Via Lasie n.10/L
40026 Imola - BOLOGNA

Studio Viel & Sangiorgi
Geologia Applicata

Comune:	**COMUNE DI MARANELLO (MO)**
Oggetto:	***ANALISI DI RISPOSTA SISMICA LOCALE*** ***Allegati alla Relazione Geologica***
Stesura:	**dicembre 2008**
Elaborazione:	**Dott. geol. Giovanni Viel** **Dott. geol. Samuel Sangiorgi** **Dott. geol. Venusia Ferrari**
Committente:	**Comune di Maranello**

tel. 0542 640279 fax 0542 647385 mail viel@studioviel.it sangiorgi@studioviel.it
www.studioviel.it

ALLEGATI AL TESTO

PROVE PENETROMETRICHE DINAMICHE

SONDAGGI A CAROTAGGIO CONTINUO A ROTAZIONE E PER VIBROINFISSIONE

ANALISI DI LABORATORIO

ANALISI TROMOGRAFICHE

MASW E REMI

DOWN HOLE

DIAGRAMMA PROVA PENETROMETRICA DINAMICA

COMMITENTE : STUDIO VIEL & SANGIORGI

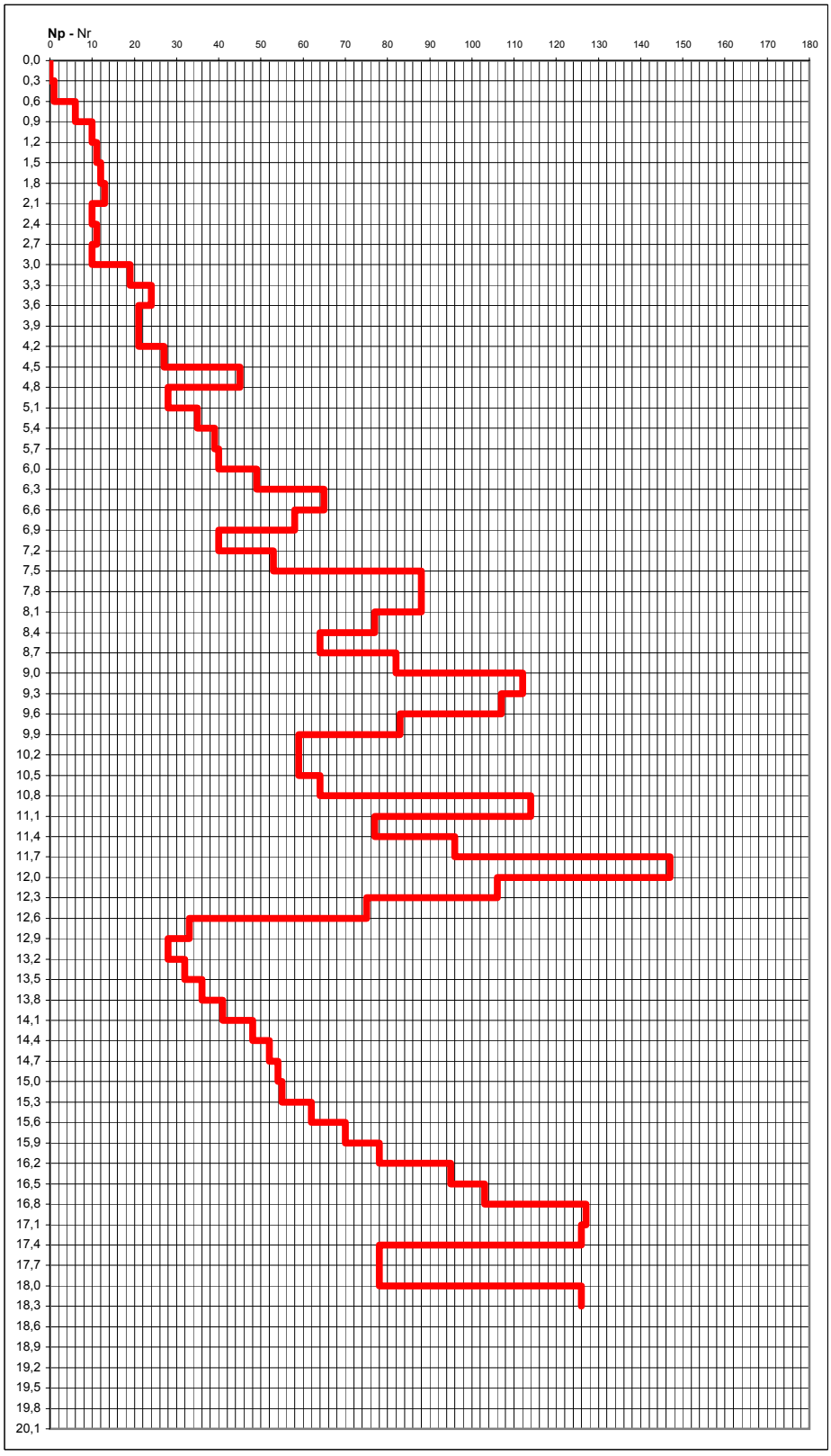
CANTIERE : BELL'ITALIA - MARANELLO

DATA PROVA : DICEMBRE 2008

LIVELLO ACQUA:

Np :numero colpi punta

S.C.P.T. N° 1



Prof	Np	Prof	Np
0,3	0,0	14,4	48,0
0,6	1,0	14,7	52,0
0,9	6,0	15,0	54,0
1,2	10,0	15,3	55,0
1,5	11,0	15,6	62,0
1,8	12,0	15,9	70,0
2,1	13,0	16,2	78,0
2,4	10,0	16,5	95,0
2,7	11,0	16,8	103,0
3,0	10,0	17,1	127,0
3,3	19,0	17,4	126,0
3,6	24,0	17,7	78,0
3,9	21,0	18,0	78,0
4,2	21,0	18,3	126,0
4,5	27,0	18,6	124,0
4,8	45,0		
5,1	28,0		
5,4	35,0		
5,7	39,0		
6,0	40,0		
6,3	49,0		
6,6	65,0		
6,9	58,0		
7,2	40,0		
7,5	53,0		
7,8	88,0		
8,1	88,0		
8,4	77,0		
8,7	64,0		
9,0	82,0		
9,3	112,0		
9,6	107,0		
9,9	83,0		
10,2	59,0		
10,5	59,0		
10,8	64,0		
11,1	114,0		
11,4	77,0		
11,7	96,0		
12,0	147,0		
12,3	106,0		
12,6	75,0		
12,9	33,0		
13,2	28,0		
13,5	32,0		
13,8	36,0		
14,1	41,0		

Sperimentatore: ***Direttore del laboratorio***

Antonio Montanari ***Dott. Geol. RITA BALLISTA***

DIAGRAMMA PROVA PENETROMETRICA DINAMICA

COMMITENTE : STUDIO VIEL & SANGIORGI

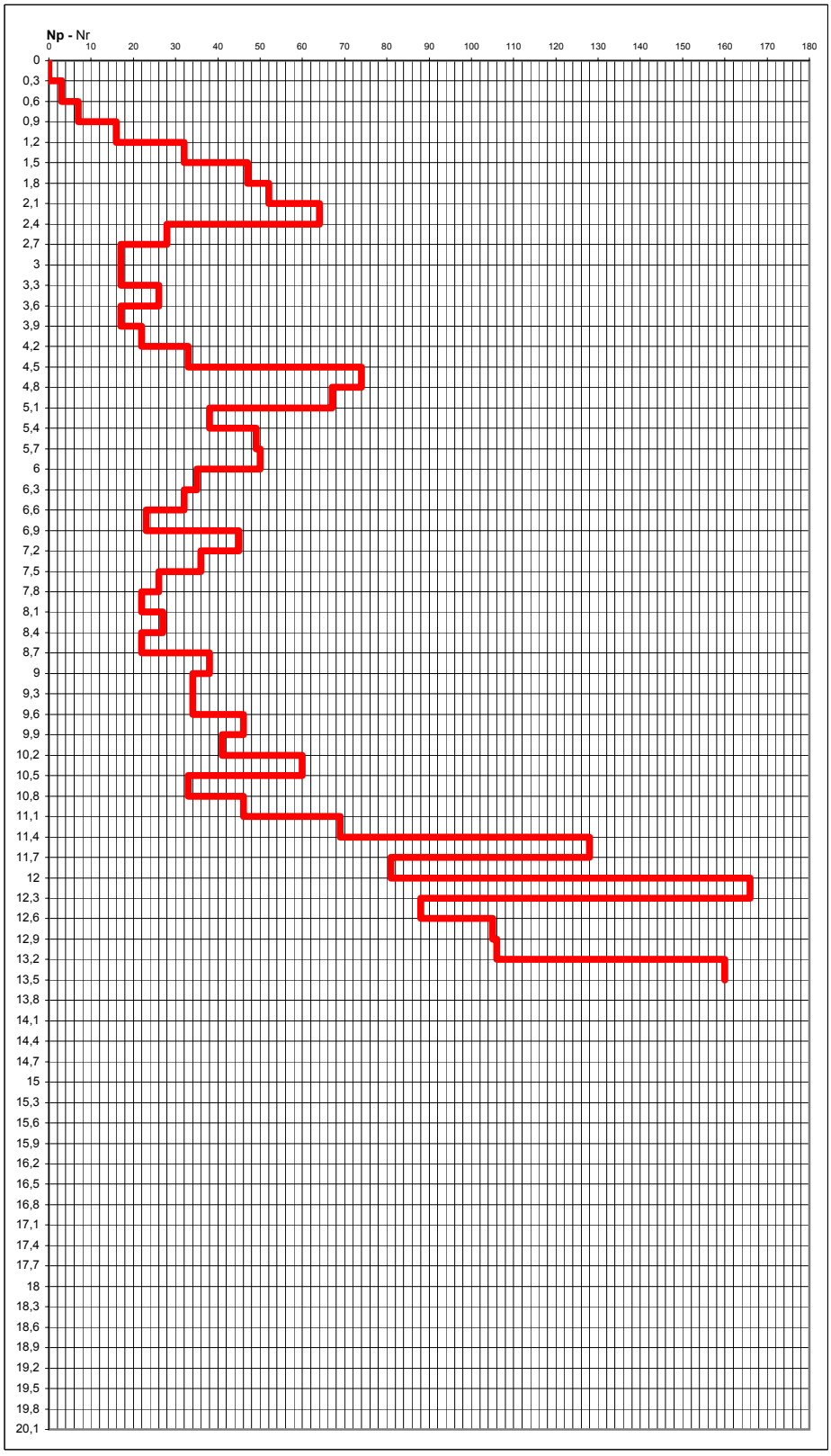
CANTIERE : POZZA - MARANELLO

DATA PROVA : DICEMBRE 2009

LIVELLO ACQUA:

