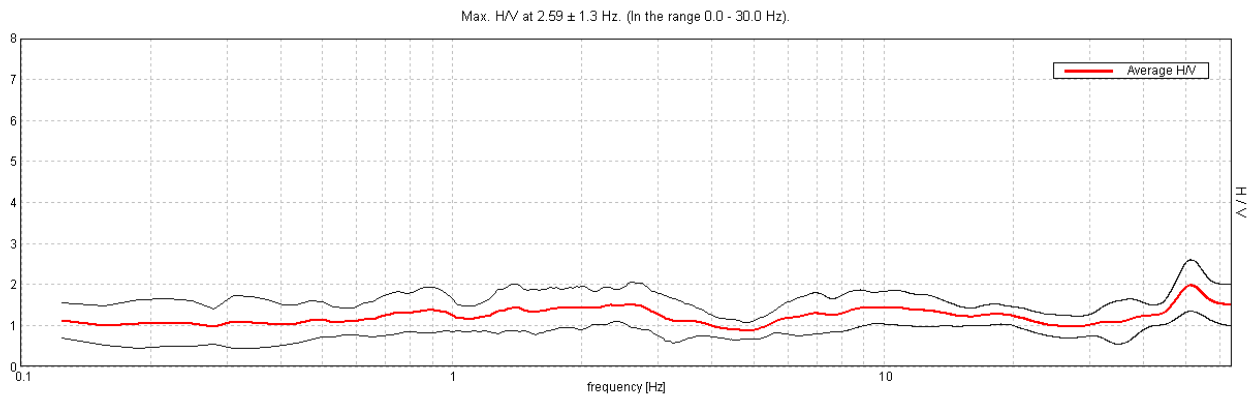
DIRECTIONAL HV



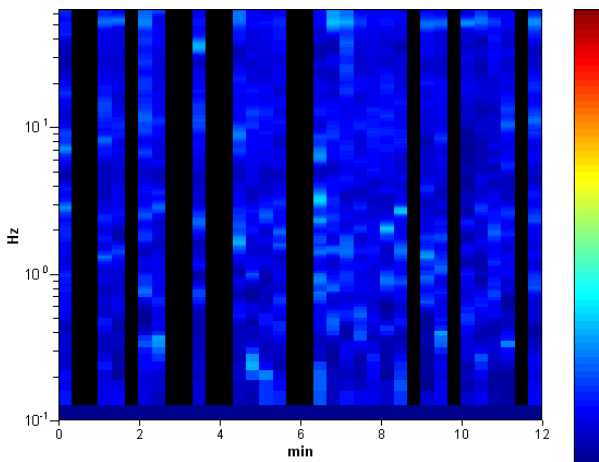
SAVIGNO, 037058P3HVSR3

Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 10:19:46 End recording: 03/05/13 10:31:46
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 67% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

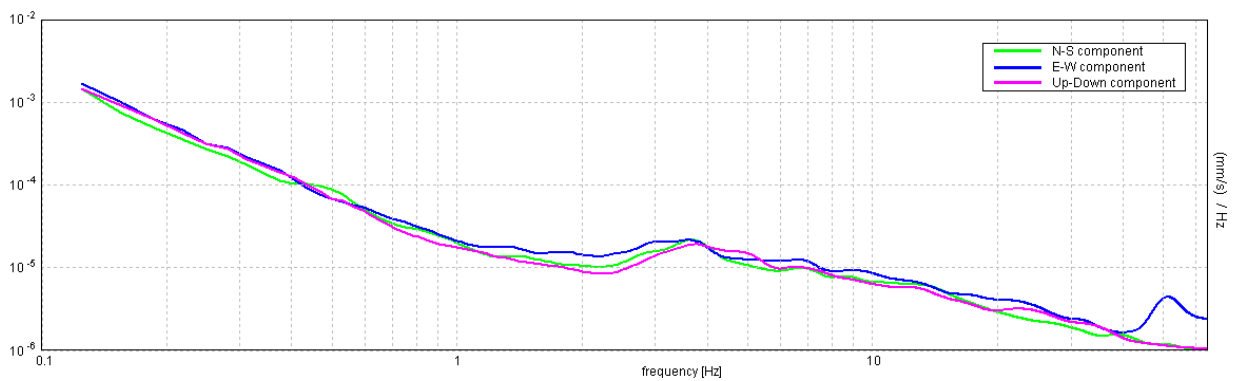
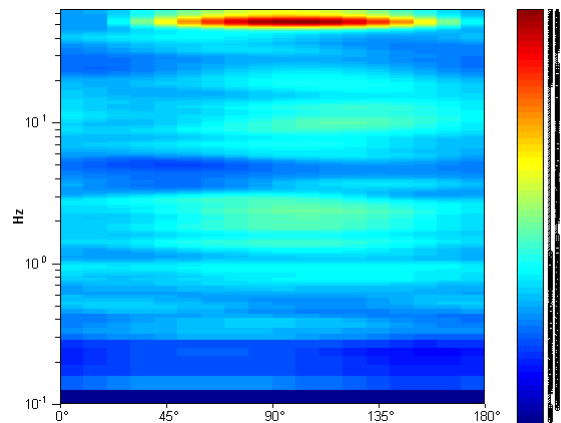
HORIZONTAL TO VERTICAL SPECTRAL RATIO



H/V TIME HISTORY



DIRECTIONAL H/V

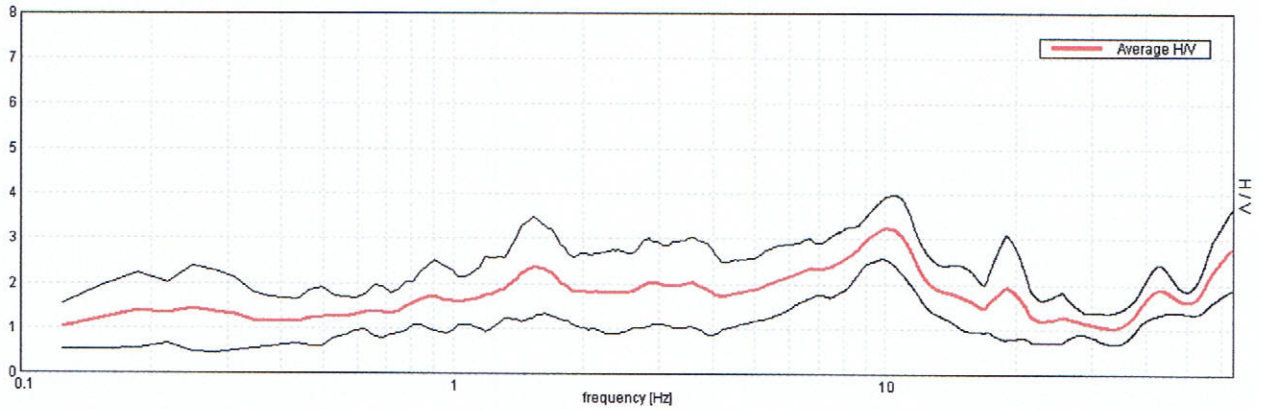


SAVIGNO, 037058P4HVSR4

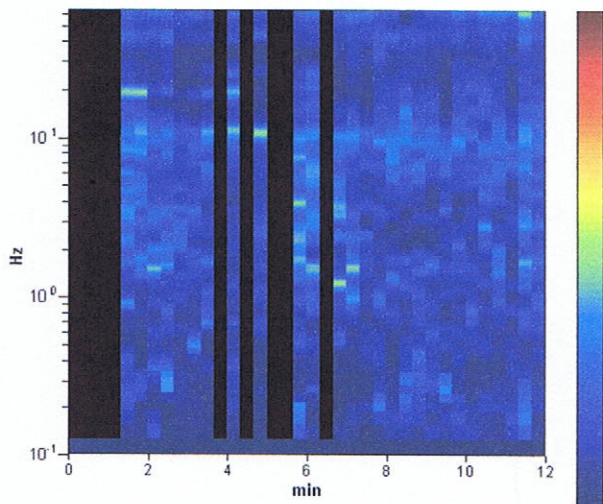
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 10:38:45 End recording: 03/05/13 10:50:46
 Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
 Trace length: 0h12'00". Analyzed 75% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

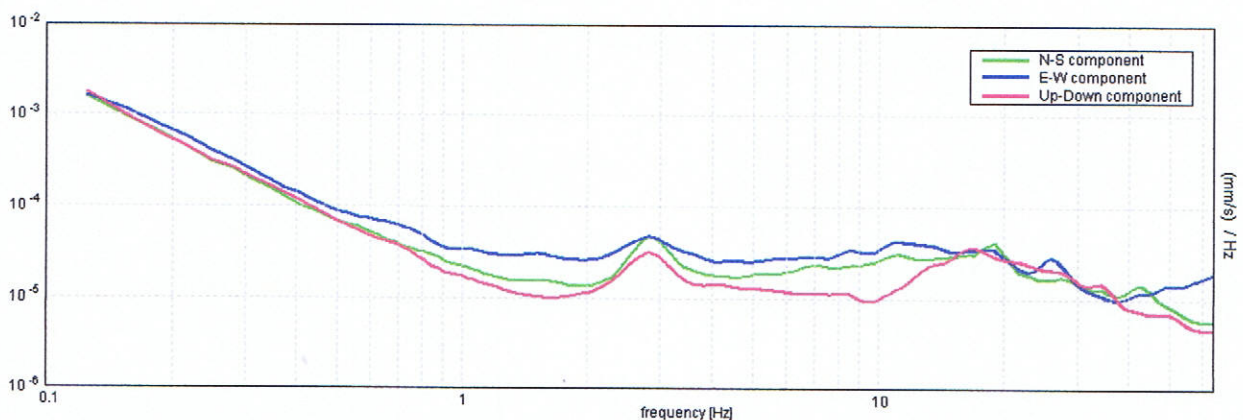
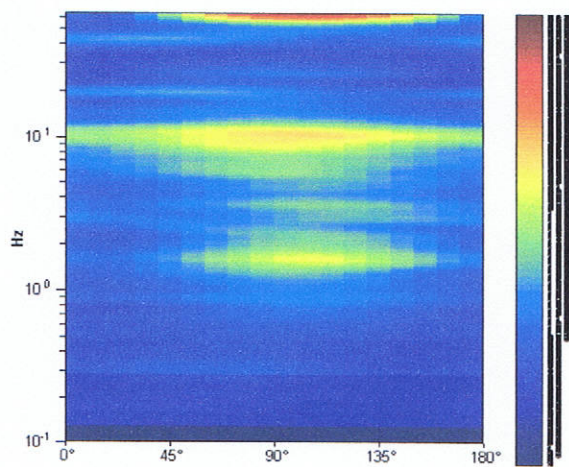
Max. HV at 10.06 ± 1.4 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



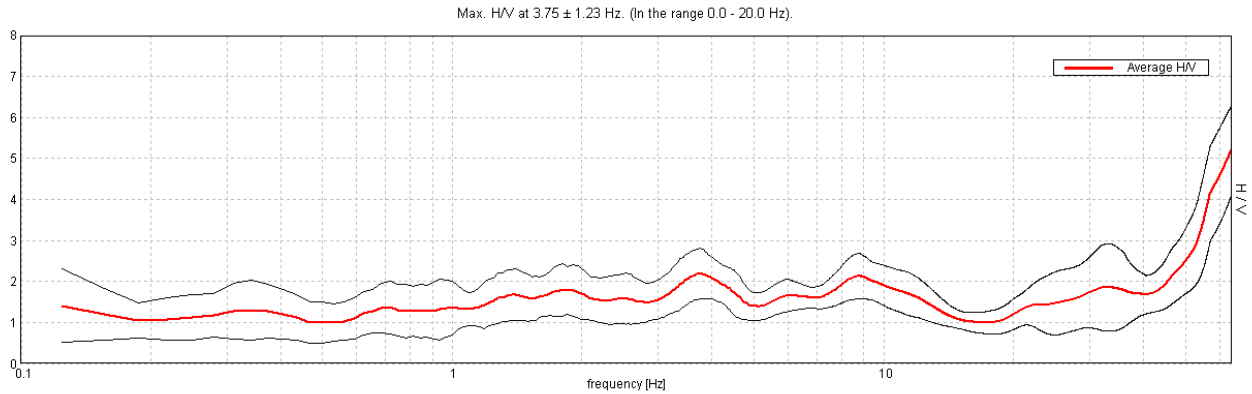
DIRECTIONAL HV



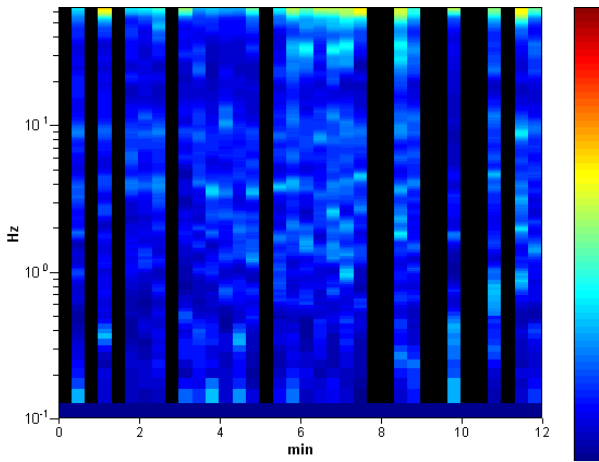
SAVIGNO, 037058P5HVSR5

Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 10:56:01 End recording: 03/05/13 11:08:02
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 67% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

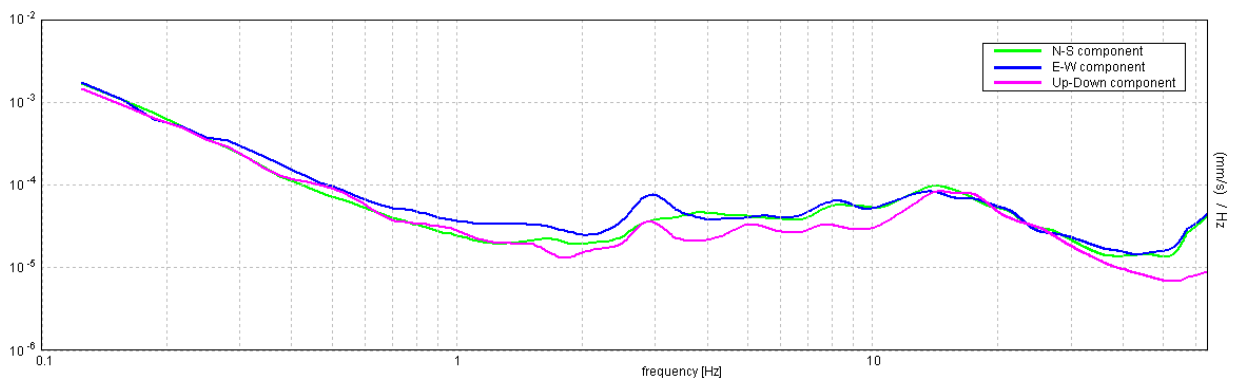
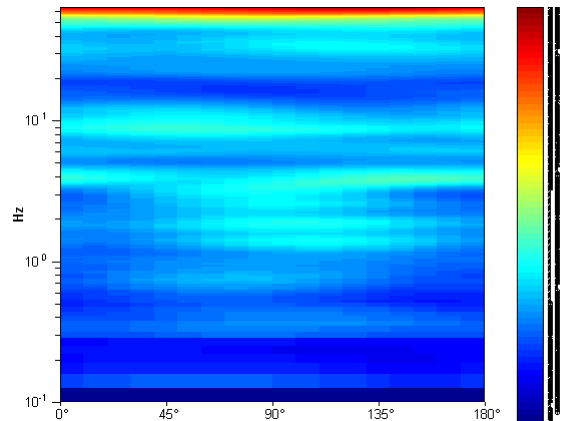
HORIZONTAL TO VERTICAL SPECTRAL RATIO



H/V TIME HISTORY



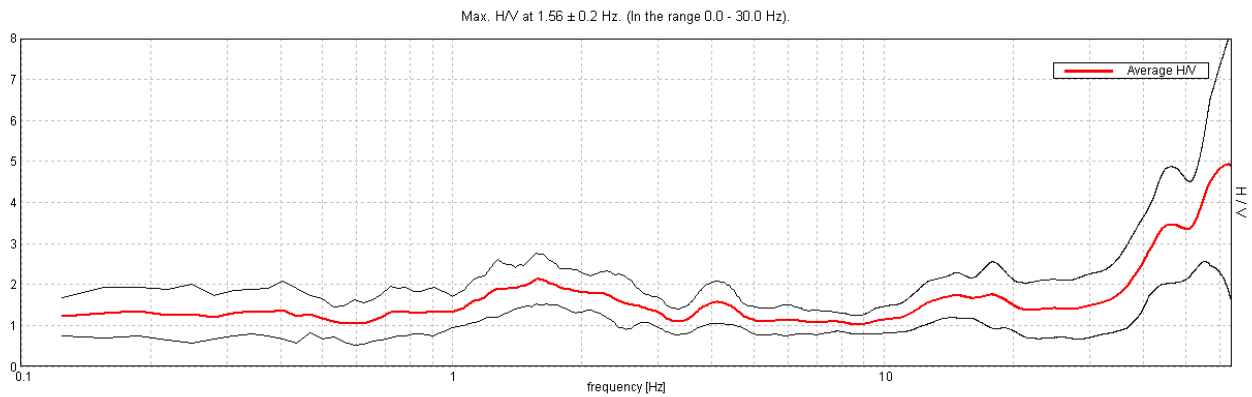
DIRECTIONAL H/V



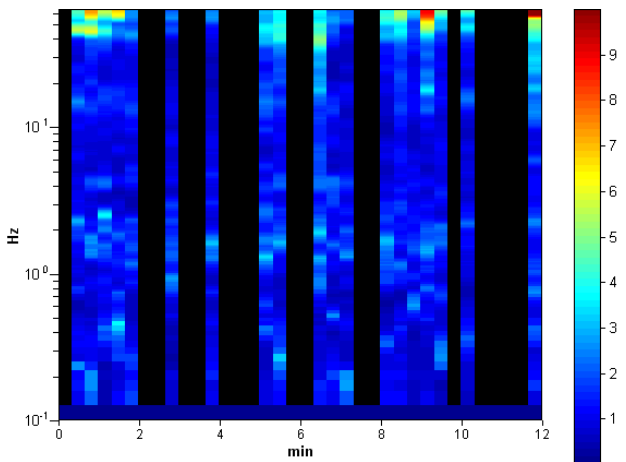
SAVIGNO, 037058P6HVSR6

Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 11:13:34 End recording: 03/05/13 11:25:35
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 53% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

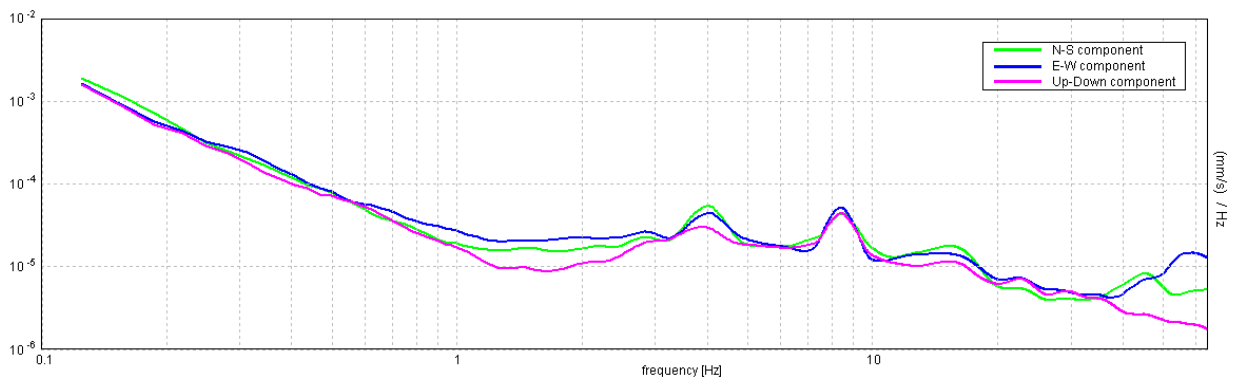
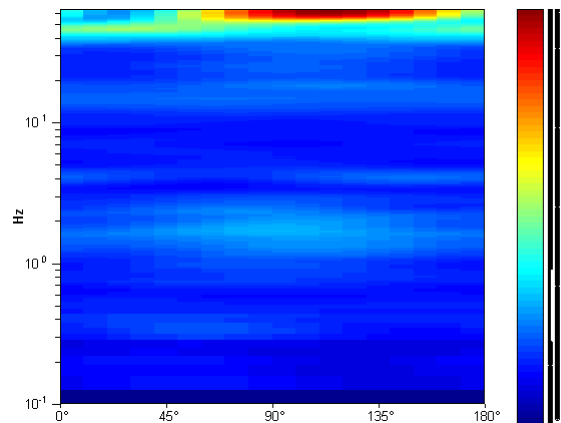
HORIZONTAL TO VERTICAL SPECTRAL RATIO



H/V TIME HISTORY



DIRECTIONAL H/V

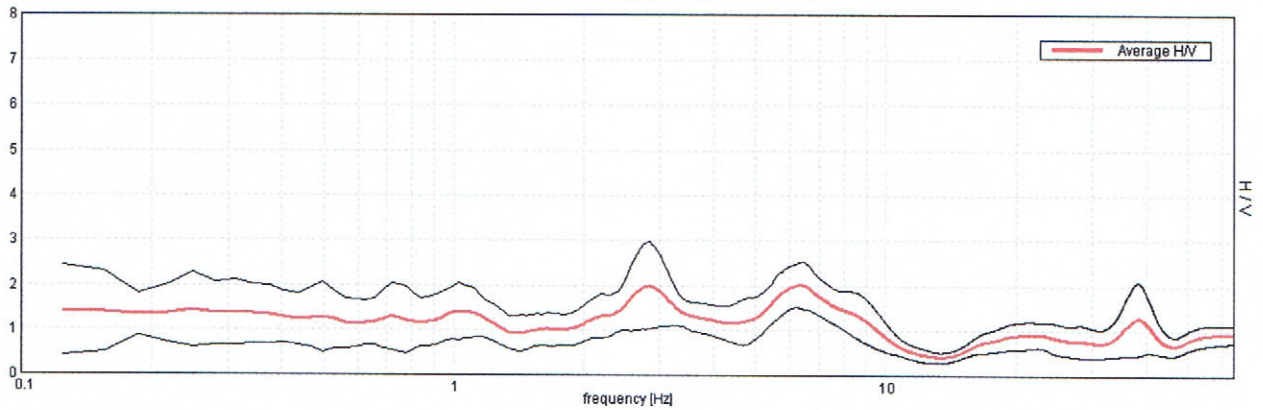


SAVIGNO, 037058P7HVSR7

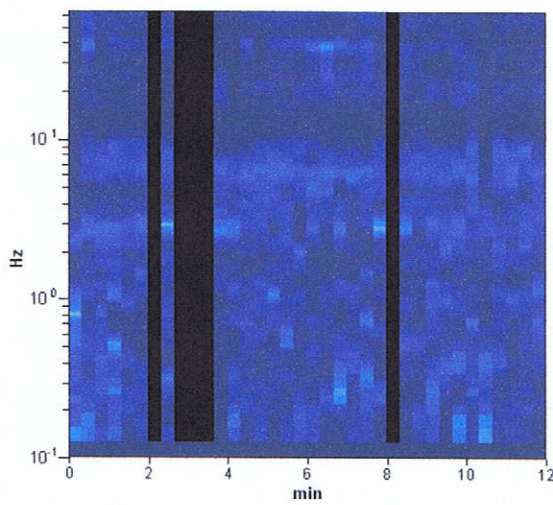
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 11:32:01 End recording: 03/05/13 11:44:02
 Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
 Trace length: 0h12'00". Analyzed 86% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

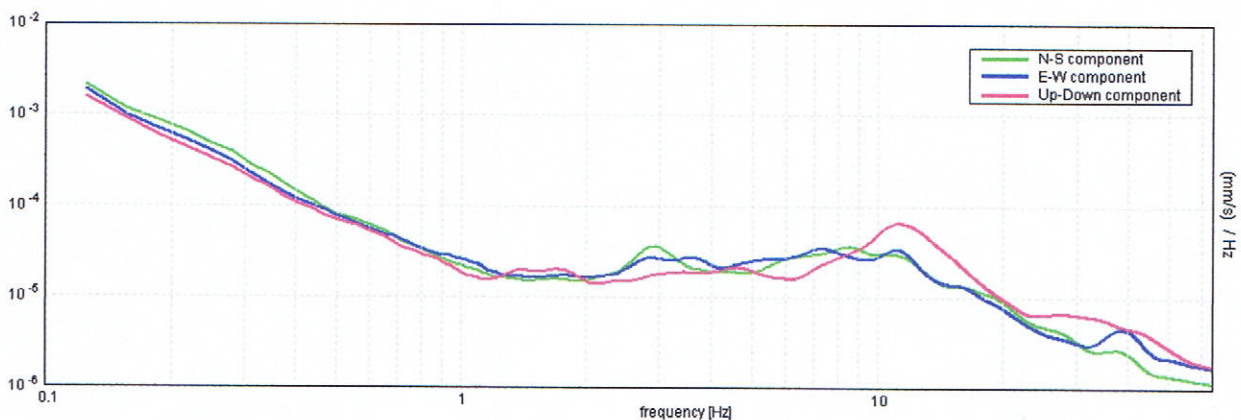
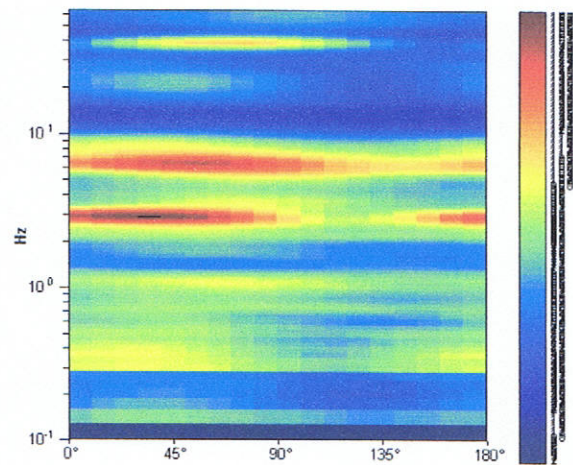
Max. HV at 6.25 ± 1.42 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

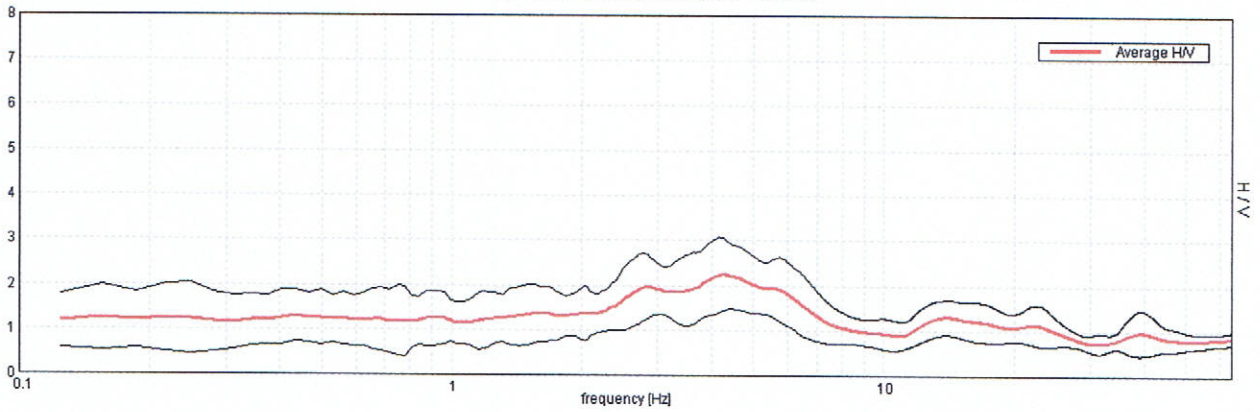


SAVIGNO, 037058P8HVSR8

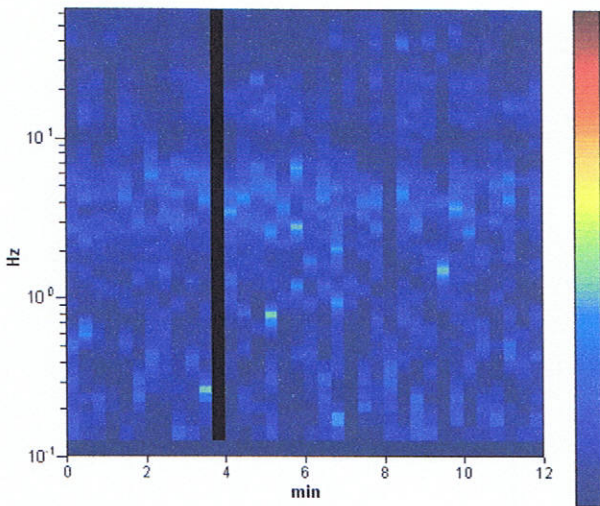
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 12:23:50 End recording: 03/05/13 12:35:51
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 97% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

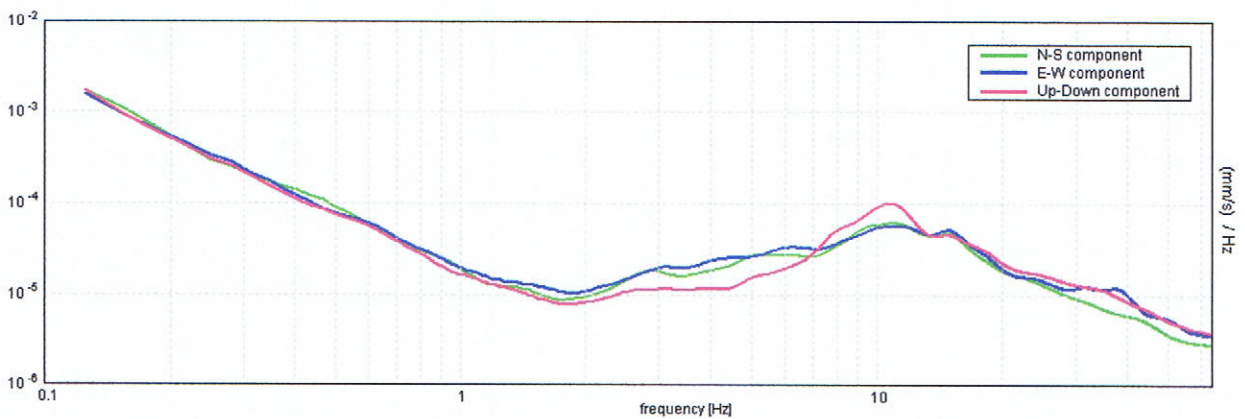
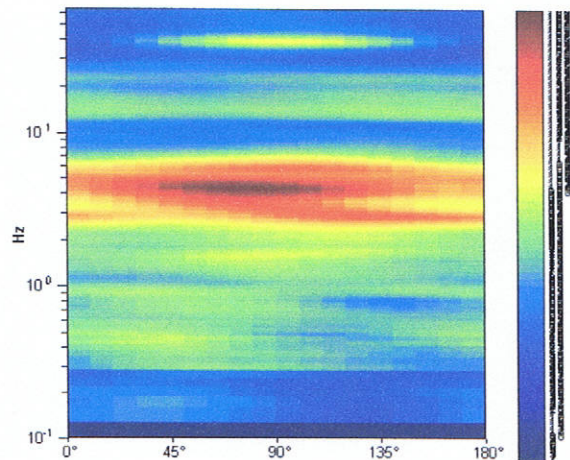
Max. HV at 4.25 ± 0.38 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL HV

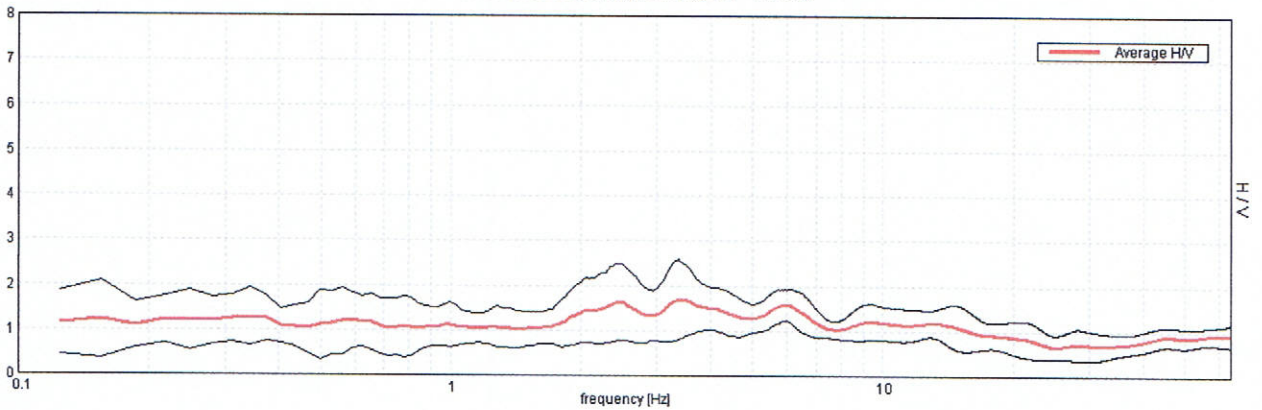


SAVIGNO, 037058P9HVSR9

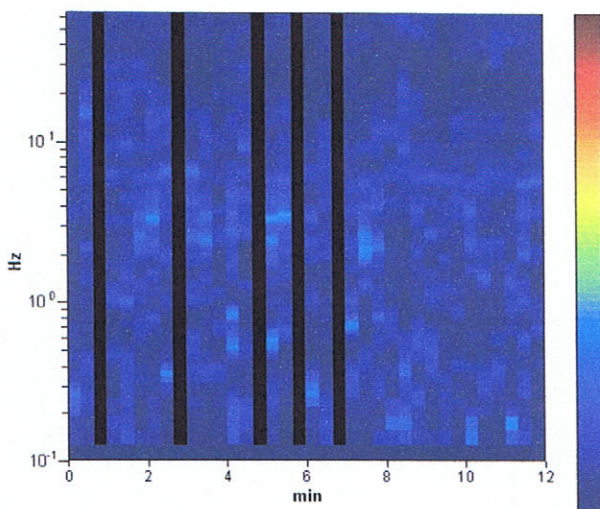
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 13:59:59 End recording: 03/05/13 14:11:59
 Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
 Trace length: 0h12'00". Analyzed 86% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

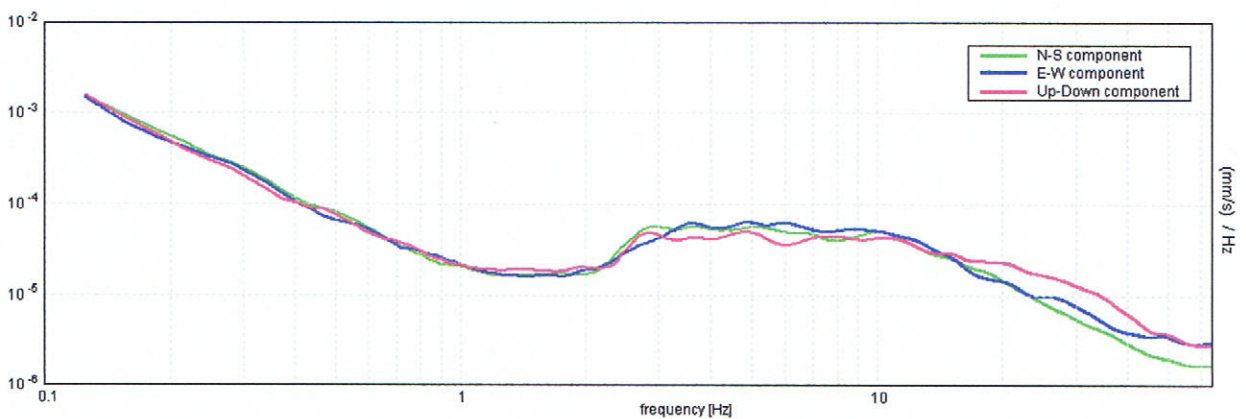
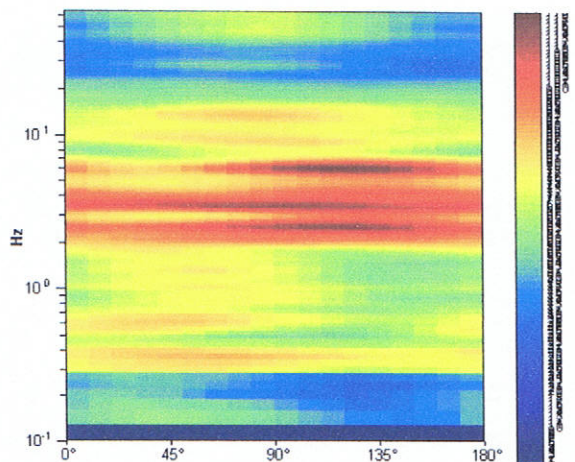
Max. HV at 3.38 ± 0.94 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL HV

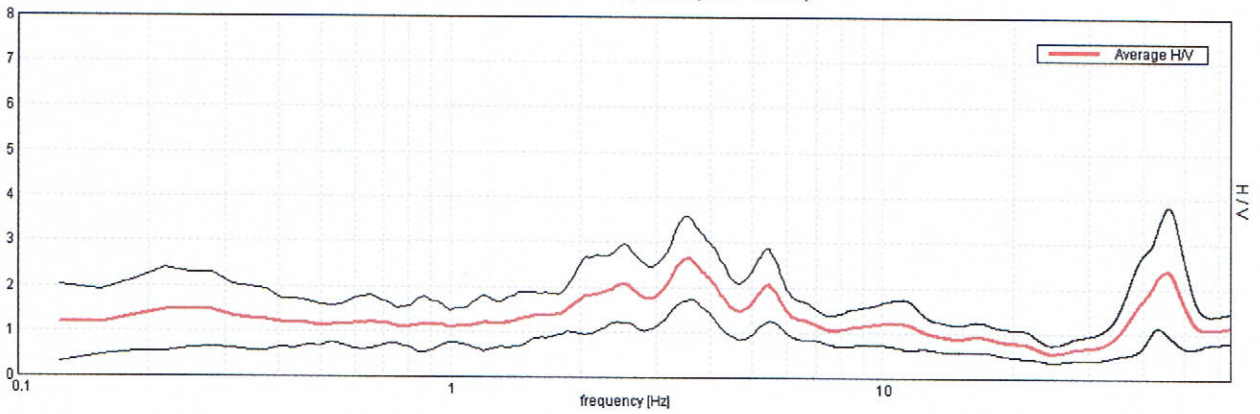


SAVIGNO, 037058P10HVSR10

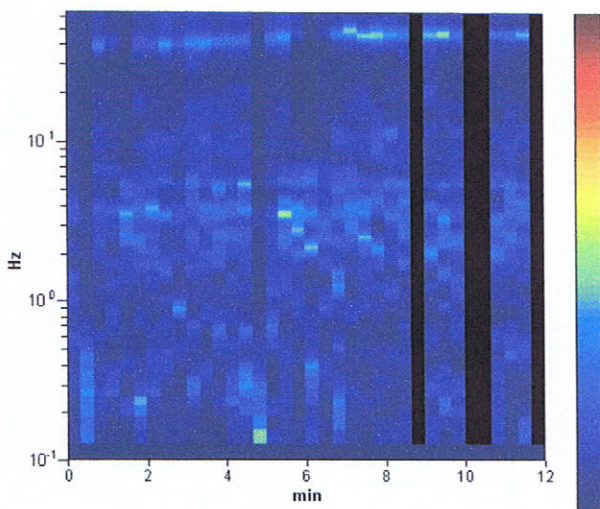
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 14:19:10 End recording: 03/05/13 14:31:11
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 89% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

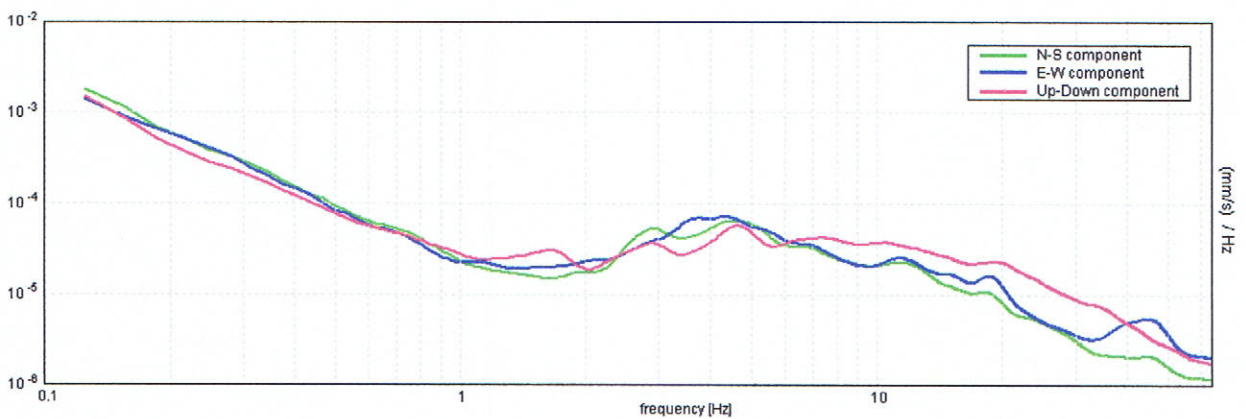
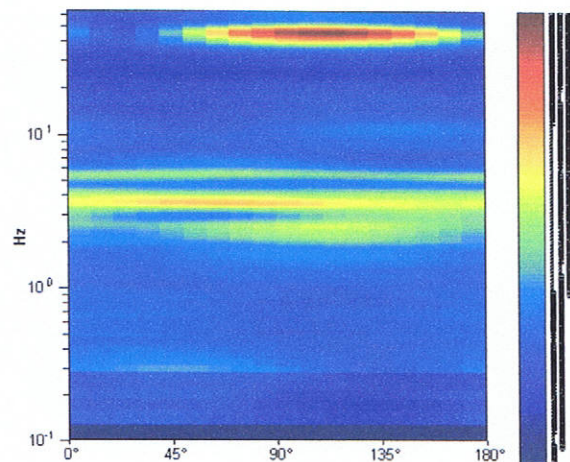
Max. HV at 3.53 ± 0.37 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL HV