Np :numero colpi punta

S.C.P.T. N° 2



Prof	Np
0,3	0,0
0,6	3,0
0,9	7,0
1,2	16,0
1,5	32,0
1,8	47,0
2,1	52,0
2,4	64,0
2,7	28,0
3,0	17,0
3,3	17,0
3,6	26,0
3,9	17,0
4,2	22,0
4,5	33,0
4,8	74,0
5,1	67,0
5,4	38,0
5,7	49,0
6,0	50,0
6,3	35,0
6,6	32,0
6,9	23,0
7,2	45,0
7,5	36,0
7,8	26,0
8,1	22,0
8,4	27,0
8,7	22,0
9,0	38,0
9,3	34,0
9,6	34,0
9,9	46,0
10,2	41,0
10,5	60,0
10,8	33,0
11,1	46,0
11,4	69,0
11,7	128,0
12,0	81,0
12,3	166,0
12,6	88,0
12,9	105,0
13,2	106,0
13,5	160,0
13,8	00/8cm

Sperimentatore: ***Antonio Montanari***

Direttore del laboratorio ***Dott. Geol. RITA BALLISTA***

DIAGRAMMA PROVA PENETROMETRICA DINAMICA

COMMITENTE : STUDIO VIEL & SANGIORGI

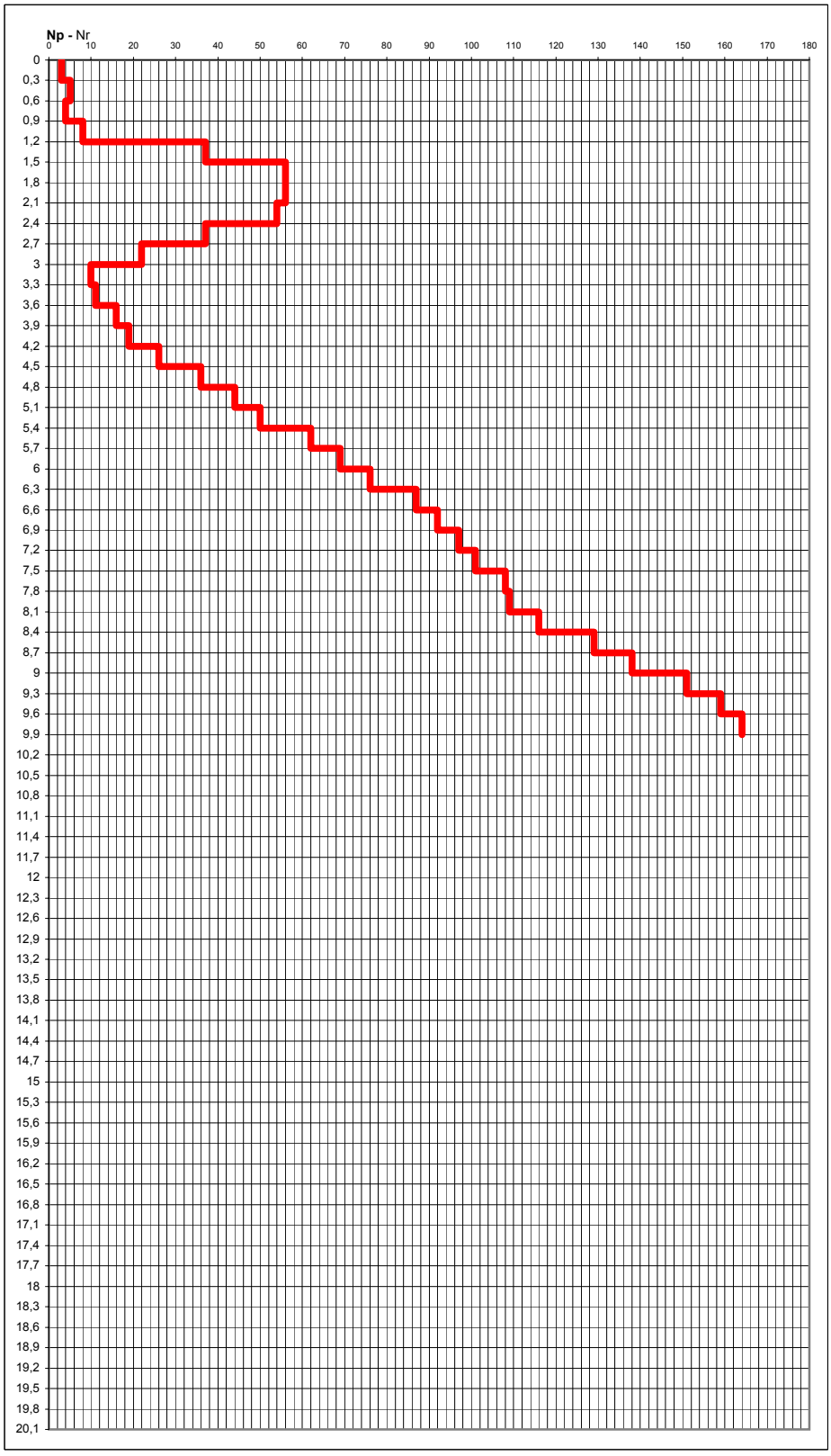
CANTIERE : NICOLINI - MARANELLO

DATA PROVA : DICEMBRE 2009

LIVELLO ACQUA:

Np :numero colpi punta

S.C.P.T. N° 3



Prof	Np
0,3	3,0
0,6	5,0
0,9	4,0
1,2	8,0
1,5	37,0
1,8	56,0
2,1	56,0
2,4	54,0
2,7	37,0
3,0	22,0
3,3	10,0
3,6	11,0
3,9	16,0
4,2	19,0
4,5	26,0
4,8	36,0
5,1	44,0
5,4	50,0
5,7	62,0
6,0	69,0
6,3	76,0
6,6	87,0
6,9	92,0
7,2	97,0
7,5	101,0
7,8	108,0
8,1	109,0
8,4	116,0
8,7	129,0
9,0	138,0
9,3	151,0
9,6	159,0
9,9	164,0

Sperimentatore: ***Antonio Montanari***

Direttore del laboratorio ***Dott. Geol. RITA BALLISTA***

DIAGRAMMA PROVA PENETROMETRICA DINAMICA

COMMITENTE : STUDIO VIEL & SANGIORGI

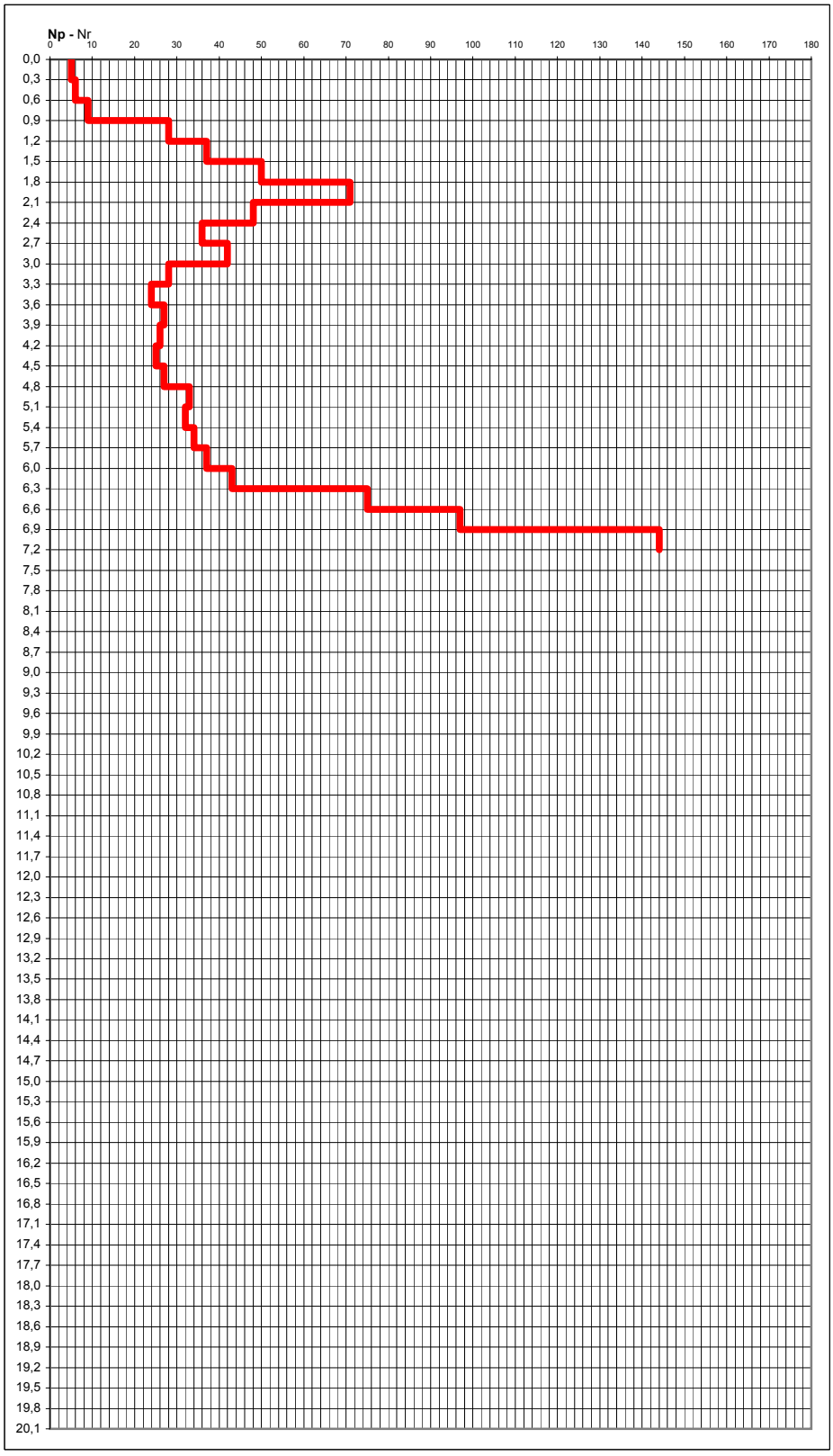
CANTIERE : TORRE OCHE - MARANELLO

DATA PROVA : DICEMBRE 2009

LIVELLO ACQUA:

Np :numero colpi punta

S.C.P.T. N° 4



Prof	Np
0,3	5,0
0,6	6,0
0,9	9,0
1,2	28,0
1,5	37,0
1,8	50,0
2,1	71,0
2,4	48,0
2,7	36,0
3,0	42,0
3,3	28,0
3,6	24,0
3,9	27,0
4,2	26,0
4,5	25,0
4,8	27,0
5,1	33,0
5,4	32,0
5,7	34,0
6,0	37,0
6,3	43,0
6,6	75,0
6,9	97,0
7,2	144,0

Sperimentatore: ***Direttore del laboratorio***

Antonio Montanari ***Dott. Geol. RITA BALLISTA***

Direzione Cantiere:	Cantiere: VIA TREBBO NORD, MARANELLO	Inizio/Fine Esecuzione:
	Operatore:	Quota lavoro:
Committente: STUDIO VIEL & SANGIORGI	Tipo Carotaggio: CAROTAGGIO CONTINUO	Sigla Sondaggio: S2