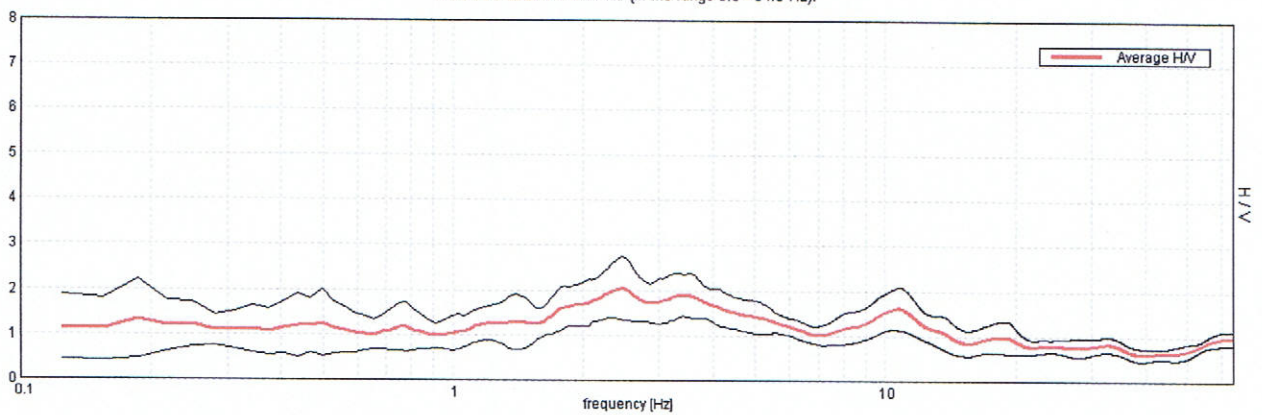
SAVIGNO, 037058P11HVSR11

Instrument: TRZ-0108/01-10
Start recording: 03/05/13 14:36:03 End recording: 03/05/13 14:48:03
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available

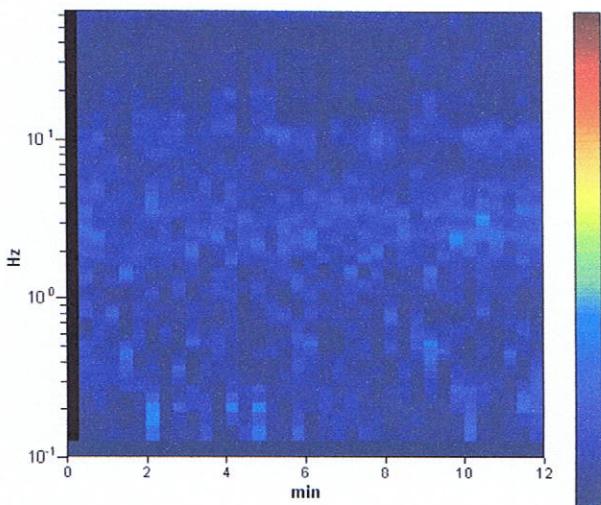
Trace length: 0h12'00". Analyzed 97% trace (manual window selection)
Sampling rate: 128 Hz
Window size: 20 s
Smoothing type: Triangular window
Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

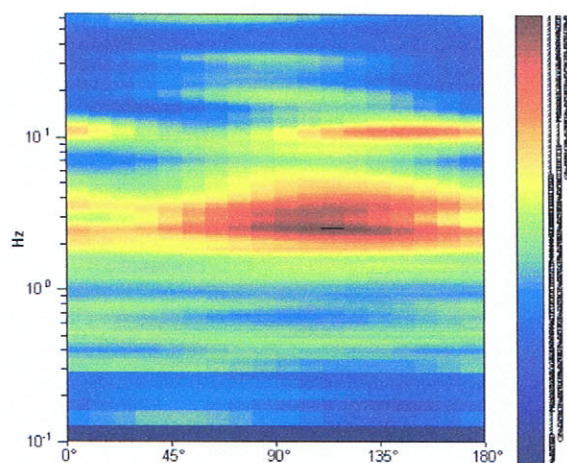
Max. H/V at 2.47 ± 0.11 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

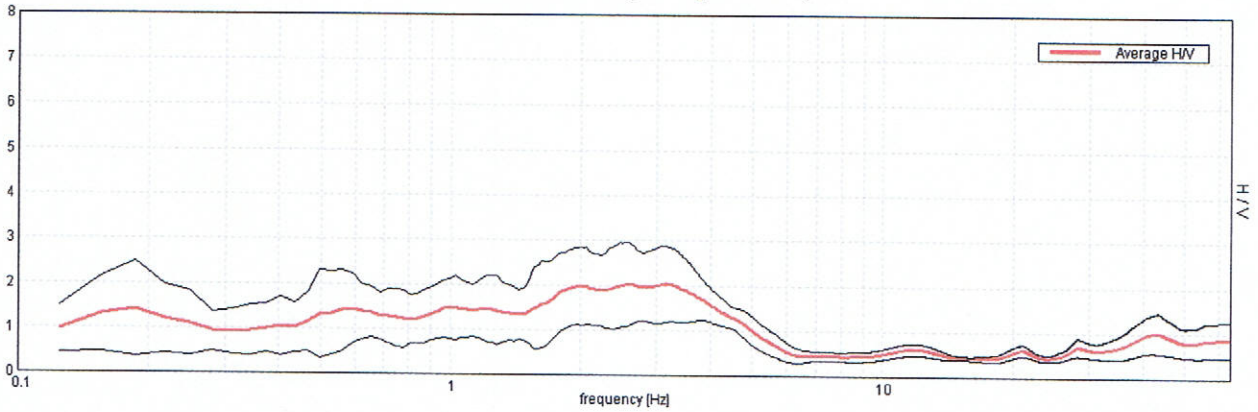


SAVIGNO, 037058P12HVSR12

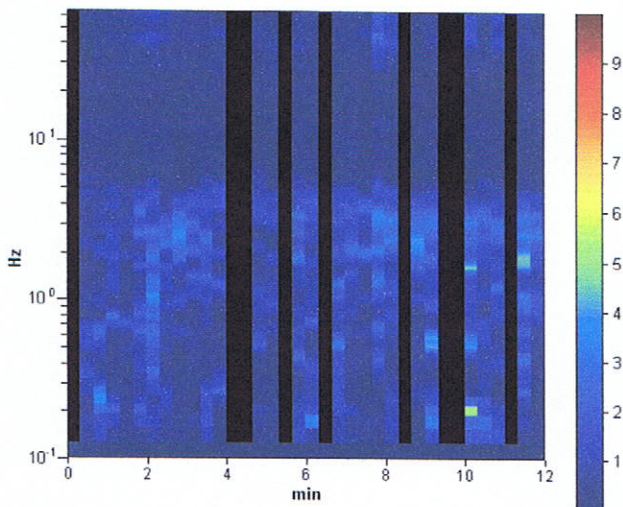
Instrument: TRZ-0108/01-10
Start recording: 03/05/13 14:51:19 End recording: 03/05/13 15:03:20
Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
Trace length: 0h12'00". Analyzed 75% trace (manual window selection)
Sampling rate: 128 Hz
Window size: 20 s
Smoothing type: Triangular window
Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

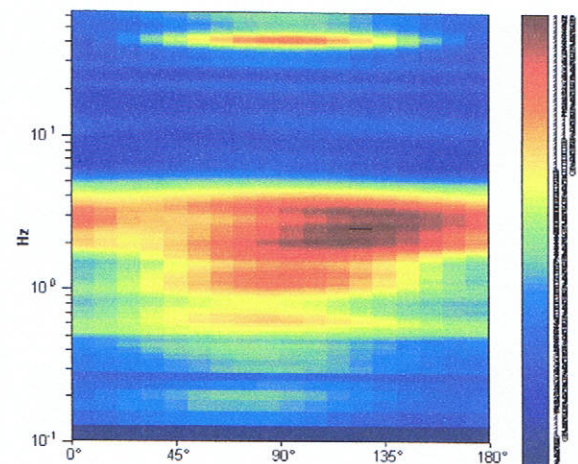
Max. H/V at 3.13 ± 0.61 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

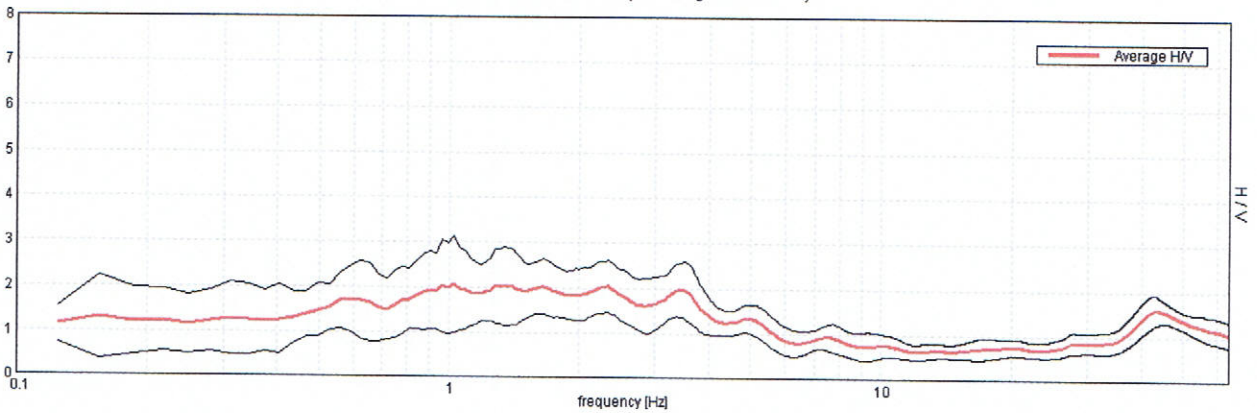


SAVIGNO, 037058P13HVSR13

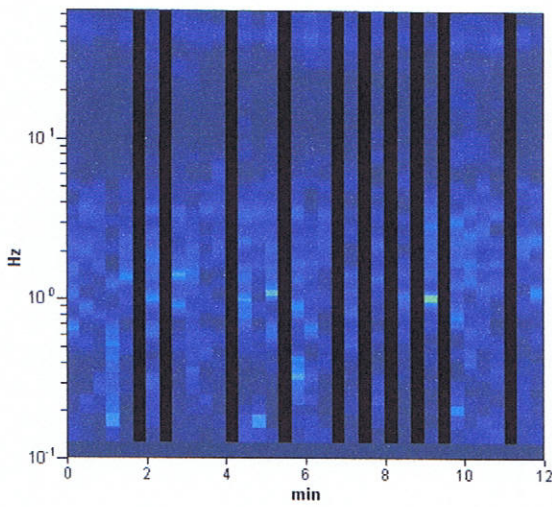
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 15:08:09 End recording: 03/05/13 15:20:10
 Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
 Trace length: 0h12'00". Analyzed 72% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

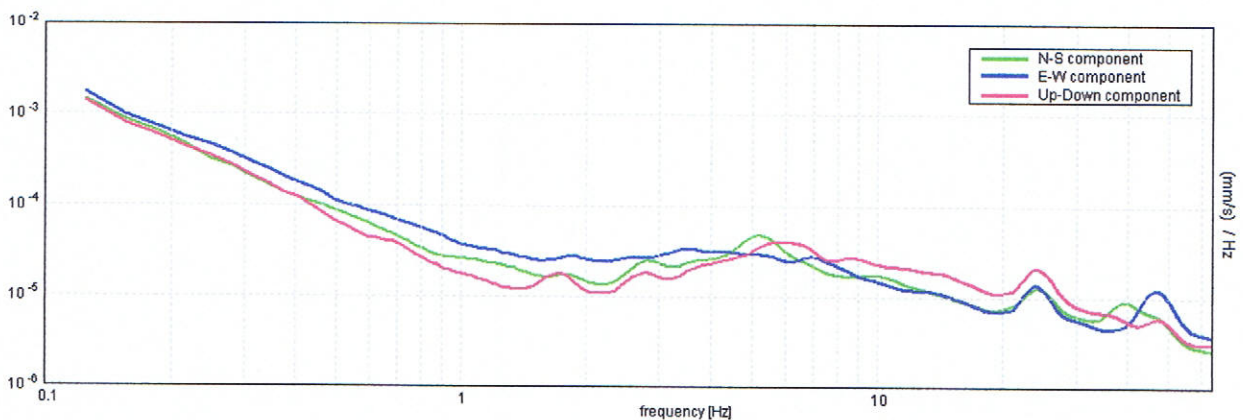
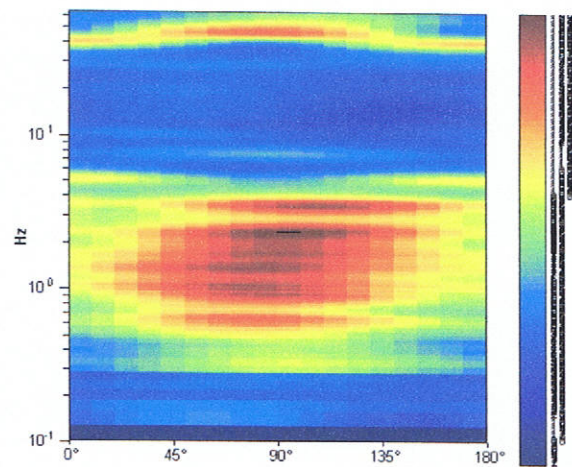
Max. H/V at 1.03 ± 0.18 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

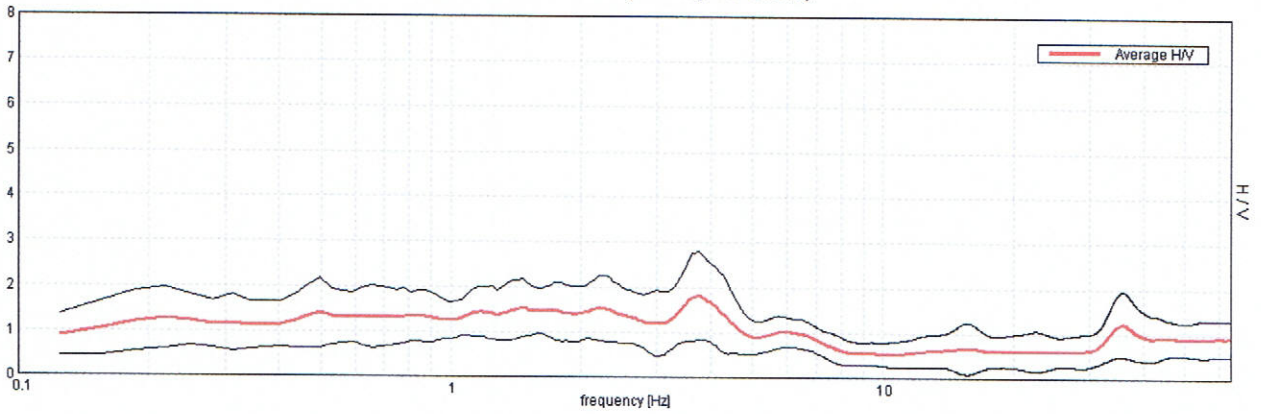


SAVIGNO, 037058P14HVSR14

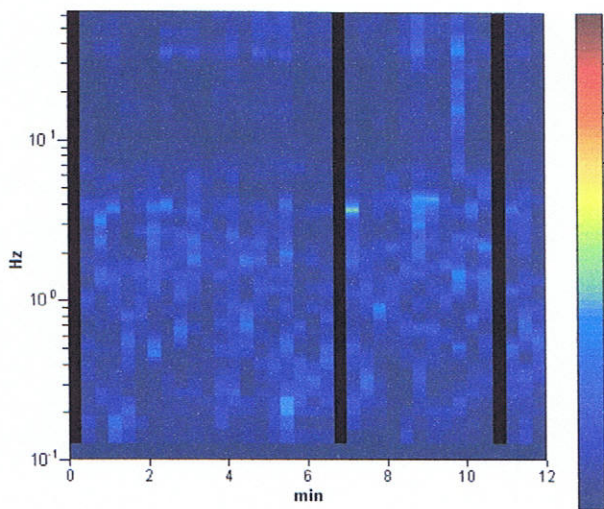
Instrument: TRZ-0108/01-10
 Start recording: 03/05/13 15:56:51 End recording: 03/05/13 16:08:52
 Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
 Trace length: 0h12'00". Analyzed 92% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

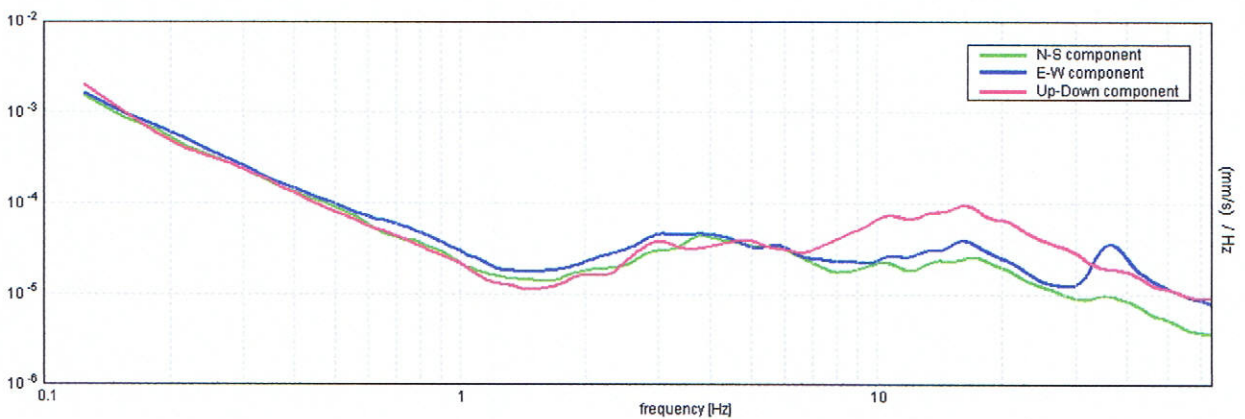
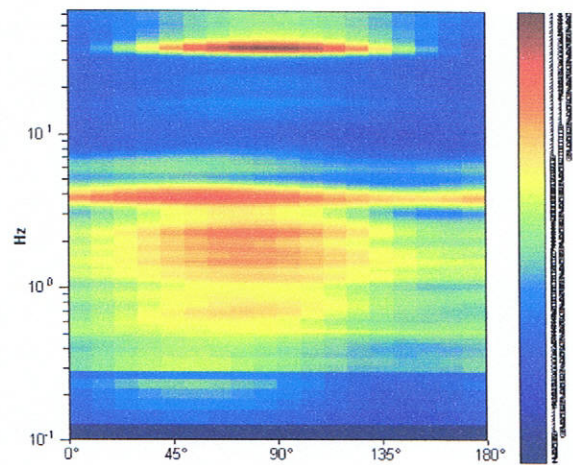
Max. H/V at 3.75 ± 0.18 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



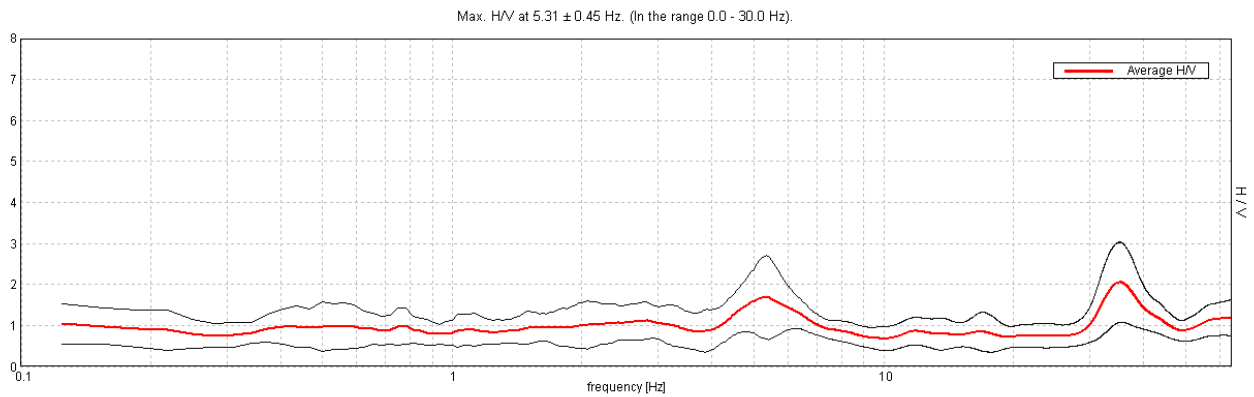
DIRECTIONAL H/V



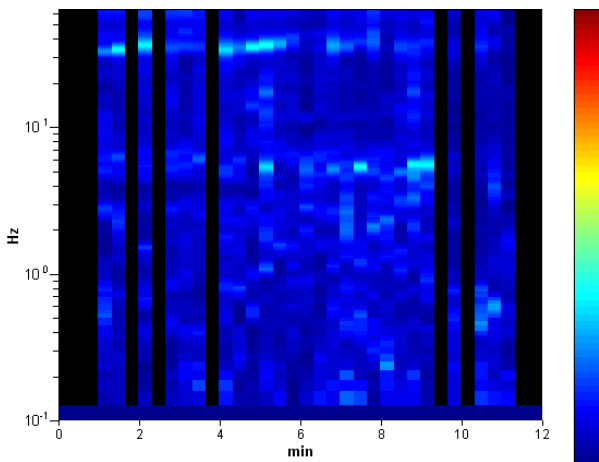
SAVIGNO, 037058P15HVSR15

Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 14:32:06 End recording: 03/05/13 14:44:06
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 72% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

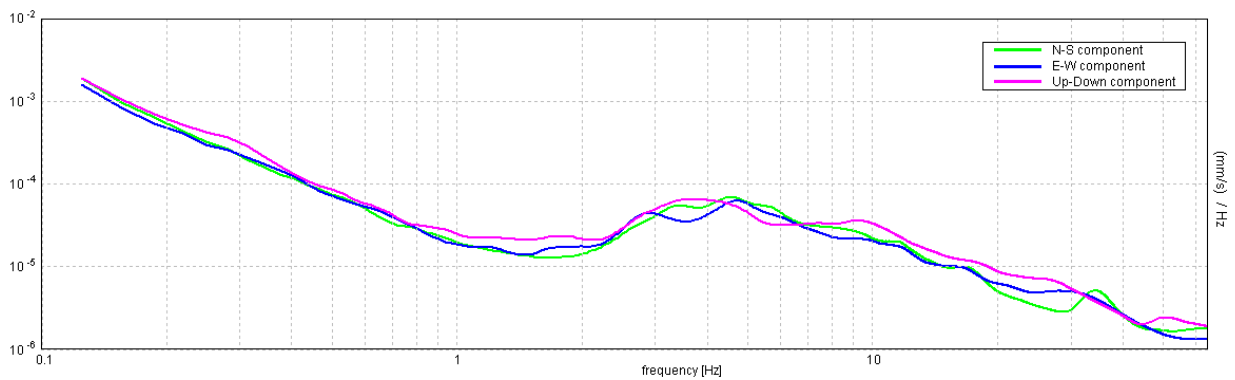
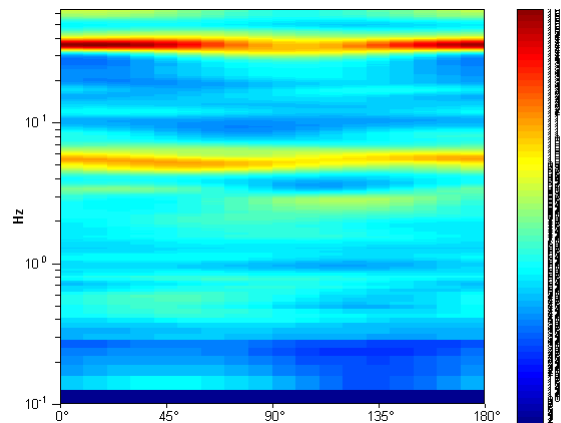
HORIZONTAL TO VERTICAL SPECTRAL RATIO



H/V TIME HISTORY



DIRECTIONAL H/V

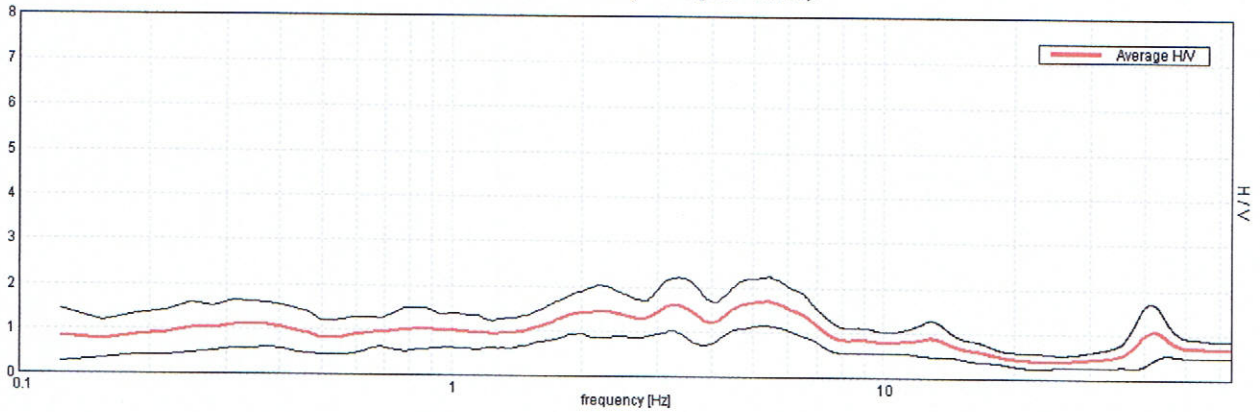


SAVIGNO, 037058P16HVSR16

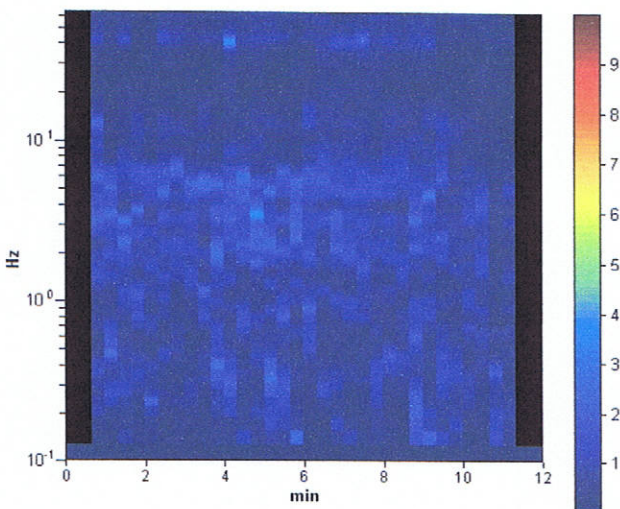
Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 15:06:52 End recording: 03/05/13 15:18:52
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 89% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

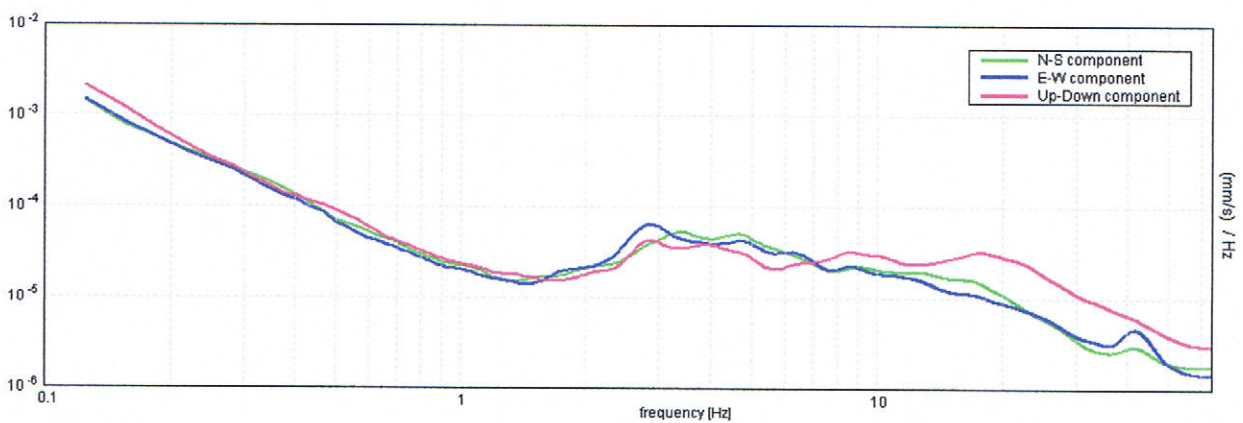
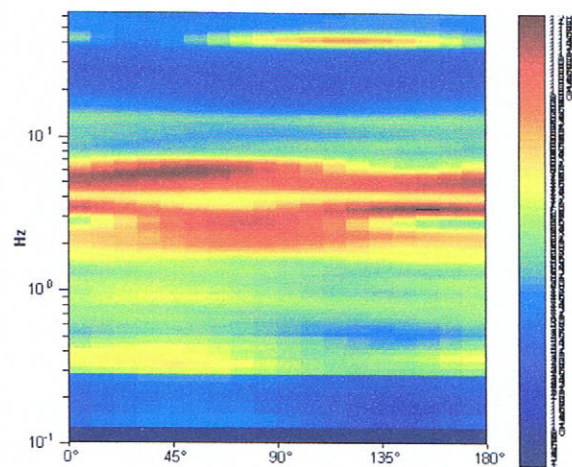
Max. H/V at 5.36 ± 0.58 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

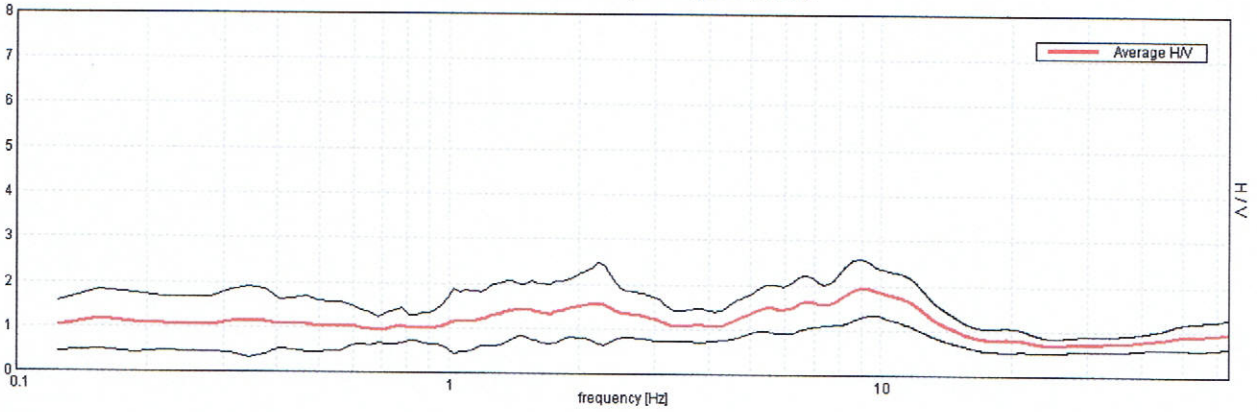


SAVIGNO, 037058P17HVSR17

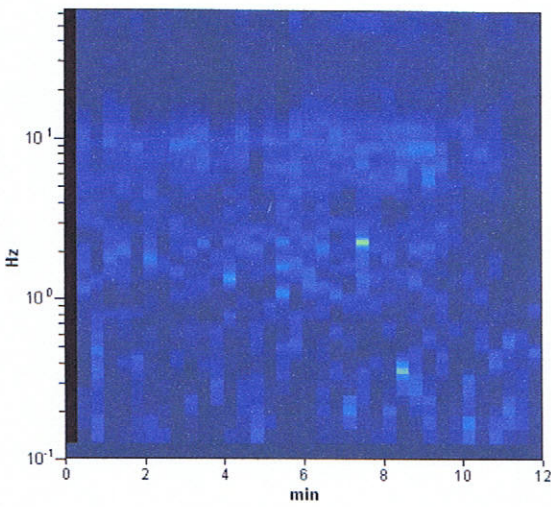
Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 15:23:00 End recording: 03/05/13 15:35:00
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 97% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

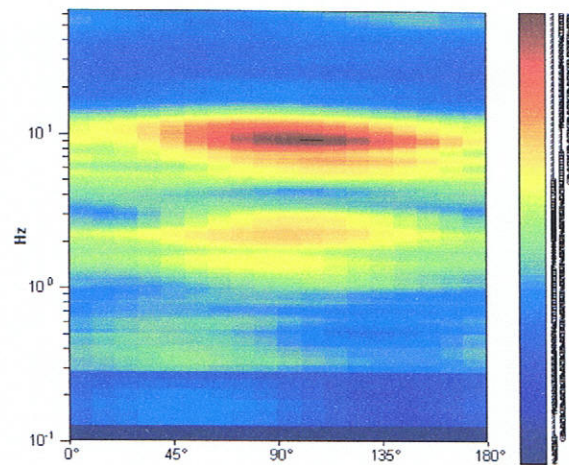
Max. H/V at 9.09 ± 0.79 Hz (in the range 0.0 - 64.0 Hz).



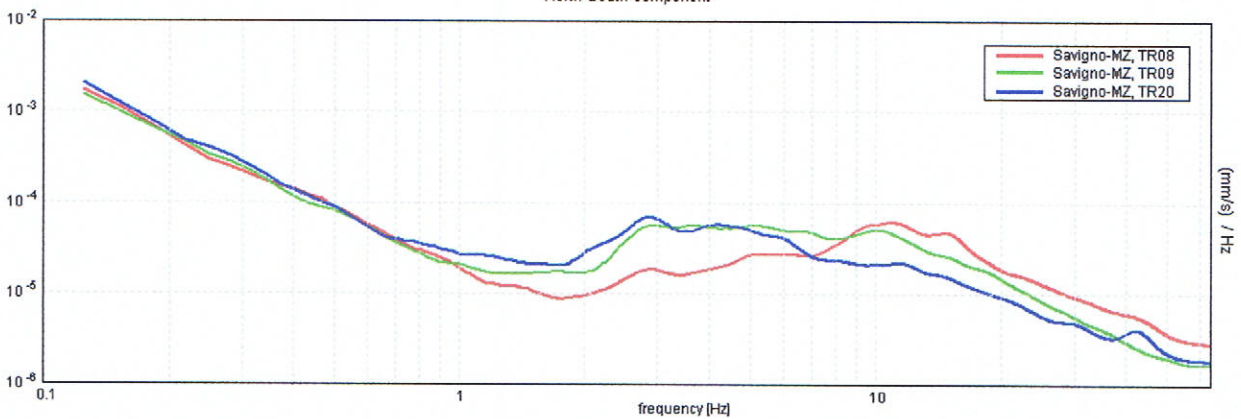
H/V TIME HISTORY



DIRECTIONAL H/V



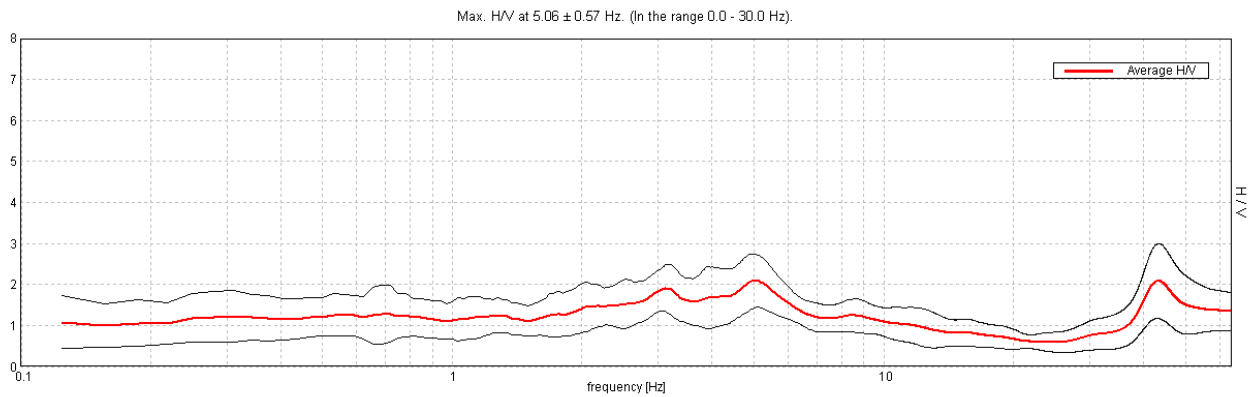
North-South component



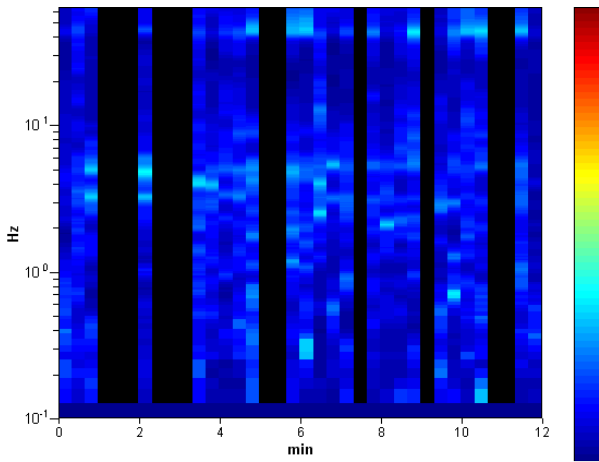
SAVIGNO, 037058P18HVSR18

Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 15:38:59 End recording: 03/05/13 15:50:59
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 67% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

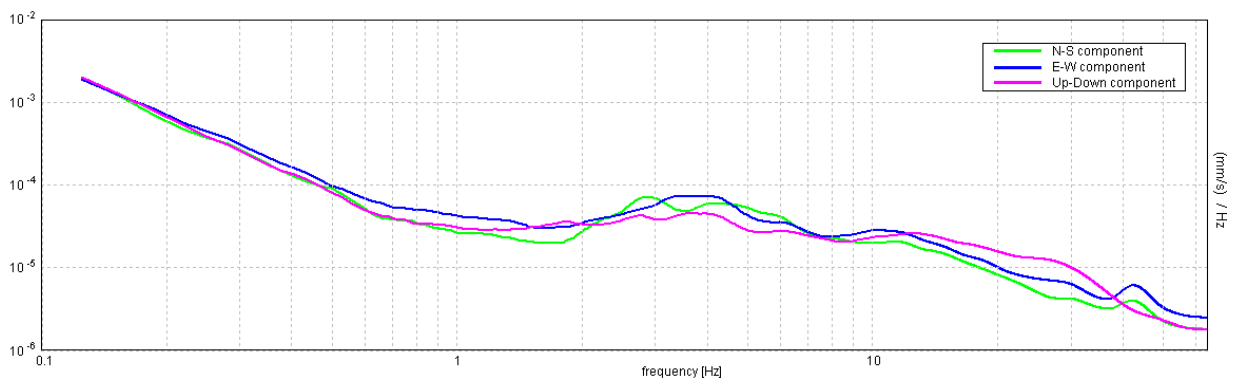
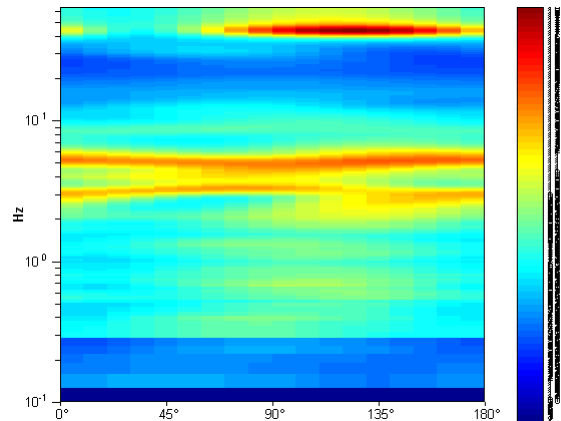
HORIZONTAL TO VERTICAL SPECTRAL RATIO



H/V TIME HISTORY



DIRECTIONAL H/V

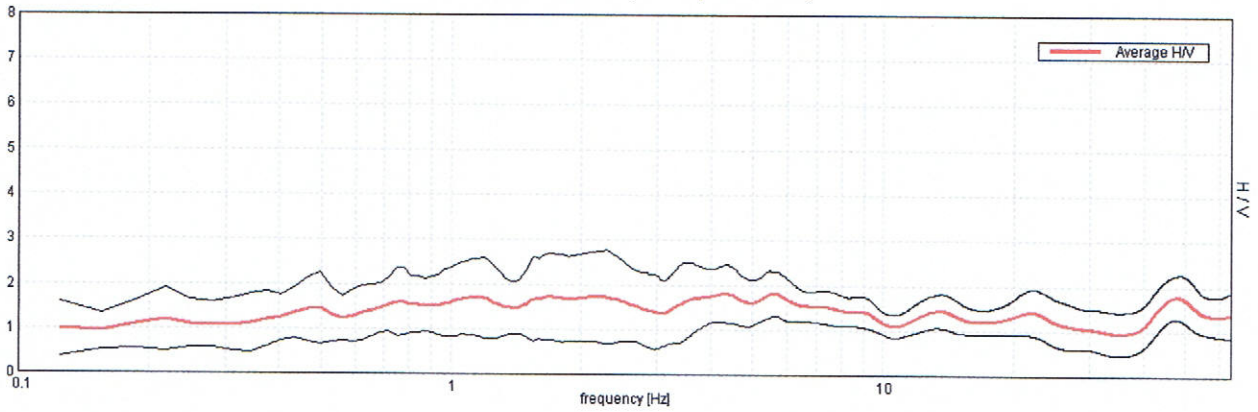


SAVIGNO, 037058P19HVSR19

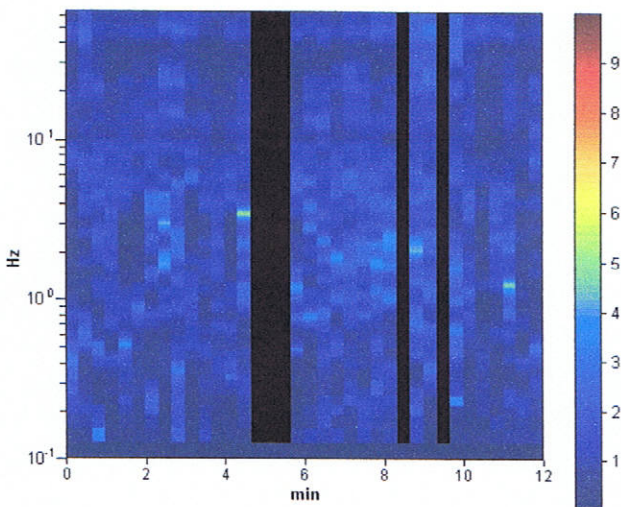
Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 15:55:00 End recording: 03/05/13 16:07:00
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 86% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

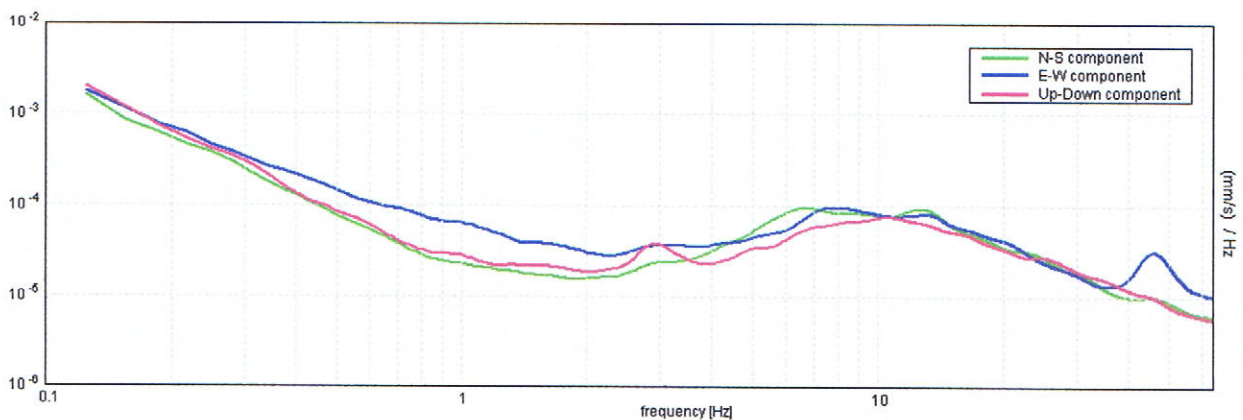
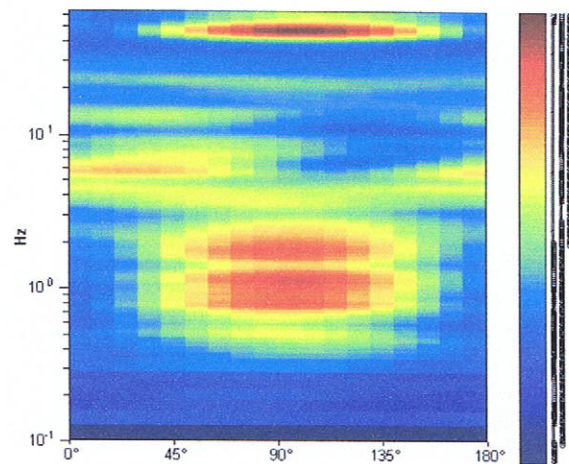
Max. H/V at 4.38 ± 0.76 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

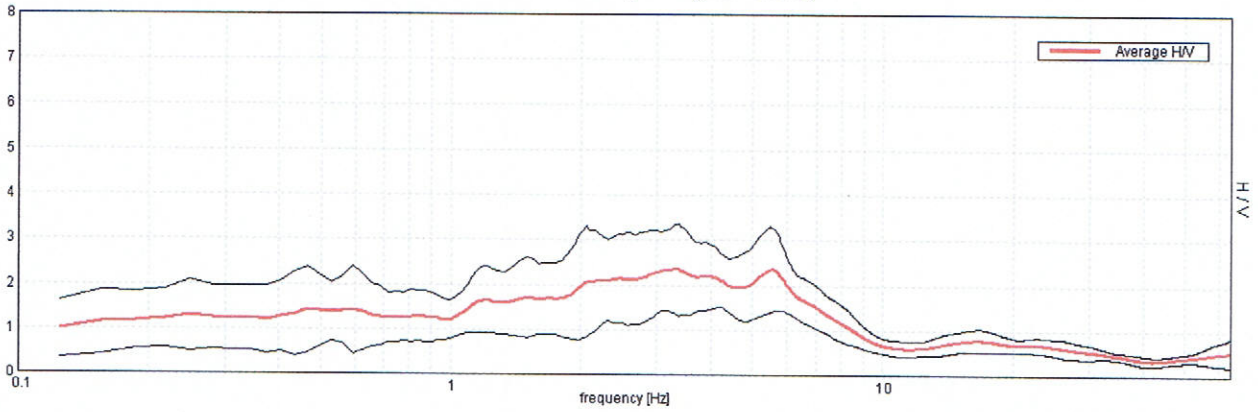


SAVIGNO, 037058P20HVSR20

Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 16:11:32 End recording: 03/05/13 16:23:32
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 69% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

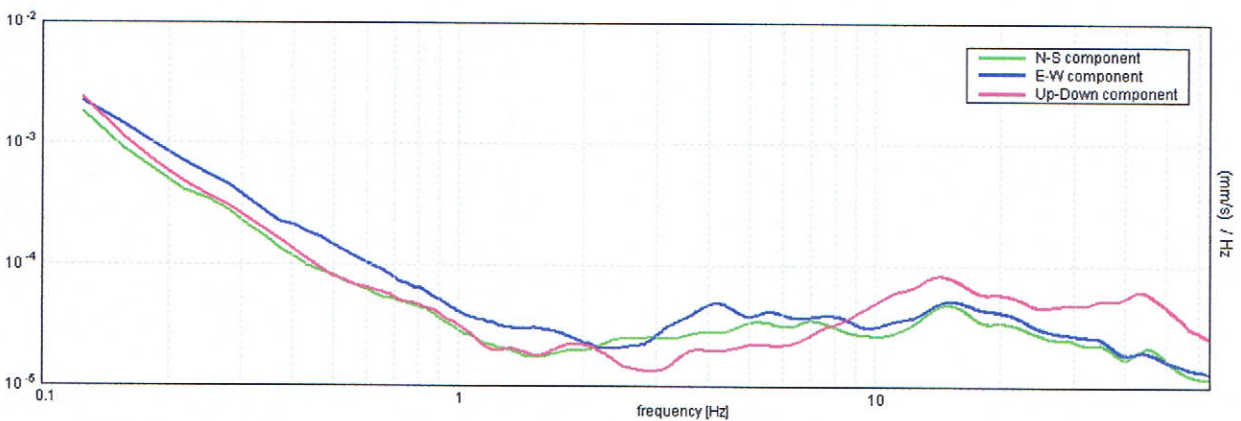
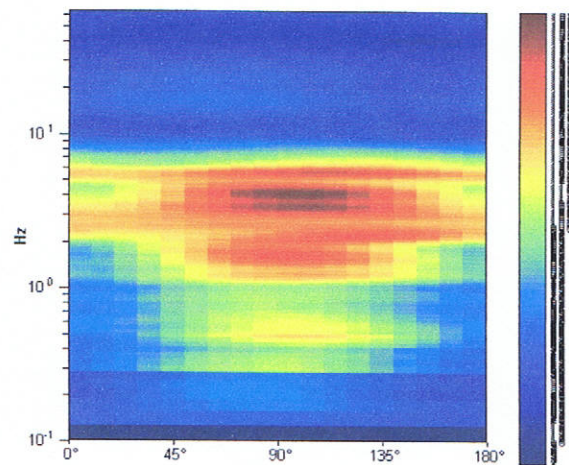
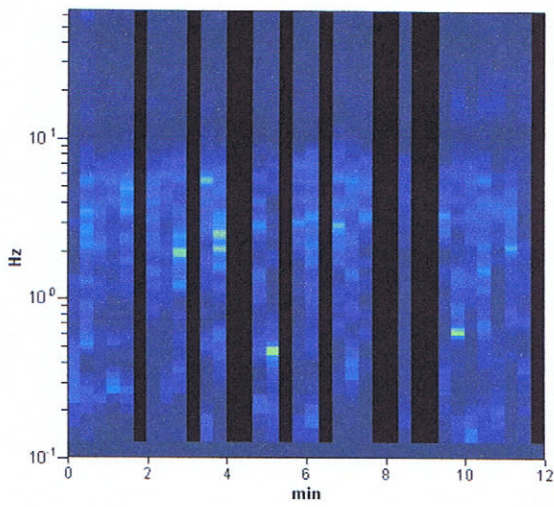
HORIZONTAL TO VERTICAL SPECTRAL RATIO

Max. H/V at 5.47 ± 0.81 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY

DIRECTIONAL H/V

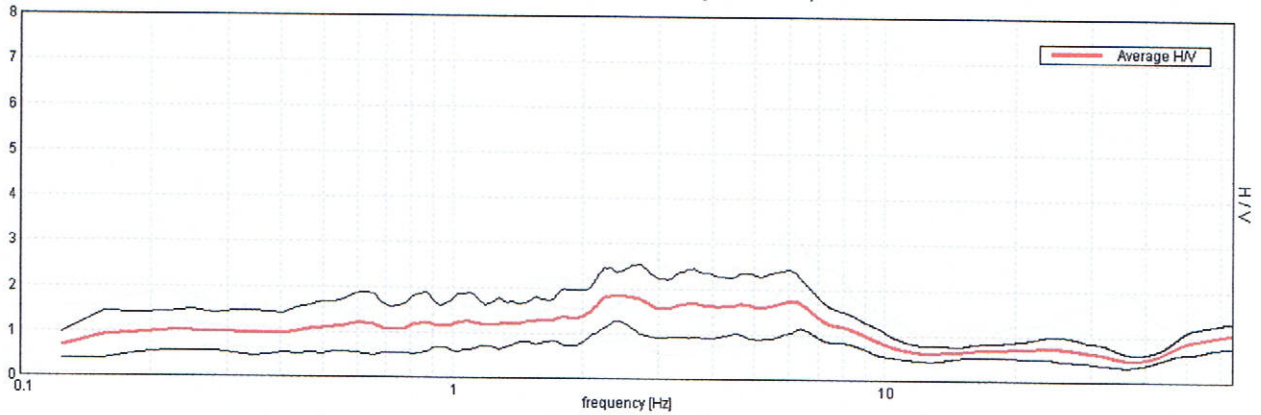


SAVIGNO, 037058P21HVSR21

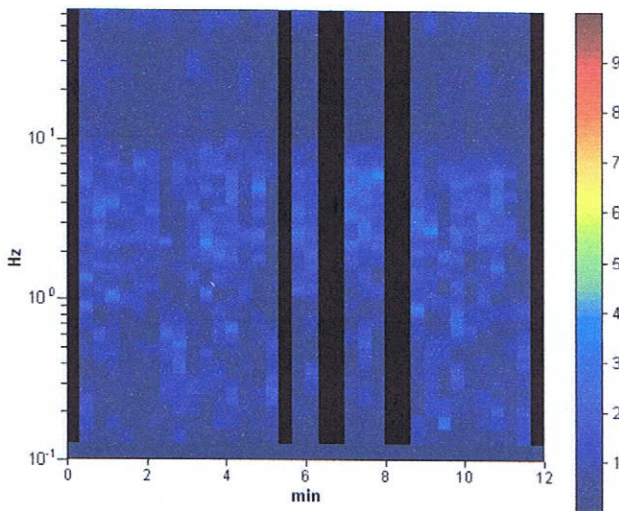
Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 16:26:20 End recording: 03/05/13 16:38:20
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 81% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

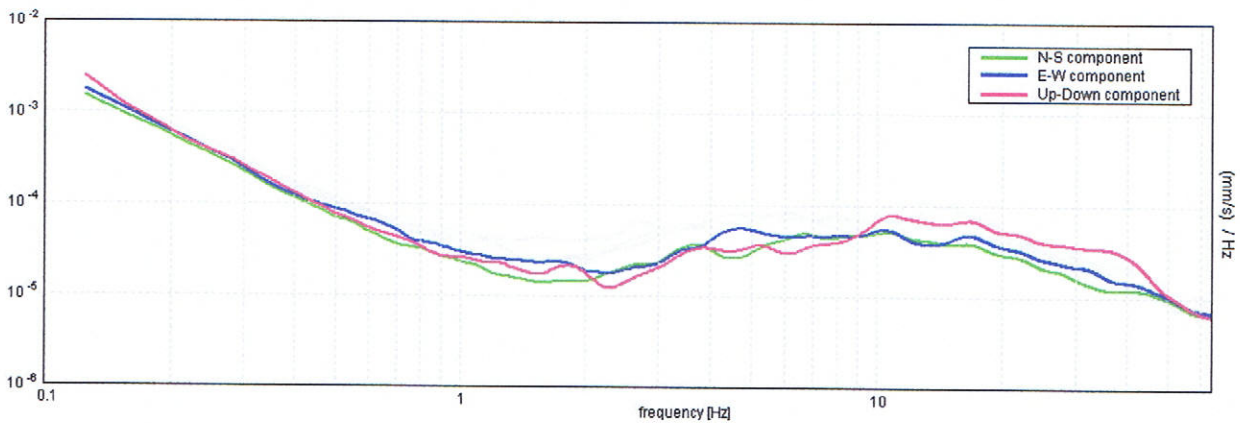
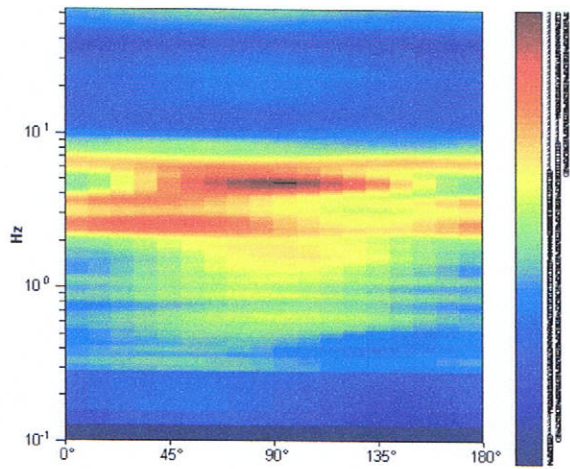
Max. H/V at 2.34 ± 0.25 Hz. (In the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V

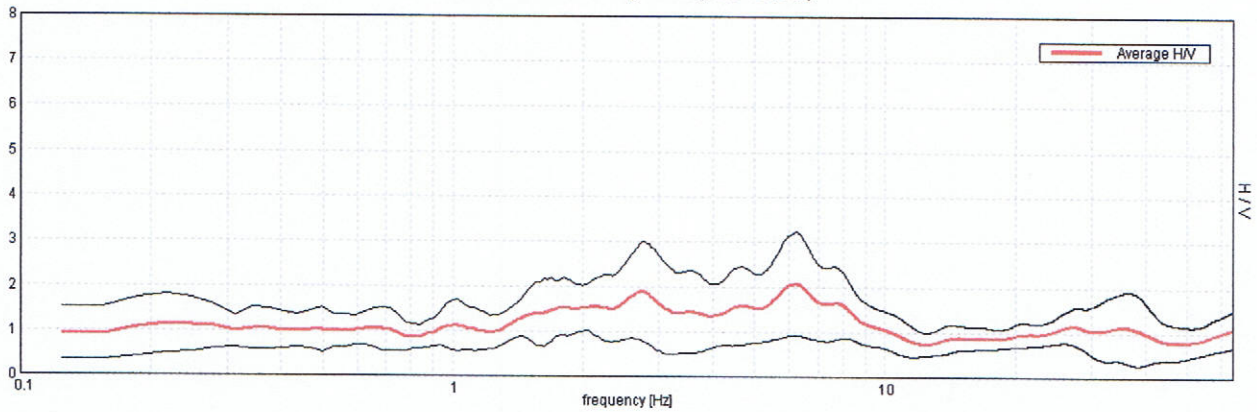


SAVIGNO, 037058P22HVSR22

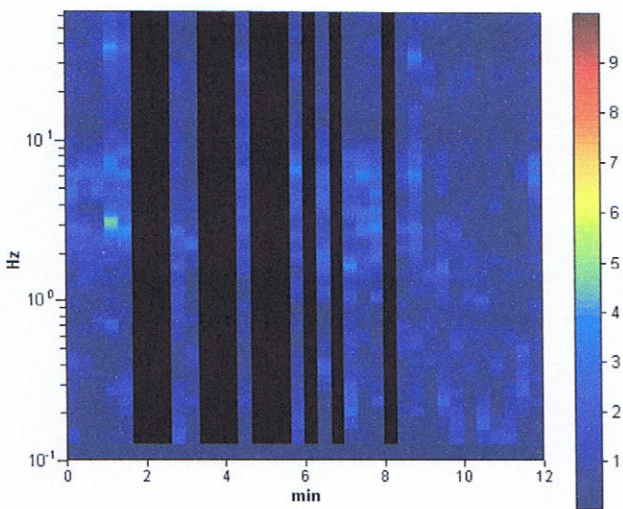
Instrument: TRZ-0153/01-11
 Start recording: 03/05/13 16:46:07 End recording: 03/05/13 16:58:07
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 67% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

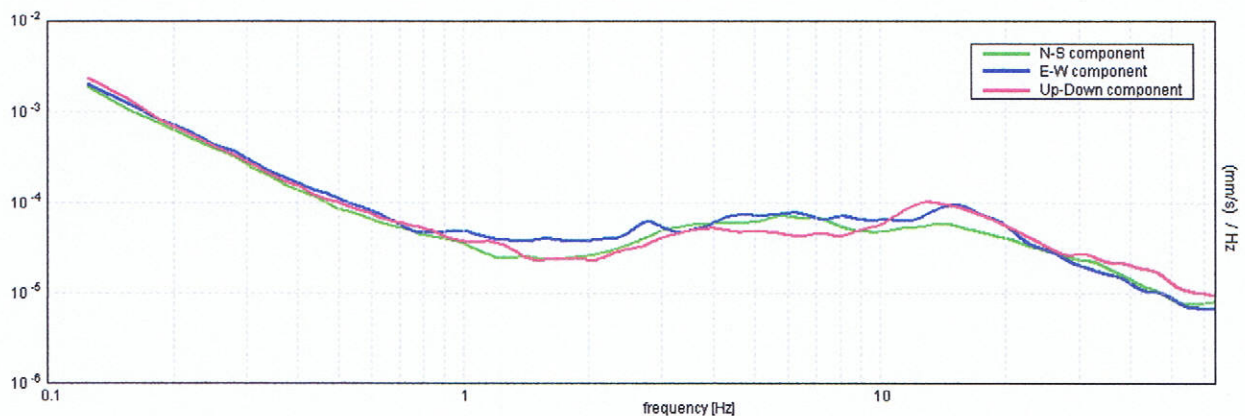
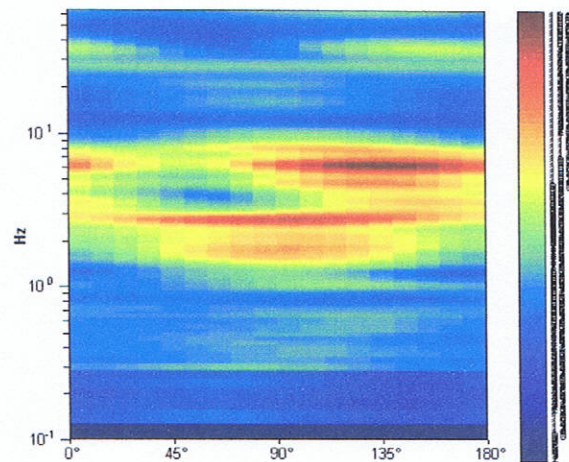
Max. HVV at 6.22 ± 0.55 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V



PROVA PENETROMETRICA DINAMICA 037058P23DP23

Strumento utilizzato... DPSH TG 63-200 PAGANI

DIAGRAMMA NUMERO COLPI PUNTA-Rpd

Committente :

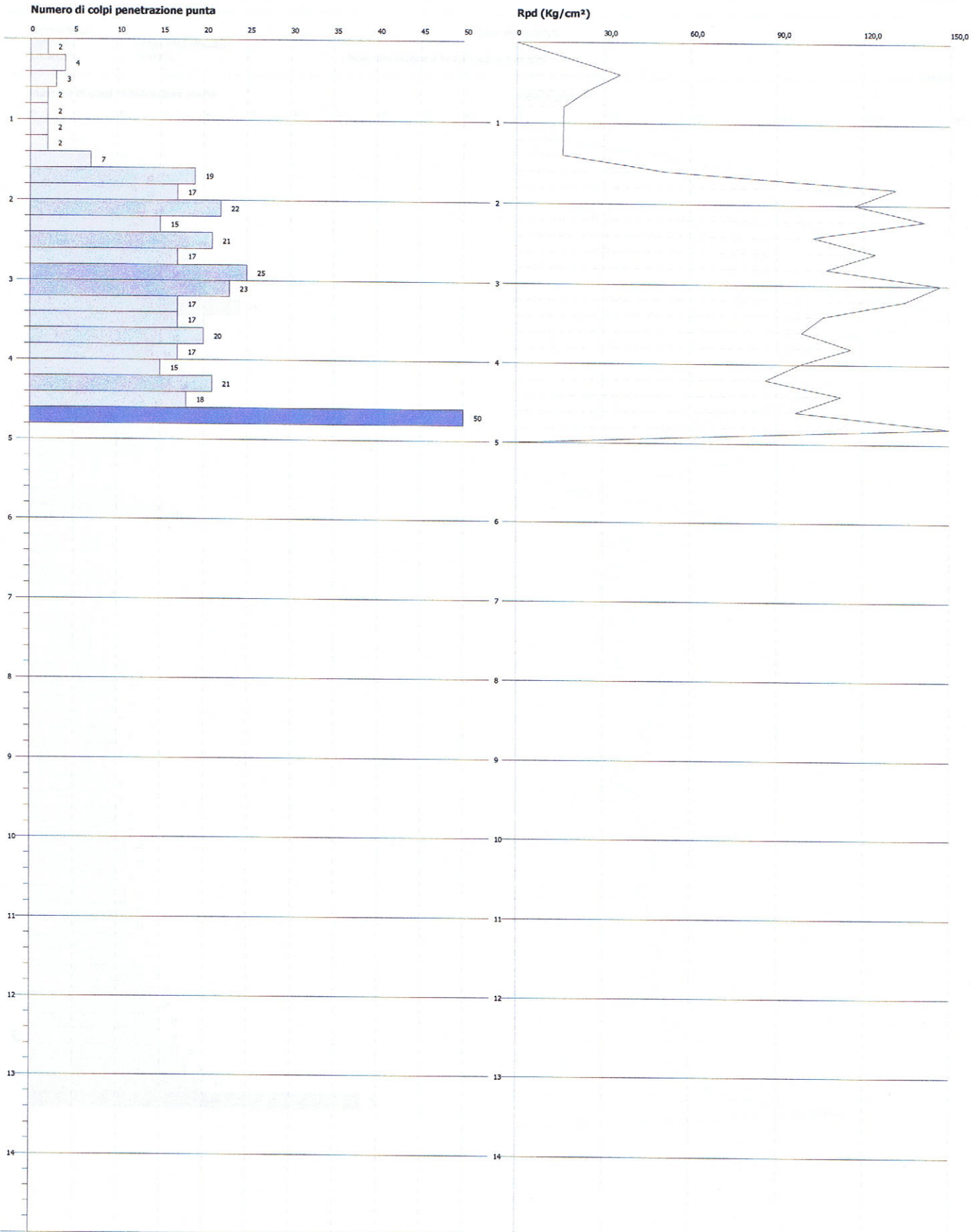
Cantiere : DPSH VALSAMOGGIA

Località : Savigno

Data :09/05/2013

falda: foro occluso a m 4,30 acqua a m 3,80

Scala 1:66



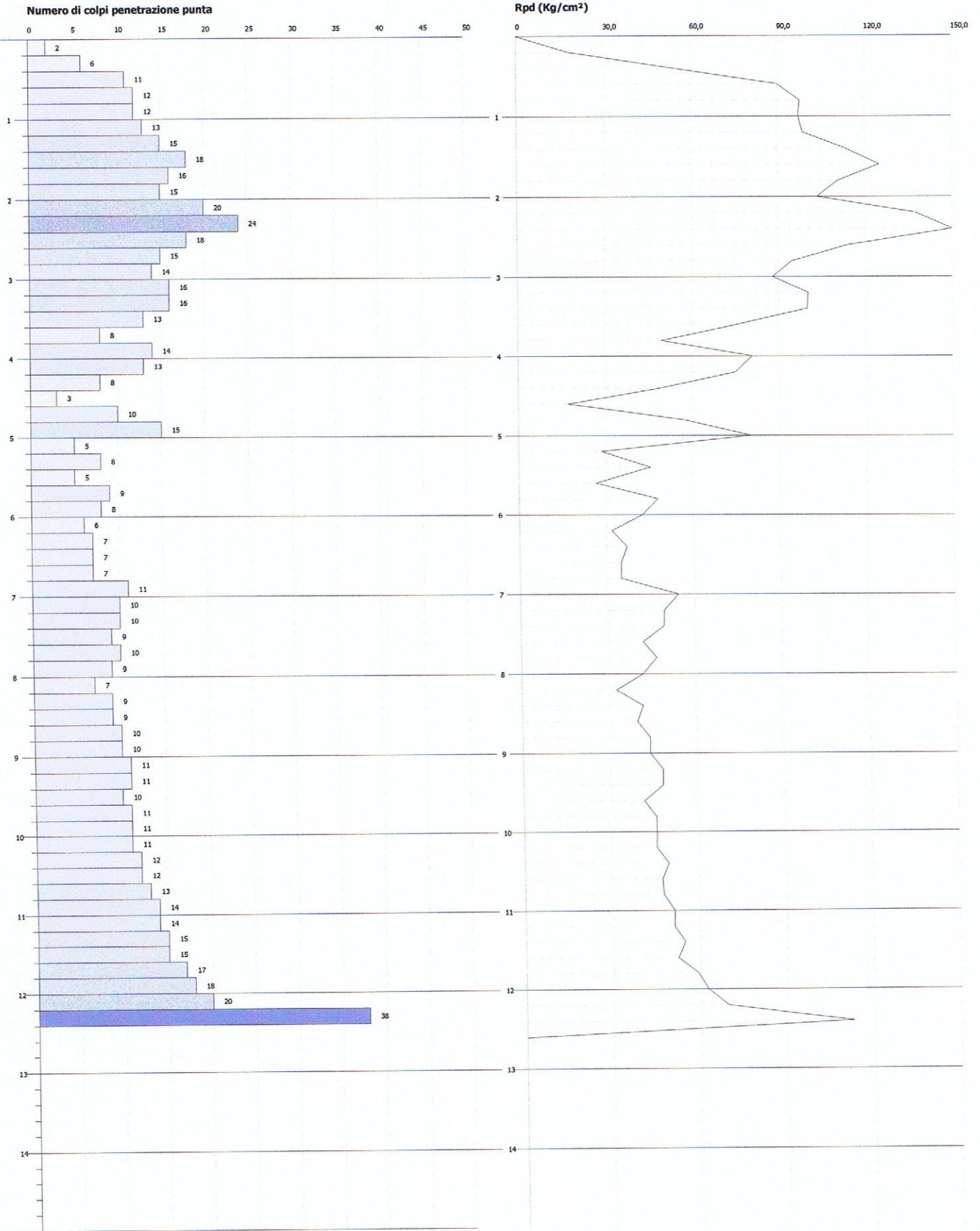
PROVA PENETROMETRICA DINAMICA 037058P24DP24
Strumento utilizzato... DPSH TG 63-200 PAGANI
DIAGRAMMA NUMERO COLPI PUNTA-Rpd

Committente :
 Cantiere : DPSH VALSAMOGGIA
 Località : Savigno

Data : 09/05/2013

falda: foro occluso a m 2,60 acqua a m 2,50

Scala 1:66



037058P25CPT25

GEO-PROBE S.r.l. Indagini Geognostiche

GEO-PROBE S.r.l.

- Indagini Geognostiche

40033 CASALECCHIO DI R.

Via Cimara, 119 - Tel. 051/61

CPT (CONE PENETRATION TEST)

Comuni Valle Samoggia

Prova da 100 KN

Prova da 100 KN

N. 4

Rapporto di Prova N°

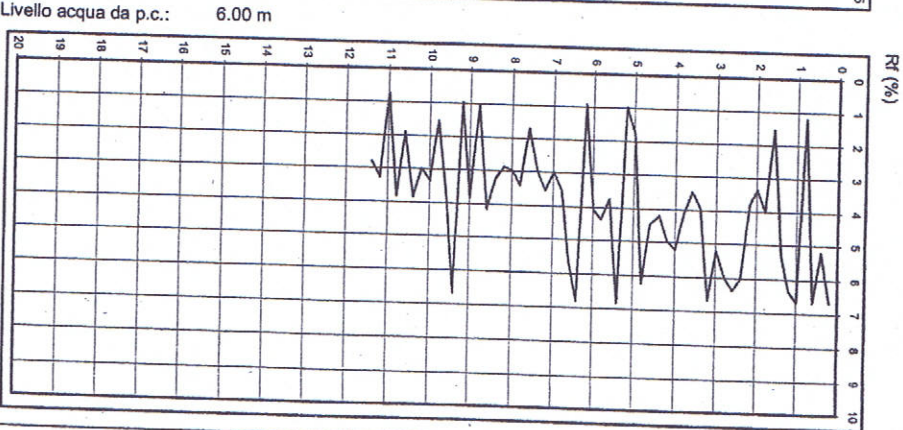
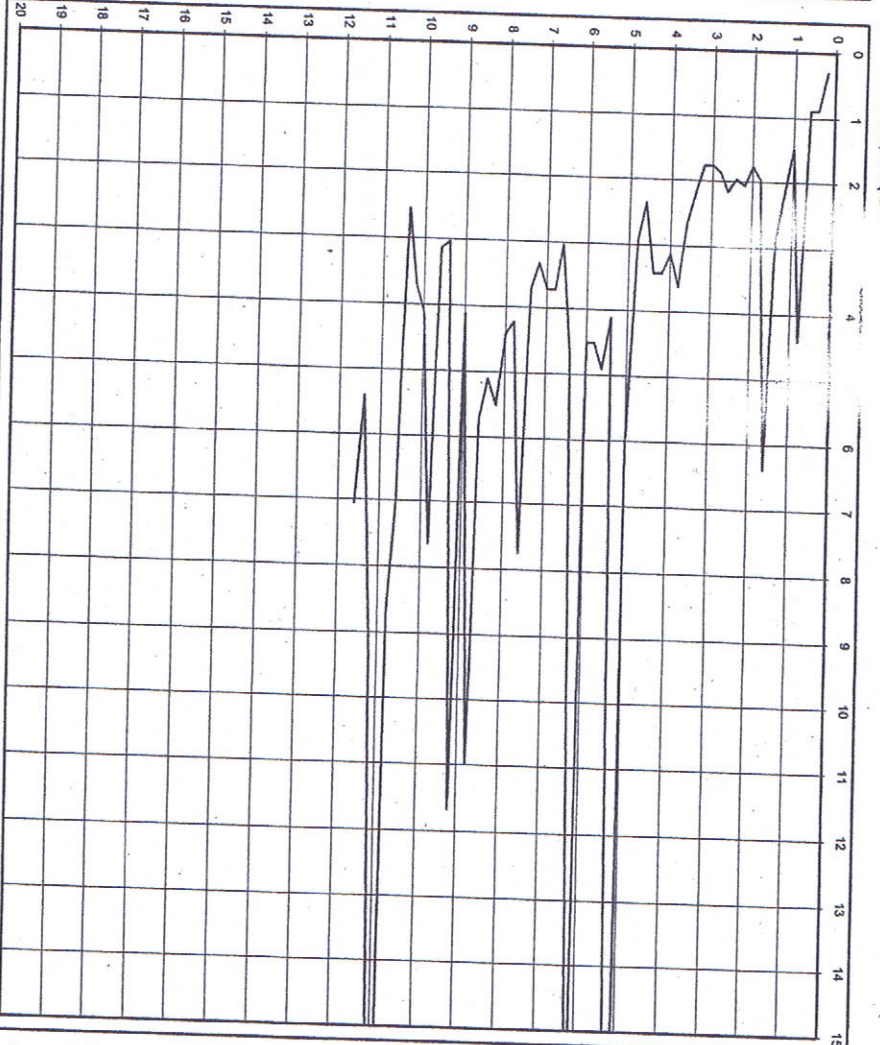
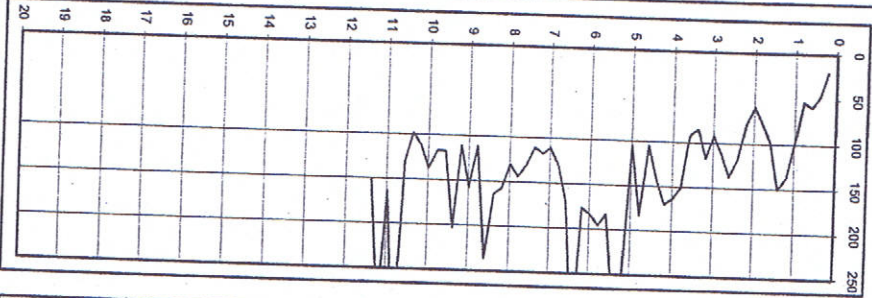
10.0105 /RSP

Quota:

Data prova: 16/02/2010

Codice lavoro: 2010.015

Titolo: _____
 Località: _____
 Altro: _____



Livello acqua da p.c.: 6.00 m

Note: ---

Procedura di prova	Normativa di riferimento	Rev.	Data emissione	Sperimentatore	Il Direttore di Laboratorio
---	---	0	16/02/2010	Dr. Chelli	Dr. Luca Conti

GEO-PROBE s.r.l.

40033 Casalecchio di Reno (BO)
Via Cimarosa, 119 - Tel. 051/61.33.072
P.I. 04135500371

DPSH 3

Data prova: 29/01/2010
Quota ---
Codice lavoro: 2010.015

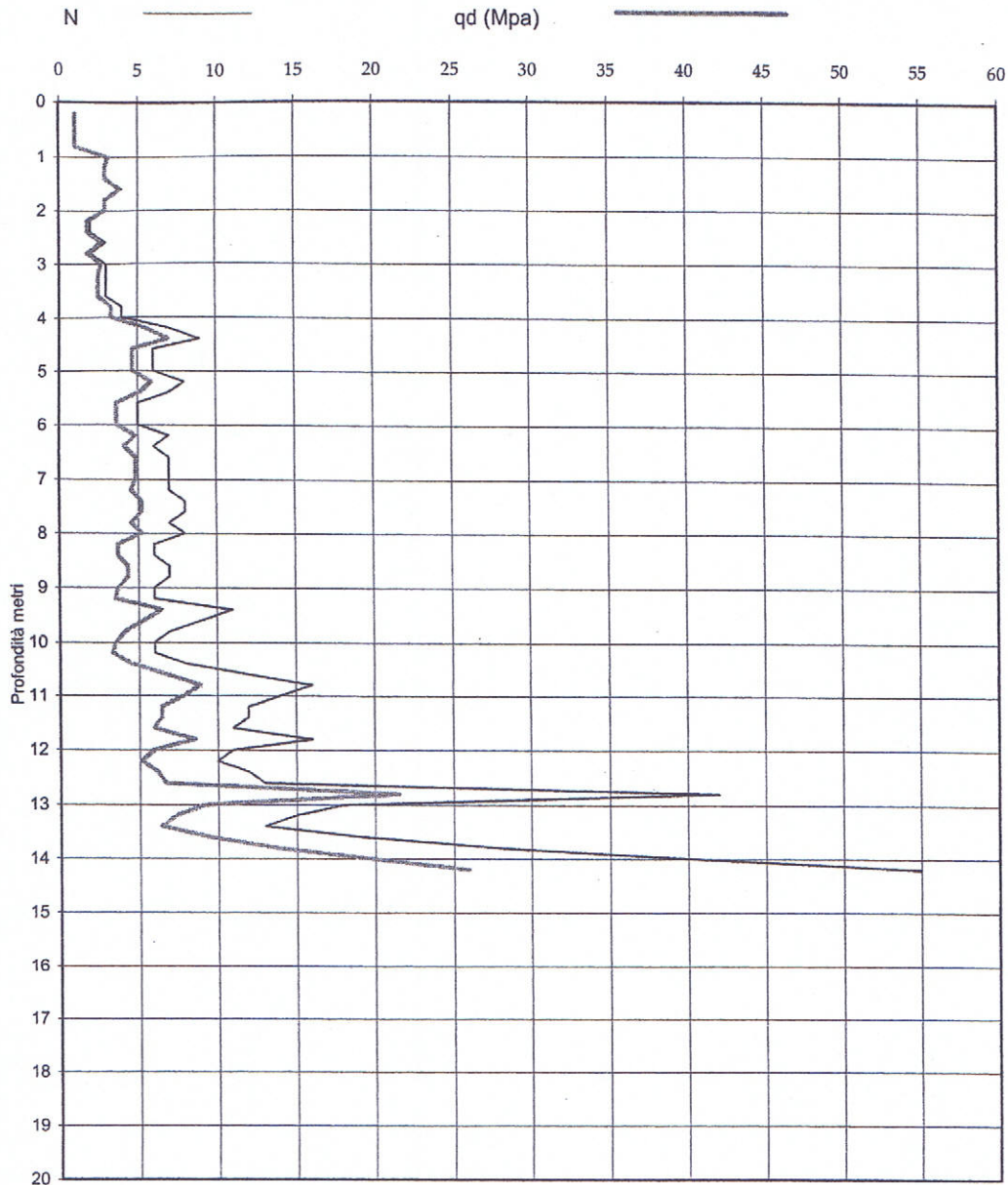
Committente: Unione Comuni Valle Samoggia

Rapporto di prova N. 10.0069 /RSP

Località: Savigno (BO)

Cà Bortolani

Attrezzatura: Penetrometro dinamico Emilia-DPSH



GEO-PROBE S.r.l. Indagini Geognostiche

Profondità acqua da p.c. : 2.70 m

Note: ---

Procedure di prova	Rapporto di prova N°	Rev.	Data emissione	Sperimentatore	Il Direttore di Laboratorio
---	10.0069 /RSP	0	29/01/2010	Dr. Chelli	Dr. Luca Conti

037058 P26 DP27

2010

Relazione geologica – Ampliamento scuola materna Casa Bortolani- Progetto esecutivo

GEO-PROBE S.r.l.