Scala (mt)	Litologia	Descrizione	Quota	%Carotag. R.Q.D.	S.P.T. (n° Colpi)	Pocket Test kg/cmq	Vane Test kg/cmq	campioni	Falda
1		suolo	0.50	%C=100					
1		Ghiaia fine con matrice sabbiosa passante a limosa		%C=100					
2									
3									
4									4.76
5			5.58 5.65						
6		limo leggermente variegato ghiaia con matrice limoso-argillosa	6.50 6.58	%C=100					
7		argilla	7.03						
		ghiaia con matrice limoso-argillosa	7.33						
8		argilla scura con ciottoletti ghiaia con matrice limosa al tetto e al letto ghiaia addensata	8.54 8.61	%C=100			FS		
9		argilla limosa							
10		ghiaia con matrice limosa	11.00	%C=100					
11		limo argilloso variegato rosso	11.57						
12		ghiaia con matrice sabbiosa	13.00	%C=100		4	1.3		
13		variegato limo con poca argilla	13.50						
		sabbia fine-media	13.80			4	1.5		
14		ciottoli ben arrotondati in matrice limoso-sabbiosa	14.64						
15		paleosuolo	15.86 16.00	%C=100		1 4.3	0.9 1.3		
16		argilla e limo sabbia ghiaiosa al tetto e ghiaia sabbiosa al letto	17.08	%C=100					
17									
18									
19									
20									

FIGURA 2.2 f-STRATIGRAFIA SONDAGGIO S2, VIA TREBBO NORD

Direzione Cantiere:	Cantiere: VIA SAN VENANZIO	Inizio/Fine Esecuzione:
	Operatore:	Quota lavoro:
Committente: STUDIO VIEL & SANGIORGI	Tipo Carotaggio: CAROTAGGIO CONTINUO	Sigla Sondaggio: S3

Scala (mt)	Litologia	Descrizione	Quota	%Carotag. R.Q.D.	S.P.T. (n° Colpi)	Pocket Test kg/cmq	Vane Test kg/cmq	campioni	Falda
1		suolo	1.00	%C=100		0.8	0.52		
		ciottoli in matrice argillosa, presenza di calcinelli	1.22						
2		argilla e limo variegati	2.44	%C=100					
3		paleosuolo variegato con argilla consolidata	3.66				0.80		
4		argille	4.88	%C=100					
5		argille con frammenti vegetali ciottoli di arenaria	6.10						
6		argilla grigia con ciottoli di arenaria	7.32	%C=100					
7		alternanza di marne argillose e argille marnose	8.54	%C=100					
8		marna con presenza di ciottoli	13.42	%C=100					
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

FIGURA 2.2g- SONDAGGIO S3 , VIA SAN VENANZIO

GEOTEA s.r.l.
Laboratorio Geotecnico
Accreditato presso Ministero Lavori Pubblici

Certificato: 2168
Verbale: 516

Committente: Studio Viel e Sangiorgi
Località: Maranello
Cantiere: S. Venanzio

Sondaggio: -
Campione: C2
Profondità: -

Data ricevimento campione:
Data inizio prove:

Data emissione certificato:
Data fine prove:

Determinazione limite liquido (norma BS 1377)

Numero dei colpi	N°	n°	17
Tara	Tara	g	71,96
Massa campione umido + Tara	CU+T	g	151,70
Massa Campione secco + Tara	CS+T	g	127,49
Limite liquido	LL	%	42

Determinazione limite liquido (CNR-UNI 10014)

			Provino 1	Provino 2	Provino 3
Numero dei colpi	N°	n°			
Tara	Tara	g			
Massa campione umido + Tara	CU+T	g			
Massa Campione secco + Tara	CS+T	g			
Umidità naturale	W	%	-	-	-
Limite liquido	LL	%			

Determinazione limite plastico (CNR-UNI 10014)

			Provino 1	Provino 2
Tara	Tara	g	72,01	72,22
Massa campione umido + Tara	CU+T	g	82,61	83,25
Massa Campione secco + Tara	CS+T	g	81,00	81,54
Limite plastico	LP	%	18,00	18,00

Determinazione limite ritiro (CNR-UNI 10014)

			Provino 1	Provino 2
Massa campione umido + Tara	CU+T	g		
Massa Campione secco + Tara	CS+T	g		
Tara	Tara	g		
Volume tara	V	cm^3		
Volume mercurio	Vhg	cm^3		
Massa campione umido	CU	g		
Massa Campione secco	CS	g		
Limite di Ritiro	LR	%		
Media	M	%		

Determinazione ritiro lineare (BS 1377)

Lunghezza iniziale	Lo	mm	
Lunghezza finale	Li	mm	
Ritiro lineare	RL	%	

Classe del campione: Q3

Il Direttore del laboratorio

Sperimentatore

40128 Bologna Via Calzolari 30/A Tel. 051-6311300 Fax 051 6311303
Autorizzazione del Consiglio Superiore dei Lavori Pubblici n. 156 del 11/01/2008

GEOTEA s.r.l.
Laboratorio Geotecnico
Accreditato presso Ministero Lavori Pubblici

Certificato: 2167
Verbale: 516

Committente: Studio Viel e Sangiorgi
Località: Maranello
Cantiere: S. Venanzio

Sondaggio: -
Campione: C1
Profondità: -

Data ricevimento campione:
Data inizio prove:

Data emissione certificato:
Data fine prove:

Determinazione limite liquido (norma BS 1377)

Numero dei colpi	N°	n°	19
Tara	Tara	g	72,00
Massa campione umido + Tara	CU+T	g	139,37
Massa Campione secco + Tara	CS+T	g	121,67

Limite liquido	LL	%	34

Determinazione limite liquido (CNR-UNI 10014)

			Provino 1	Provino 2	Provino 3
Numero dei colpi	N°	n°			
Tara	Tara	g			
Massa campione umido + Tara	CU+T	g			
Massa Campione secco + Tara	CS+T	g			
Umidità naturale	W	%	-	-	-
Limite liquido	LL	%			

Determinazione limite plastico (CNR-UNI 10014)

			Provino 1	Provino 2
Tara	Tara	g	71,77	71,25
Massa campione umido + Tara	CU+T	g	81,82	80,37
Massa Campione secco + Tara	CS+T	g	80,44	79,12
Limite plastico	LP	%	16,00	16,00

Determinazione limite ritiro (CNR-UNI 10014)

			Provino 1	Provino 2
Massa campione umido + Tara	CU+T	g		
Massa Campione secco + Tara	CS+T	g		
Tara	Tara	g		
Volume tara	V	cm^3		
Volume mercurio	Vhg	cm^3		
Massa campione umido	CU	g		
Massa Campione secco	CS	g		
Limite di Ritiro	LR	%		
Media	M	%		

Determinazione ritiro lineare (BS 1377)