DPSH 2

40033 Casalecchio di Reno (BO)
Via Cimarsa, 119 - Tel. 051/61.33.072
P.I. 04135500371

Data prova: 29/01/2010
Quota ---
Codice lavoro: 2010.015

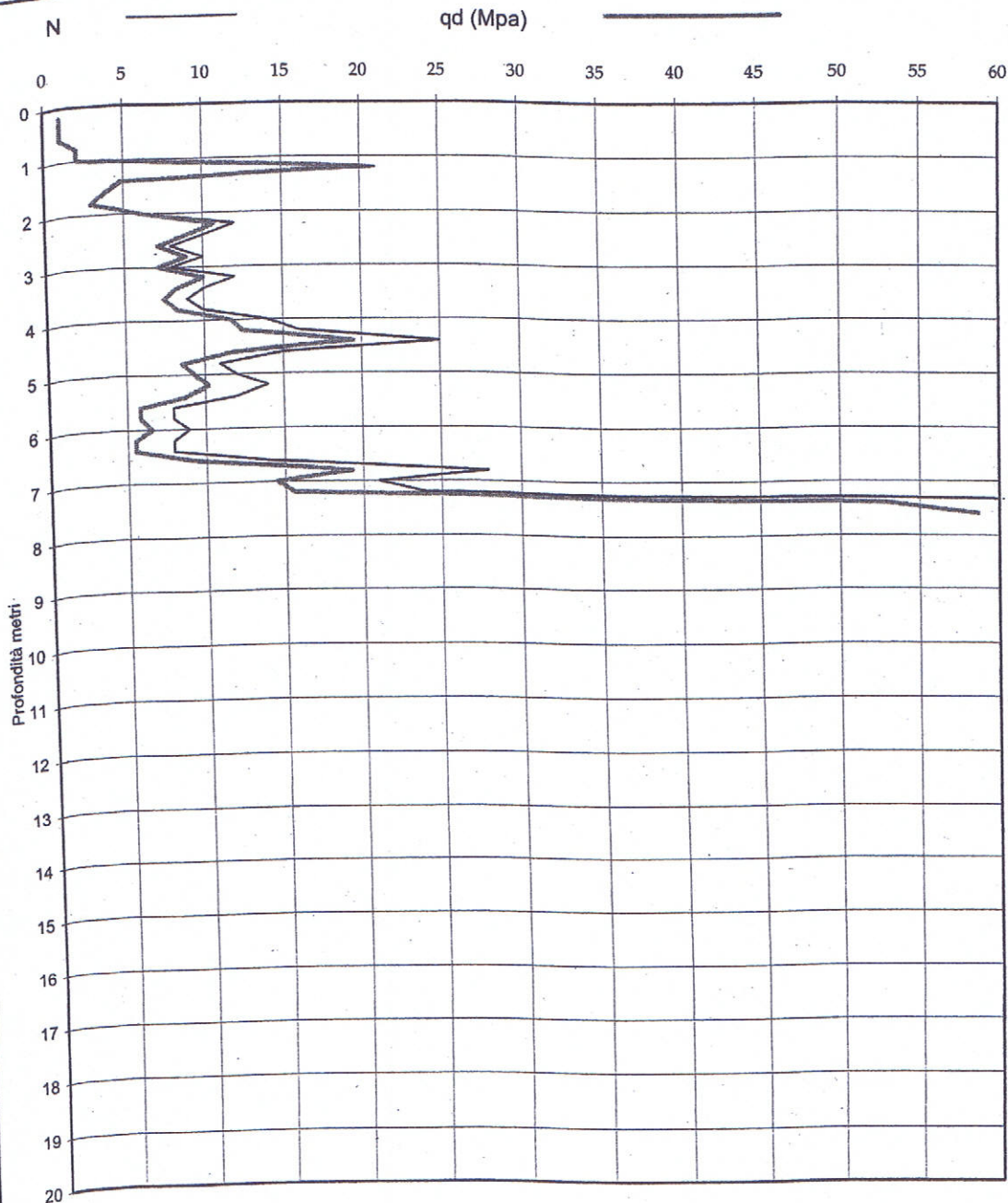
Committente: Unione Comuni Valle Samoggia

Rapporto di prova N. 10.0068 /RSP

Località: Savigno (BO)

Cà Bortolani

Attrezzatura: Penetrometro dinamico Emilia-DPSH



GEO-PROBE S.r.l. Indagini Geognostiche

Profondità acqua da p.c. : foro chiuso a 1.86 m

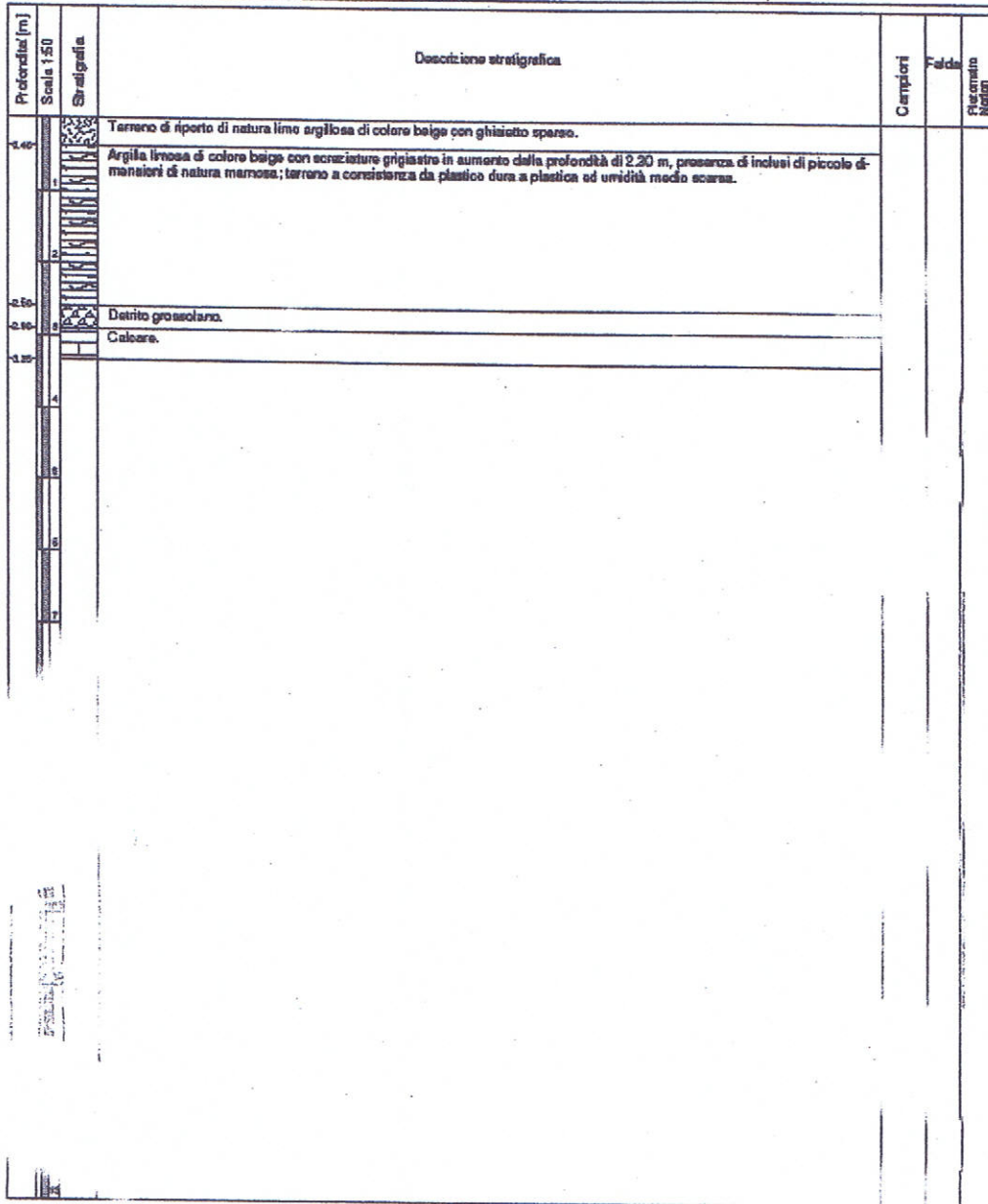
Note: ---

Procedure di prova	Rapporto di prova N°	Rev.	Data emissione	Sperimentatore	Il Direttore di Laboratorio
---	10.0068 /RSP	0	29/01/2010	Dr. Tabarroni	Dr. Luca Conti

037058 P27SD28

MOD.0 RSP STRAT (Rev. 0 del 12/09)

GEO-PROBE s.r.l. Indagini Geognostiche 40033 CASALECCHIO IN VERDE (BO) Via Cimaraia, 119 - Tel. 051/46133072		Committente: <u>Unione Comuni Valle Sanpaoletta</u>		Quote: <u>---</u>		Rep. Pr. N° <u>10.0107/RSP</u>	
		Località: <u>Savigno (BO)</u>		Profondità: <u>3,95 m</u>		Codice Laboratorio <u>---</u>	
		Cantiere: <u>Cà Bartolani</u>		Data Inizio: <u>16/02/2010</u>		SONDAGGIO <u>1</u>	
		Perforazione: <u>Tiratura a secco di 120 mm</u>		Data Fine: <u>16/02/2010</u>		FOGLIO <u>1/1</u>	
		Attrezzatura: <u>Unilog U400L</u>		Il geologo: <u>Dr. L. Conti</u>			
Procedura di Prova	Rapporto di Prova N°	Rev.	Data di emissione	Lo Sperimentatore	Il Direttore di Laboratorio		
-	10.0107/RSP	0	16/02/2010	Dr. Tabaroni	Dr. L. Conti		



037058 P285529

SOIL INVESTIGATION s.n.c.
 Di MARCO ROSSI & C.
 Via Sartiano 1, 47863 NOVAFELTRIA (RN)
 C.F. P.I.e Reg. Imprese Rimini n° 02 139 670 414
 Email: soil2000@libero.it
 Tel 3473154659; 3286675382

PROF. DAL P.C.		SPESSORE STRATO		STRATIG.	CAMPIONE QUOTA P.C.	DESCRIZIONE	ROD	S.P.T.	PERCENTUALE CARDTAGGIO SO	PENETROM. TASCABILE (Kg/cm²)	TORVANE (Kg/cm²)	FALDA
0.30	0.30					ASFALTO O MANTO DI USURA BITUMINOSO						
0.70	0.40					STABILIZZATO CON GHIAIE E CLASTI						
2						LIMI SABBIOSI CON ARGILLA NOCCIOLA CON DIFFUSI CLASTI CALCARI MM E CM ANCHE CALCARENTICI, MATERIALI COMPATTI ESSICCATI NON PLASTICI. PRESENTI DIFFUSE LENTI MM SABBIGIO LIMOSE DI COLORE OCRA.	100%			>5 >5 >5 >5 >5 >5 >5 >5 >5 >5	>2 >2 >2 >2 >2 >2 >2 >2 >2 >2 >2	
4.30					4.00 4.10 4.20 4.30 4.40 4.50 4.60 4.70							
5	0.20					GHIAIE CALCAREE-CALCARENITICHE IN ABBONDANTE MATRICE LIMOSO-ARGILLOSA	100%					NO
5.20						ARGILLITI GRIGIE VERDI ED AZZURRE CON FREQUENTI LENTI DM DI COLORE VIOLACEO						
6						MATERIALI LEGGERMENTI DECOMPRESSI NEL PRIMO METRO PASSANTI A MARRE COMPATTE.						
7						FORMAZIONE ARGILLE VARICOLORI.	100%					
8	3.00				7.50 7.60 7.70							
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

Cassetto catalogatrici n°2

Campione indisturbato shelby

Campione rimangiato

TUBO NO

037058 P 295530

SOIL INVESTIGATION s.n.c.
 DI MARCO ROSSI & C.
 Via Sartiano 1, 47863 NOVA FELTRIA (RN)
 C.F. P.I.e Reg. Imprese Rimini n° 02 139 670 414
 Email: soil2000@libero.it
 Tel 3473154659; 3286675382

COMMITTENTE: CONSORZIO BONIFICA RENANA CANTIERE: SAVIGNO, VIA SAMOGGIA LOCALITÀ: BELL'ARIA (BO) DATA 11-09-2012		rif: cr 09/12 QUOTA: p.c.		SOIL INVESTIGATION s.n.c. DI MARCO ROSSI & C. via Sartiano 1 Novafeltria RN email: soil2000@libero.it					
SONDAGGIO n° 2		Attrezzatura: EK 2005 Elettrici Carotieri: semplice diam. 101 mm; rivest. diam. 127 mm		Sistema di perforazione: Rotazione secco					
PROF. DAL P.C.	SPESSORE STRATO	STRATIG.	CAMPIONE QUOTA P.C.	DESCRIZIONE	PERCENTUALE CAROTAGGIO		PENETROM. TASCABILE (kg/cmq)	TORVANE (kg/cmq)	FALDA
					RQD	S.P.T.			
0.20	0.20			ASFALTO O MANTO DI LUBRIFICO BUTUMINOSO					
0.70	0.50			STABILIZZATO CON GHIAIE E CLASTI					
1	1.40			LIMI SABBIOSI CON ARGILLA NOCCIOLA CON DIFFUSI CLASTI CALCAREI MM E CM ANCHE CALCARENTICI, MATERIALI COMPATTI ESSICCATI NON PLASTICI. PRESENTI DIFFUSE LENTI MM SABBIOSE LIMOSE DI COLORE OCRA.	100%		>5 >5 >5 >5	>2 >2 >2 >2	
2	2.10			LIMI ARGILLOSI BRIGI CON RARE ZONATURE NOCCIOLA ED OCRA COMPATTE ESSICCATI NON PLASTICHE.	100%		>5 >5	>2 >2	
3	3.20			ARGILLI GRIGIE VERDI ED AZZURRE CON RARE LENTI MM DI COLORE OCRA PRESENTI INTERCALAZIONI DI LIMI SABBIOSI GRIGIO CHIARO (L.10-L.90). FORMAZIONE ARGILLE VARI-COLORI DEBOLMENTE ALTERATA.	100%		>5 >5 >5 >5	>2 >2 >2 >2	NO 1
4	1.80			ARGILLI GRIGIE VERDI ED AZZURRE CON FREQUENTEMENTI DCM DI COLORE VIOLECCO MATERIALI LEGGERMENTI DECOMPRESSI NEL PRIMO METRO PASSANTI A MARRE COMPATTE. FORMAZIONE ARGILLE VARI-COLORI.	100%		>5 >5 >5 >5	>2 >2 >2 >2	
5	3.50						>5 >5 >5 >5	>2 >2 >2 >2	
6							>5 >5 >5 >5	>2 >2 >2 >2	
7							>5 >5 >5 >5	>2 >2 >2 >2	
8							>5 >5 >5 >5	>2 >2 >2 >2	
8.50									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

TUBO NO Cassette catalogotrici n°2 Campione indisturbato Shelby Campione rimaneggiato

037058 P30D131

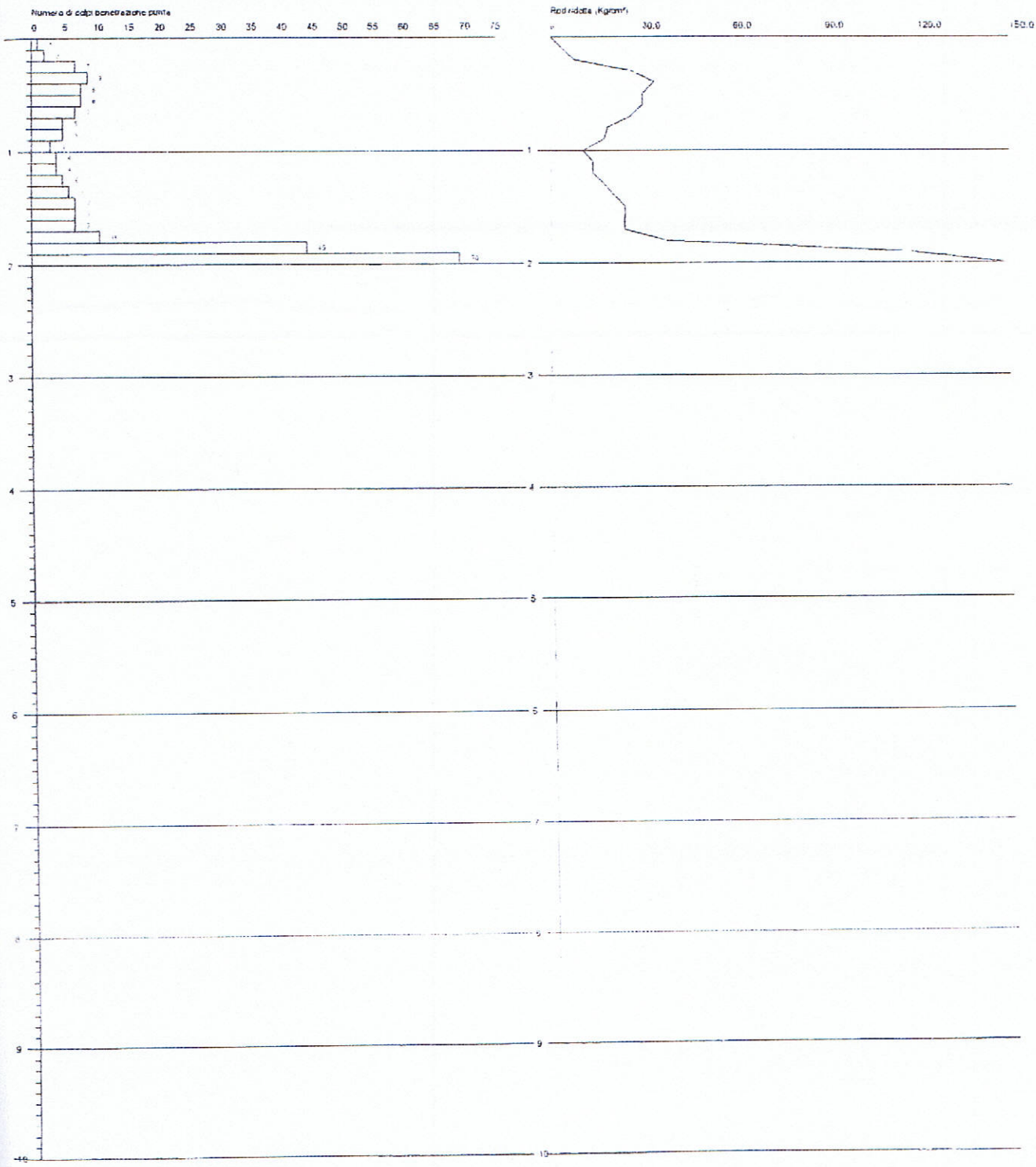
Dott. Geol. Alberto Filelfi
Via Manfredi n°27
Tel.: 3356113540 filelfi@rilgeo.it

PROVA PENETROMETRICA DINAMICA P2
Strumento utilizzato... DPM 30-20 GEOTOOL

Committente: Dott. Geol. Fabio Fortunato
Cantiere: Via Guglielmo Marconi
Località: Savigno

Data: 15/09/2010
Falda: Assente

Foglio: 28



L'interpretazione della misura tomografica è stata sviluppata nel seguente modo:

1. identificazione nella prova geognostica di un orizzonte stratigrafico superficiale da utilizzare come vincolo
2. identificazione del *marker* HVS R corrispondente
3. *fit* della curva HVS R sintetica che si approssima al meglio la curva sperimentale

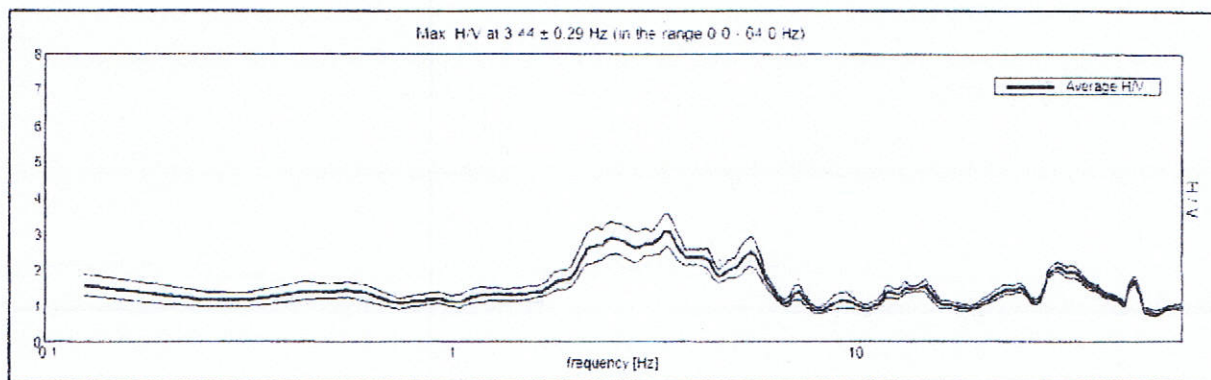


Figura 4: diagramma HVS R relativo alla misura Tr1

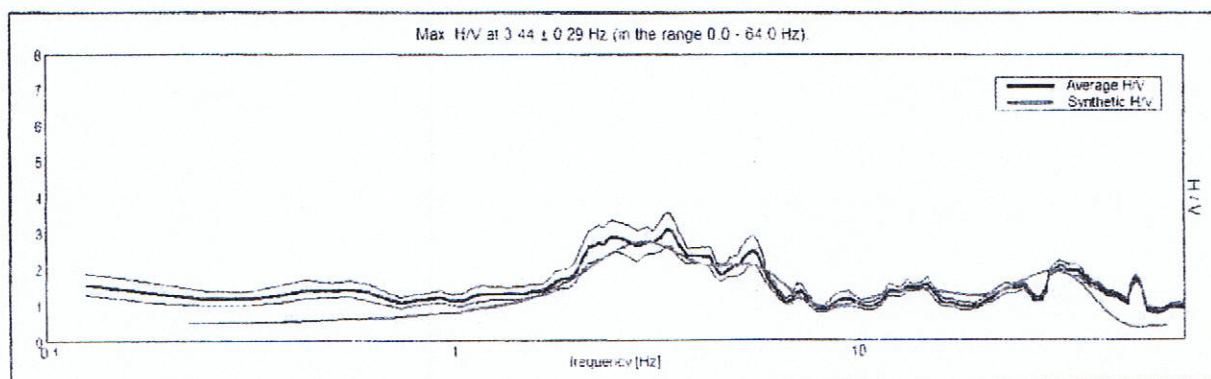


Figura 5: elaborazione della curva teorica (blu) sulla curva HVS R registrata (rosso) relativa alla misura Tr1

L'indagine geognostica indica che il primo passaggio stratigrafico utile per essere utilizzato come vincolo per la costruzione del modello sismico si attesta a circa 1,7 m di profondità

Con tale vincolo si è ottenuta una buona congruenza tra i dati derivanti dall'analisi sismica e quelli dell'indagine geognostica. Nella figura 5 è ben evidente come la curva teorica (blu) ricalca (*fit*) con buona approssimazione la curva HVS R registrata (rossa), fornendo una buona ricostruzione del profilo sismico del sito.

L'andamento della linea del grafico HVS R mostra la presenza di un ampio picco di risonanza a frequenze medie (tra 2,2 e 6 Hz), ed una serie di picchi minori ad alte frequenze (tra 13 e 35 Hz).

A 31 Hz è presente un picco con valore del rapporto H/V pari a 2,1 che rappresenta un passaggio litologico superficiale. A frequenze maggiori è visibile un picco stretto e di forma triangolare dovuto ad una interferenza di origine antropica. tale picco non è stato considerato nell'interpretazione.

037058.P31DP33

GEO-PROBE

DPSH

40134 BOLOGNA

Via C. Treves, 44/C - Tel. 051/61.45.360

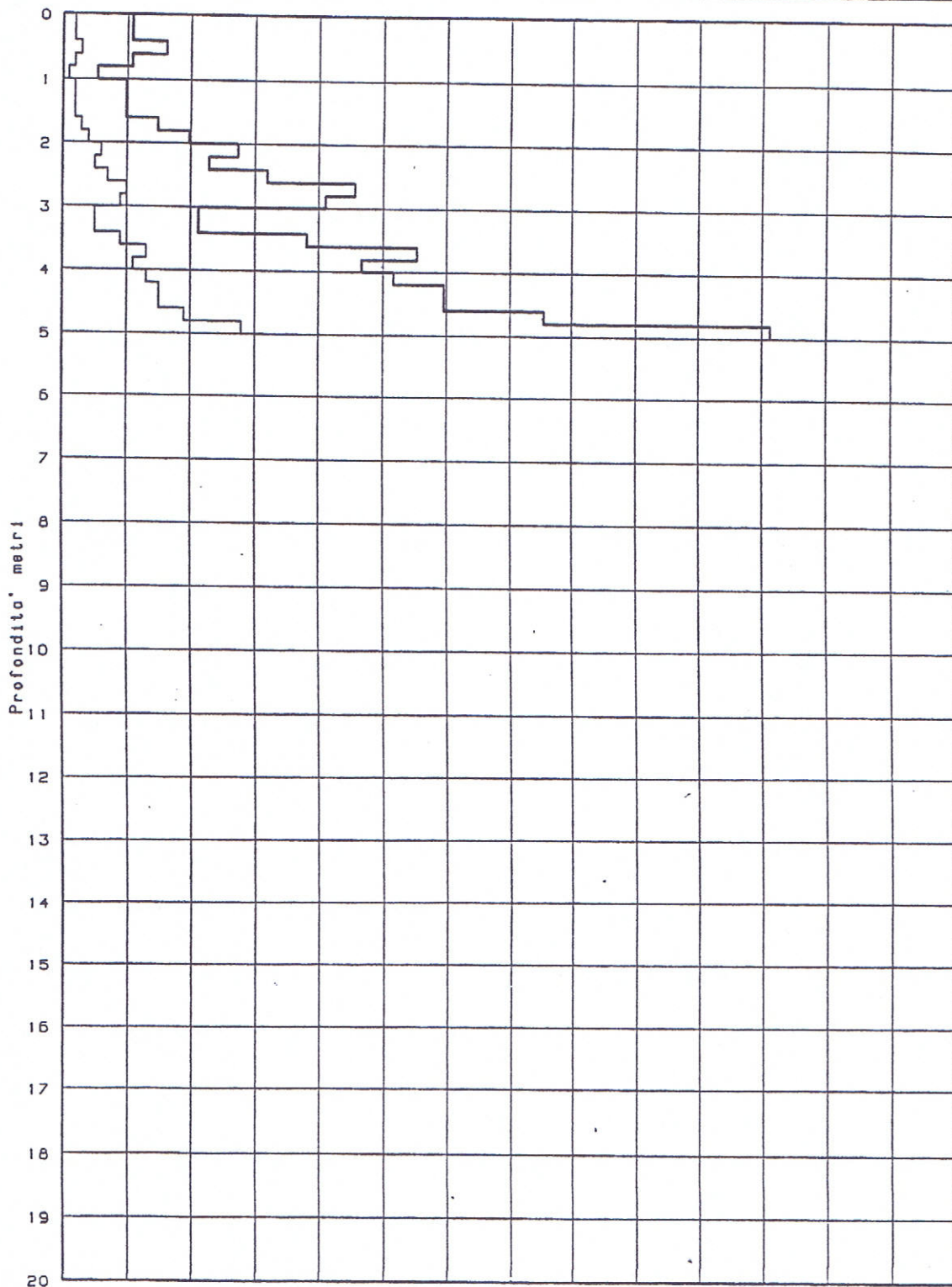
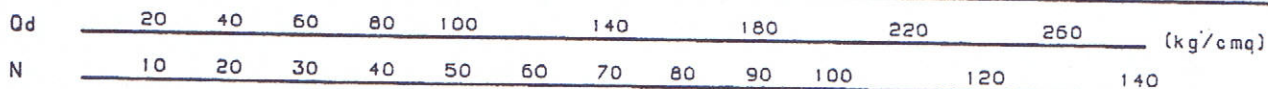
Data: 22/06/95

N. 1

Committente: Immobiliare Barso

N. Certificato: D95149A1

Localita': Savigno (BO) Lottizzazione Montevercchio



GEO-PROBE s.n.c. Indagini Geognostiche

Quota di folia: assente

GEO-PROBE

40134 BOLOGNA

Via C. Treves, 44/C - Tel. 051/61.45.360

SONDAGGIO

N. 1

N. Certificato: 95149A01

Data: 22/06/95

Committente: Immobiliare Borsa
 Località: Sovigno (BO) Lottizzazione Monteverocchio

Profondità' (m)	Colonna stratigr.	Descrizione stratigrafica	Foldo	Campioni		Packel penetrometer (kg/cmq)	Torvone (kg/cmq)	S.P.T.		Piazometro (m)	Schema
				Profondità' (m)	n.			Tipo	Profondità' (m)		
1.70		Terreno di origine coltivata di natura argillosa limosa di colore bruno oliva con abbondanti puntinature bruno rossastre di alterazione e numerosi epiporiti radiceali.									
3.80		Argilla debolmente limosa di colore grigio olivo con patine bruno giallastre e bruno rossastre di alterazione; - Terreno a consistenza plastico.		3.60 - 3.80	1					3.00	
6.00		Argilla debolmente limosa a strutture scagliose di colore bruno rossastro; presenza di sacche da millimetriche a centimetriche (max. 3 cm) di argilla con limo di colore grigio azzurro; - Terreno a consistenza plastico.								6.00	
Cuoto di foldo: assente											

Trivellazione a secco Ø mm 152

GEO-PROBE

40134 BOLOGNA

Via C. Treves, 44/C - Tel. 051/61.45.360

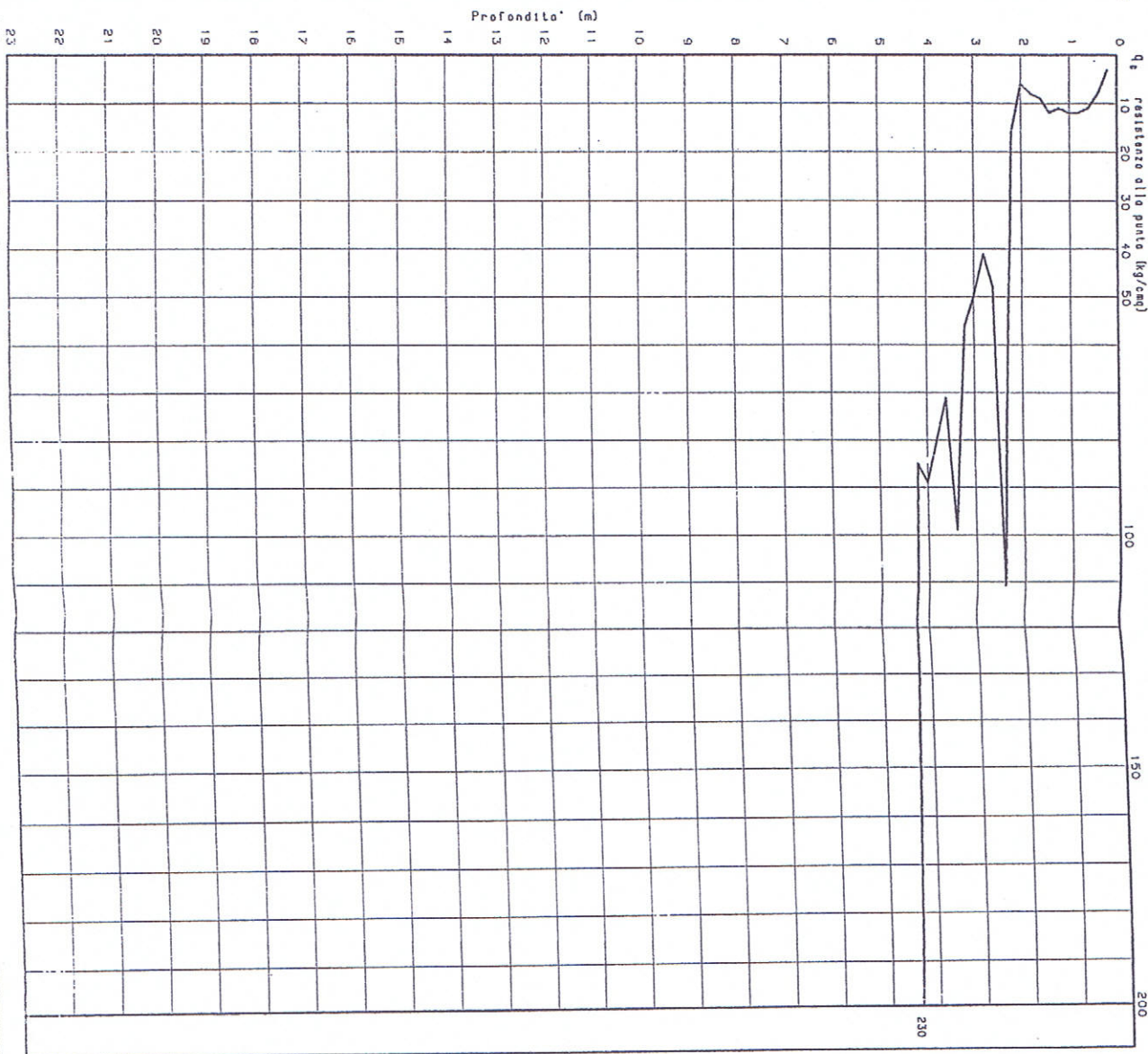
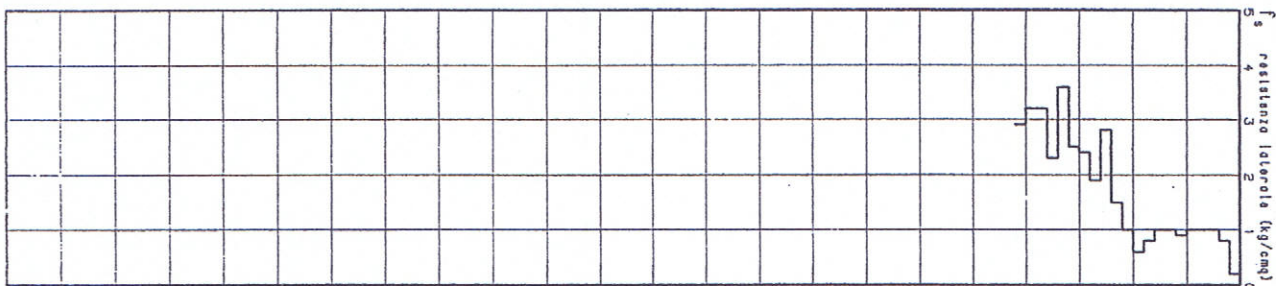
CPT (CONE PENETRATION TEST) N.1

Committente: Immobiliare Borsa

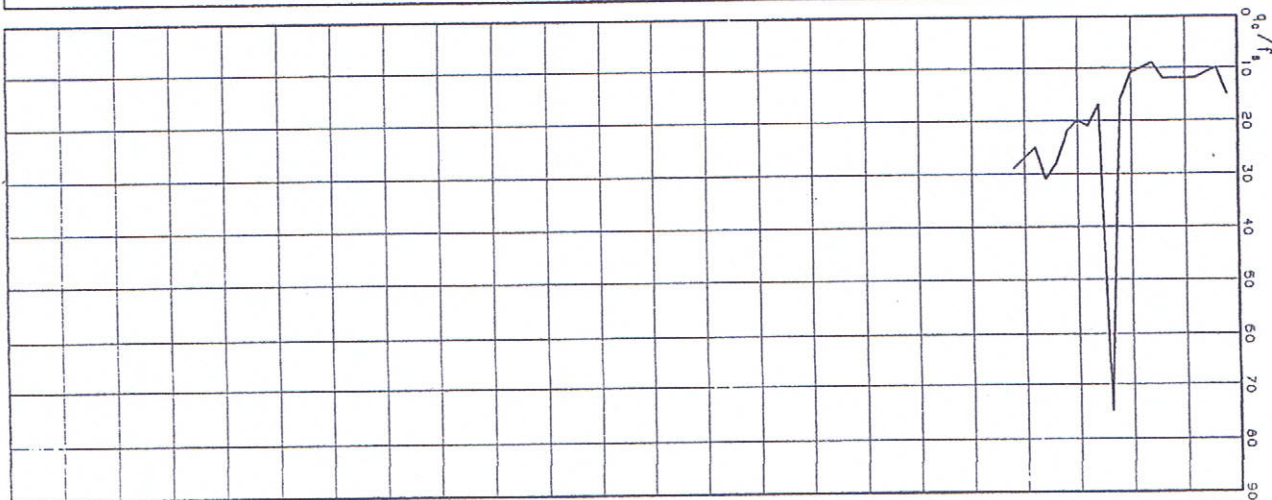
Localita': Sovigno (BO) Localizzazione Montevecchio

N. Certificato: 95149A01

Data: 22/05/95



Custo di fondo: -4.00 m.



Note: Posto in opera pirozantre lungo 3,70 m. di cui l'ultimo fessurato.

GEO-PROBE

40134 BOLOGNA

Via C. Treves, 44/C - Tel. 051/61.45.360

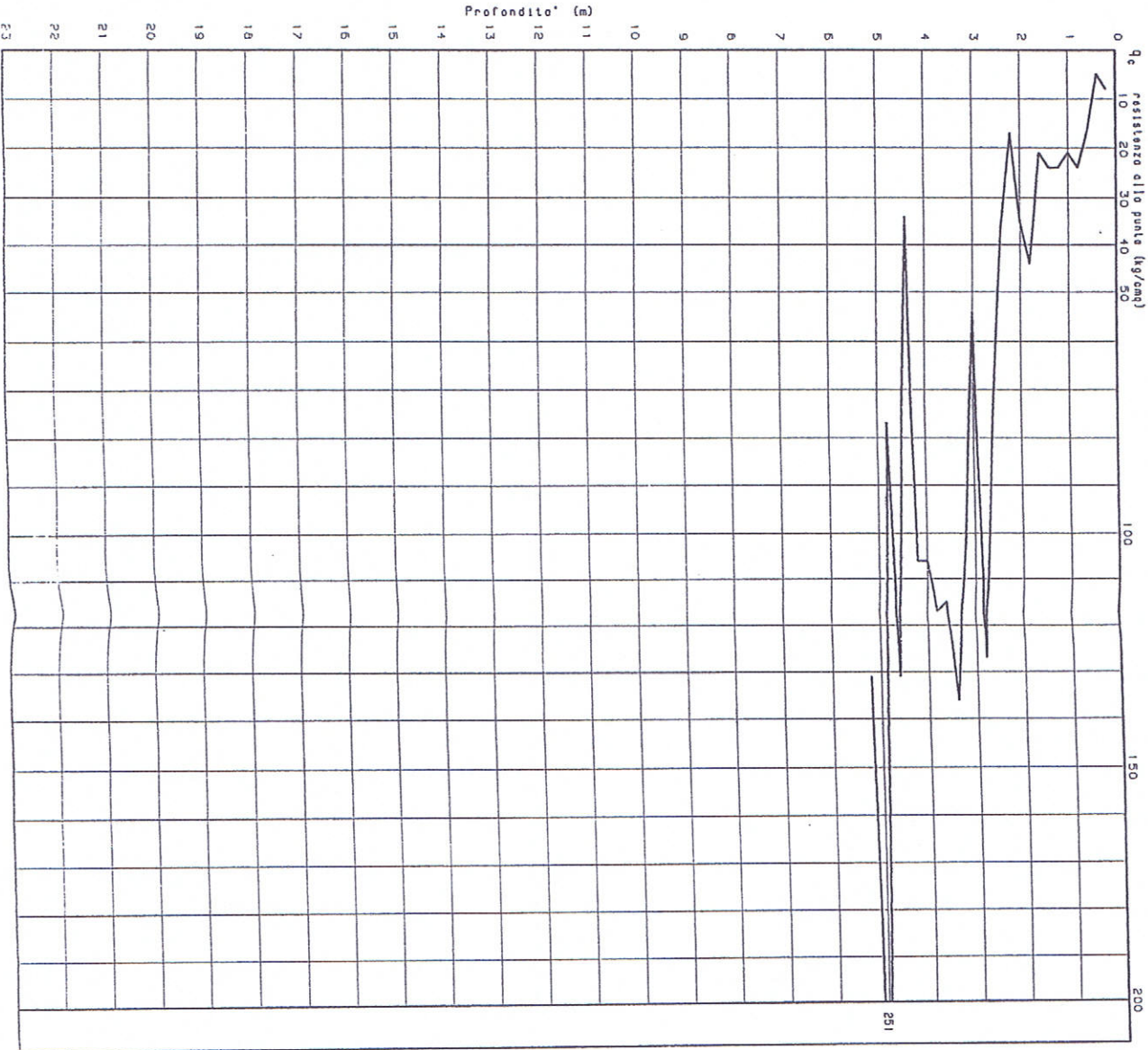
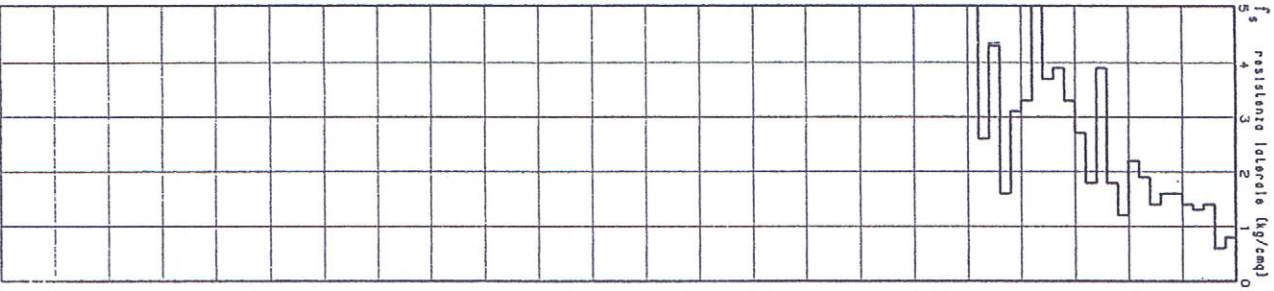
Committente: Immobiliare Borsò

Località: Sovigno (BO) Lottizzazione Monteverchio

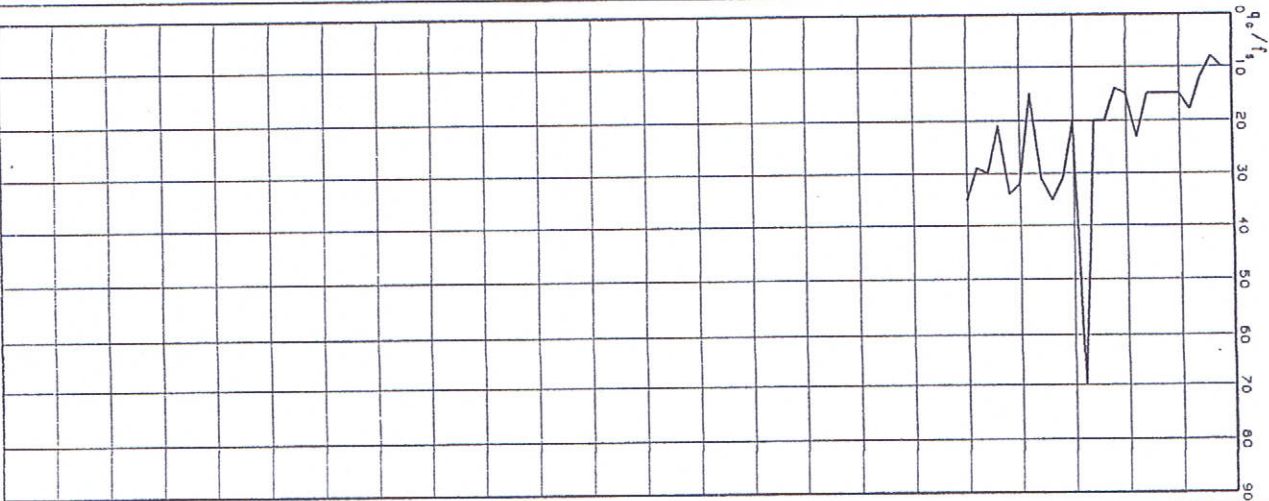
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N. Certificato: 95149A02

Data: 22/06/95



Quota di fondo: -4.00 m.



Note: Pisto in opere piazzenate lungo 3.00 m. di cui l'ultima fissurata.

GEO-PROBE

40134 BOLOGNA

Via C. Travas, 44/C - Tel. 051/61.45.360

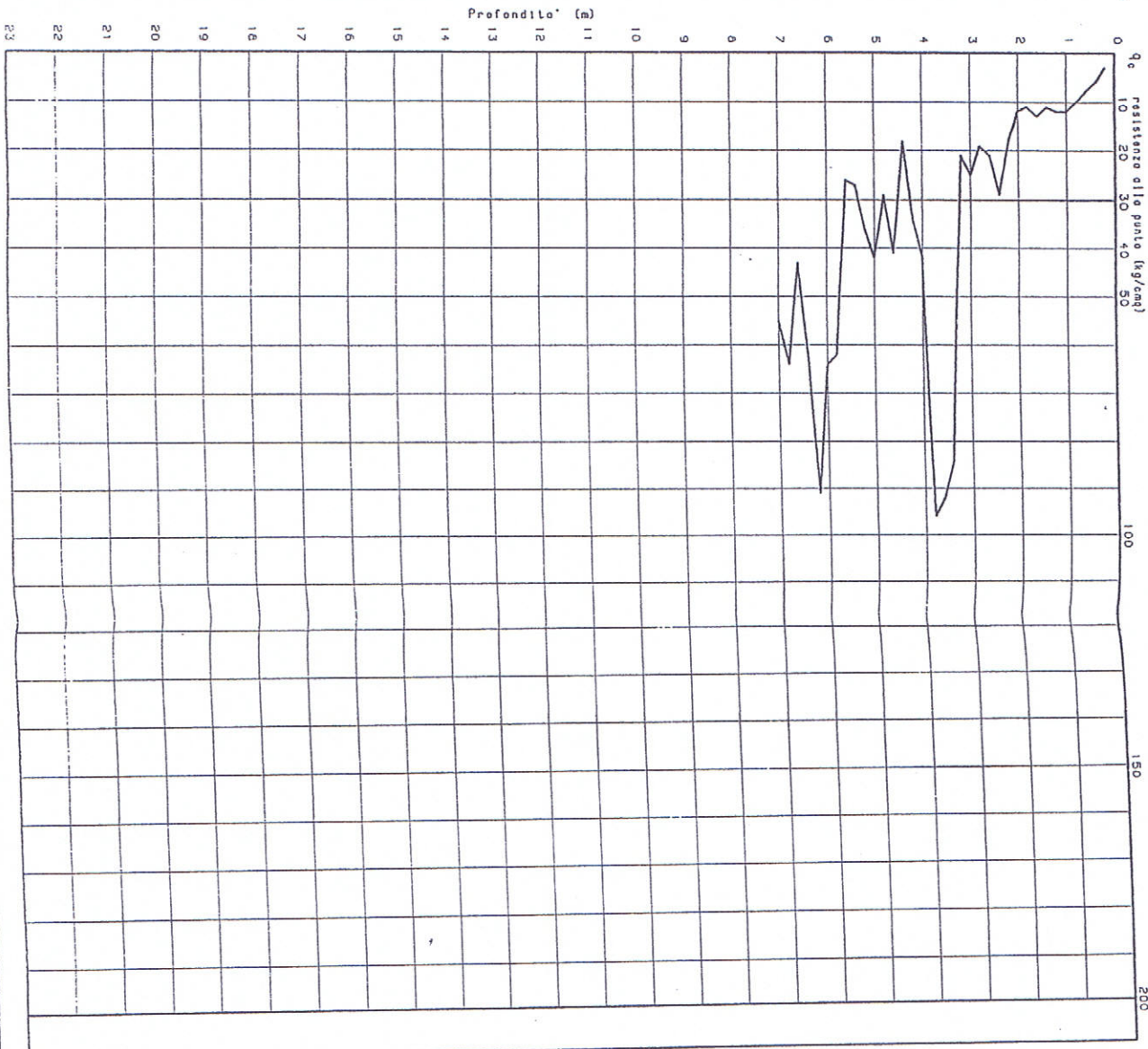
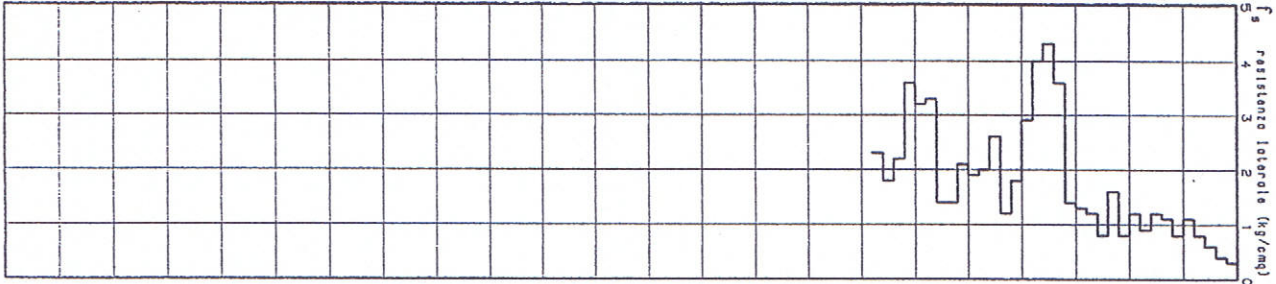
CPT (CONE PENETRATION TEST) N.3

Committente: Immobiliare Borsa

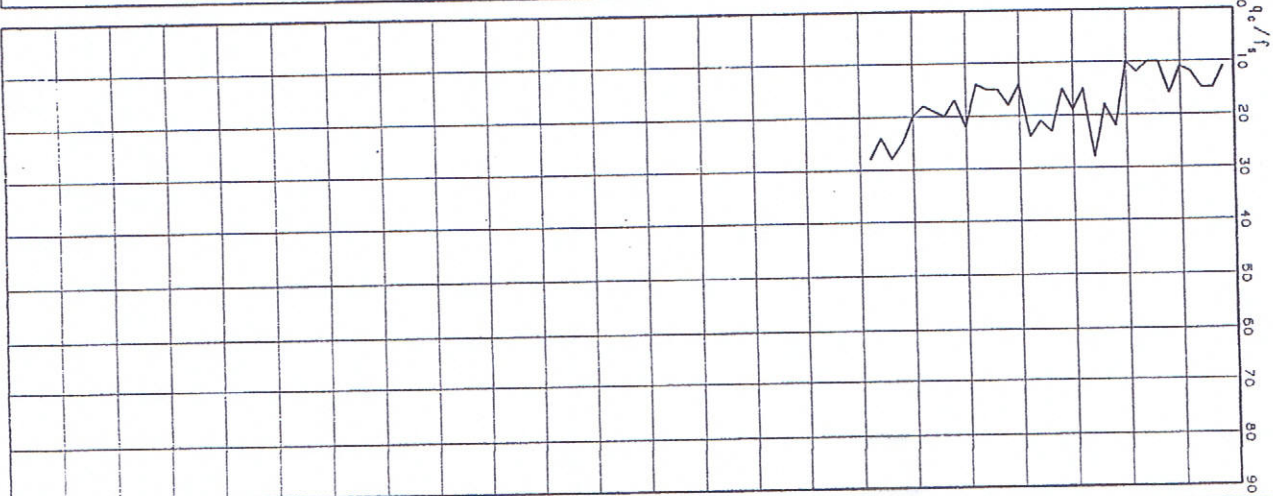
Località: Savigno (BO) Localizzazione Montevercchio

N. Certificato: 95149A03

Data: 22/06/95

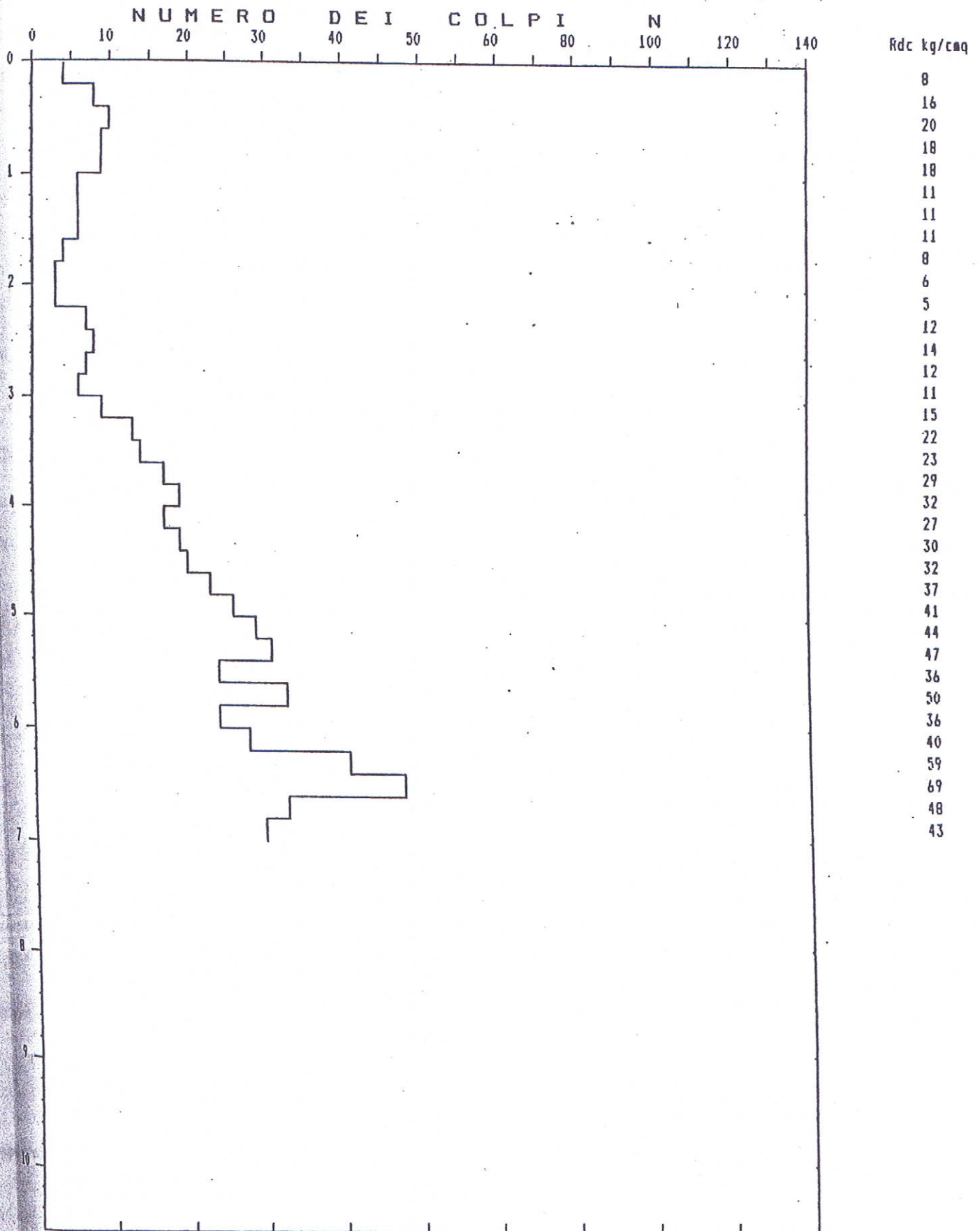


Quota di fondo: -3.70 m.



PROVA PENETROMETRICA N. 1

037058 P36 DP38



Savigno Lottizzazione Barsa 4.6.92

GEO-PROBE 1

40134 BOLOGNA

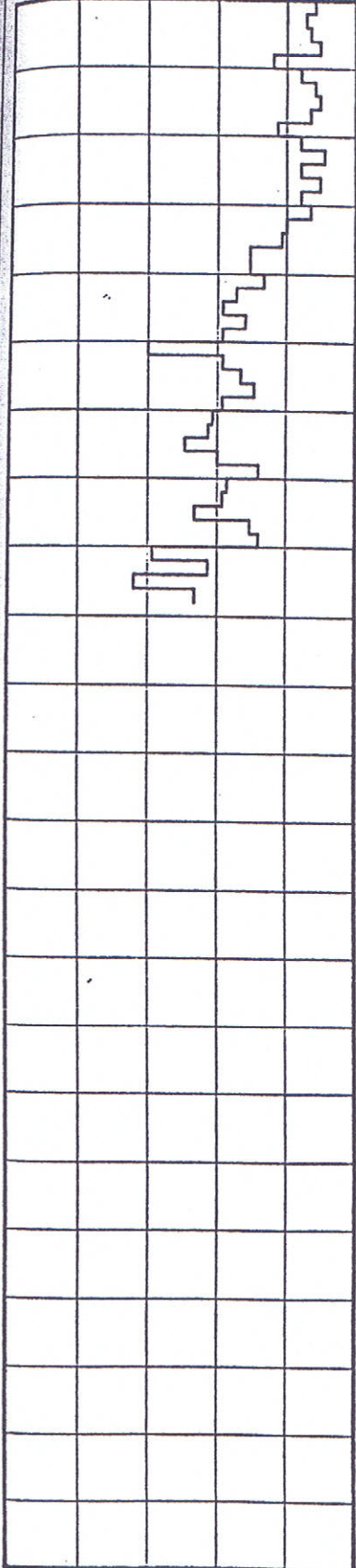
Via C. Treves, 44/C - Tel. 051/42.35.

037058 P 37 CPT 39

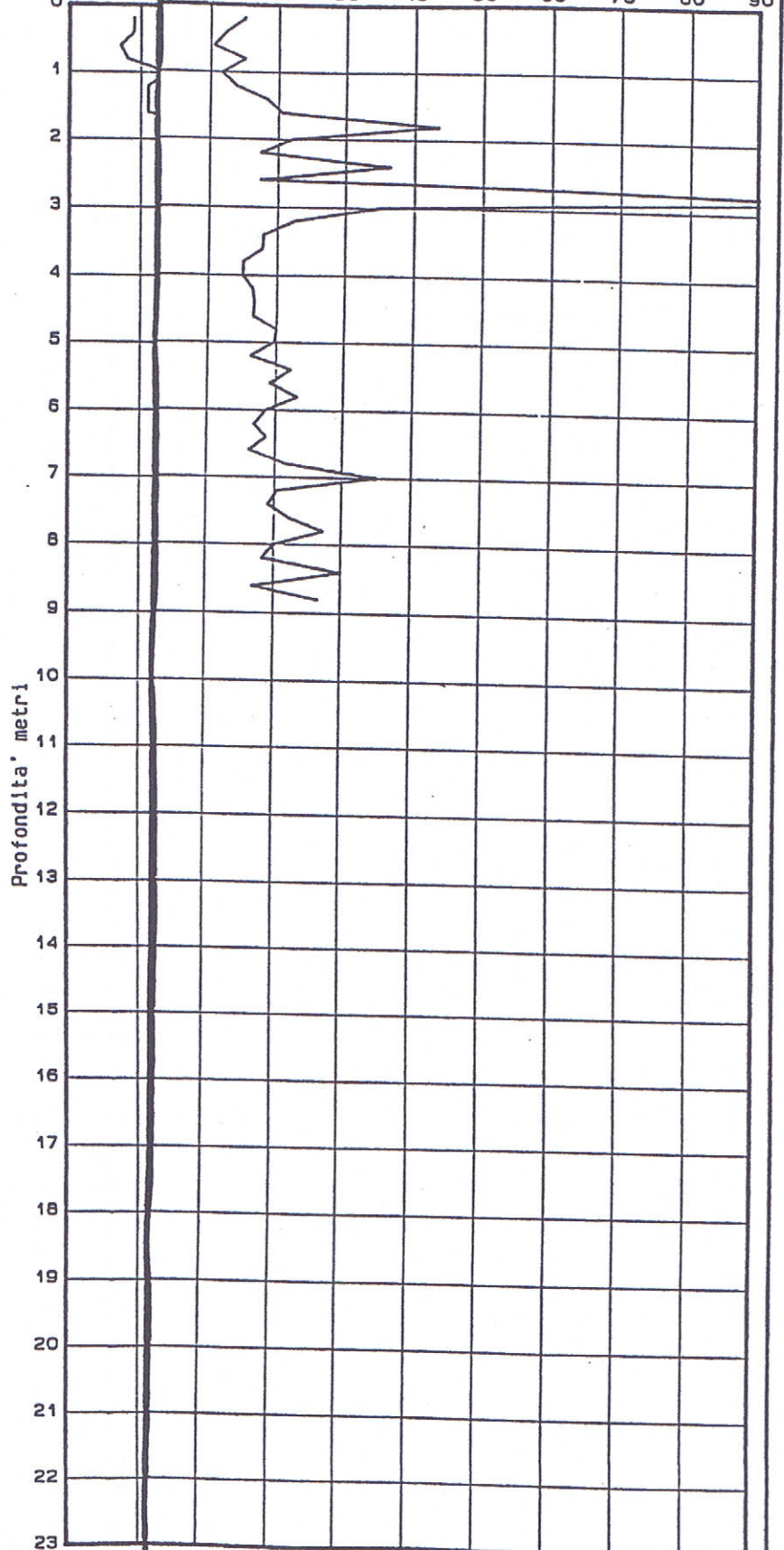
N. Certificato: 93036001

Data: 12/02/93

f_s resistenza laterale (kg/cmq)
5 4 3 2 1 0



Q_c res / f_s
10 10 20 30 40 50 60 70 80 90



GEO-PROBE S.N.C. - INDIRIZZO BOLOGNA

037058P38CPT40

GEO-PROBE

40134 BOLOGNA

Via C. Treves, 44/C - Tel. 051/42.35.10

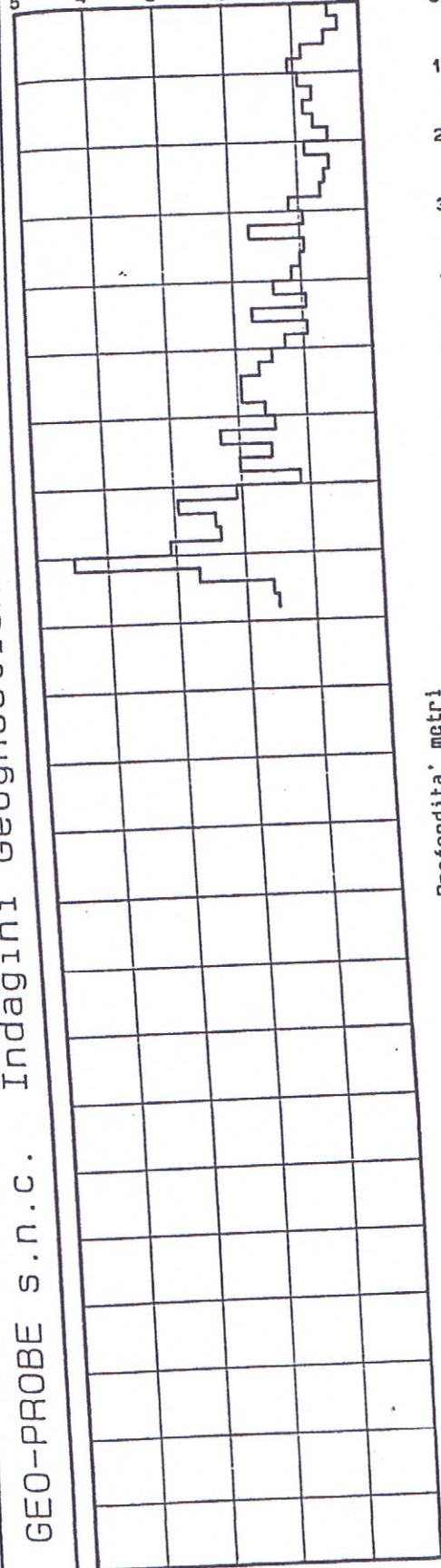
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N. Certificato: 93036002

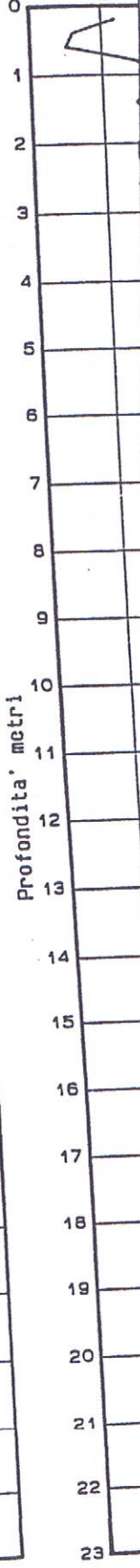
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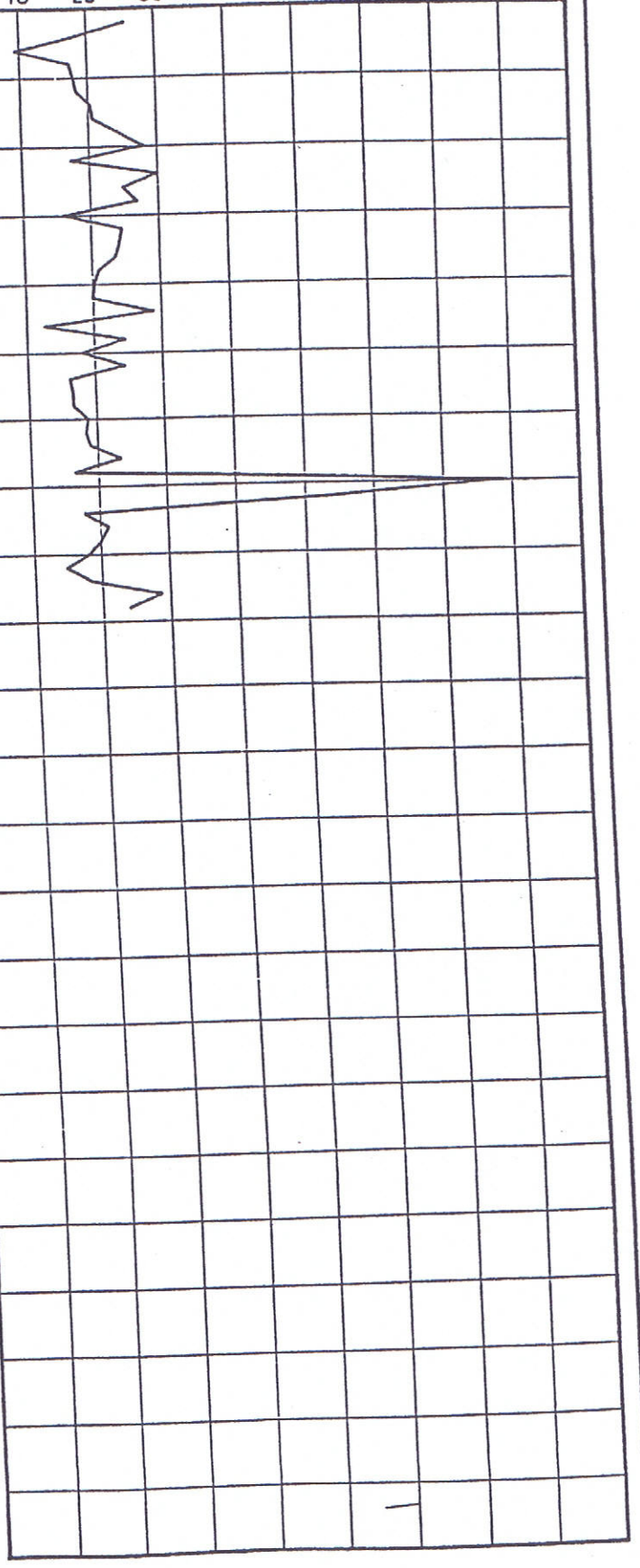
f_s resistenza laterale (kg/cmq)



Q_c resis



c / f_s 10 20 30 40 50 60 70 80 90



Profondita' metri

GEO-PROBE S.N.C. Indagini Geognostiche

GEO-PRO

40134 BOLOGNA)

Via C. Treves, 44/C - Tel. 051

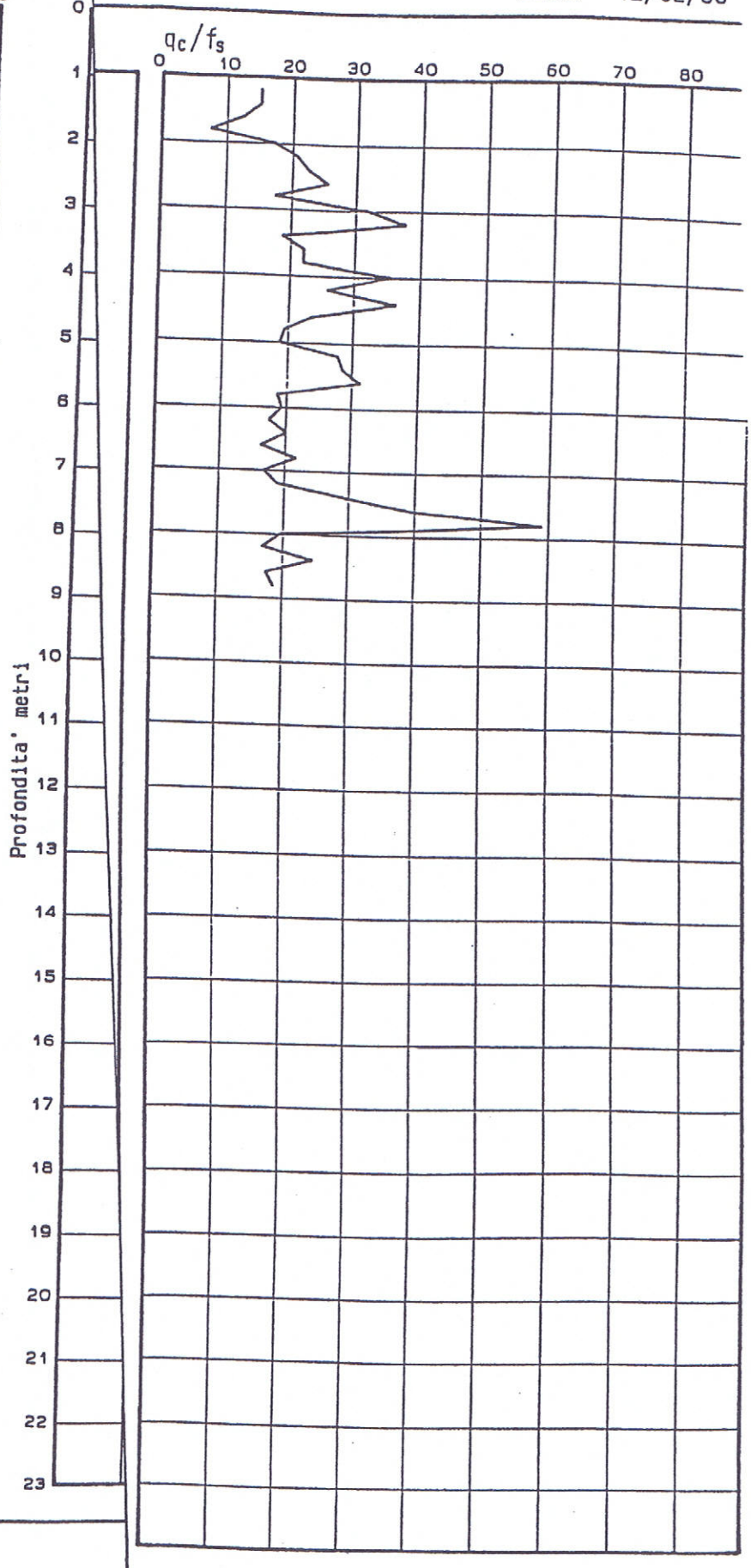
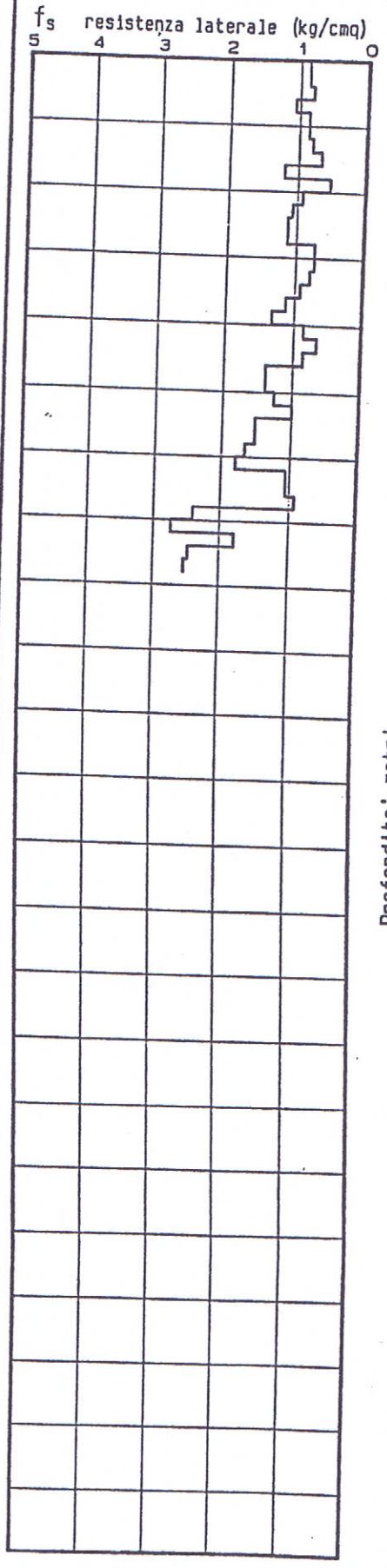
037058 P39 CPT41

N. 4

N. Certificato: 93036004

Data: 12/02/93

GEO-PROBE s.n.c. Indagini Geognostiche



037058 P40 CPT42

N. Certificato: 93036005

5

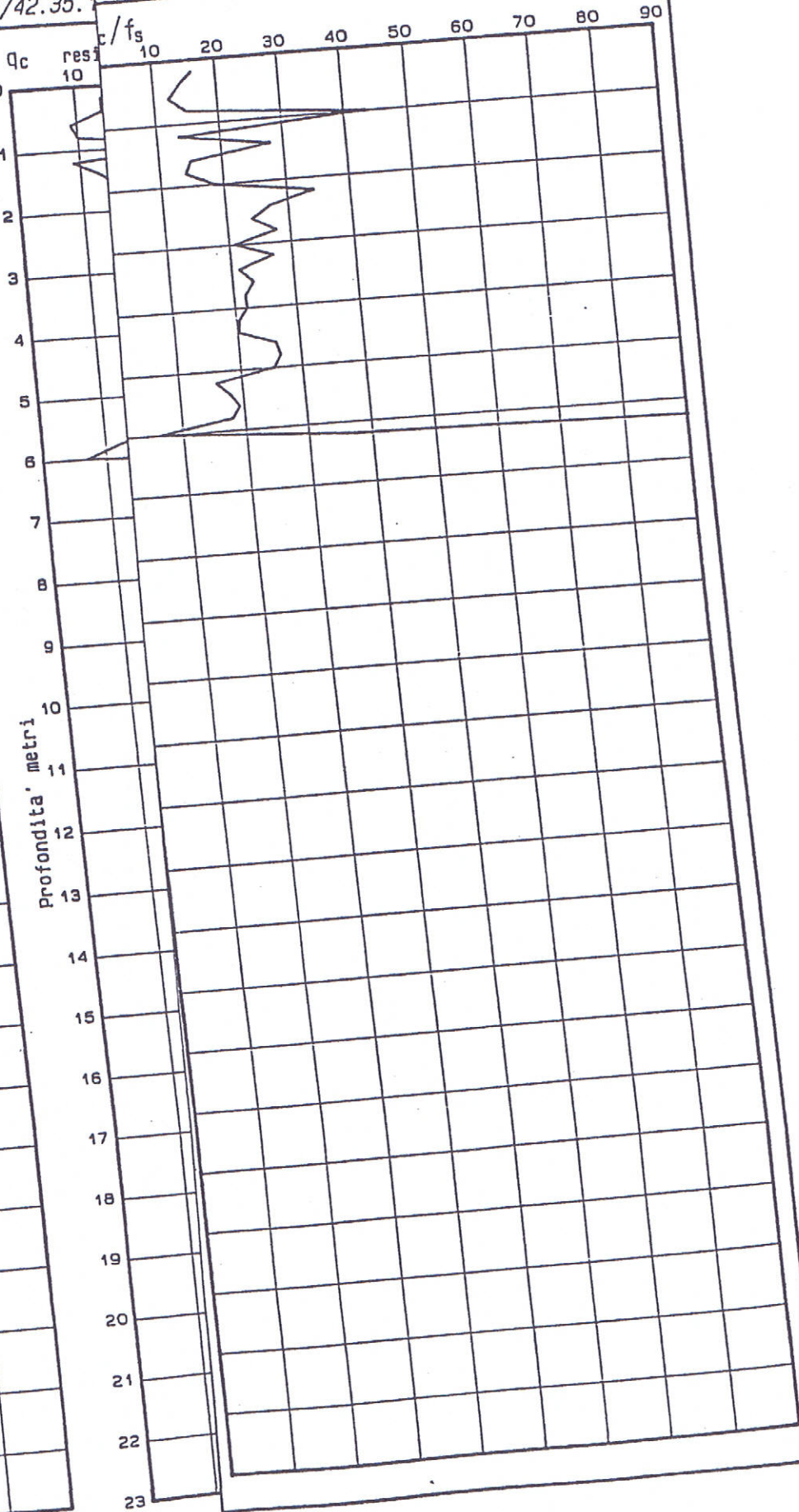
GEO-PROBE

Data: 12/02/93

40134 BOLOGNA

C. Treves, 44/C - Tel. 051/42.35.

resistenza laterale (kg/cmq)

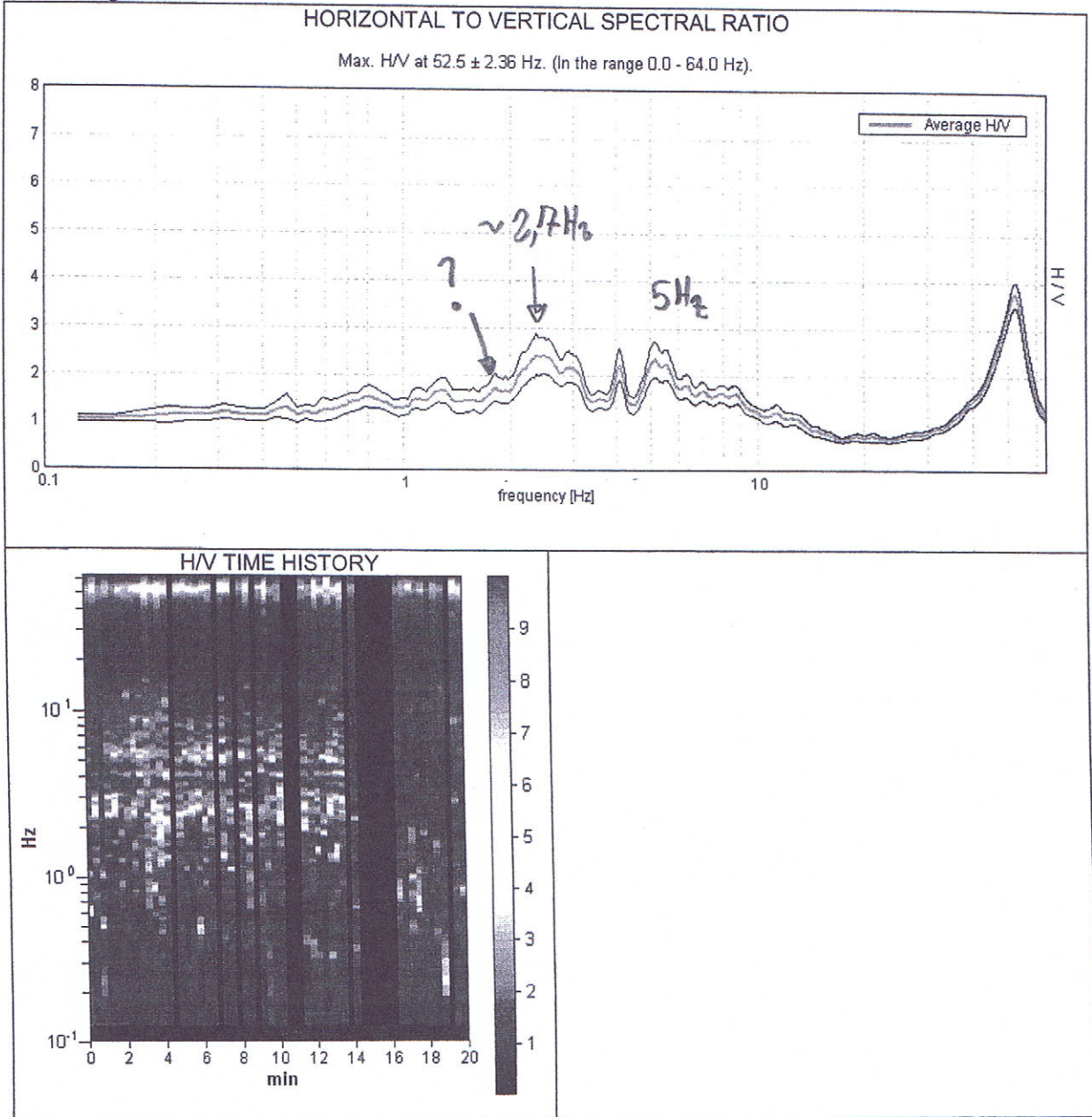


GEO-PROBE S.N.C. Indagini

037058 P41 HV SR 44

GRILLA FOLDER, SAVIGNO ZAMBONI TRACCIA 01

Start recording: 23/06/09 08:57:42 End recording: 23/06/09 09:17:43
Channel labels: NORTH SOUTH; EAST WEST; UP DOWN
GPS data not available
Trace length: 0h20'00". Analyzed 75% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 5%



allegate, si possono sintetizzare, per la porzione di sottosuolo in esame, le seguenti informazioni stratigrafiche ottenute mediante il già ricordato riconoscimento di massima dei terreni attraversati:

Punto 1 - Prova penetrometrica DPSH 1

037058 P41 DP43

- da p.c. a - 0.2 m terreno vegetale;
- da - 0.2 a - 2.6 m depositi alluvionali a prevalenza incoerente ghiaie e sabbie da addensate a moto addensate;
- da - 2.6 a - 3.6 m depositi alluvionali costituiti da argille, limi argillosi con sabbie grossolane e ghiaie fini da poco a moderatamente addensate;
- da - 3.6 a - 6.2 m depositi alluvionali, sabbie medie, argille e limi argillosi da moderatamente ad addensati;
- da - 6.2 a - 8.4 m argille sovraconsolidate, substrato (F.ne di Poggio ?, F.ne di Savigno-membro di Villa ?).

Punto 2 - Prova penetrometrica CPT 2/DPSH-2

- da p.c. a - 0.4 m terreno vegetale;
- da - 0.4 a - 1.8 m depositi alluvionali a prevalenza incoerente ghiaie e sabbie da addensate a moto addensate;
- da - 1.8 a - 3.2 m depositi alluvionali costituiti da argille, limi argillosi con sabbie grossolane e ghiaie fini da poco a moderatamente addensate.

Punto 3 - Prova penetrometrica DPSH-3

- da p.c. a - 0.4 m terreno vegetale e copertura detritica;
- da - 0.4 a - 2.4 m depositi alluvionali a prevalenza incoerente ghiaie e sabbie da addensate a moto addensate;
- da - 2.4 a - 3.0 m depositi alluvionali costituiti da argille, limi argillosi con sabbie grossolane e ghiaie fini da poco a moderatamente addensate;
- da - 3.0 a - 4.4 m depositi alluvionali, sabbie medie, argille e limi argillosi da moderatamente ad addensati;
- da - 4.4 a - 5.0 m argille sovraconsolidate con alla base un trovante? strato ?; substrato (F.ne di Poggio ?, F.ne di Savigno-membro di Villa ?).

Punto 4 - Prova penetrometrica DPSH-4

037058 P42 DP45

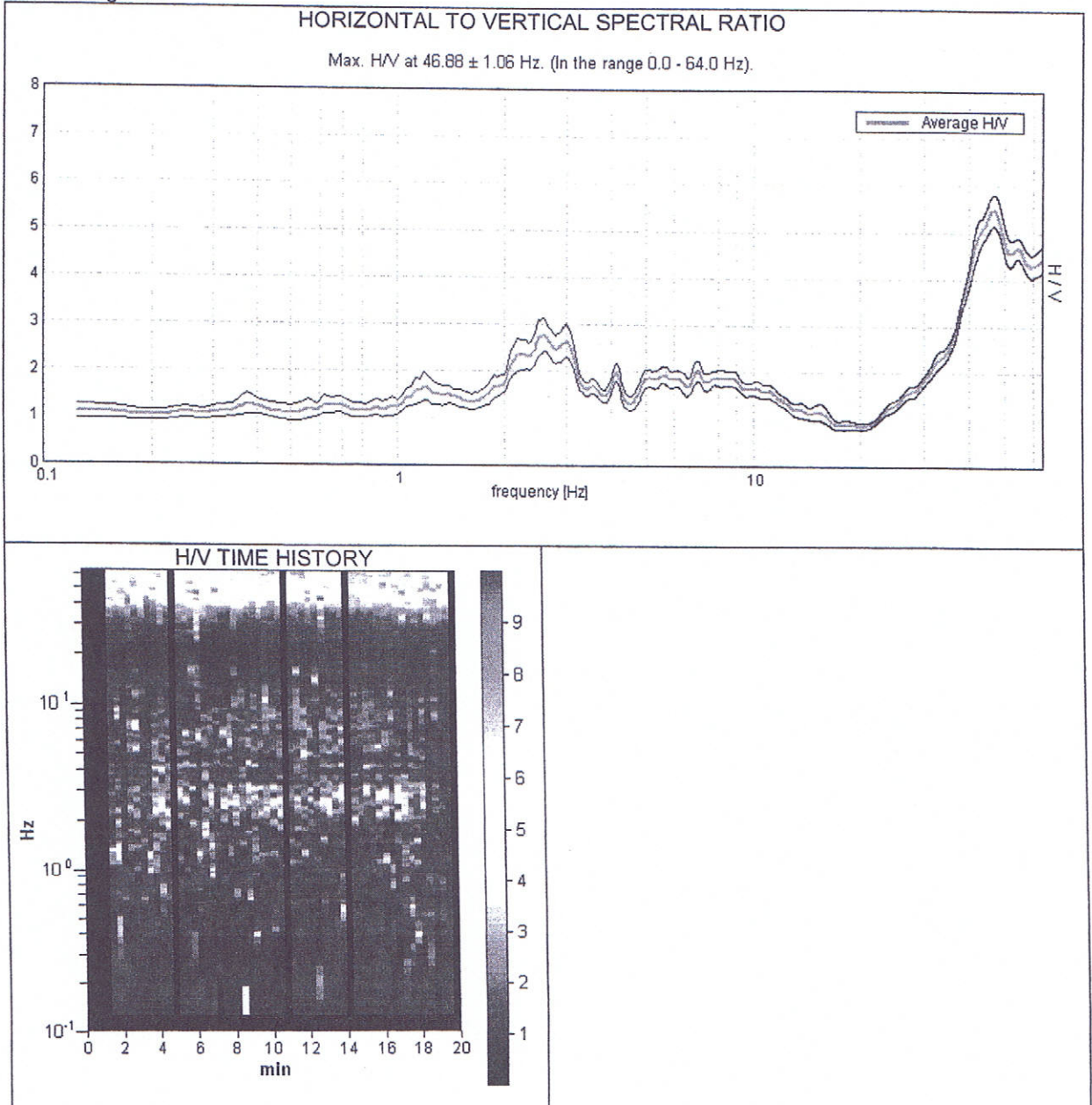
- da p.c. a - 0.2 m terreno vegetale;
- da - 0.2 a - 0.8 m coltre di alterazione superficiale, terreni eluvio colluviali/detritici;
- da - 0.8 a - 2.2 m depositi alluvionali a prevalenza incoerente ghiaie e sabbie da addensate a moto addensate;
- da - 2.2 a - 3.6 m depositi alluvionali costituiti da argille, limi argillosi con sabbie grossolane e ghiaie fini da poco a moderatamente addensate;
- da - 3.6 a - 4.6 m depositi alluvionali, sabbie medie, argille e limi argillosi da moderatamente ad addensati;
- da - 4.6 a - 5.2 m argille sovraconsolidate con alla base un trovante? strato ?; substrato (F.ne di Poggio ?, F.ne di Savigno-membro di Villa ?).