Lunghezza iniziale	Lo	mm	
Lunghezza finale	Li	mm	
Ritiro lineare	RL	%	

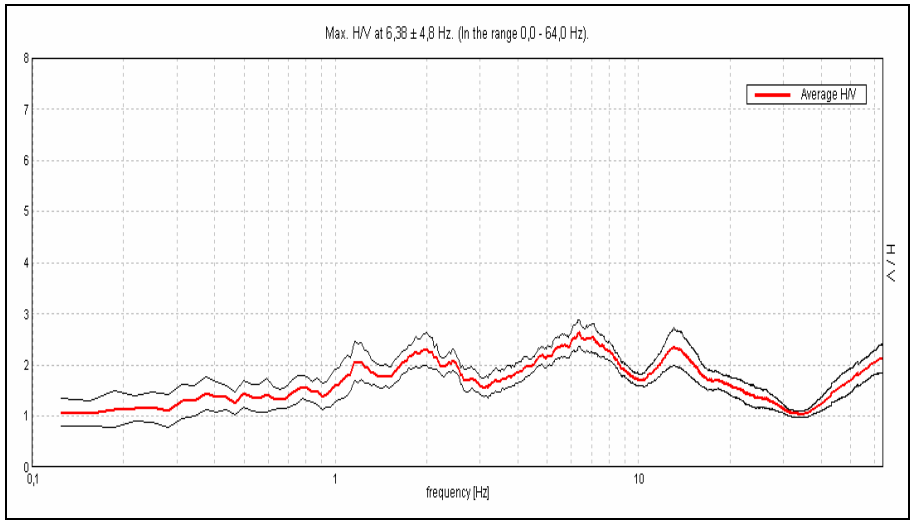
Classe del campione: Q3

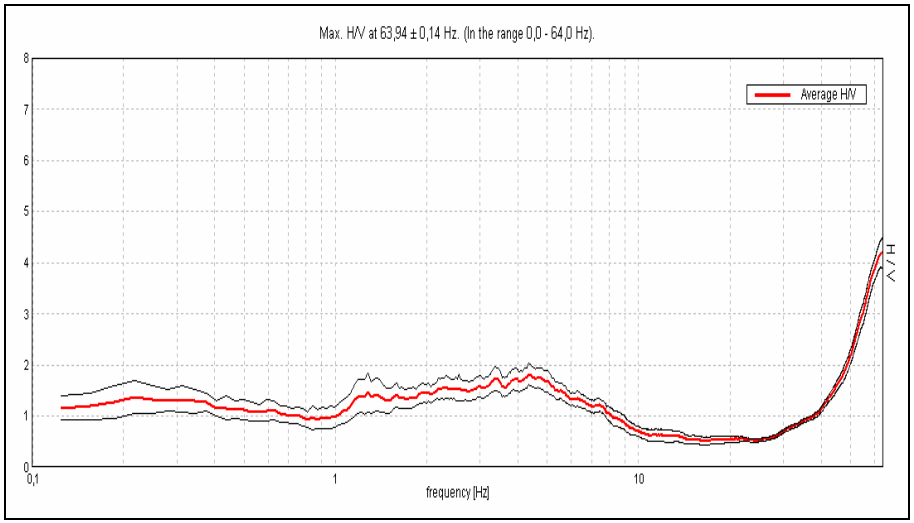
Il Direttore del laboratorio

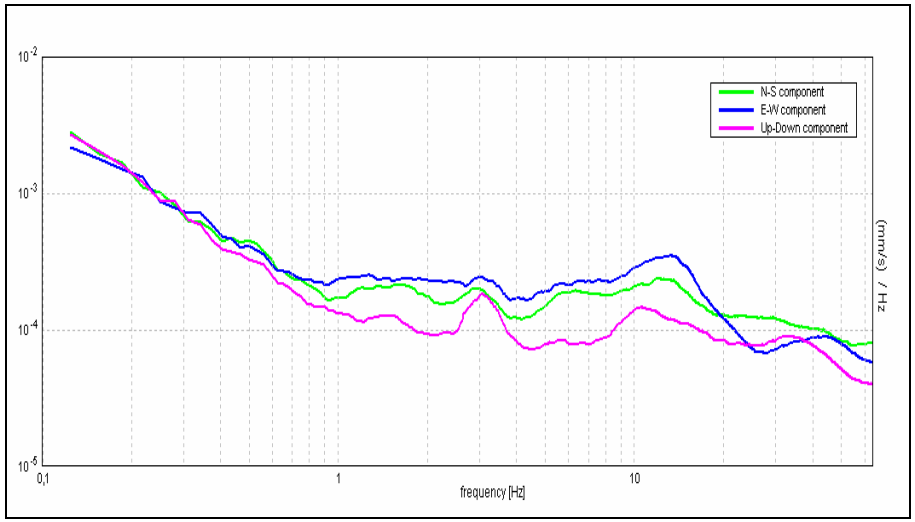
Sperimentatore

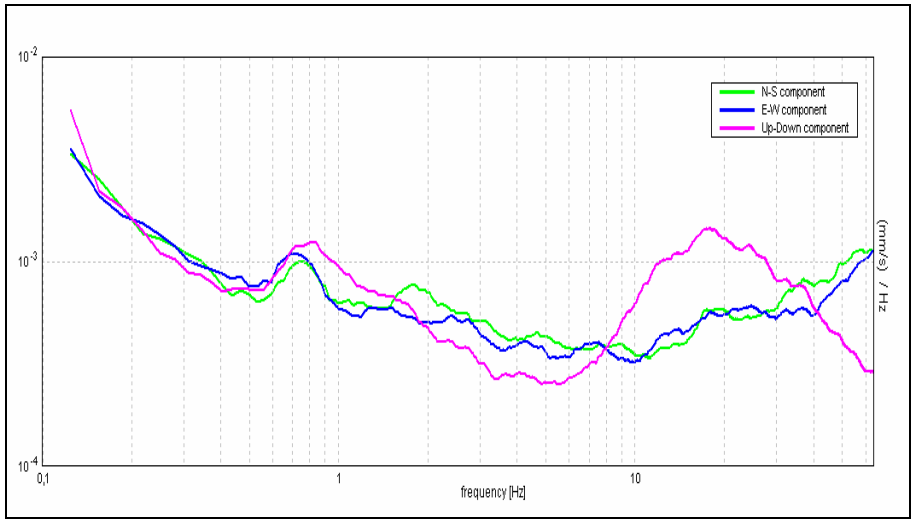
40128 Bologna Via Calzolari 30/A Tel. 051-6311300 Fax 051 6311303
Autorizzazione del Consiglio Superiore dei Lavori Pubblici n. 156 del 11/01/2008

COMUNE DI MARANELLO



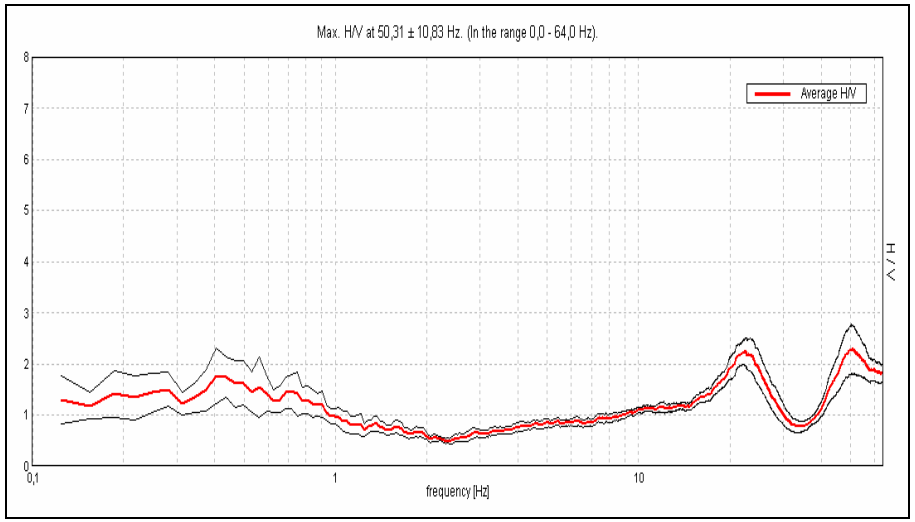


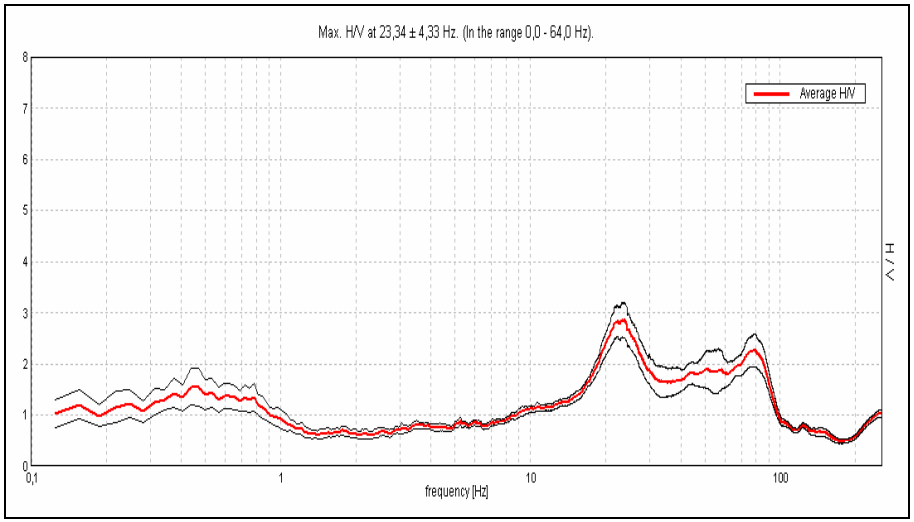


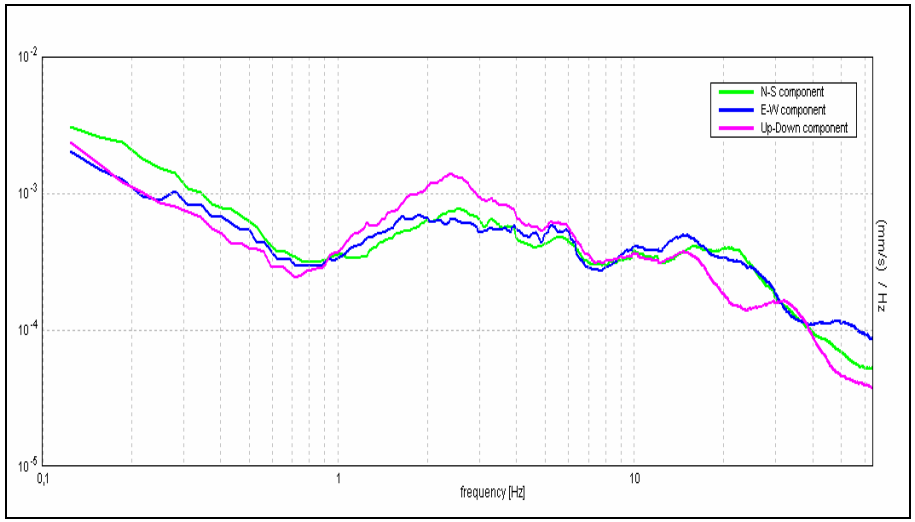


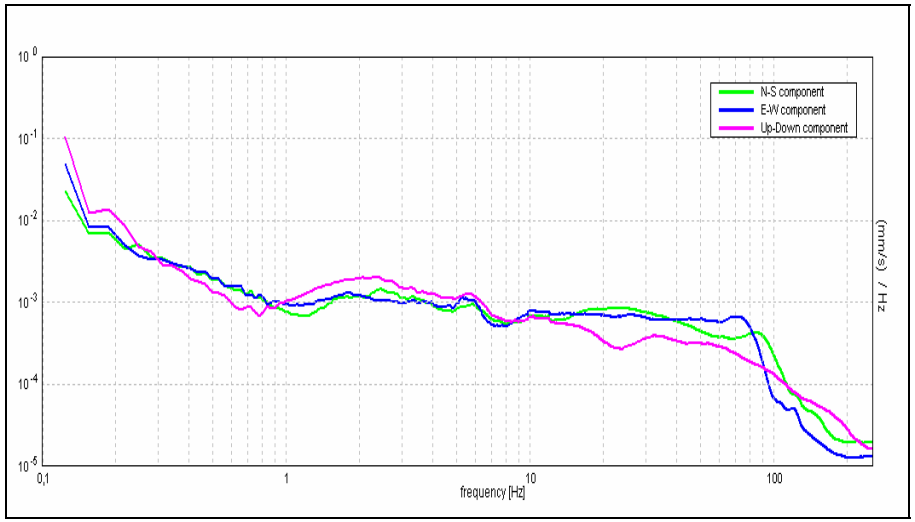
Tr 1

Tr 2


Max. H/V at 50,31 ± 10,83 Hz. (In the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

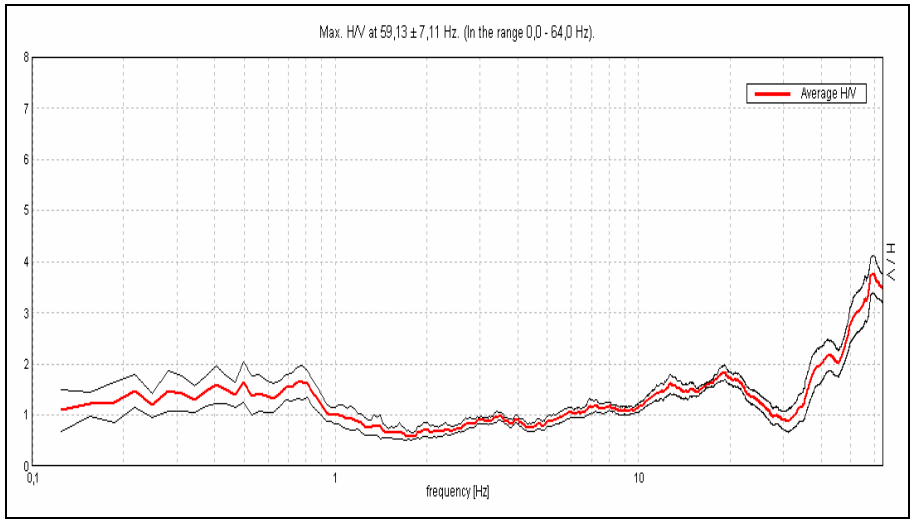

Max. H/V at 23,34 ± 4,33 Hz. (In the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