Punto 5 - Prova penetrometrica CPT 5

- da p.c. a - 0.4 m terreno vegetale;
- da - 0.4 a - 1.2 m coltre di alterazione superficiale limo argillosa a tratti sabbiosa, terreni eluvio colluviali/detritici;
- da - 1.2 a - 2.6 m depositi alluvionali a prevalenza incoerente ghiaie e sabbie da addensate a moto addensate;
- da - 2.6 a - 3.6 m depositi alluvionali costituiti da argille, limi argillosi con sabbie grossolane e

GRILLA FOLDER, SAVIGNO ZAMBONI TRACCIA 02

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 Sampling frequency: 128 Hz
 Window size: 20 s
 Smoothing window: Triangular window
 Smoothing: 5%



037058 P43SS47

MOD. RSP_CA (Rev. 0 del 12/09)

GEO-PROBE s.r.l. Indagini Geognostiche 40033 CASALECCHIO DI RENGO (BO) Via Cimara, 119 - Tel. 051/61.33.072		Committente: Provincia di Bologna Località: Savigno (BO) Cantiere: Cà Bortolani Perforazione: Carotaggio Continuo diam. 101 Attrezzatura: Sonda CMV		Quota: --- Profondità: 15.80 m Data Inizio: 18/05/2011 Data Fine: 18/05/2011 Il geologo: Dr. Conti		Rap. Pr. N°11.0461/RSP Codice Lavoro 2011.092 SONDAGGIO: 1 FOGLIO: 1/1	
Procedura di Prova IO_001	Reporto di Prova N° 11.0461/RSP	Rev. 0	Data di emissione 18/05/2011	Lo Sperimentatore Dr. Regazzi	Il Direttore di Laboratorio Dr. Conti		

Scala 1:50	Manovre Lunghezza carotiere	Rivestimento	Profondità [m]	Stratigrafia	Descrizione stratigrafica	Percentuale Carotaggio	Campioni	Prof. SPT	N° colpi SPT	Tipo di punta	Scala 1:50	P. P. [kg/cmq]	V. T. [kg/cmq]	Falda	Piezometro Norton	Note
0.50	1.50		0.30		Asfalto, rilevato.											
1	0.50		0.50		Detrito brecciato (3<d<12 cm) in scarsa matrice sabbiosa.						1					
2	0.50		0.50								2					
3	0.40		2.70		Argilla mamosa di colore nocciola, blocchi arenacei e talora calcarei, a tratti livelli sabbiosi, alterazione medio elevata; terreno ad umidità scarsa.						3	4.1	2.0	3.00		
4	0.40		4.60		Argilla mamosa di colore grigio, media alterazione.						4	>4.5	>2.0			
5	0.50		5.30								5	1.3				
6	0.80		8.50		Argilla mamosa di colore grigio, media alterazione.						6	1.5				
7	0.80		8.70		Argilla mamosa di colore nocciola, alterazione medio elevata, blocchi calcarei dalla profondità di 6.90-7.90 m, dalla profondità di 8.00 m matrice più limosa.						7	3.5	1.9			
8	0.50										8	2.7				
9	0.50				Argilla mamosa di colore nocciola, alterazione medio elevata, blocchi calcarei dalla profondità di 6.90-7.90 m, dalla profondità di 8.00 m matrice più limosa.						9	3.6	>2.0			
10	0.50				Argilla mamosa di colore grigiastro, alterazione medio scarsa.						10	2.2	1.0			
11	0.50				Argilla mamosa di colore nocciola, medio elevata alterazione, abbondante detrito calcareo talora prevalente.						11	2.3	1.1			
12	0.50										12	>4.5	>2.0			
13	0.60		12.40		Argilla limosa a struttura scagliosa di colore grigio, alterazione scarsa, inalterata dalla profondità di 15.50 m, leggero odore di idrocarburi.						13	>4.5	>2.0			
14	0.80										14	>4.5	>2.0			
15	0.40										15	>4.5	>2.0			
16	0.50										16	>4.5	>2.0			
17	0.60										17	>4.5	>2.0			
18	0.40										18	>4.5	>2.0			
19	0.40										19	>4.5	>2.0			
20	0.40		15.80								20	>4.5	>2.0			

Rilevamento acqua nel foro di sondaggio
 DATA | ORA IN | QUOTA F.F. | QUOTA H2O | ORA F. | QUOTA F.F. | QUOTA H2O
 18/05/11 | 09:30 | | | 16:15 | 15.80 m | 3.00 m |

GEO-PROBE s.r.l. Indagini Geognostiche 40033 CASALECCHIO DI RENO (BO) Via Cimarosa, 119 - Tel. 051/61.33.072		Committente: <u>Provincia di Bologna</u>		Quota: <u>---</u>		Rap. Pr. N°11.0462/RSP	
		Località: <u>Savigno (BO)</u>		Profondità: <u>12.00 m</u>		Codice Lavoro 2011.092	
Carriera: <u>Cà Bortolani</u>		Perforazione: <u>Carotaggio Continuo diam. 101</u>		Data Inizio: <u>19/05/2011</u>		SONDAGGIO	
Attrezzatura: <u>Sonda CMV</u>		Data Fine: <u>19/05/2011</u>		Il geologo: <u>Dr. Conti</u>		FOGLIO 2 / 1/1	
Procedura di Prova IO_001	Rapporto di Prova N° 11.0462/RSP	Rev. 0	Data di emissione 19/05/2011	Lo Sperimentatore Dr. Regazzi		Il Direttore di Laboratorio Dr. Conti	

Scala 1:50	Manovre	Lunghezza carotiere	Rivestimento	Profondità [m]	Stratigrafia	Descrizione stratigrafica	Percentuale Carotaggio	Campioni	Prof. SPT	N° colpi SPT	Tipo di punta	Scala 1:50	P. P. [kg/cmq]	V. T. [kg/cmq]	Falda	Piezometro	Note
0.40	1.50					Asfalto, rilevato, detrito grossolano in scarsa matrice sabbiosa.											
1	0.90	1.50		0.60		Argilla limosa di colore da nocciola a grigio, abbondante detrito fine, alterazione da medio elevata a media; terreno ad umidità medio scarsa.						1	3.2	1.6			
													3.0	1.5			
													3.4	1.7			
2	1.20	1.50		2.60		Argilla limosa di colore da grigio nocciola a nocciola grigio, media alterazione; terreno ad umidità medio scarsa.						2	2.8	1.5			
													2.6	1.4			
													2.0	1.1			
													1.6	0.8			
3	1.00	1.50		3.70		Argilla limosa di colore grigio nerastro con venature giallastre grigie, medio elevata alterazione; terreno ad umidità media.						3	2.6	1.3			
													2.4	1.2			
													2.6	1.3			
													1.9	1.0			
4	1.00	1.50		4.30		Argilla limosa di colore nocciola grigio con puntinature ruggine, presenza di detrito; terreno ad umidità medio scarsa.						4	2.0	1.1			
													2.4	1.2			
													2.7	1.4			
5	0.90	1.50		8.90		Argilla limosa di colore nocciola chiaro con striature grigie, abbondante fine detrito; terreno ad umidità medio scarsa.						5	2.7	1.3			
													2.6	1.3			
													2.5	1.2			
6	0.90	1.50		7.60		Argilla limosa di colore nocciola; terreno bagnato.						6	2.5	1.2			
													1.8	0.9			
													2.0	1.1			
7	1.30	1.50		9.50		Argilla limosa di colore nocciola con striature grigie; terreno ad umidità medio scarsa.						7	2.8	1.3			
													2.4	1.1			
													2.5	1.3			
8	1.20	1.50		11.40		Argilla limosa a struttura scagliosa di colore grigio ruggine, media alterazione, trovante dalla profondità di 11.50-11.60m.						8	1.0	0.4			
													1.5	0.7			
													2.0	0.9			
9	1.00	1.50		11.60		Argilla limosa di colore grigio, inalterata; terreno ad umidità scarsa.						9	1.1	0.6			
													1.0	0.5			
													0.9	0.4			
10	1.00	1.50		12.00								10	2.5	1.1			
													1.0	0.4			
													0.8	0.4			
													0.8	0.3			
													4.4	>2.0			
11	0.70	1.50										11	1.1	0.4			
													0.2	0.3			
													>4.5	>2.0			
													>4.5	>2.0			
12	0.50	1.50										12					
13												13					
14												14					
15												15					
16												16					
17												17					
18												18					
19												19					
20												20					

Rilevamento acqua nel foro di sondaggio
 I DATA I ORA IN. I QUOTA F.F. I QUOTA H2O I ORA F. I QUOTA F.F. I QUOTA H2O I
 19/05/11 08:45 | | | 13:00 | 12.00 m | 10.00 m |

PROVA PENETROMETRICA DINAMICA P1
Strumento utilizzato DPHS TG 63-200
DIAGRAMMA NUMERO COLPI PUNTA-Rpd

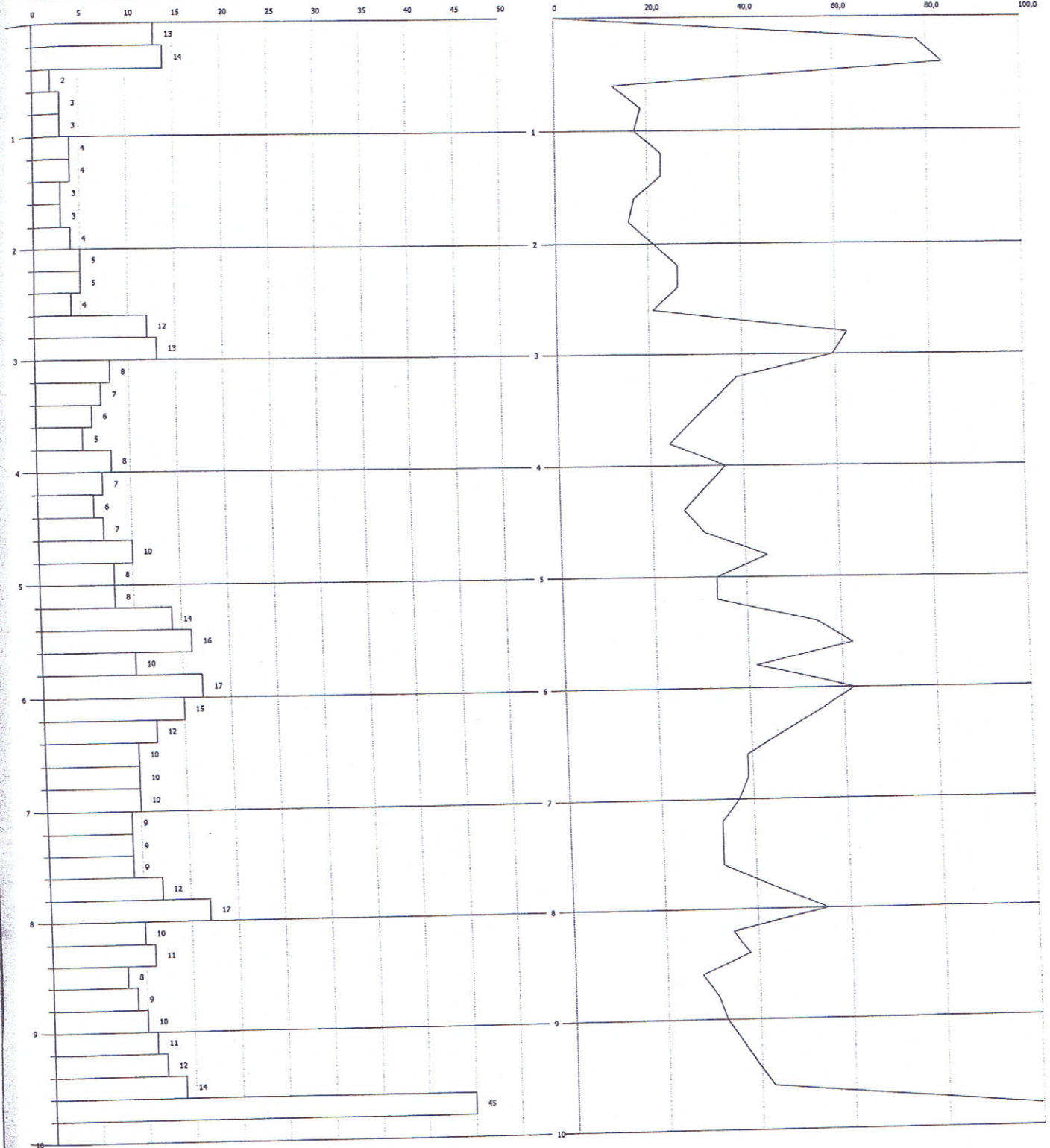
Committente : Società Agricola Cooperativa
Cantiere : Caseificio Cooperativo
Località : Case Bortolani

Data : 22/05/2008

Scala 1:50

Numero di colpi penetrazione punta

Rpd ridotta (Kg/cm²)



Case Bortolani, Caseificio - TR1

Instrument: TEP-0060/01-10

Start recording: 09/12/10 13:42:34 End recording: 09/12/10 13:58:34

Channel labels: NORTH SOUTH; EAST WEST; UP DOWN

GPS data not available

Trace length: 0h16'00". Analyzed 89% trace (manual window selection)

Sampling frequency: 128 Hz

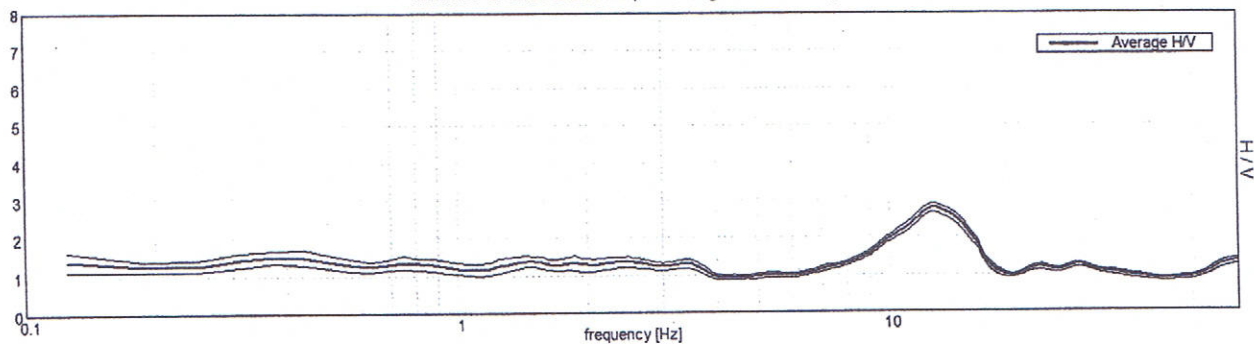
Window size: 15 s

Smoothing window: Triangular window

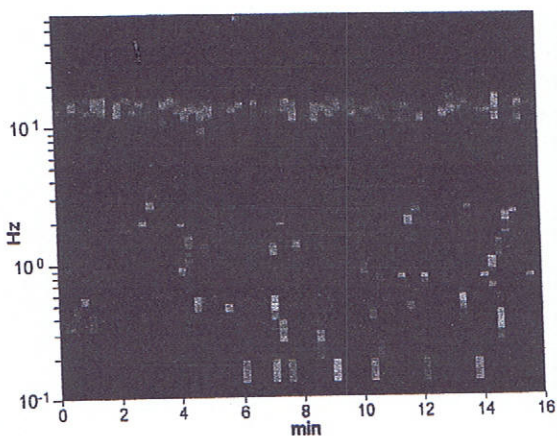
Smoothing: 10%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

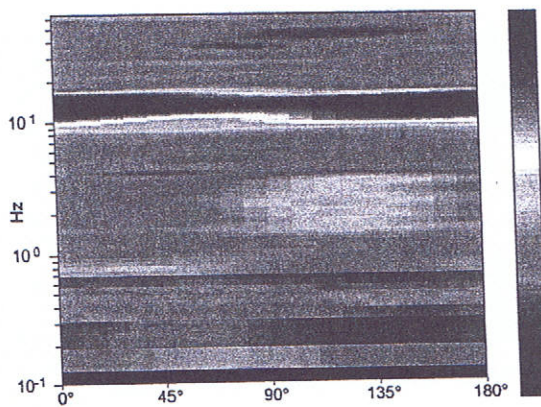
Max. H/V at 12.81 ± 0.05 Hz (in the range 0.0 - 64.0 Hz).



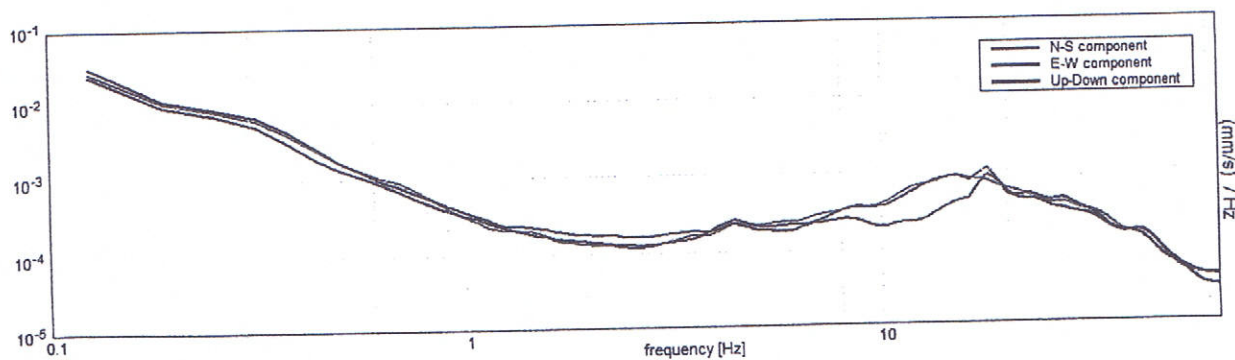
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



GEO-PROBE

CPT (CONE PENETRATION TEST)

40133 BOLOGNA

Data: 24/06/98

N. 5

Via R. Grieco, 7 - Tel. 051/61.45.360

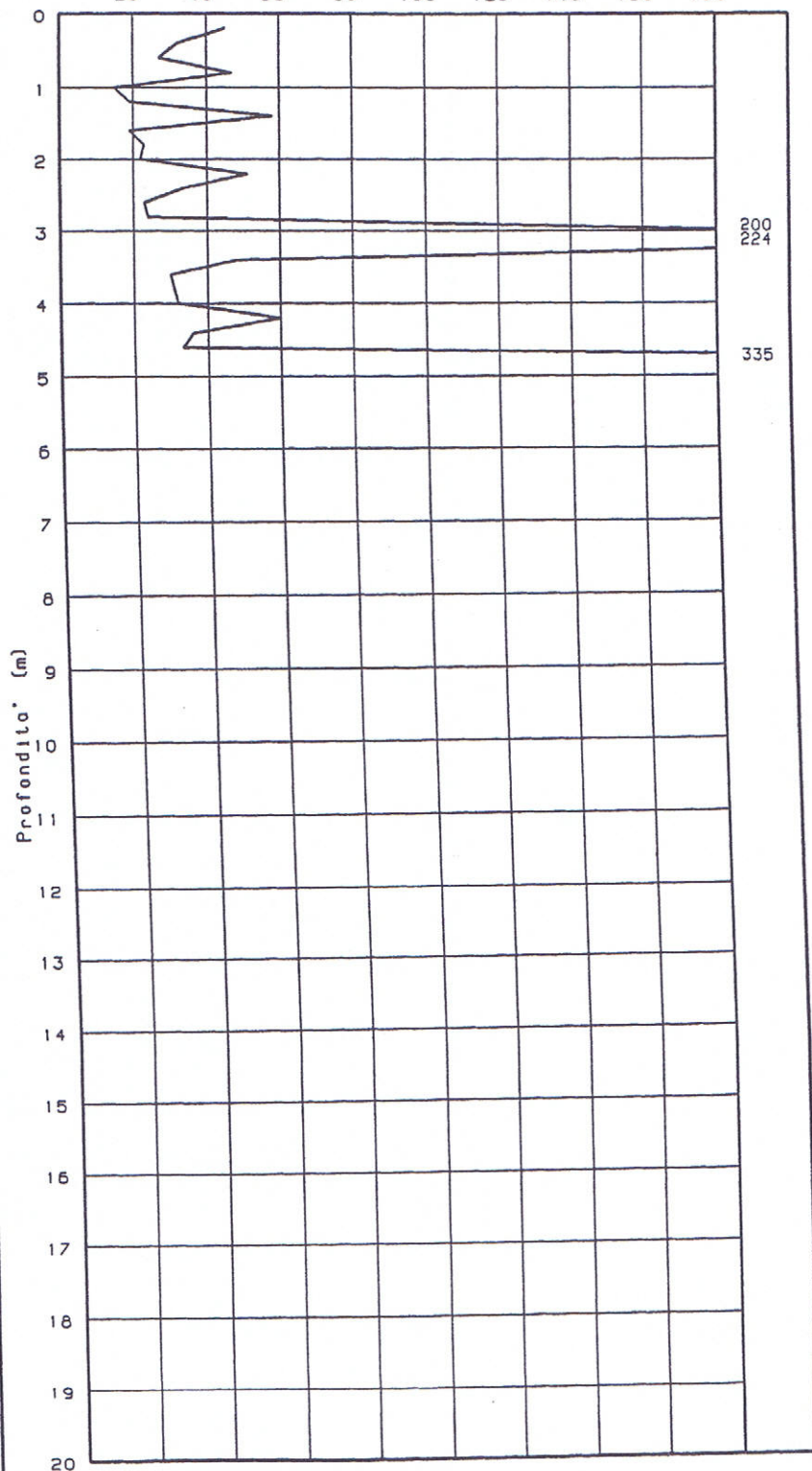
Committente: Gea Soc. Coop. a r.l.

N. Certificato: 98152005

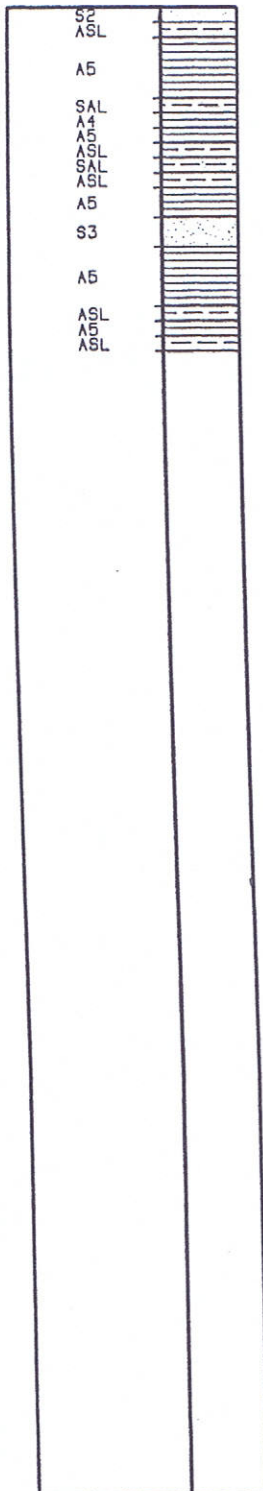
Localita': Monte San Pietro (BO) Ca' Bortoloni

q_c resistenza alla punta (kg/cm²)

20 40 60 80 100 120 140 160 180



CLASSIFICAZIONE
DEI TERRENI SEC.
SCHMERTMANN 1978



Quota di falda: assente

STUDIO GEOLOGICO ASSOCIATO

GEO-PROBE

Via R. Grieco, 7 - Tel. 051/61.45.360

40133 BOLOGNA
 Committente: Geo Soc. Coop. a r.l.
 Località: Monte San Pietro (BO) Ca' Bertoloni

SONDAGGIO N. 2

N. Certificato: 98152002

Data: 24/06/98

Profondità* (m)	Colonna stratigr.	Descrizione stratigrafica	Faldo	Comploni		Pocket penetrometer (kg/cm²)	Torvone (kg/cm²)	S.P.T.		Piezometro	Schema
				Profondità* (m)	n. Tipo			Profondità* (m)	N.		
3.30		Argilla limosa di colore beige con concrezioni calcaree; - terreno a consistenza dura ed umidità scassa. Argilla limosa di colore beige con sceszature rosso grigiastre e frammenti lapidei elementari; - terreno a consistenza plastico dura ed umidità scassa.									
1.90		Trovante calcareo.									
2.70		Argilla debolmente limosa di colore verde rossastro con inclusi lapidei di natura calcarea; - terreno a consistenza dura ed umidità scassa.									
4.80		Trovante calcareo a consistenze lapidee.									
5.00											
Quota di fondo: assente											

Trivellazione a secco Ø mm 152

GEO-PROBE

40133 BOLOGNA

Via R. Grieco, 7 - Tel. 051/61.45.360

CPT (CONE PENETRATION TEST)

Data: 24/06/98

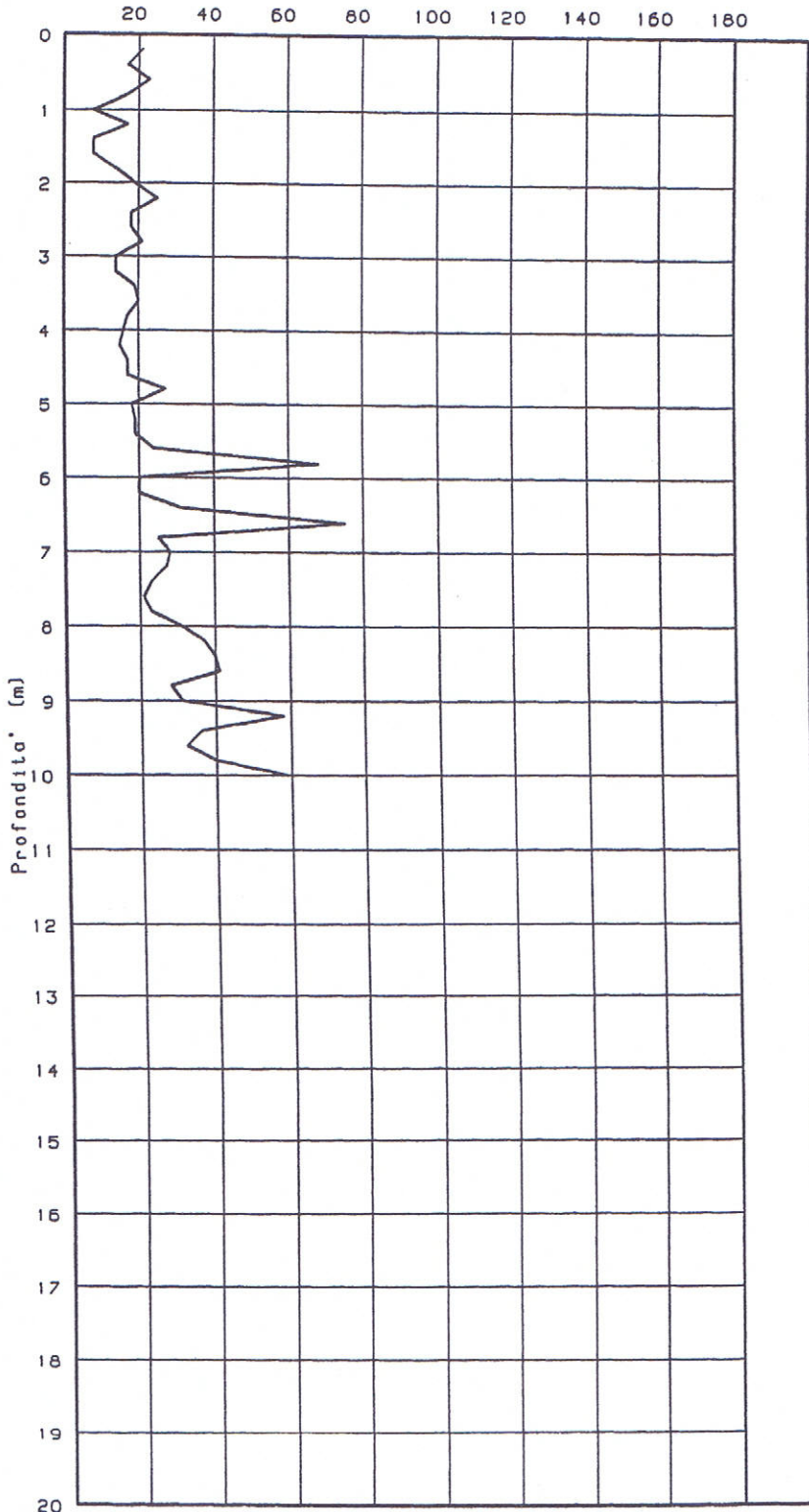
N. 6

Committente: Geo Soc. Coop. a r.l.

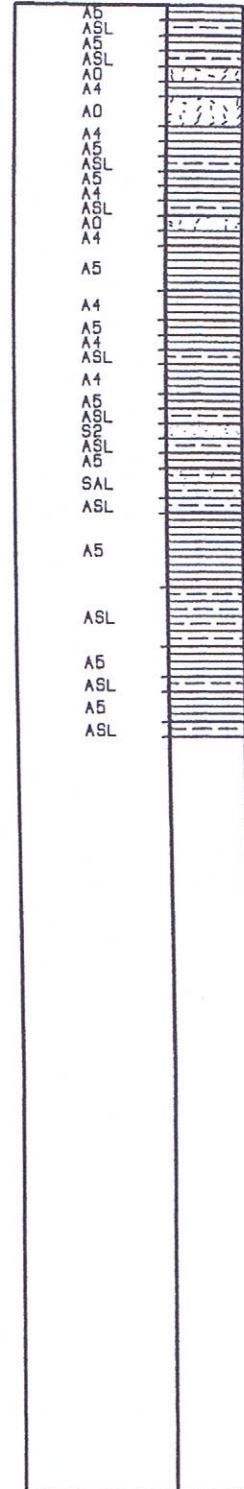
N. Certificato: 98152006

Localita': Monte San Pietro (BO) Co' Bortoloni

Q_c resistenza alla punta (kg/cm²)



CLASSIFICAZIONE
DEI TERRENI SEC.
SCHMERTMANN 1978



Quota di fondo: assente

STUDIO GEOLOGICO ASSOCIATO

GEO-PROBE

40133 BOLOGNA

Via R. Grieco, 7 - Tel. 051/61.45.360

CPT (CONE PENETRATION TEST)

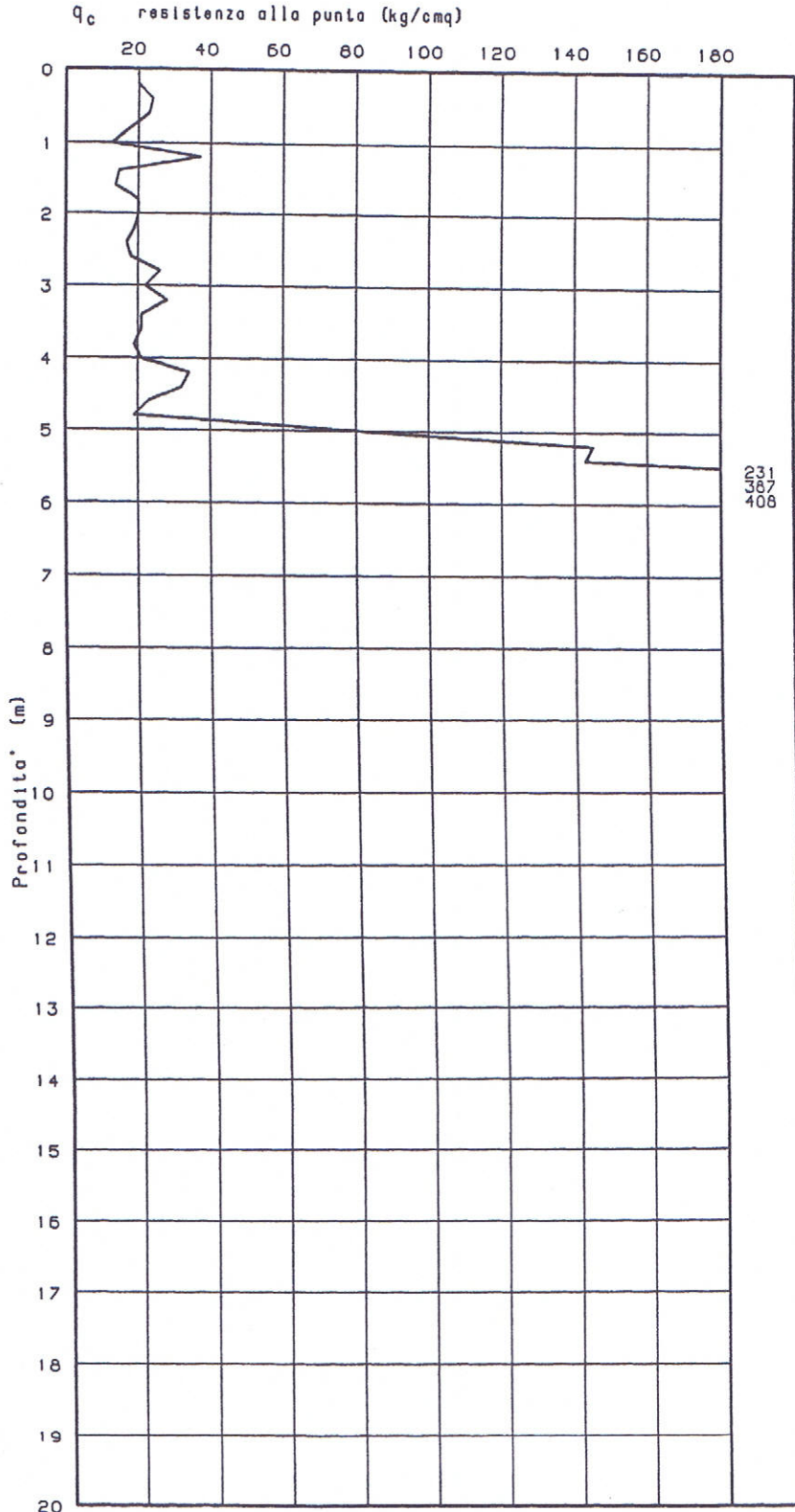
Data: 24/06/98

N. 7

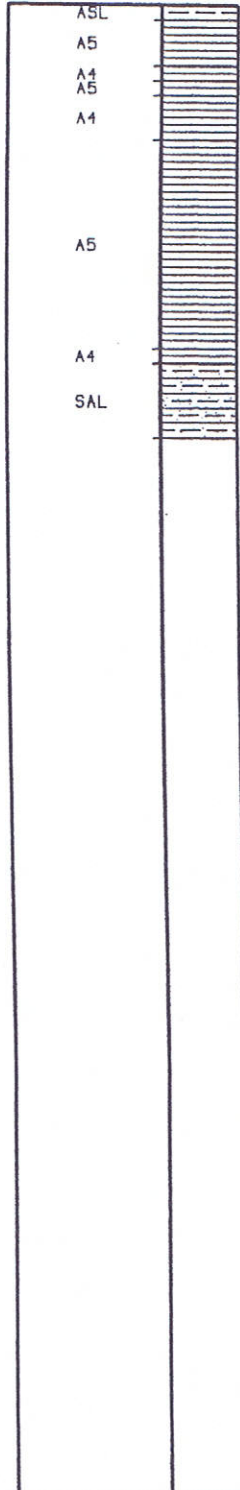
Committente: Gea Soc. Coop. a r.l.

N. Certificato: 98152007

Localita': Monte San Pietro (BO) Co' Bortolani



CLASSIFICAZIONE
DEI TERRENI SEC.
SCHMERTMANN 1978



Quota di folds: assente

STUDIO GEOLOGICO ASSOCIATO

GEO-PROBE

40133 BOLOGNA

Via R. Grieco, 7 - Tel. 051/61.45.360

SONDAGGIO N. 1

Committente: Geo Soc. oop. o r.l.

Località: Monte San Pietro (BO) Co' Bartoloni

N. Certificato: 98152001

Data: 24/06/98

Profondità* (m)	Colonna stratigr.	Descrizione stratigrafica	Folde	Campioni			Pocket penetrometer (kg/cmq)	Torvone (kg/cmq)	S.P.T.		Piezometro
				Profondità* (m)	n.	Tipo			Profondità* (m)	N.	
0.40		Argilla limosa di colore beige con concrezioni calcaree; - terreno a consistenza duro ed umido, scosso. Argilla limosa di colore grigio verde con screziature beige e rossastre, con concrezioni calcaree e frammenti lapidei; - terreno a consistenza duro ed umido, scosso.									
1.20		Argilla limosa di colore beige con screziature grigiastre; - terreno a consistenza duro ed umido, scosso.									
2.60		Terreno argilloso e argilla marnosa di colore beige; - terreno compatto ed umido, scosso.									
5.50											

Quota di folde: assente

GEO-PROBE

40133 BOLOGNA

Via R. Grieco, 7 - Tel. 051/61.45.350

CPT (CONE PENETRATION TEST)

Data: 22/05/2001

N. 2

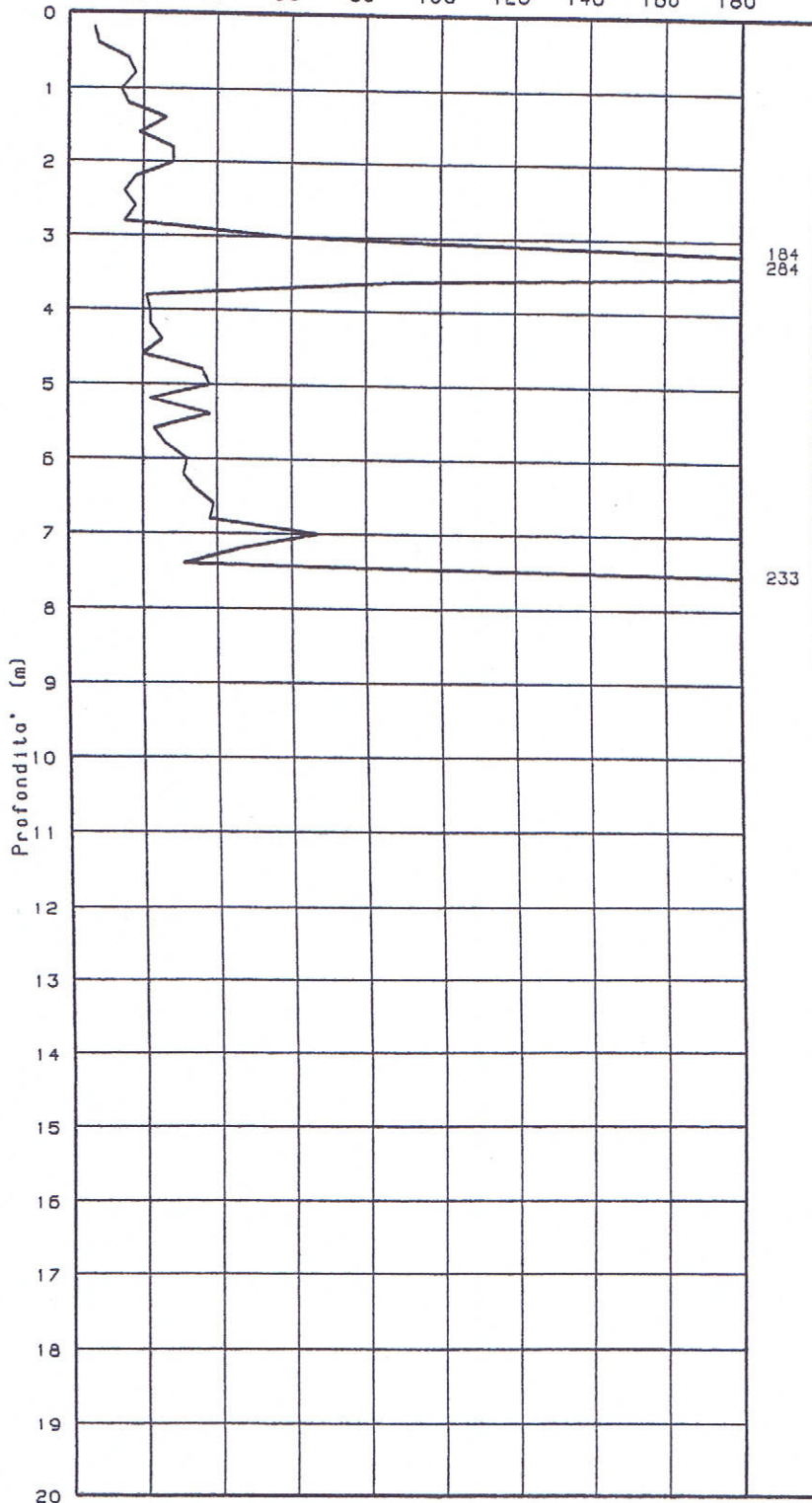
Committente: Sig. Cavazza Valerio

N. Certificato: 01153002

Localita': Savigno (BO) via S. Prospero - Ca' Bartolani

q_c resistenza alla punta (kg/cm²)

20 40 60 80 100 120 140 160 180



CLASSIFICAZIONE DEI TERRENI SEC. SCHMERTMANN 1978

AG	[Symbol]
ASL	[Symbol]
A5	[Symbol]
A4	[Symbol]
ASL	[Symbol]
A5	[Symbol]
A4	[Symbol]
A5	[Symbol]
SAL	[Symbol]
GS	[Symbol]
SG2	[Symbol]
A5	[Symbol]
A4	[Symbol]
ASL	[Symbol]
A5	[Symbol]
SAL	[Symbol]
ASL	[Symbol]
A5	[Symbol]

Profondità' acqua da p.c.: -3.20 m

STUDIO GEOLOGICO ASSOCIATO

GEO-PROBE

CPT (CONE PENETRATION TEST)