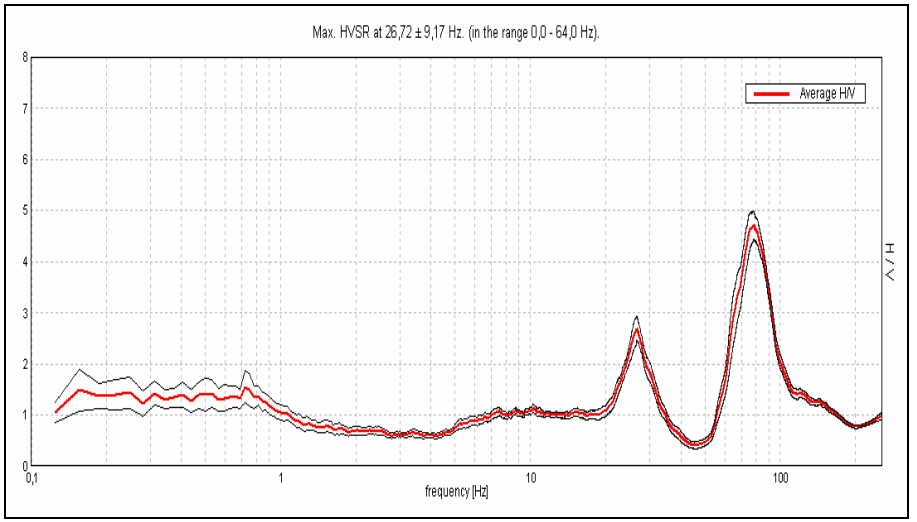

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

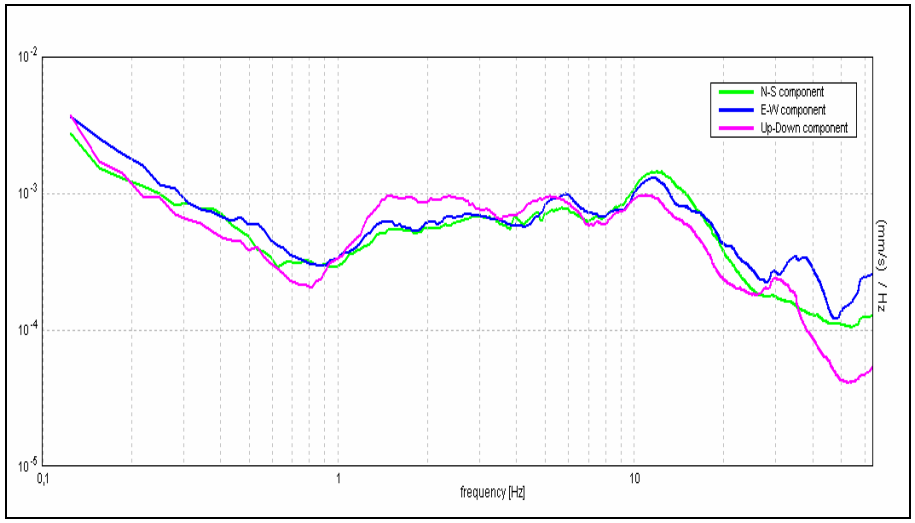

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

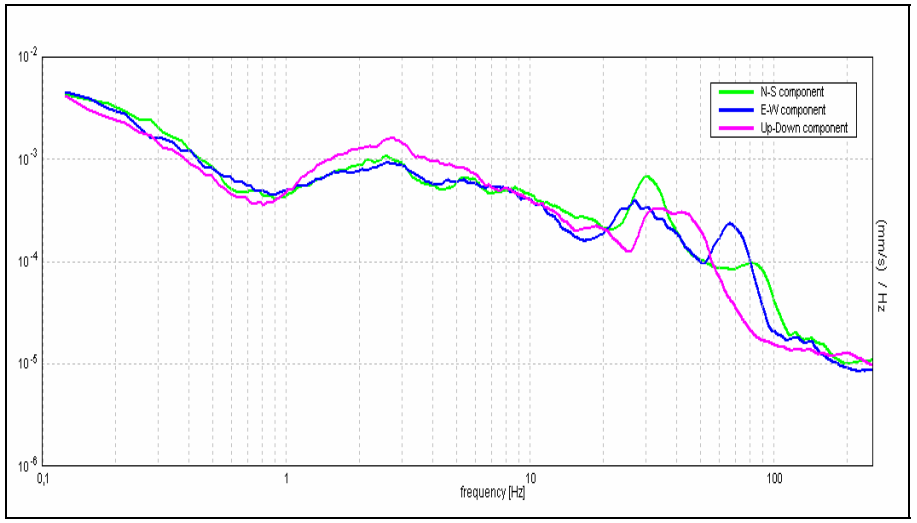
Tr 3

Tr 4


Max. H/V at 59,13 ± 7,11 Hz. (In the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

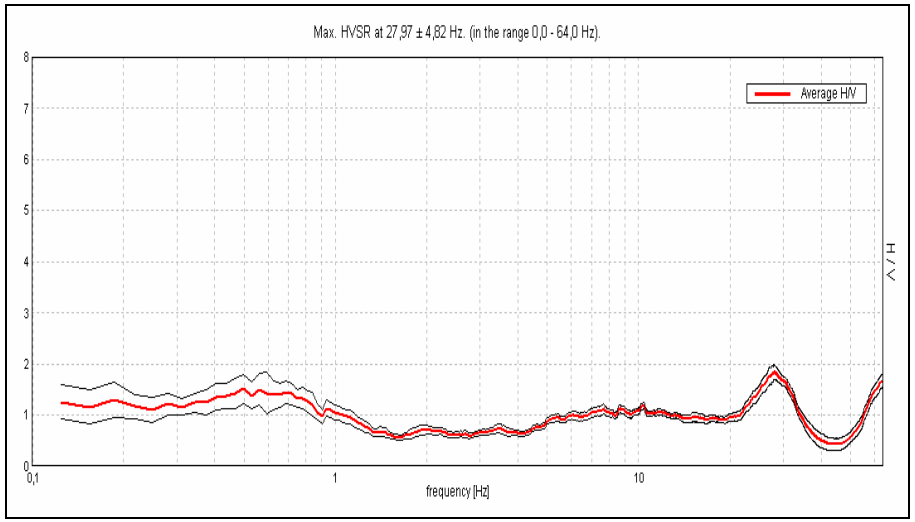

Max. HVSR at 26,72 ± 9,17 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

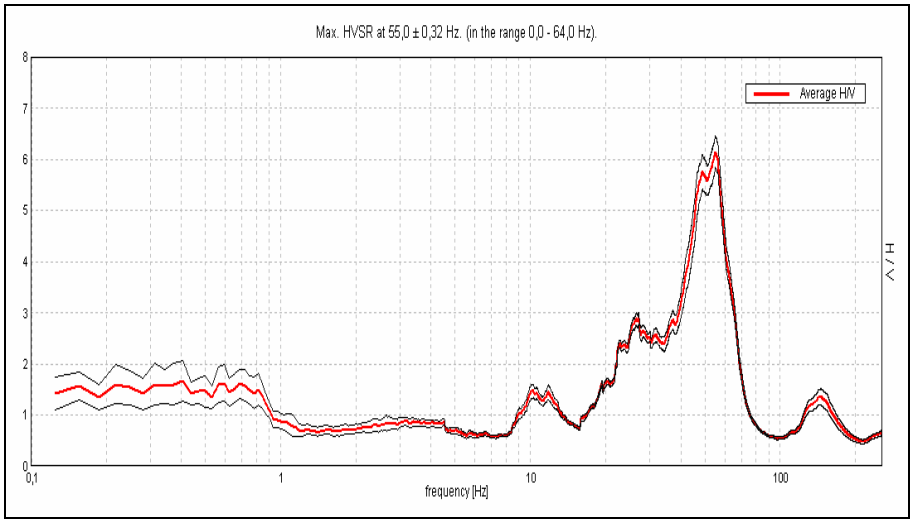

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

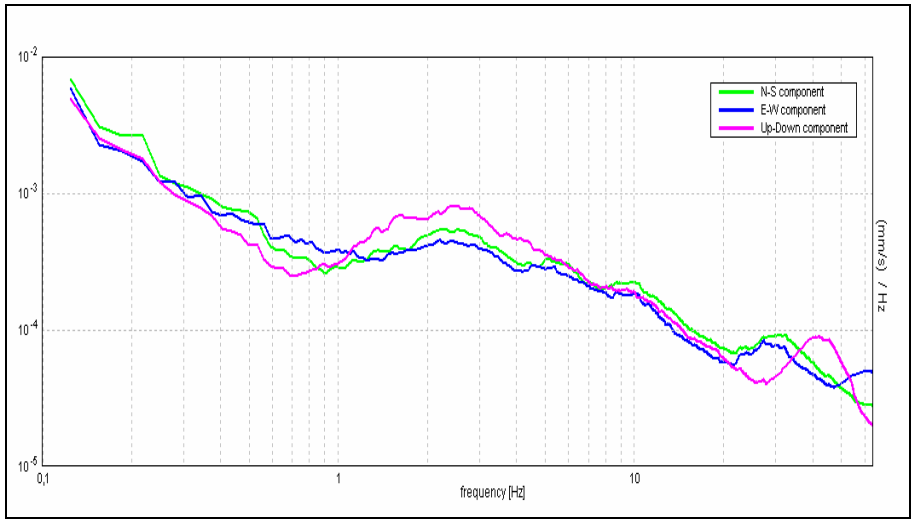

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

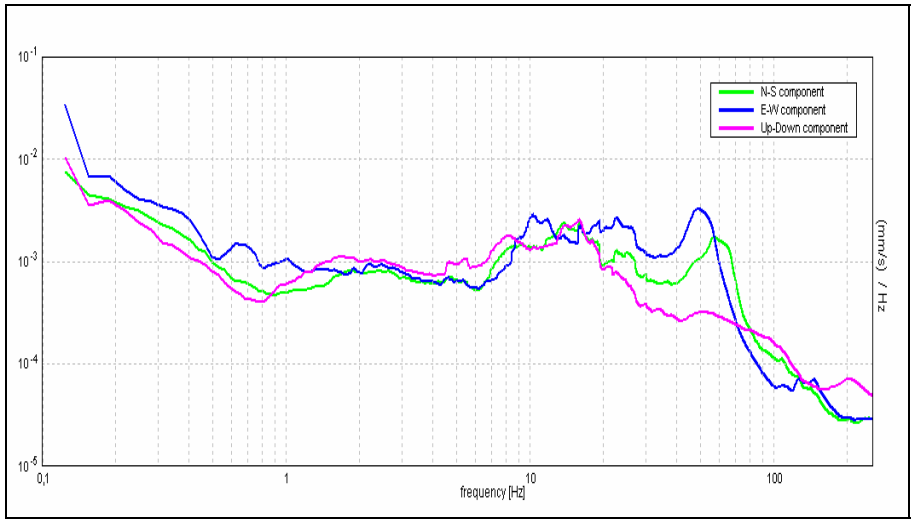
Tr 5

Tr 6


Max. HVSR at 27,97 ± 4,82 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

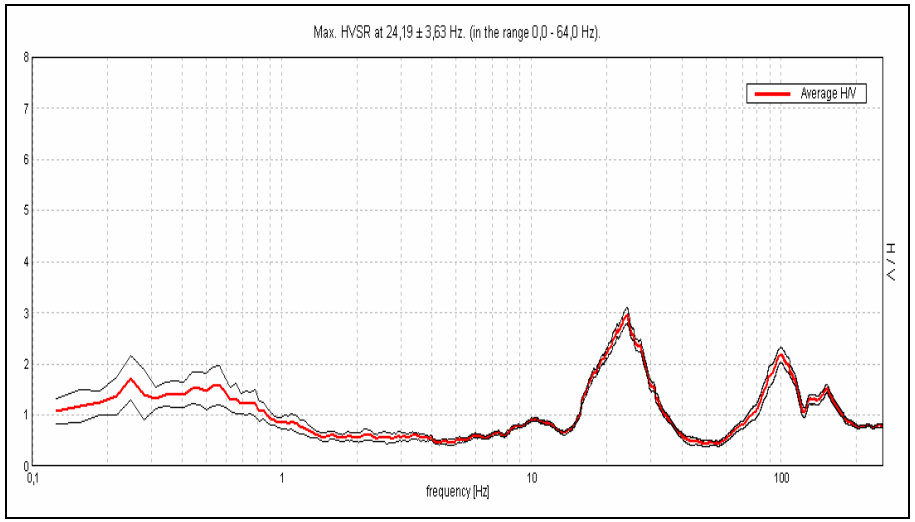

Max. HVSR at 55,0 ± 0,32 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

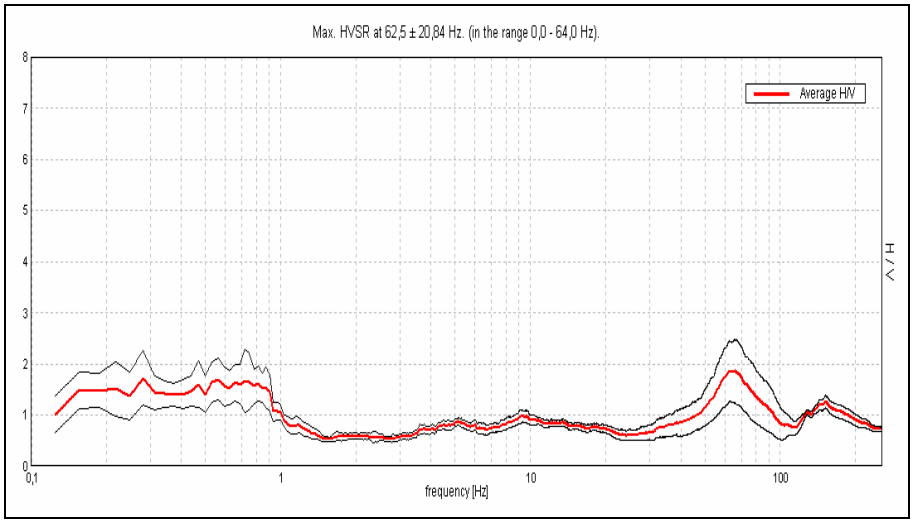

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

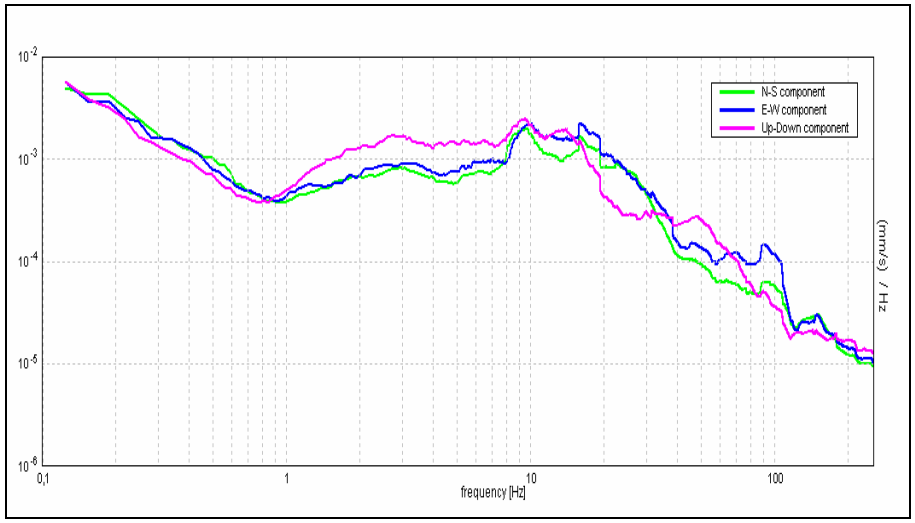

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

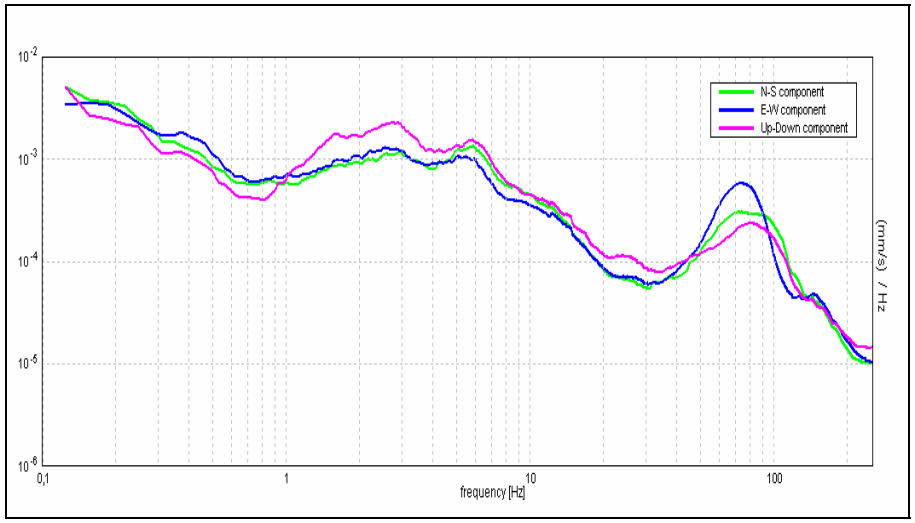
Tr 7

Tr 8


Max. HVSR at 24,19 ± 3,63 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
frequency [Hz]
H / V

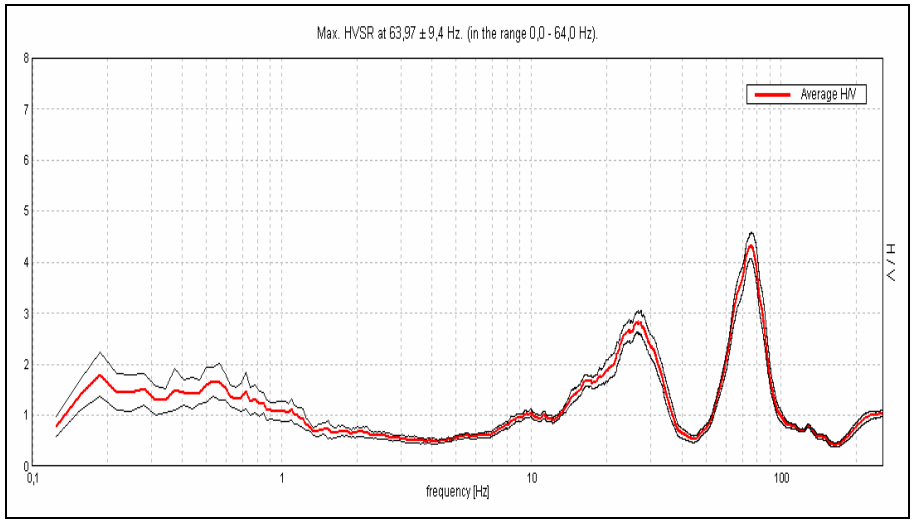

Max. HVSR at 62,5 ± 20,84 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
frequency [Hz]
H / V