40133 BOLOGNA

Data: 22/05/2001

N. 4

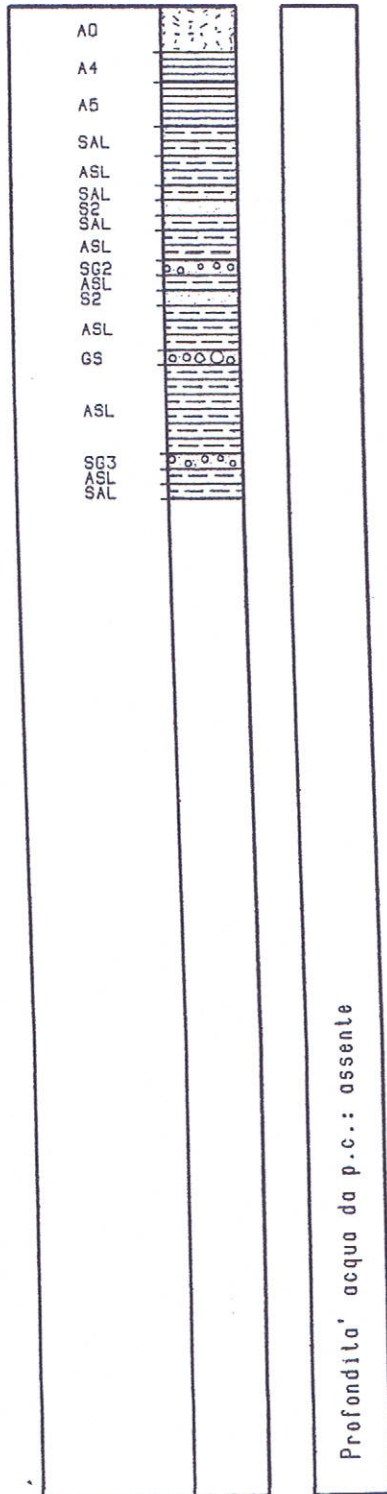
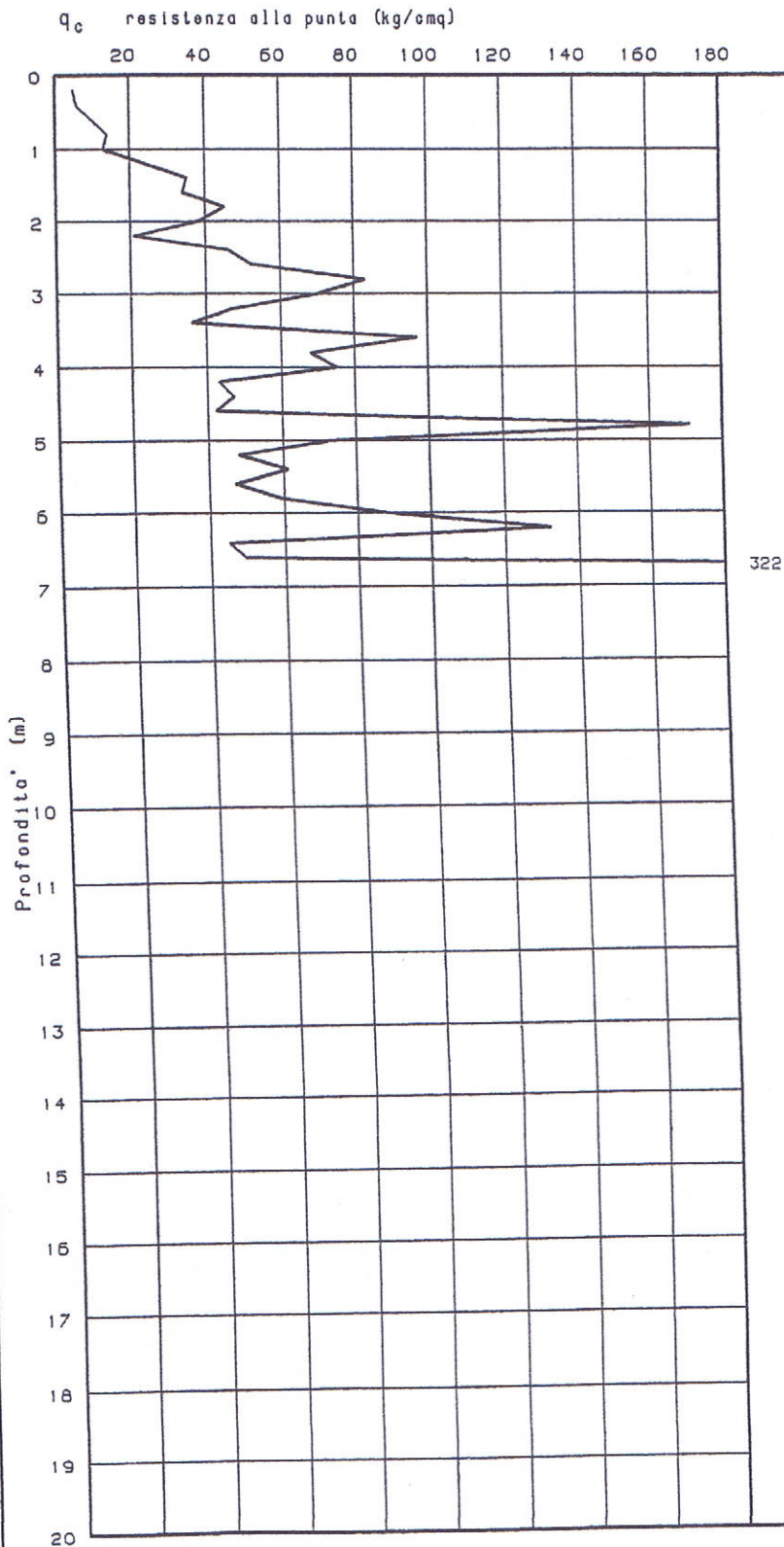
Via R. Grieco, 7 - Tel. 051/61.45.360

Committente: Sig. Cavazza Valerio

N. Certificato: 01153004

Localita': Savigno (BO) via S. Prospero - Ca' Bortolani

CLASSIFICAZIONE DEI TERRENI SEC. SCHMERTMANN 1978



GEO-PROBE

CPT (CONE PENETRATION TEST)

40133 BOLOGNA

Via R. Grieco, 7 - Tel. 051/61.45.360

Data: 22/05/2001

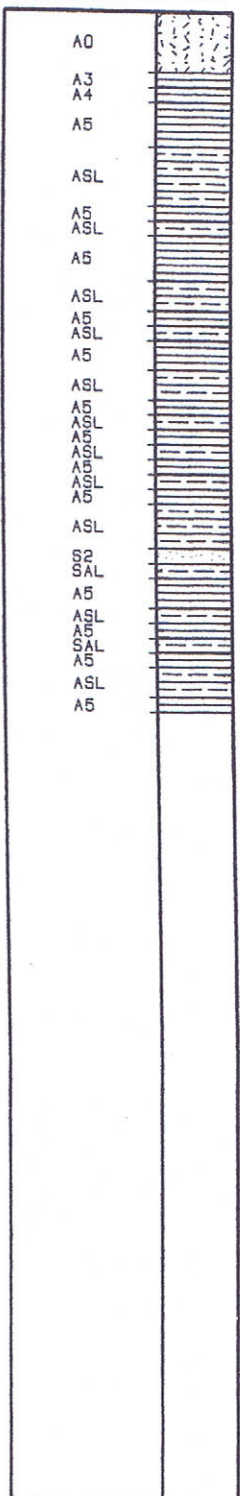
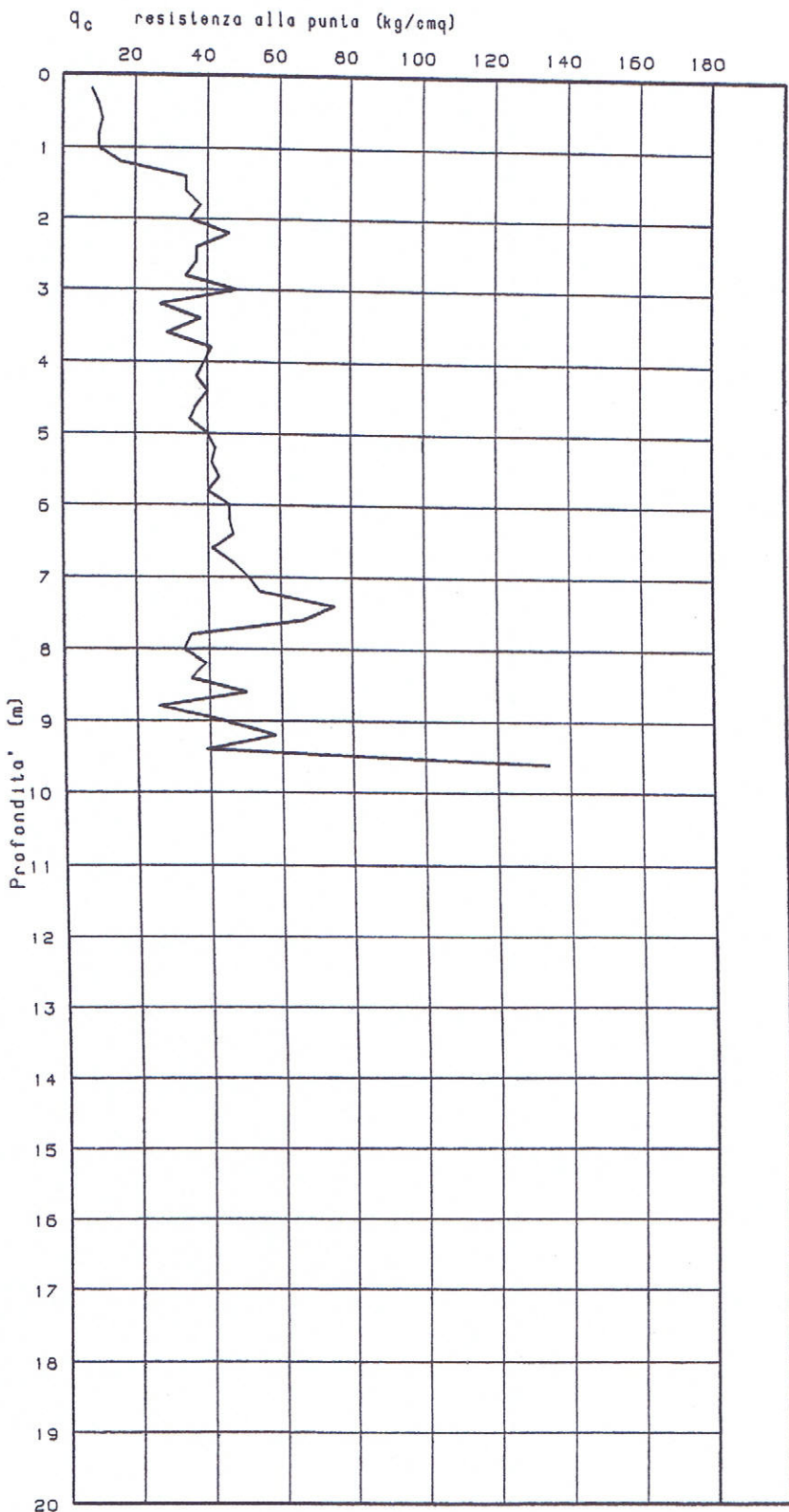
N. 5

Committente: Sig. Cavazza Valerio

N. Certificato: 01153005

Localita': Savigno (BO) via S. Prospero - Ca' Bortolani

CLASSIFICAZIONE DEI TERRENI SEC. SCHMERTMANN 1978



Profondita' acqua da p.c.: assente

SIUDIO GEOLOGICO ASSOCIATO

037058 P 53 SD 59

GEO-PROBE

SONDAGGIO N. 1

N. Certificato: 01153001

40133 BOLOGNA

Committente: Sig. Cavazza Valerio

Data: 22/05/2001

Via R. Grieco, 7 - Tel. 051/61.45.360

Localita': Savigno (BO) via S. Prospero - Ca' Bortoloni

Profondita' (m)	Colonna stratigr.	Descrizione stratigrafica	Falda	Campioni			Pocket penetrometer (kg/cmq)	Torvone (kg/cm)	S.P.T.		Piezometro	
				Profondita' (m)	n.	Tipo			Profondita' (m)	N.	Profondita' (m)	Stato
0.30		Terrano pedogenizzato di natura argilloso.										
1.50		Lima argillosa di colore grigio azzurro con screziatura verdastre, frequenti frammenti lapidei colorati; - terreno a consistenza plastico duro ed umidita' scarsa.										
5.50		Argilla limosa di colore grigiastro con frequenti travanti lapidei di medie dimensioni; - terreno a prevalente consistenza dura ed umidita' scarsa; - presenza di livelli asometrici lievemente plasticizzati di elevata umidita'										

GEO-PROBE s.n.c. Indagini Geognostiche

Profondita' acqua da p.o.: assente

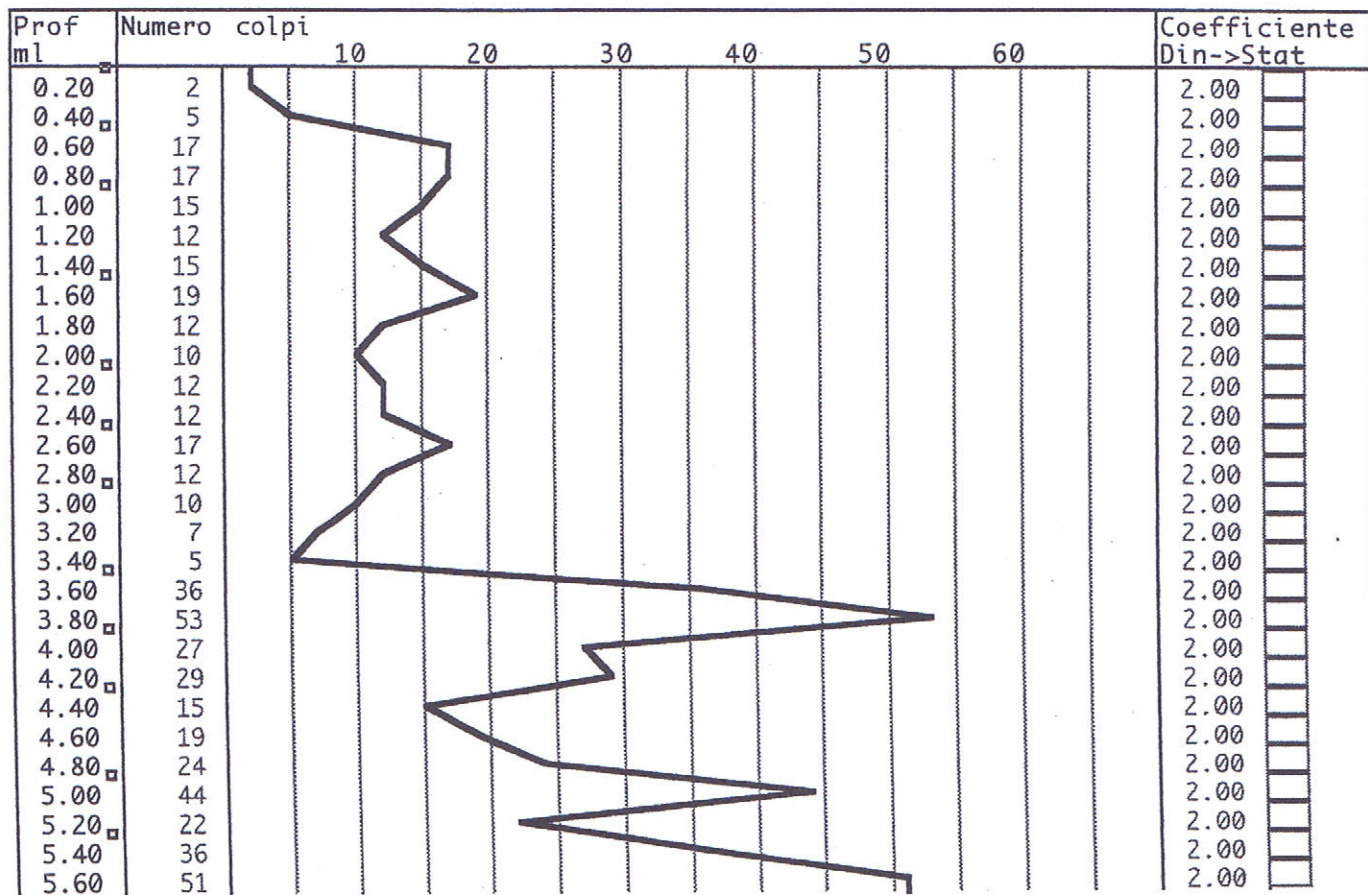
Prova penetrometrica dinamica Dpsh 2
 Ca' di Ropa (Savigno)
 23 settembre 1999

037058 P54 DP60

Prof ml	Numero colpi	10 20 30 40 50 60						Coefficiente Din->Stat
0.20	7							2.00
0.40	2							2.00
0.60	7							2.00
0.80	15							2.00
1.00	19							2.00
1.20	17							2.00
1.40	19							2.00
1.60	22							2.00
1.80	17							2.00
2.00	17							2.00
2.20	17							2.00
2.40	19							2.00
2.60	22							2.00
2.80	36							2.00
3.00	19							2.00
3.20	22							2.00
3.40	15							2.00
3.60	12							2.00
3.80	15							2.00
4.00	12							2.00
4.20	7							2.00
4.40	5							2.00
4.60	7							2.00
4.80	5							2.00
5.00	5							2.00
5.20	10							2.00
5.40	10							2.00
5.60	12							2.00
5.80	12							2.00
6.00	15							2.00
6.20	12							2.00
6.40	12							2.00
6.60	12							2.00
6.80	10							2.00
7.00	12							2.00
7.20	7							2.00
7.40	12							2.00
7.60	7							2.00
7.80	12							2.00
8.00	12							2.00
8.20	10							2.00
8.40	7							2.00
8.60	7							2.00
8.80	10							2.00
9.00	15							2.00
9.20	12							2.00
9.40	15							2.00
9.60	12							2.00
9.80	12							2.00
10.00	15							2.00
10.20	19							2.00
10.40	28							2.00
10.60	22							2.00
10.80	19							2.00

Prova penetrometrica dinamica Dpsh 3
 Ca' di Ropa (Savigo)
 23 settembre 11999

037058P55DP61



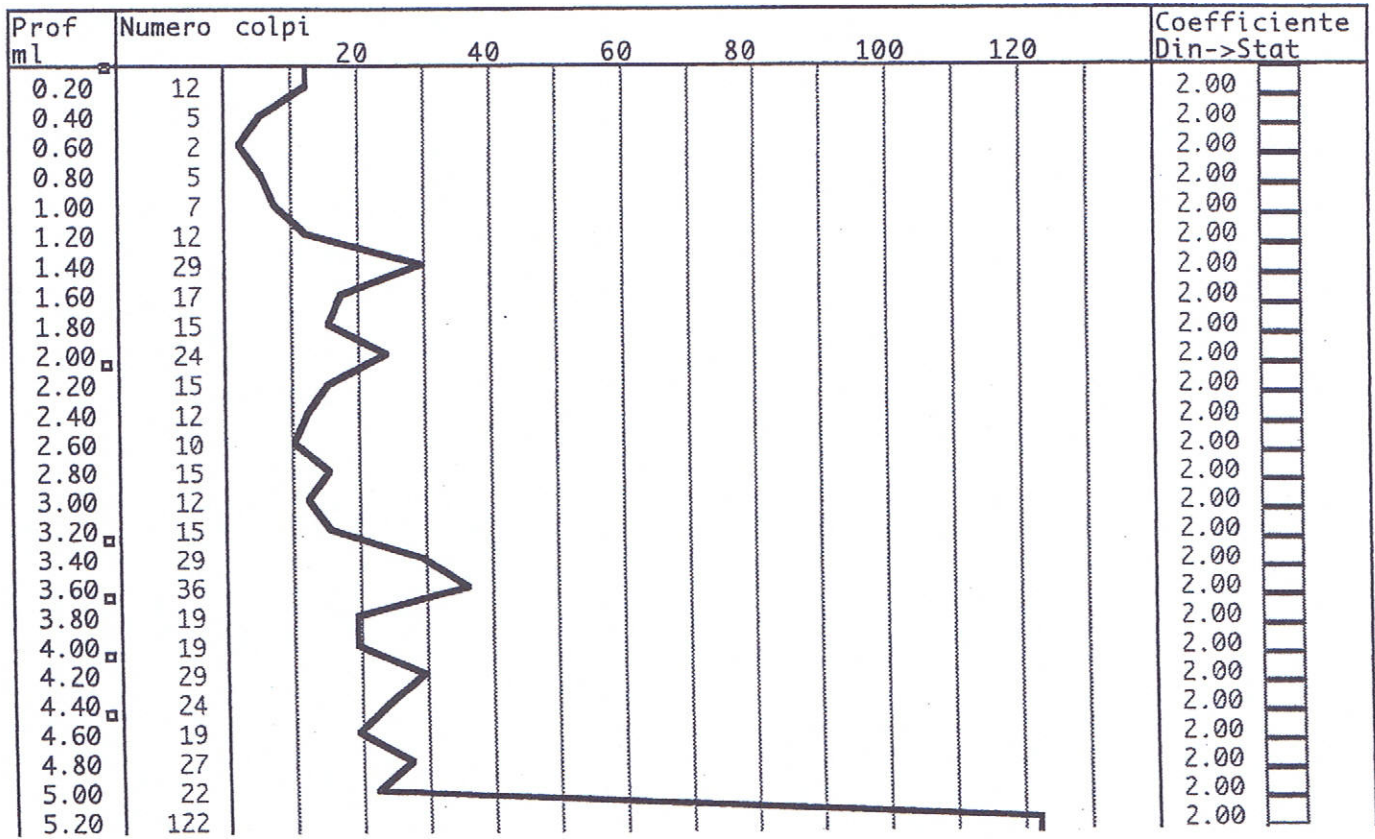
Prova penetrometrica dinamica Dpsh 4
 Ca' di Ropa (Savigno)
 23 settembre 1999

037058 P56 DP62

Prof ml	Numero colpi	Numero colpi						Coefficiente Din->Stat
		10	20	30	40	50	60	
0.20	2							2.00
0.40	5							2.00
0.60	17							2.00
0.80	17							2.00
1.00	15							2.00
1.20	12							2.00
1.40	15							2.00
1.60	36							2.00
1.80	29							2.00
2.00	19							2.00
2.20	12							2.00
2.40	12							2.00
2.60	15							2.00
2.80	29							2.00
3.00	10							2.00
3.20	12							2.00
3.40	10							2.00
3.60	36							2.00
3.80	41							2.00
4.00	15							2.00
4.20	29							2.00
4.40	15							2.00
4.60	19							2.00
4.80	36							2.00
5.00	27							2.00
5.20	34							2.00
5.40	22							2.00
5.60	41							2.00

Prova penetrometrica dinamica Dpsh 5
 Ca' di Ropa (Savigno)
 23 settembre 1999

037058 P57 DP63



Località:
Committente:
Data:
Sondaggio S1

Ca' di Ropa (Savigno)
Arch Baraldi (Castello di
Serravalle)
23 settembre 1999

037058P58 SD64

Quota iniziale:

Metodo di perforazione: p.c

Ditta esecutrice:

Trivella elicoidale Ø 100 mm

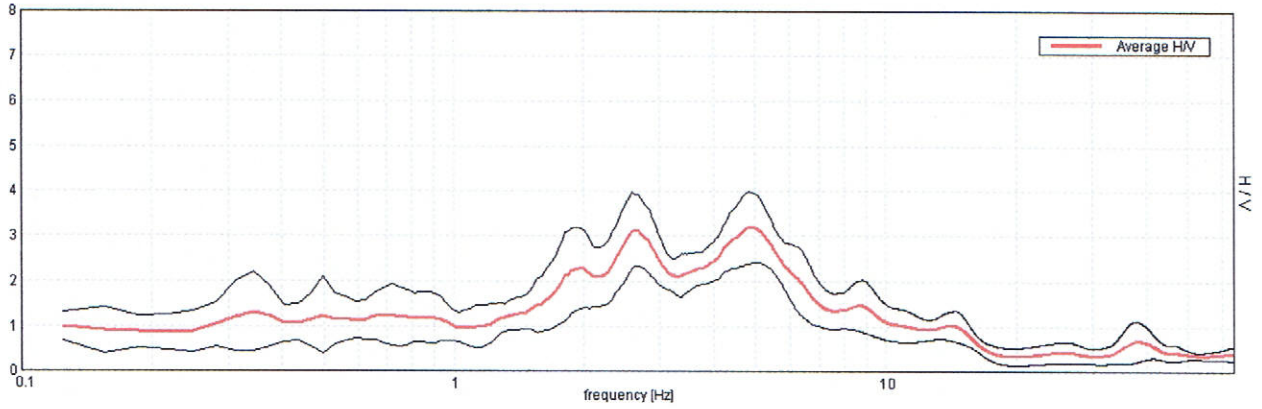
Prof. m da p.c.		Pocket kg/cmq	Vane kg/cmq	Campioni	Descrizione litologica	Note ed osservazioni
0.50					Terreno agrario	
1 -					Limo sabbioso colore marrone consistenza dura	Campione 1 (-1.70 m) Uumidità da media a scarsa.
2 -						
2.50						
3 -						
4 -						
5 -						

SAVIGNO, VARIANTE ANTICIPATORIA TR2

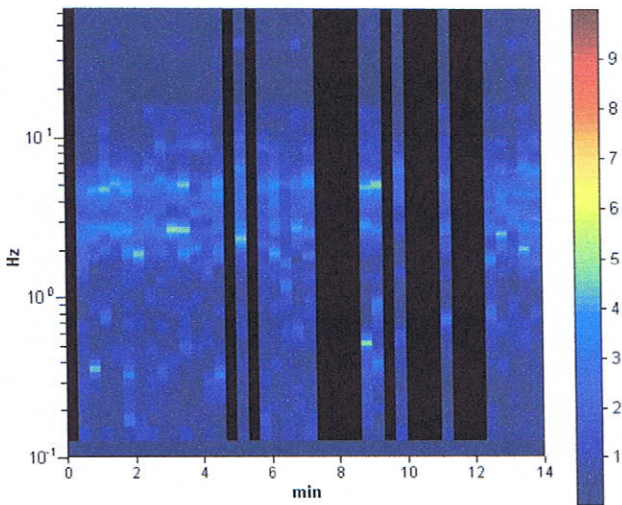
Instrument: TRZ-0108/01-10
 Start recording: 22/01/13 15:29:42 End recording: 22/01/13 15:43:42
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 67% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

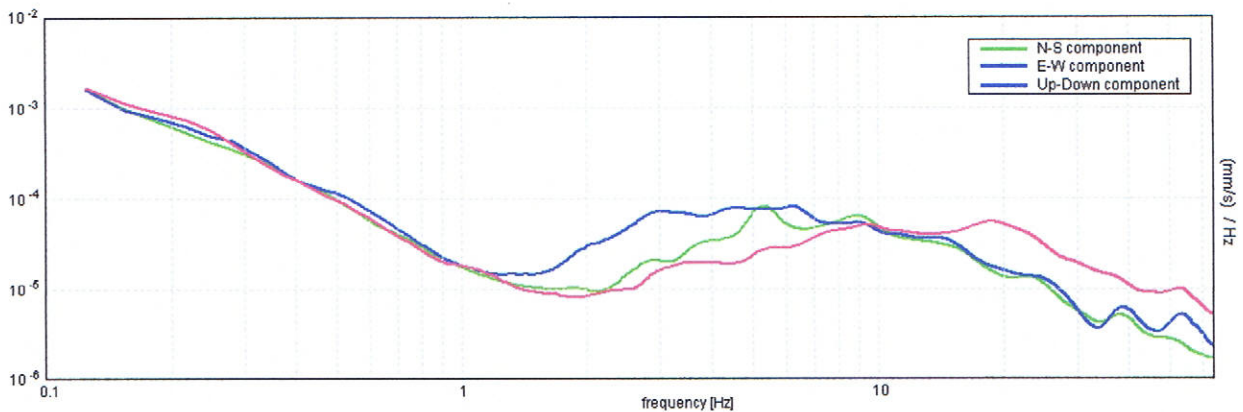
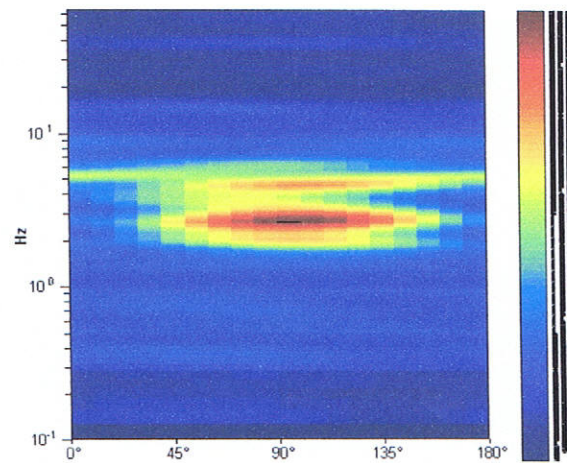
Max. H/V at 4.84 ± 0.42 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



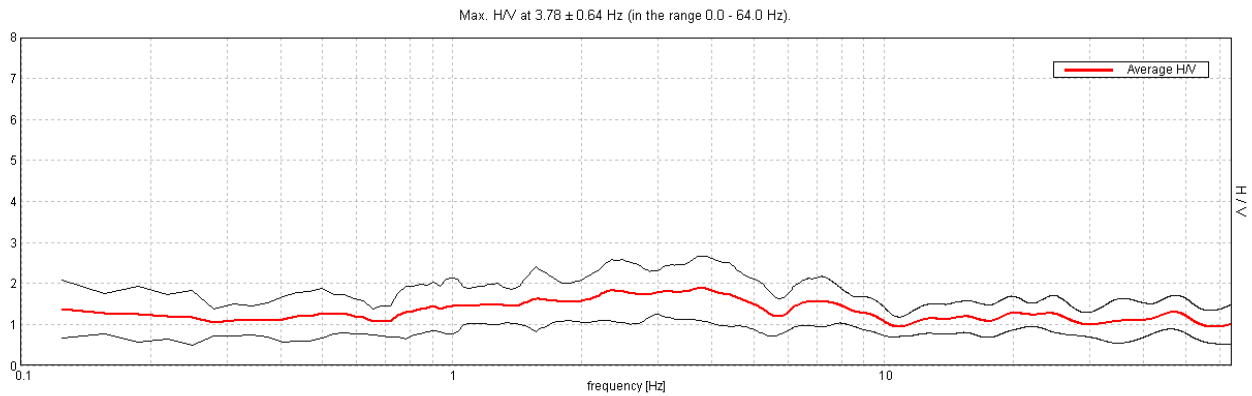
DIRECTIONAL H/V



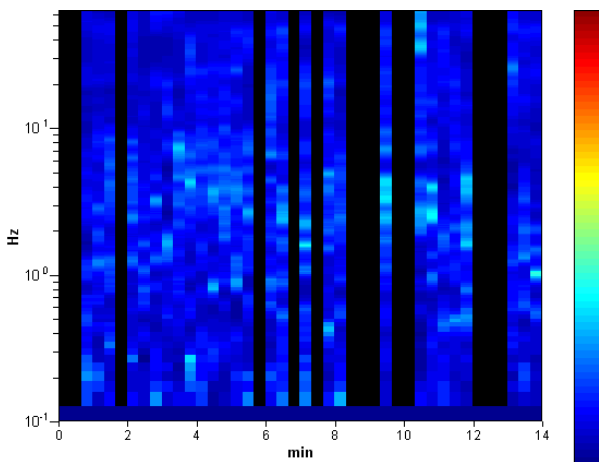
SAVIGNO, 037058P60HVSR66

Instrument: TRZ-0108/01-10
 Start recording: 31/10/13 09:52:00 End recording: 31/10/13 10:06:01
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 67% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

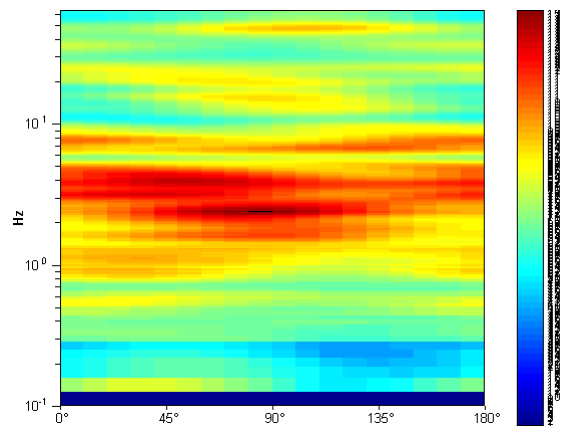
HORIZONTAL TO VERTICAL SPECTRAL RATIO



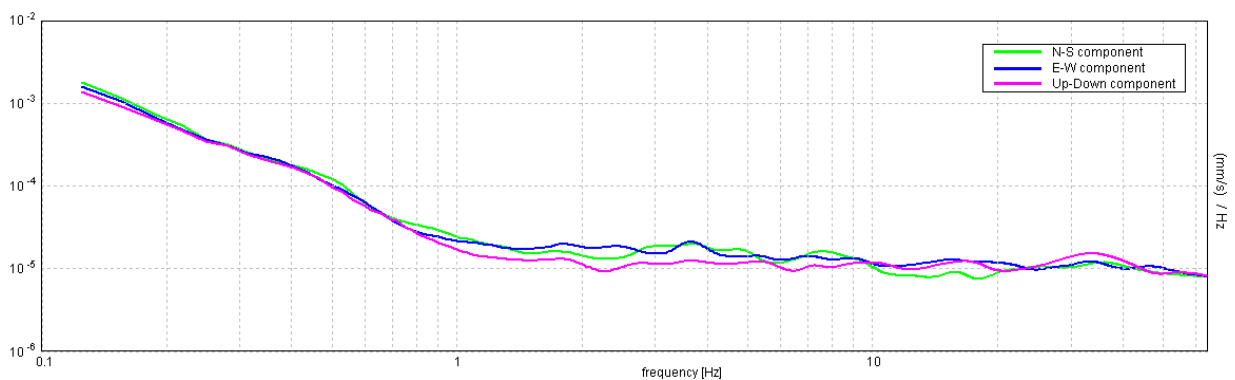
H/V TIME HISTORY



DIRECTIONAL H/V



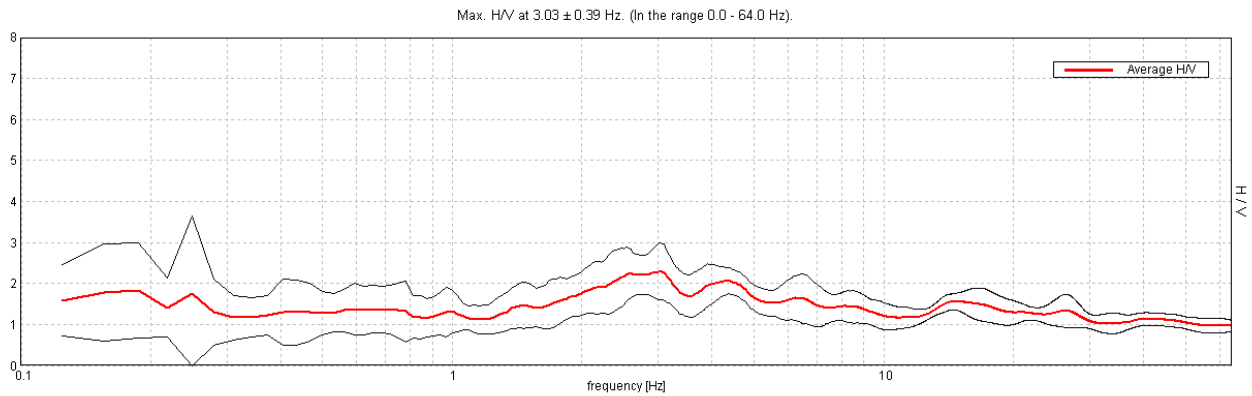
SINGLE COMPONENT SPECTRA



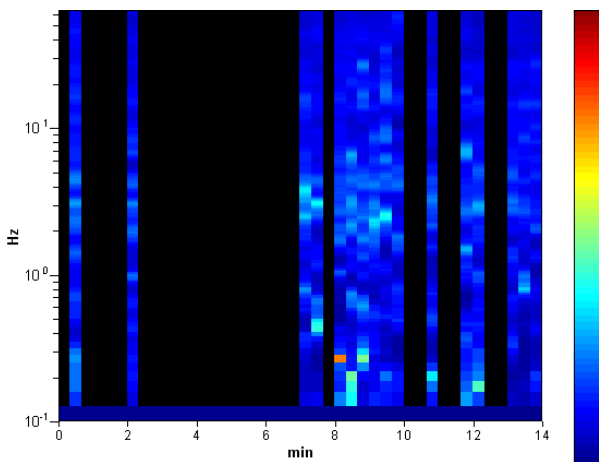
SAVIGNO, 037018P61HVSR67

Instrument: TRZ-0108/01-10
 Start recording: 31/10/13 10:21:41 End recording: 31/10/13 10:35:42
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 38% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

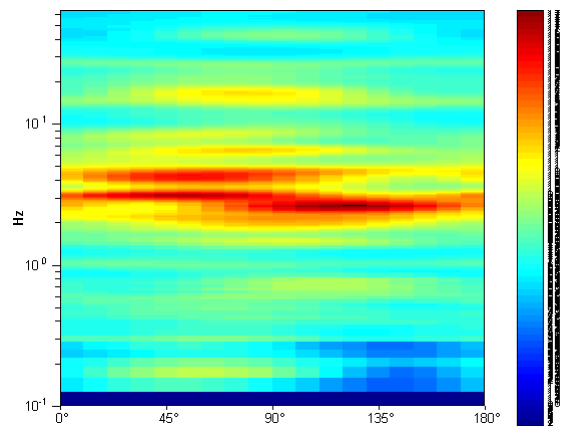
HORIZONTAL TO VERTICAL SPECTRAL RATIO



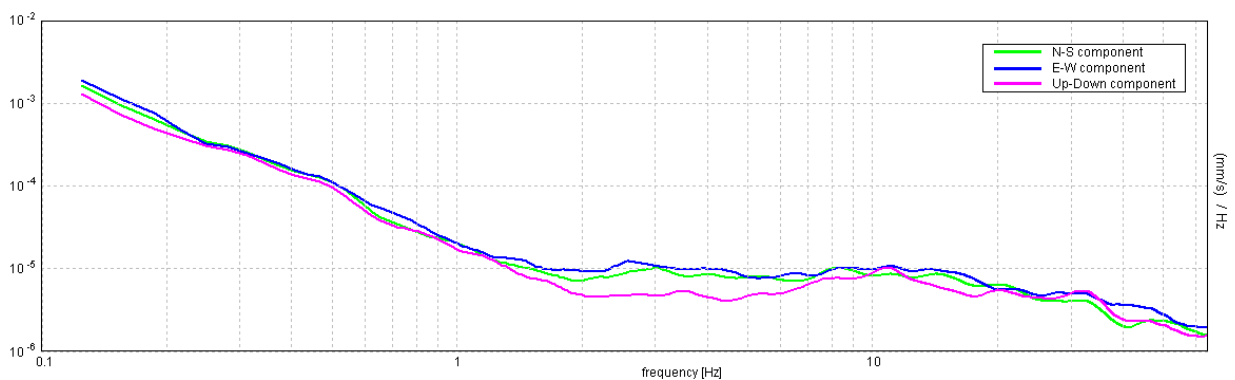
H/V TIME HISTORY



DIRECTIONAL H/V



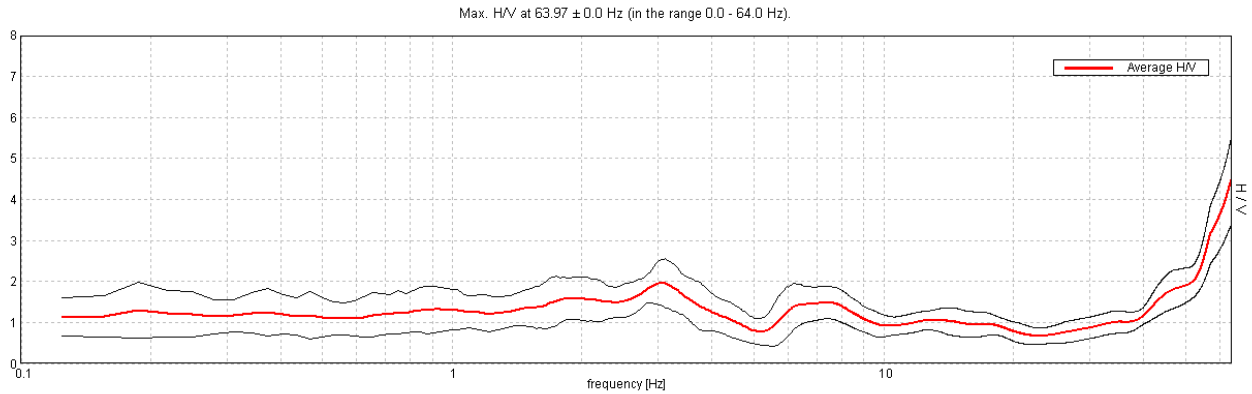
SINGLE COMPONENT SPECTRA



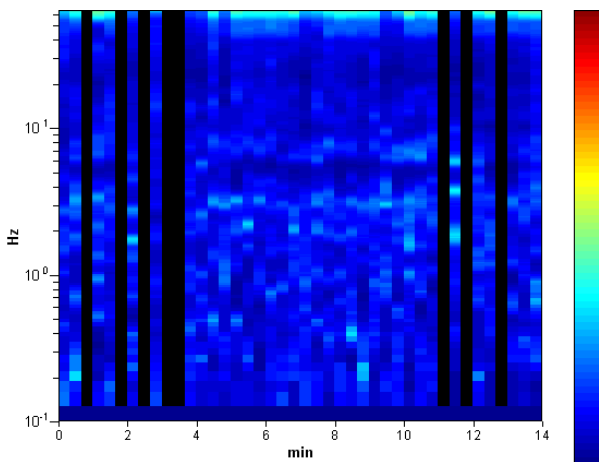
SAVIGNO,037018P62HVSR68

Instrument: TRZ-0108/01-10
 Start recording: 31/10/13 11:14:31 End recording: 31/10/13 11:28:32
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 81% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

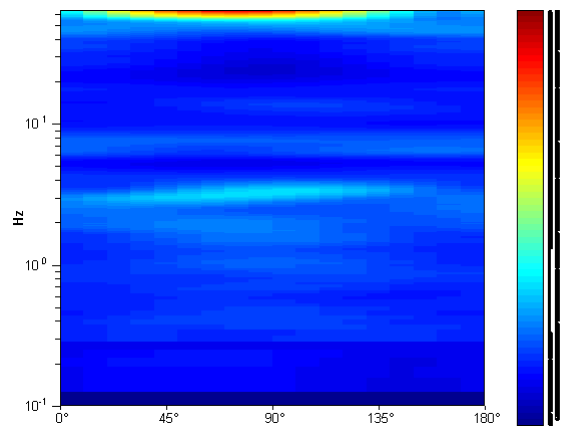
HORIZONTAL TO VERTICAL SPECTRAL RATIO



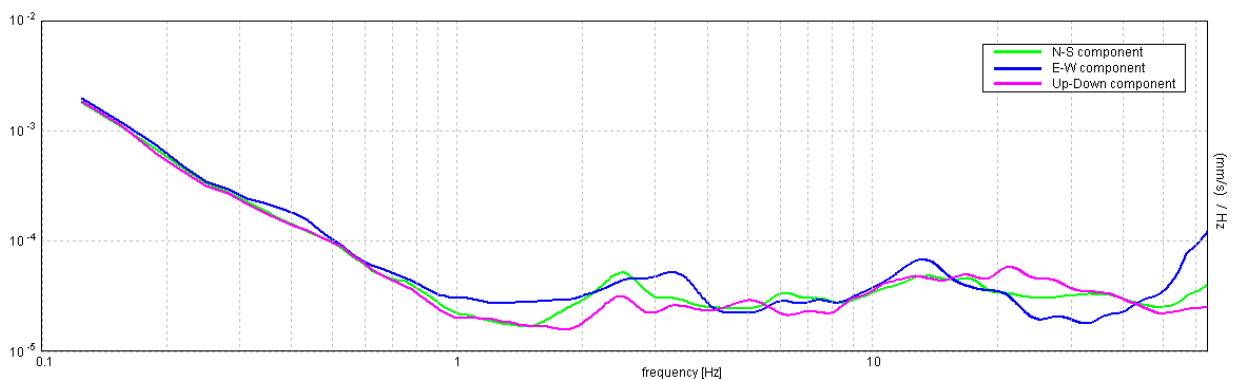
H/V TIME HISTORY



DIRECTIONAL H/V



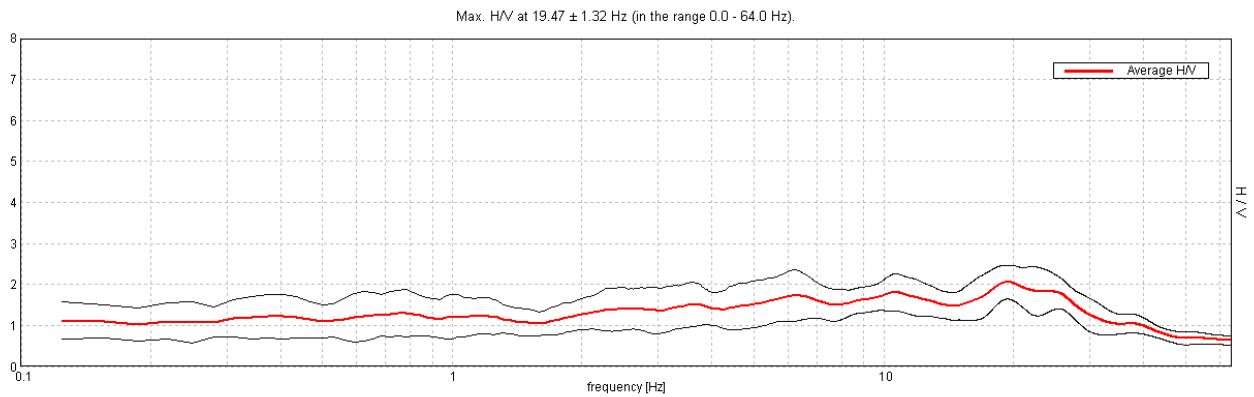
SINGLE COMPONENT SPECTRA



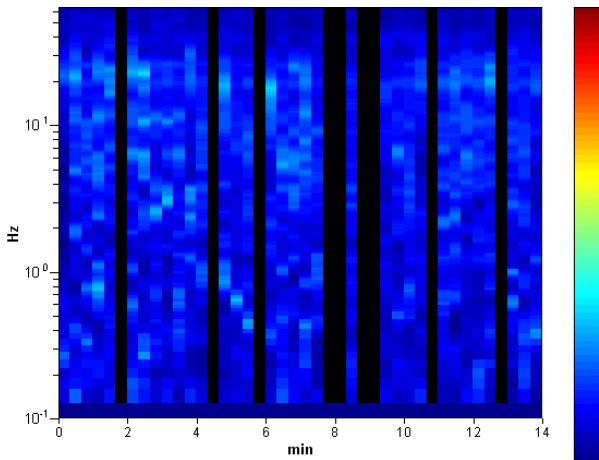
SAVIGNO,037018P63HVSR69

Instrument: TRZ-0108/01-10
 Start recording: 31/10/13 11:33:30 End recording: 31/10/13 11:47:31
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 79% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