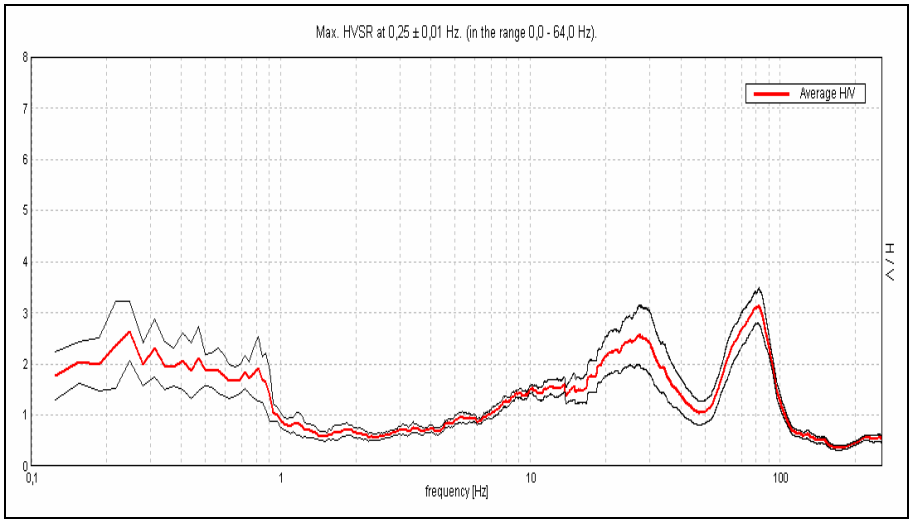

N-S component
E-W component
Up-Down component
frequency [Hz]
(mm/s) / Hz

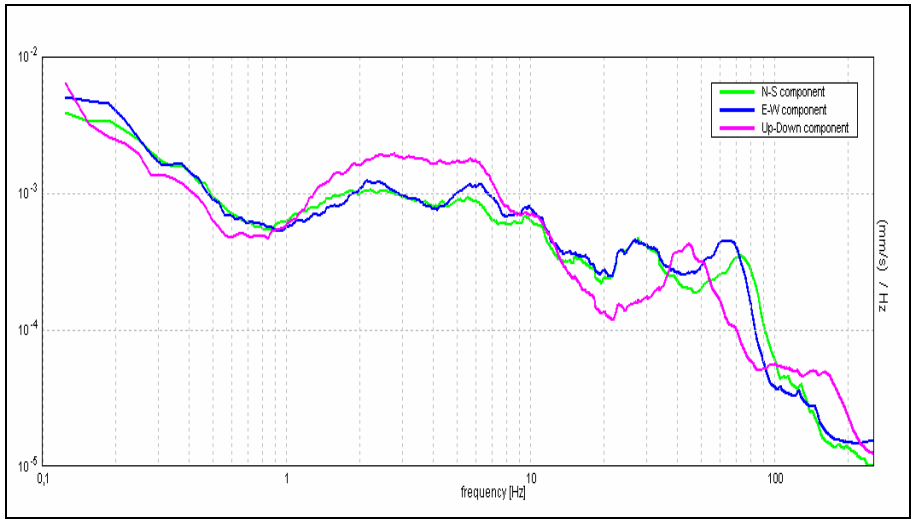

N-S component
E-W component
Up-Down component
frequency [Hz]
(mm/s) / Hz

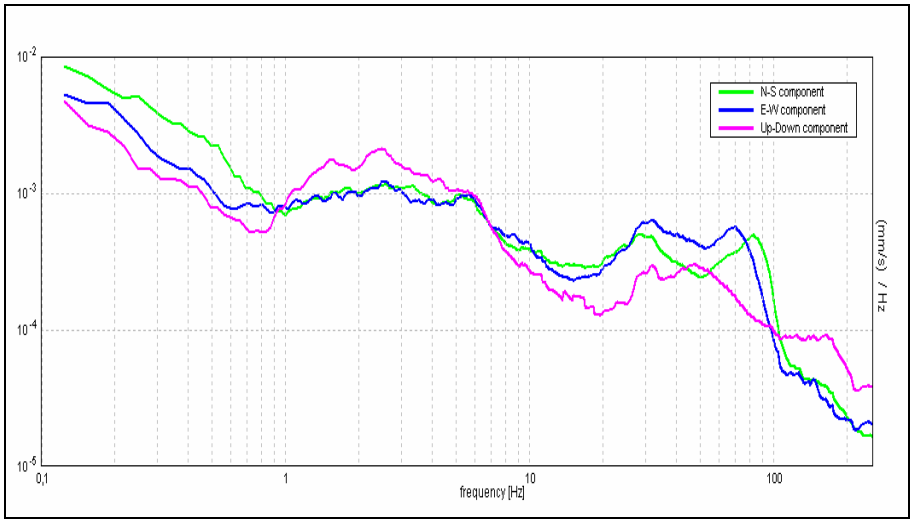
Tr 9

Tr 10


Max. HVSR at 63,97 ± 9,4 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

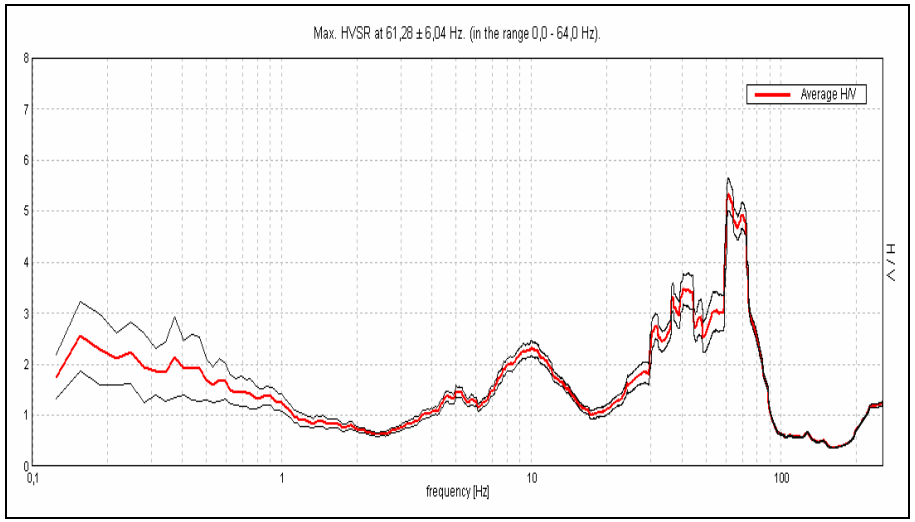

Max. HVSR at 0,25 ± 0,01 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

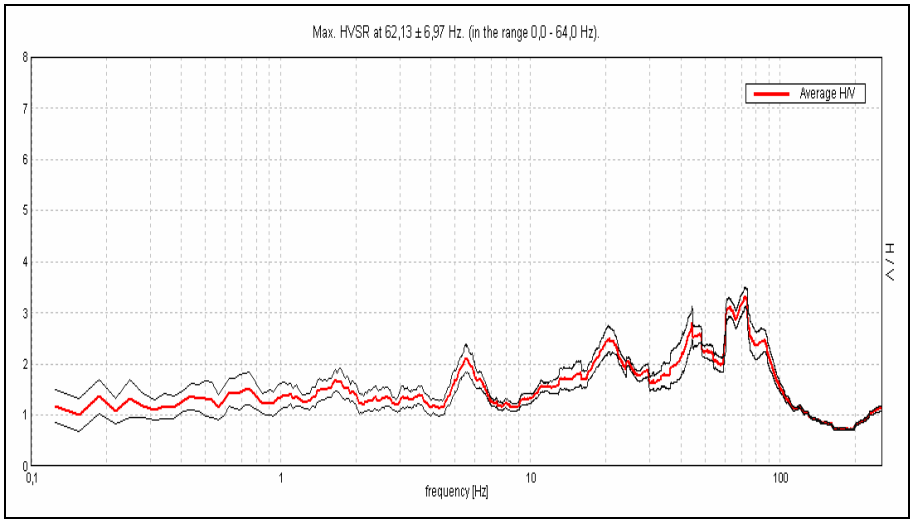

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

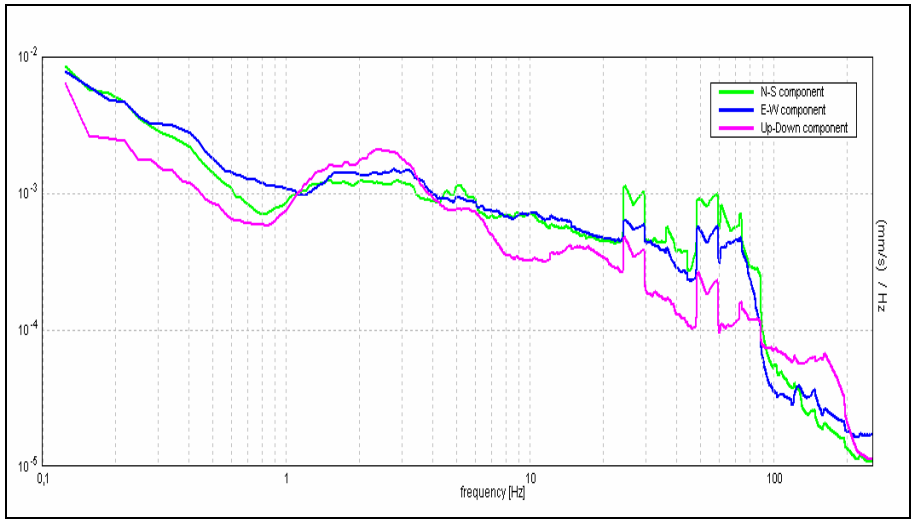

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

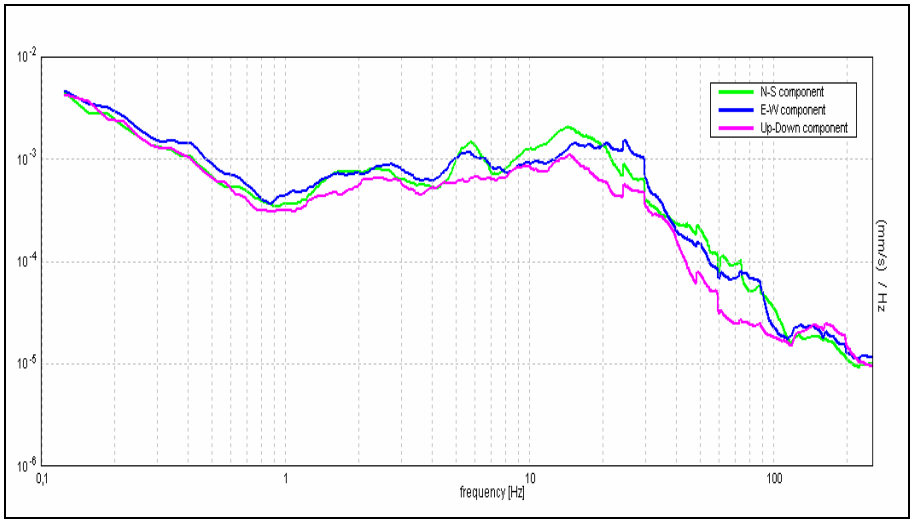
Tr 11

Tr 12


Max. HVSR at 61,28 ± 6,04 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

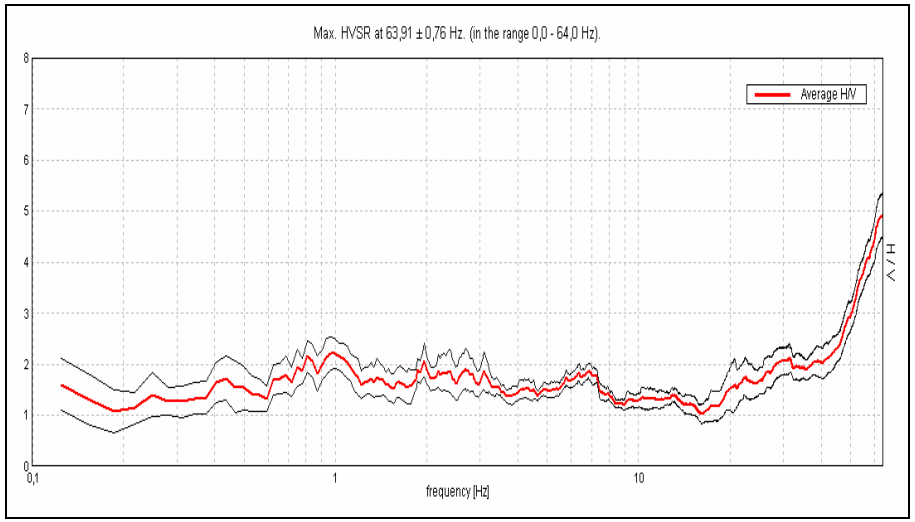

Max. HVSR at 62,13 ± 6,97 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

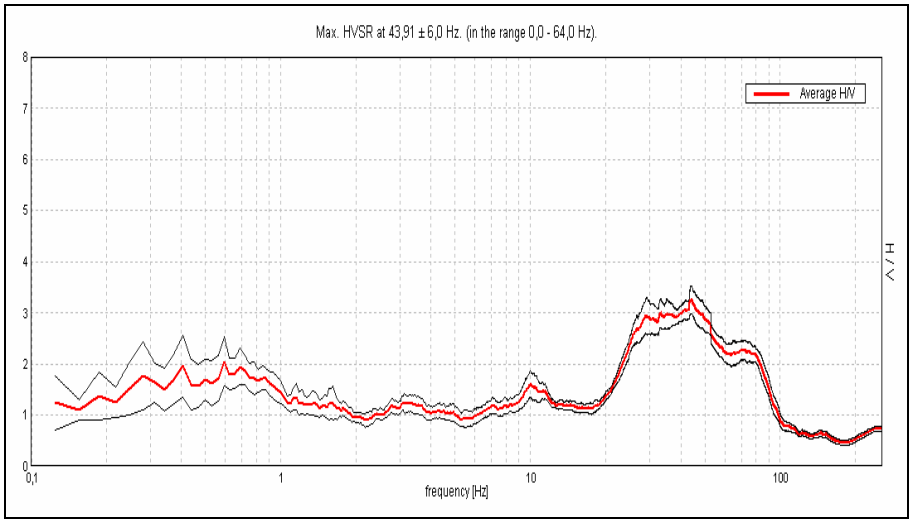