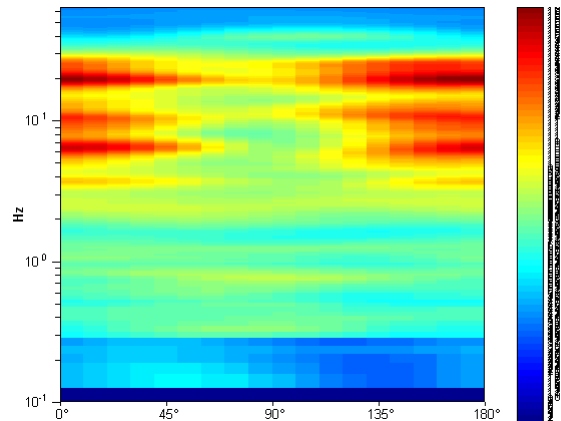
HORIZONTAL TO VERTICAL SPECTRAL RATIO



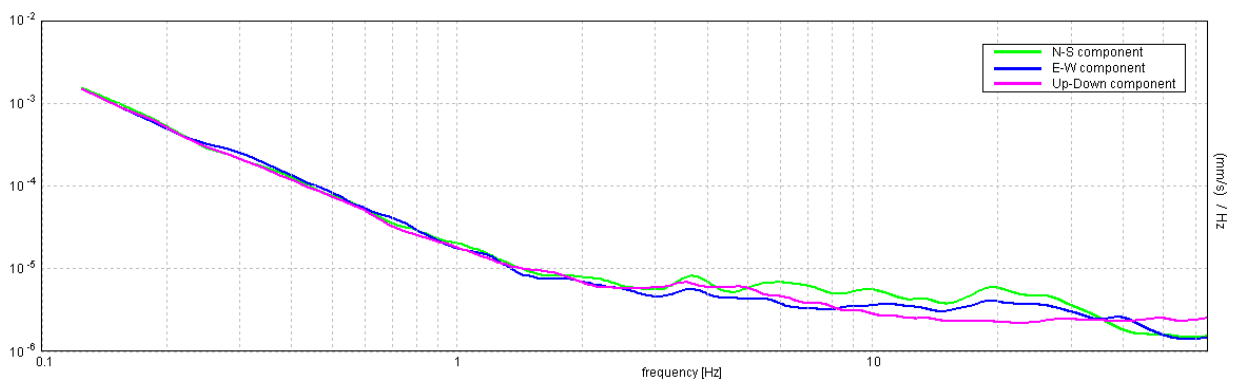
H/V TIME HISTORY



DIRECTIONAL H/V



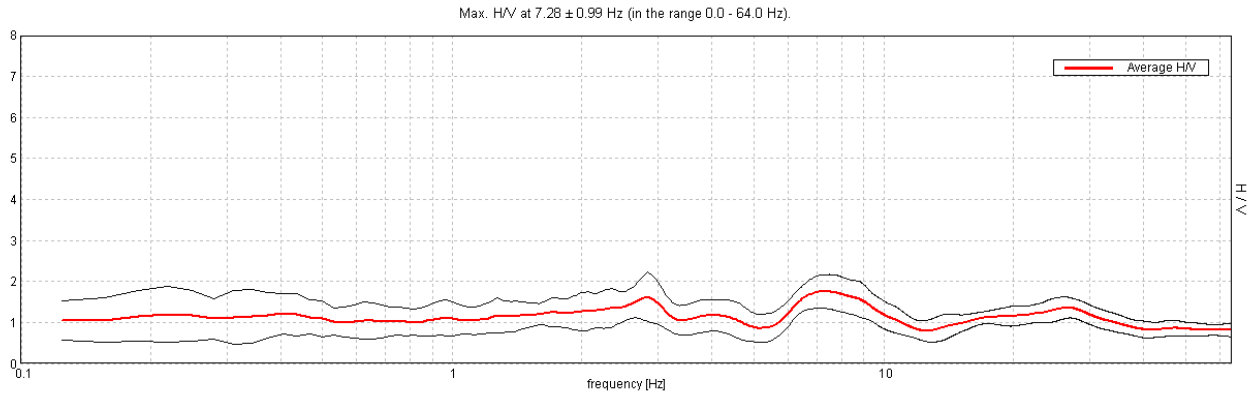
SINGLE COMPONENT SPECTRA



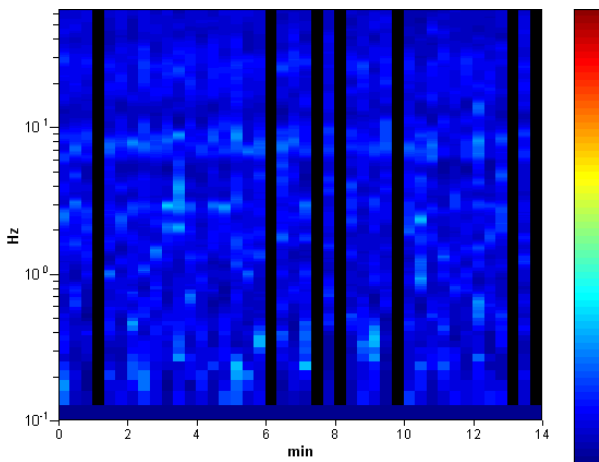
SAVIGNO,037018P64HVSR70

Instrument: TRZ-0108/01-10
 Start recording: 31/10/13 12:01:27 End recording: 31/10/13 12:15:28
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 83% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

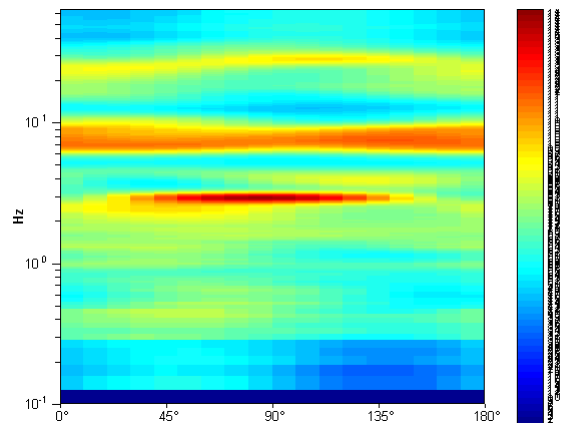
HORIZONTAL TO VERTICAL SPECTRAL RATIO



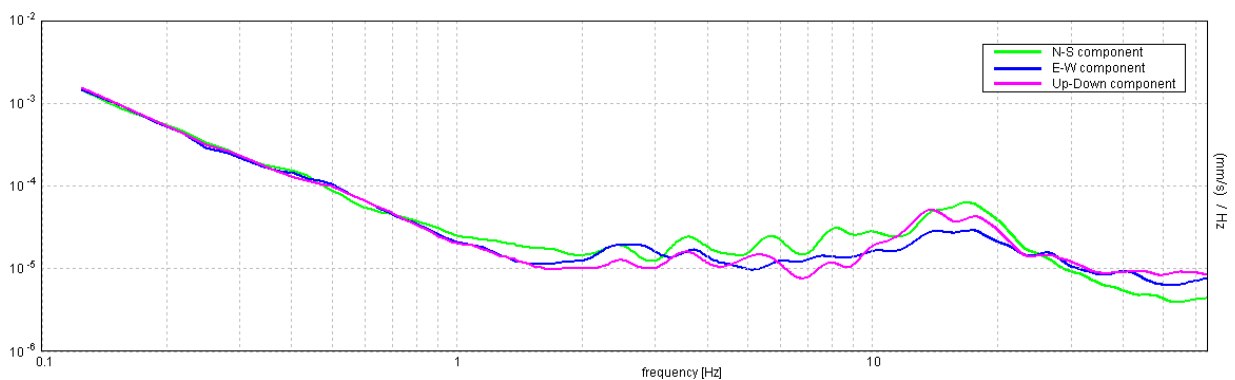
H/V TIME HISTORY



DIRECTIONAL H/V



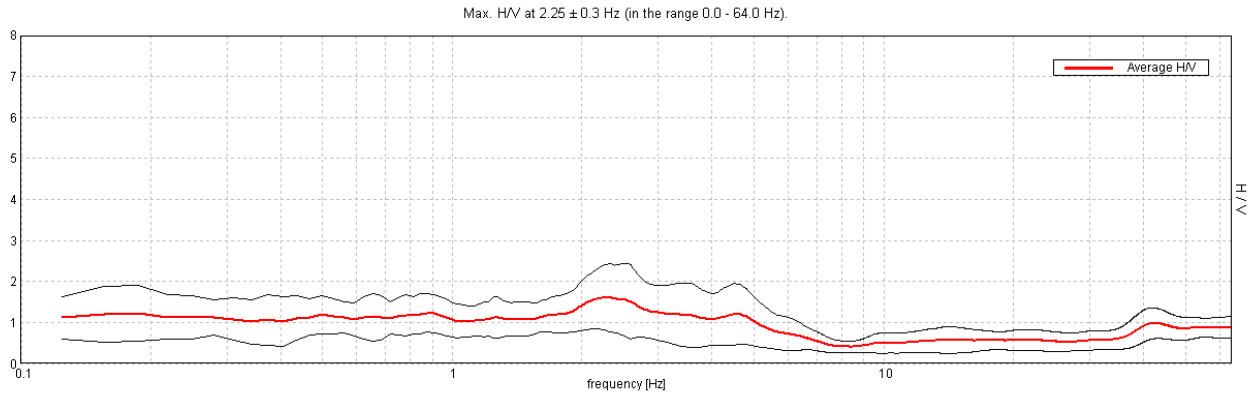
SINGLE COMPONENT SPECTRA



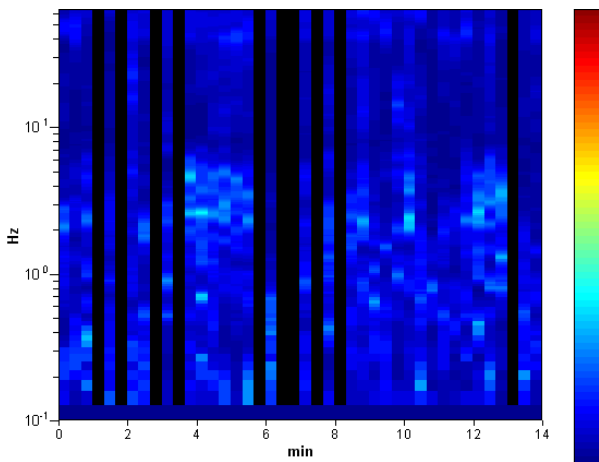
SAVIGNO, 037018P65HVSR71

Instrument: TRZ-0108/01-10
 Start recording: 31/10/13 13:04:20 End recording: 31/10/13 13:18:20
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h14'00". Analyzed 76% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

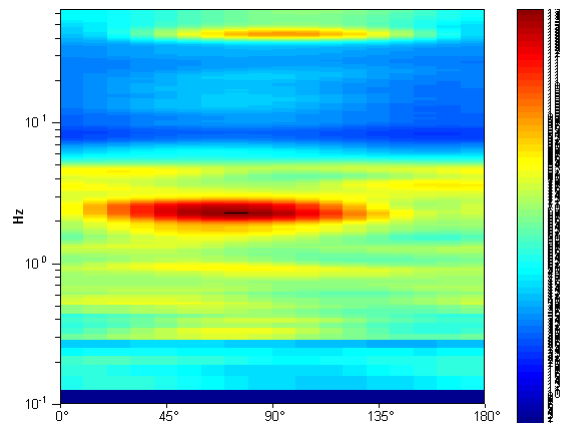
HORIZONTAL TO VERTICAL SPECTRAL RATIO



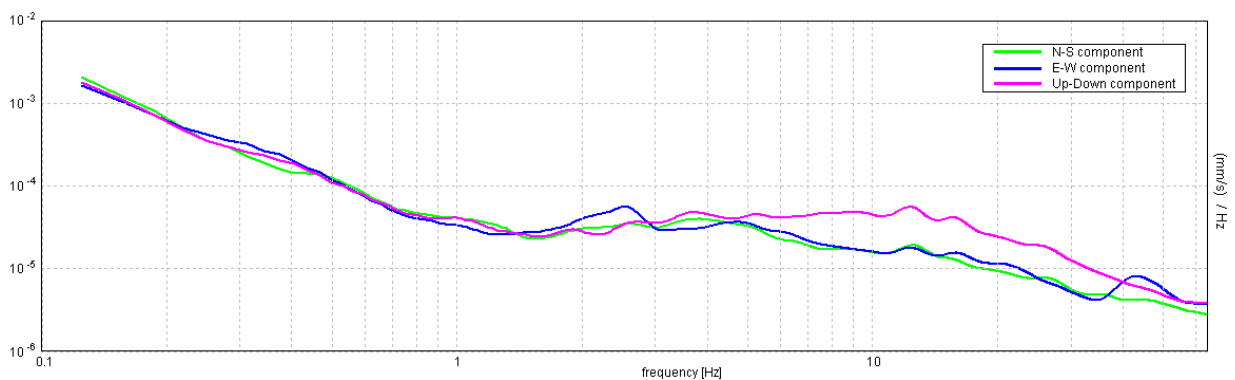
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA

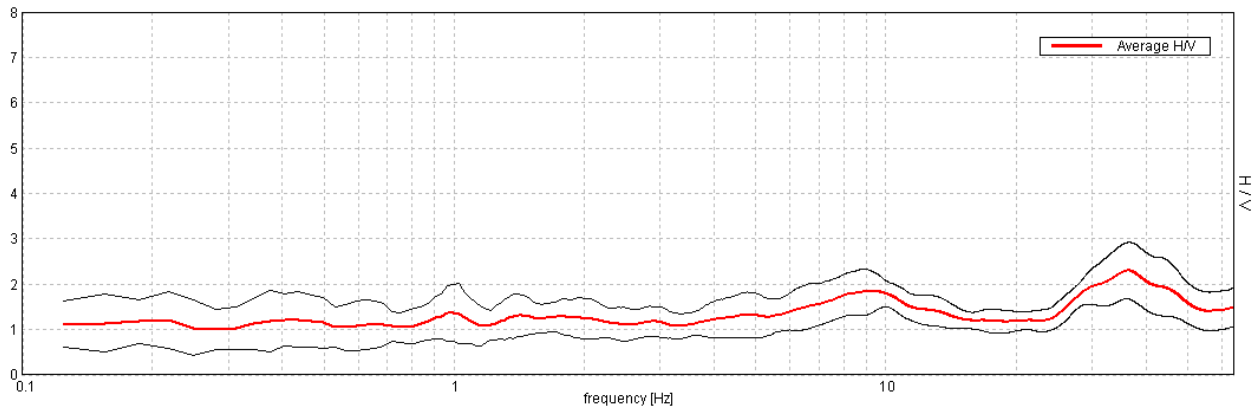


SAVIGNO, VARIANTE TR 3, 037018P66HVS72

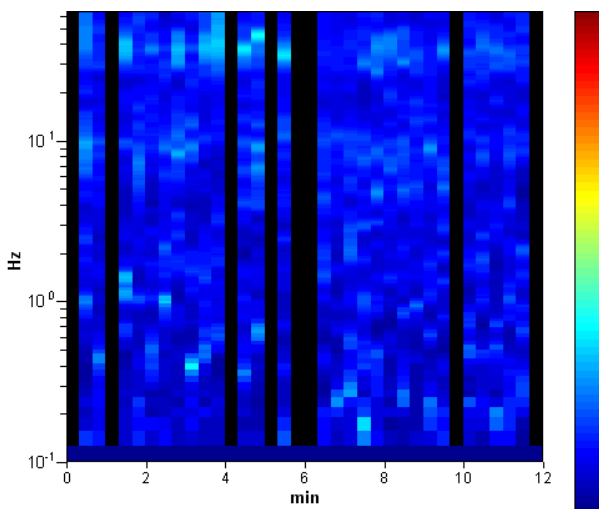
Instrument: TRZ-0108/01-10
 Start recording: 05/11/12 16:51:01 End recording: 05/11/12 17:03:02
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 Trace length: 0h12'00". Analyzed 78% trace (manual window selection)
 Sampling rate: 128 Hz
 Window size: 20 s
 Smoothing type: Triangular window
 Smoothing: 12%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

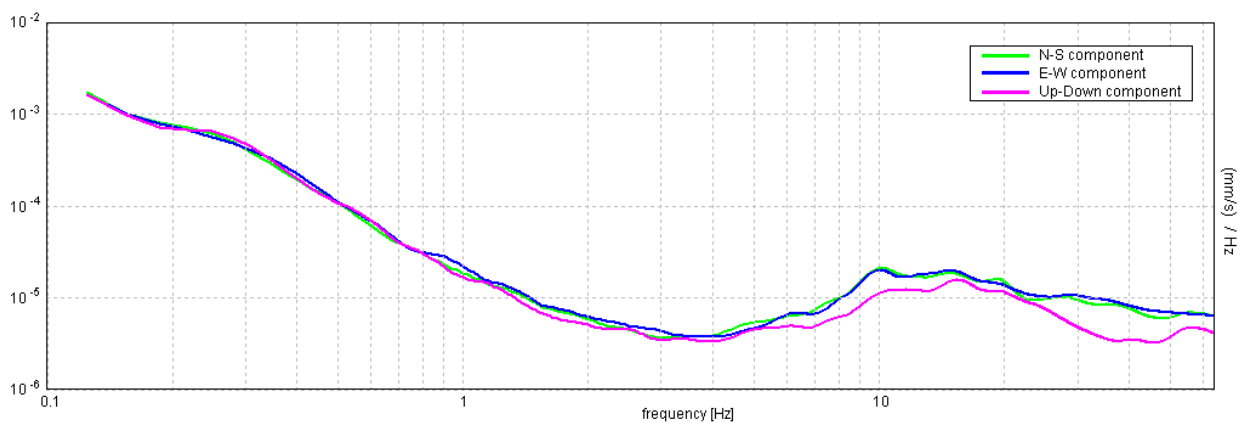
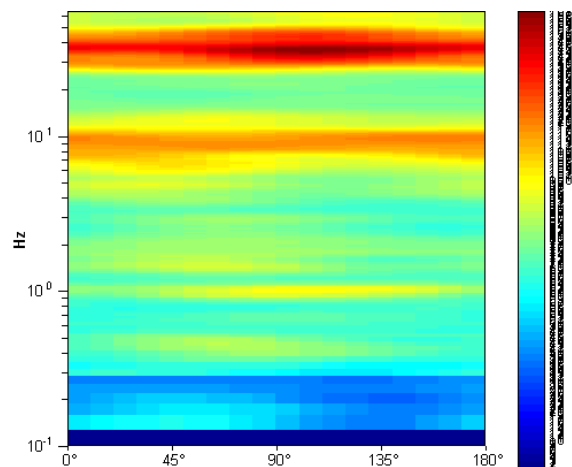
Max. H/V at 36.44 ± 2.85 Hz (in the range 0.0 - 64.0 Hz).



H/V TIME HISTORY



DIRECTIONAL H/V



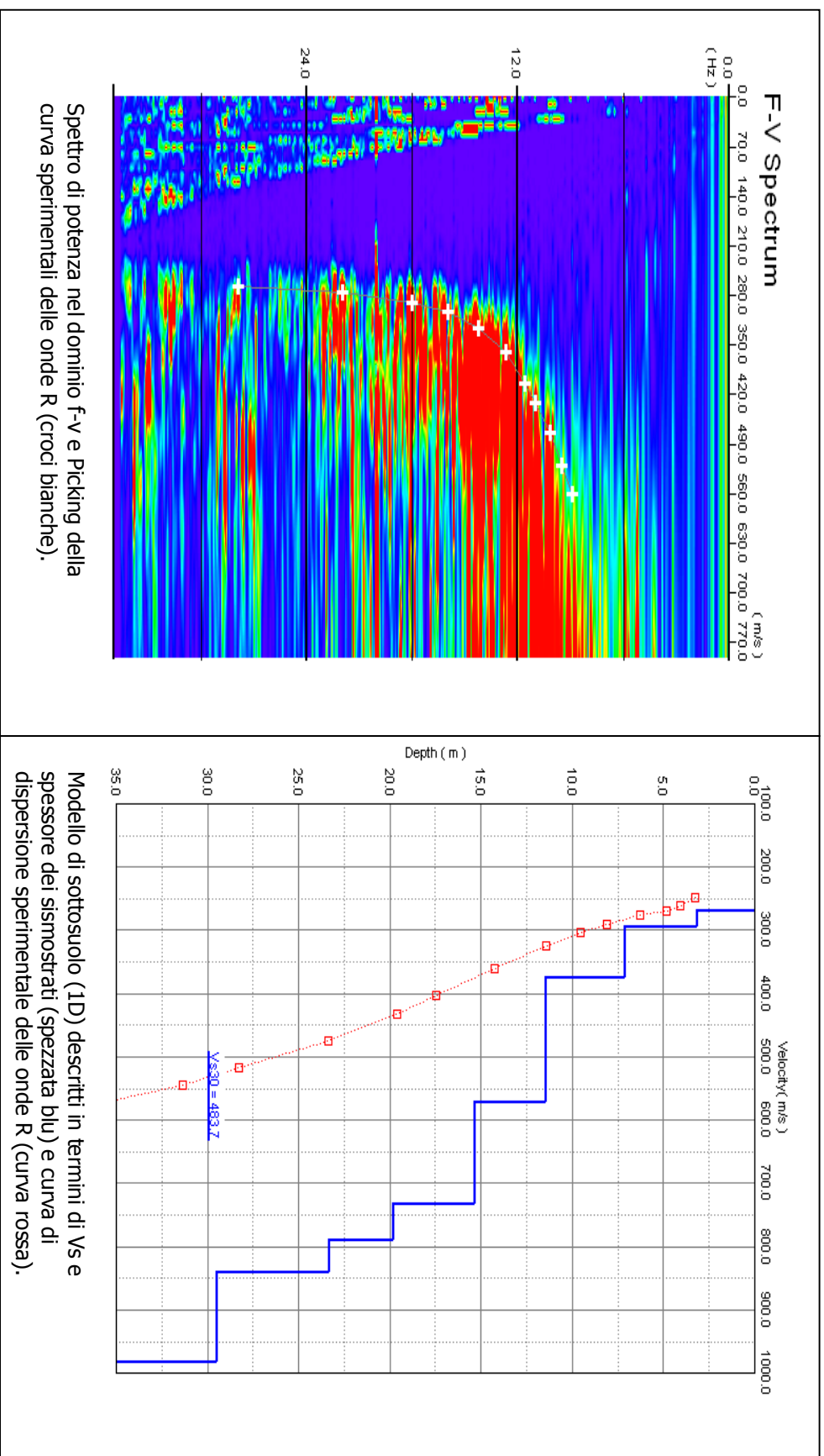
PROSPERZIONE SISMICA DI SUPERFICIE CON METODOLOGIA RE.MI.

prova n. 037058L1REM11

Sito di indagine: Comune di Savigno

n. tracce	Δx (m)	Δt (ms)	T (s)	L tot (m)
25	3	2	32,0	69

Δx : interdistanza geofonica; Δt : passo di campionamento; T: durata registrazione; L tot: lunghezza profilo.



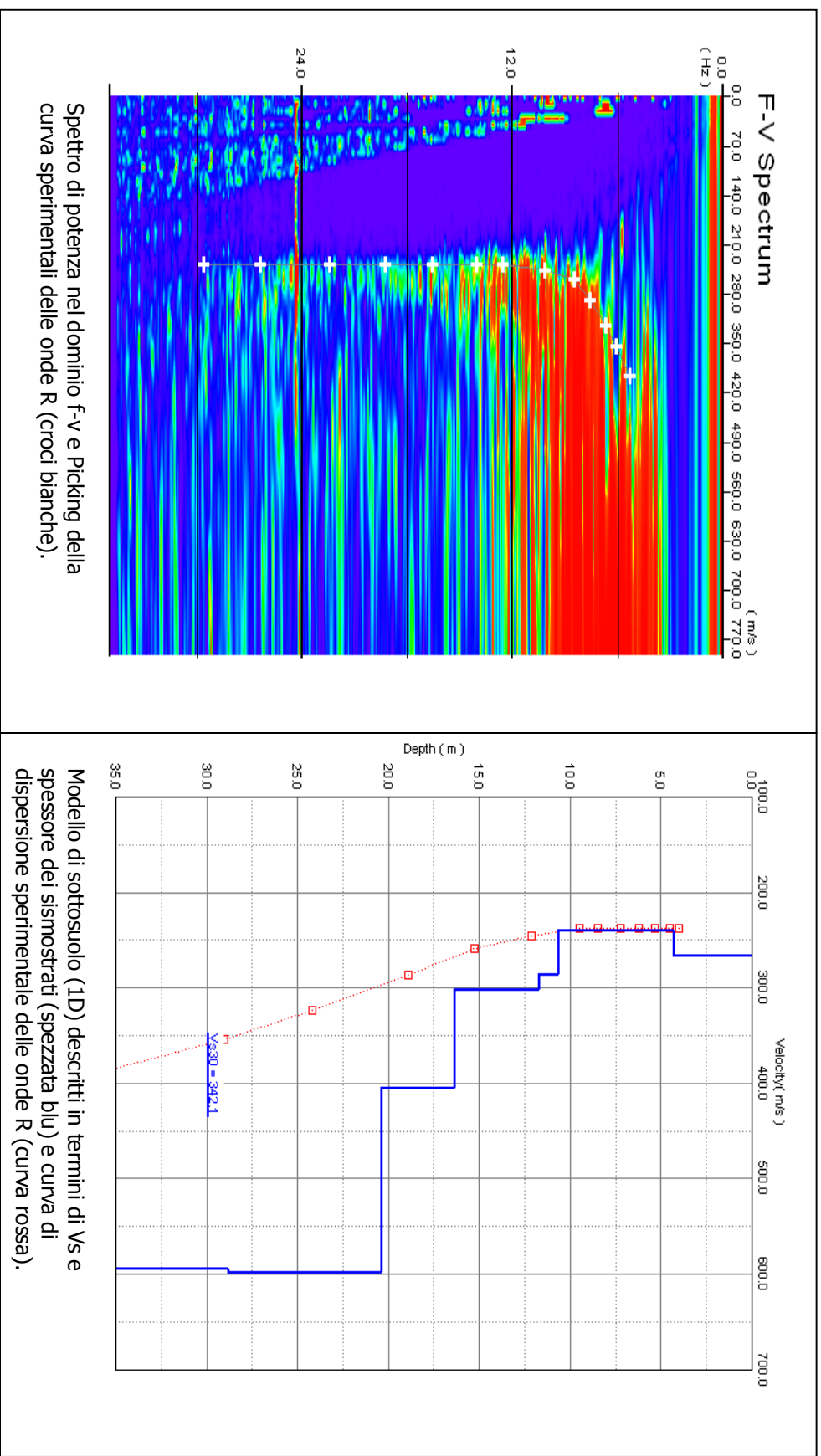
Spettro di potenza nel dominio f-v e Picking della curva sperimentali delle onde R (croci bianche).

Modello di sottosuolo (1D) descritti in termini di Vs e spessore dei sismostrati (spezzata blu) e curva di dispersione sperimentale delle onde R (curva rossa).

Sito di indagine: Comune di Savigno

n. tracce	Δx (m)	Δt (ms)	T (s)	L tot (m)
25	3	2	32,0	69

Δx : interdistanza geofonica; Δt : passo di campionamento; T: durata registrazione; L tot: lunghezza profilo.



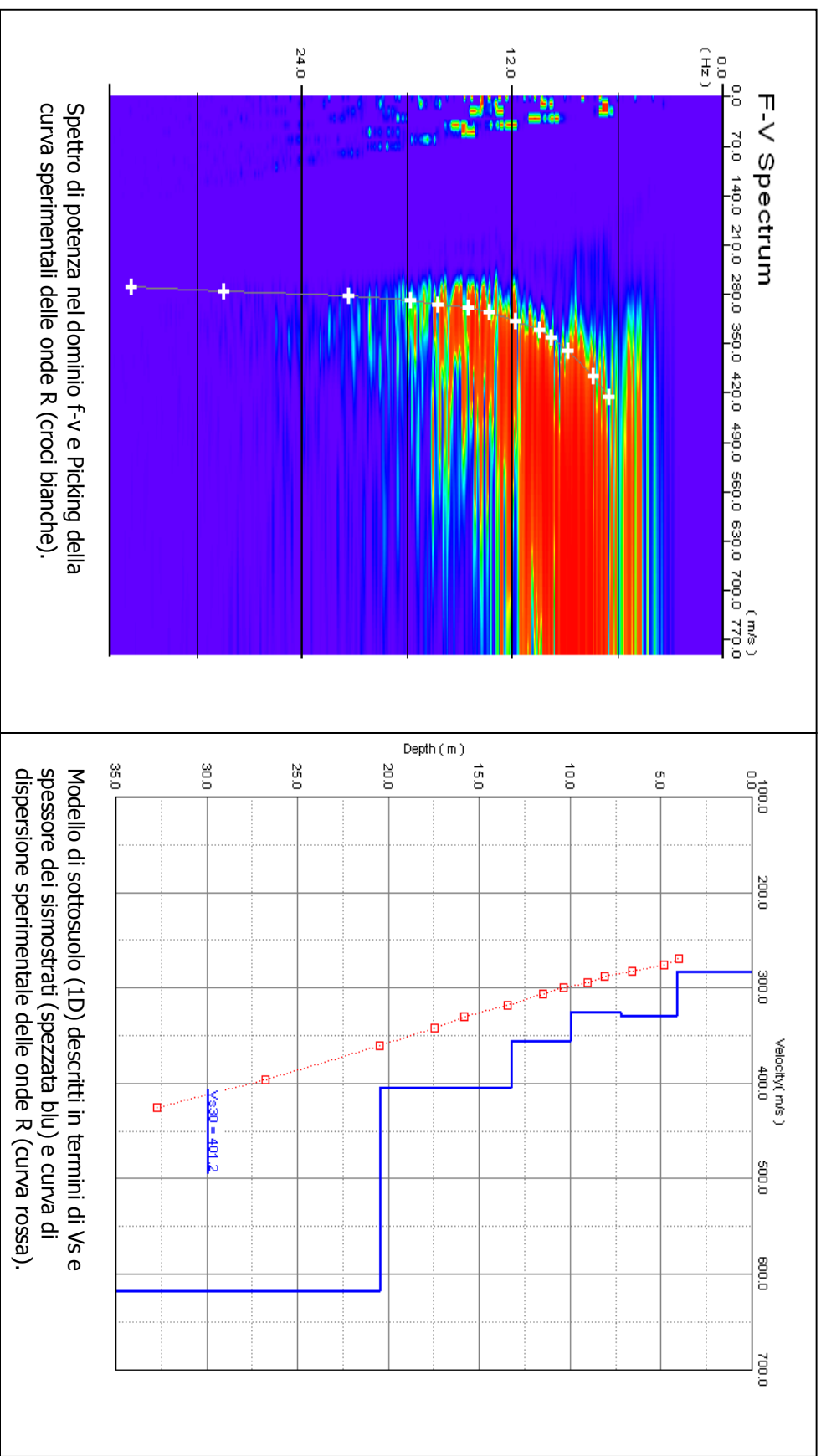
PROSPERZIONE SISMICA DI SUPERFICIE CON METODOLOGIA RE.MI.

prova n. 037058L3REM13

Sito di indagine: Comune di Savigno

n. tracce	Δx (m)	Δt (ms)	T (s)	L tot (m)
25	3	2	32,0	69

Δx : interdistanza geofonica; Δt : passo di campionamento; T: durata registrazione; L tot: lunghezza profilo.



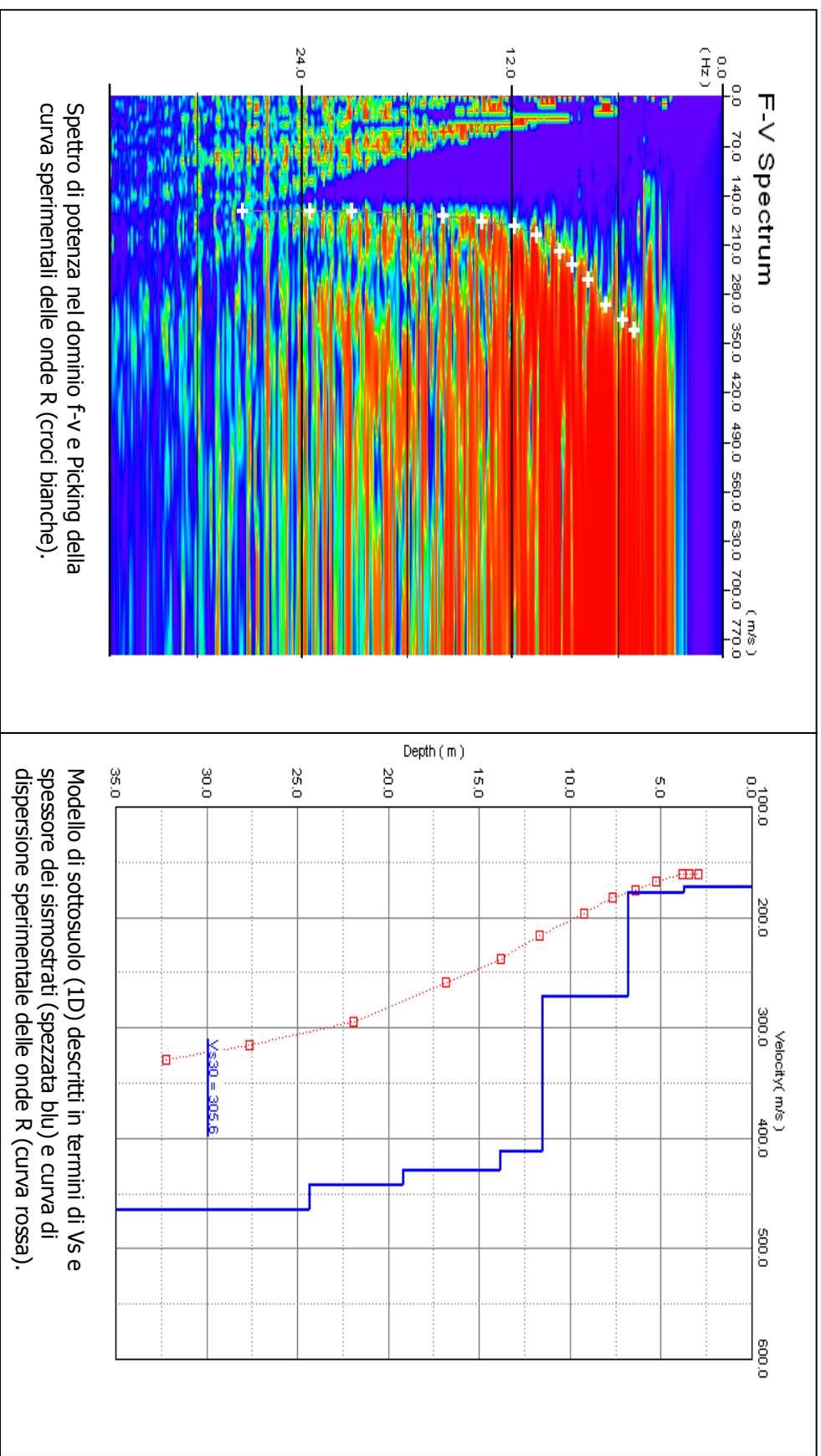
PROSPERZIONE SISMICA DI SUPERFICIE CON METODOLOGIA RE.MI.

prova n. 037058L4REM14

Sito di indagine: Comune di Savigno

n. tracce	Δx (m)	Δt (ms)	T (s)	L tot (m)
25	3	2	32,0	69

Δx : interdistanza geofonica; Δt : passo di campionamento; T: durata registrazione; L tot: lunghezza profilo.



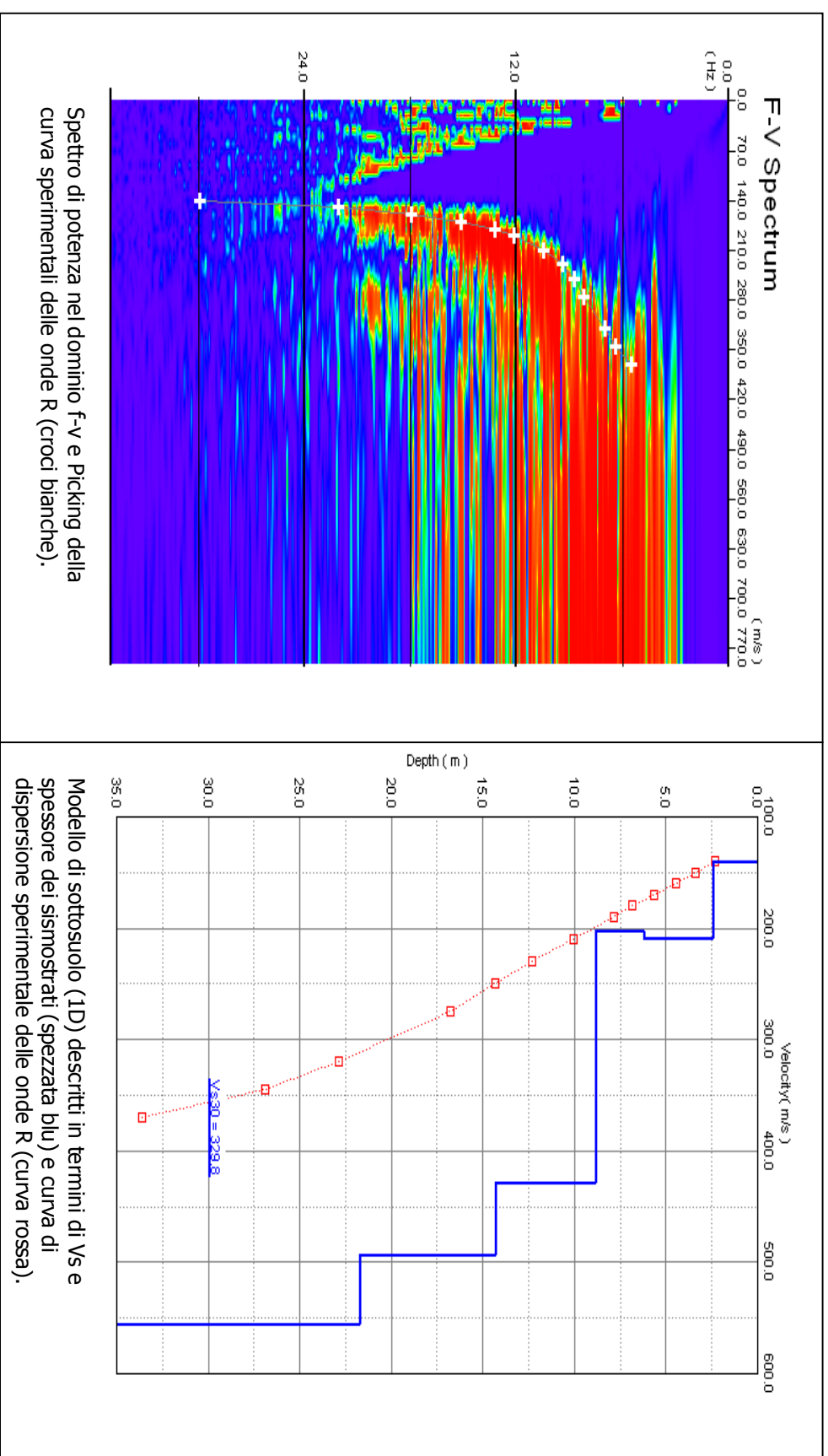
PROSPERZIONE SISMICA DI SUPERFICIE CON METODOLOGIA RE.MI.

prova n. 037058L5REM15

Sito di indagine: Comune di Savigno

n. tracce	Δx (m)	Δt (ms)	T (s)	L tot (m)
25	3	2	32,0	69

Δx : interdistanza geofonica; Δt : passo di campionamento; T: durata registrazione; L tot: lunghezza profilo.



Sito di indagine: Comune di Savigno

n. tracce	Δx (m)	Δt (ms)	T (s)	L tot (m)
25	3	2	32,0	69

Δx : interdistanza geofonica; Δt : passo di campionamento; T: durata registrazione; L tot: lunghezza profilo.