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

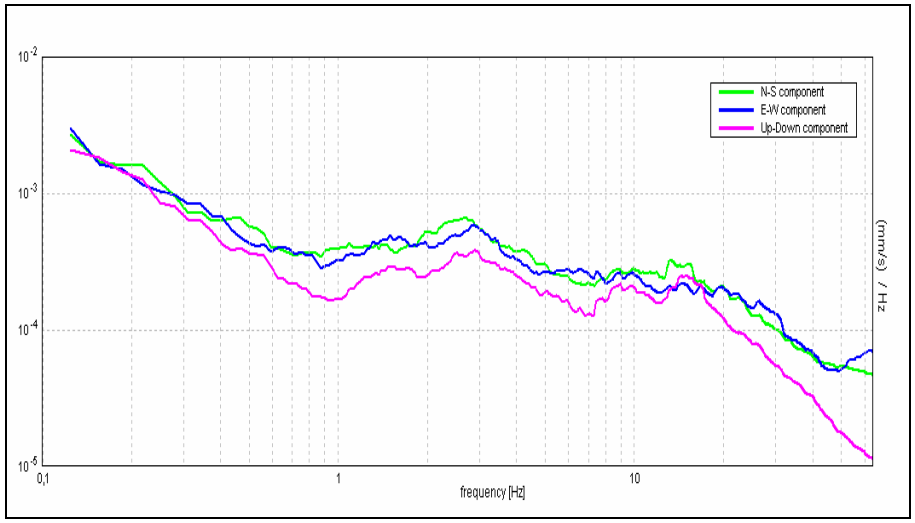

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

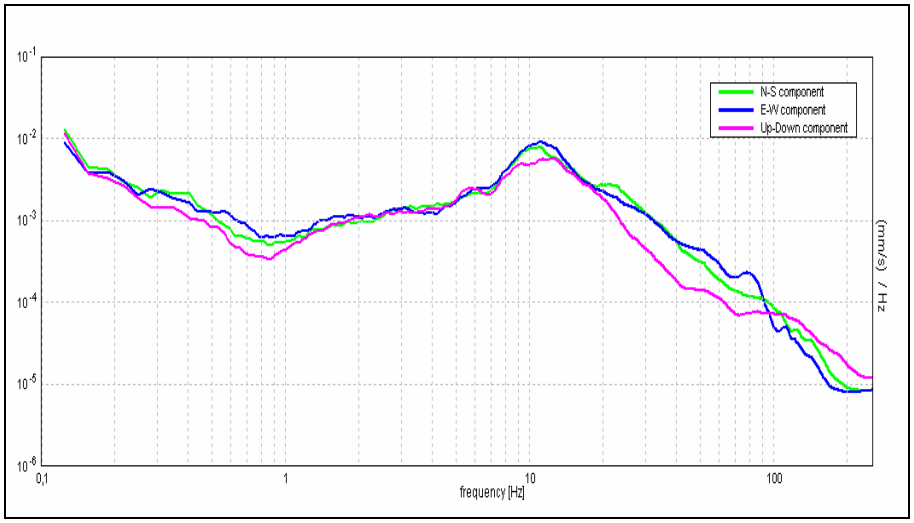
Tr 13

Tr 14


Max. HVSR at 63,91 ± 0,76 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

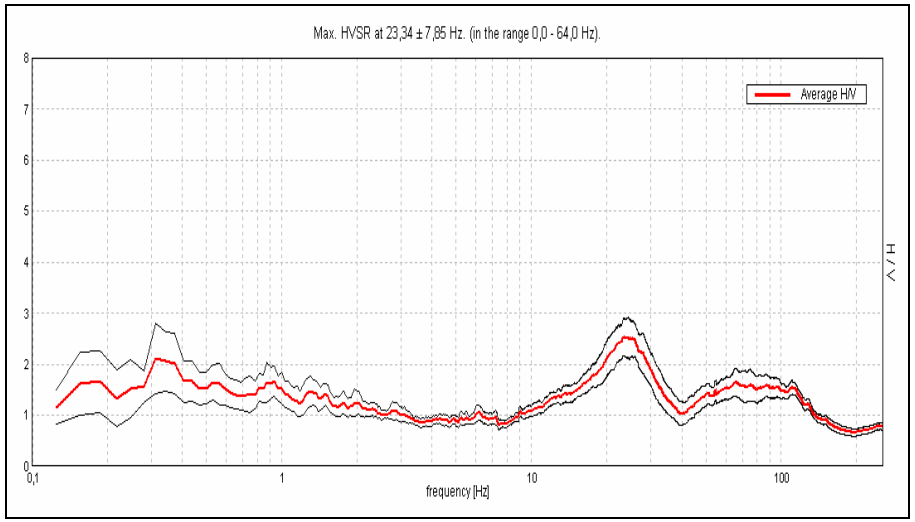

Max. HVSR at 43,91 ± 6,0 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

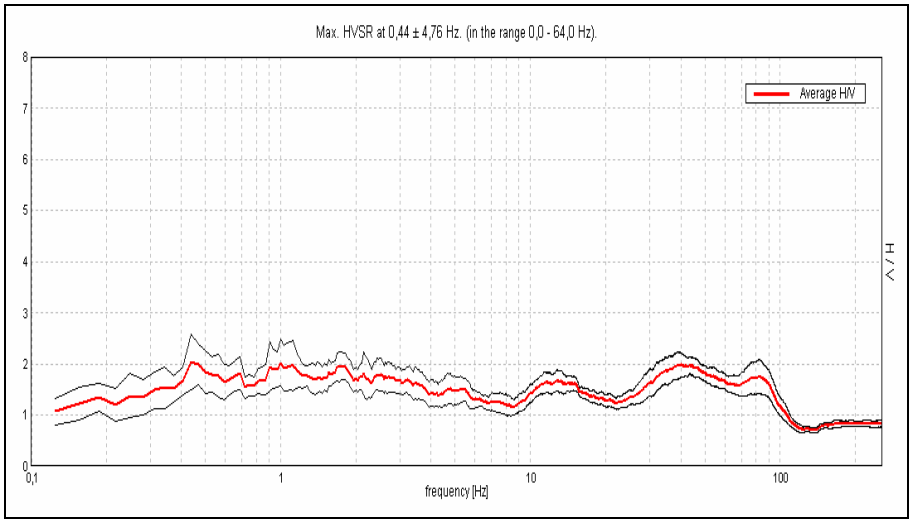

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

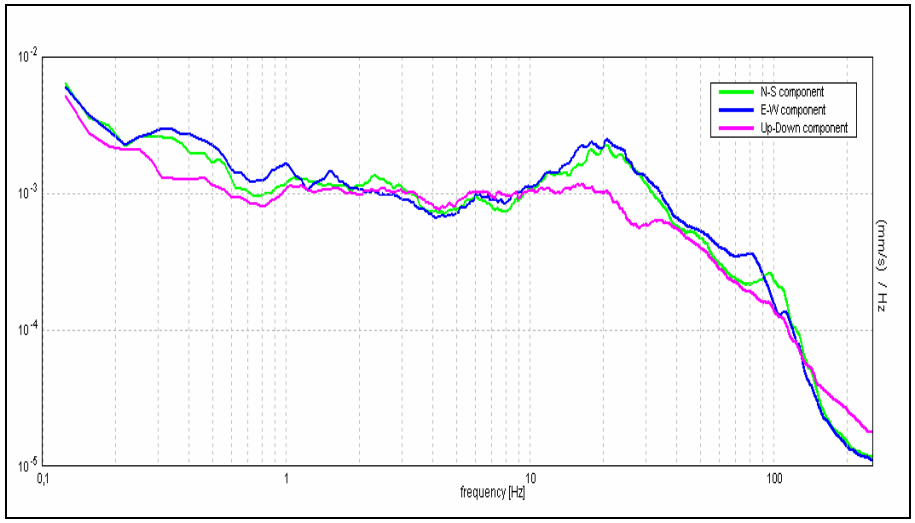

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

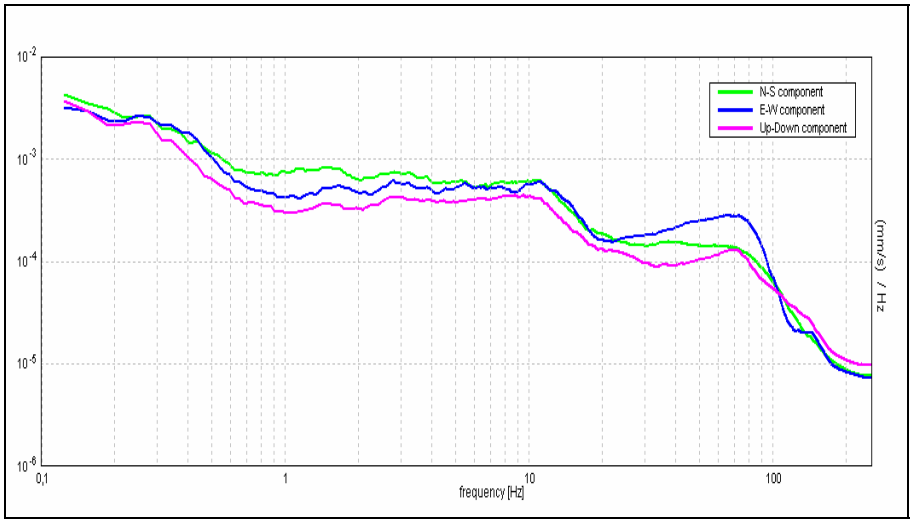
Tr 15

Tr 16


Max. HVSR at 23,34 ± 7,85 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

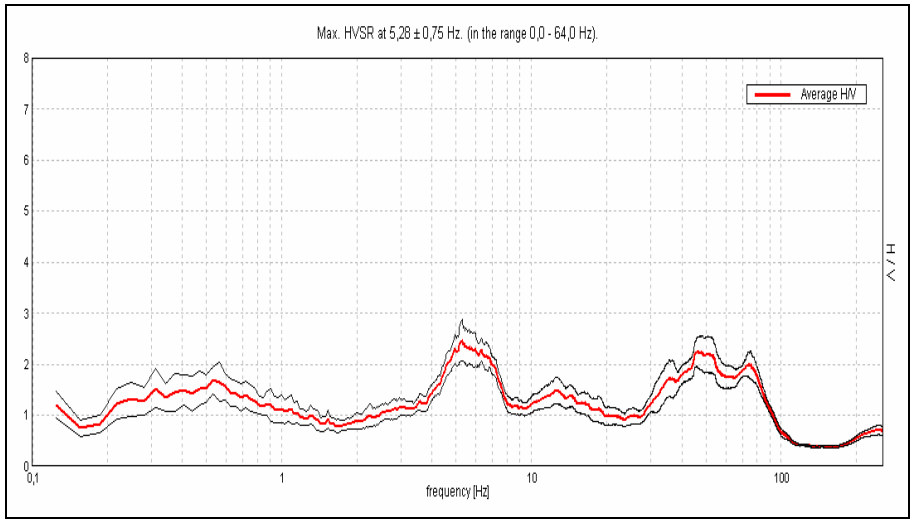

Max. HVSR at 0,44 ± 4,76 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

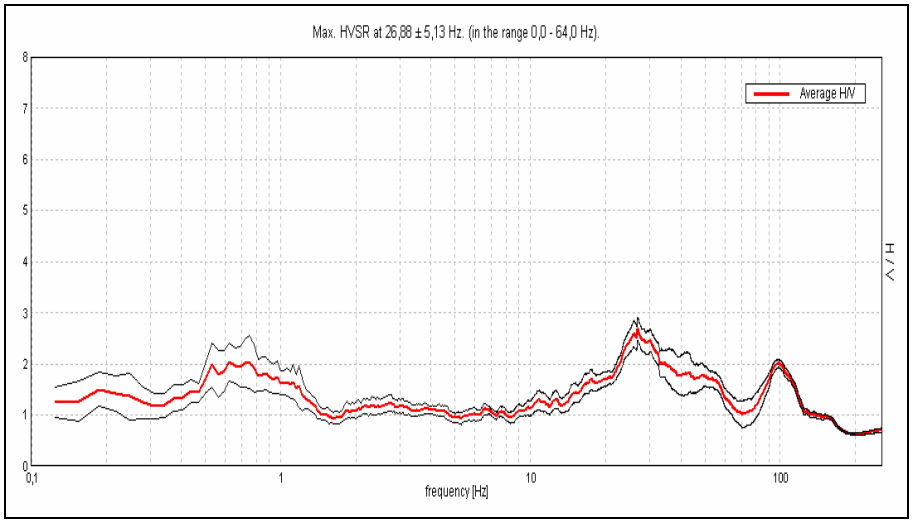

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

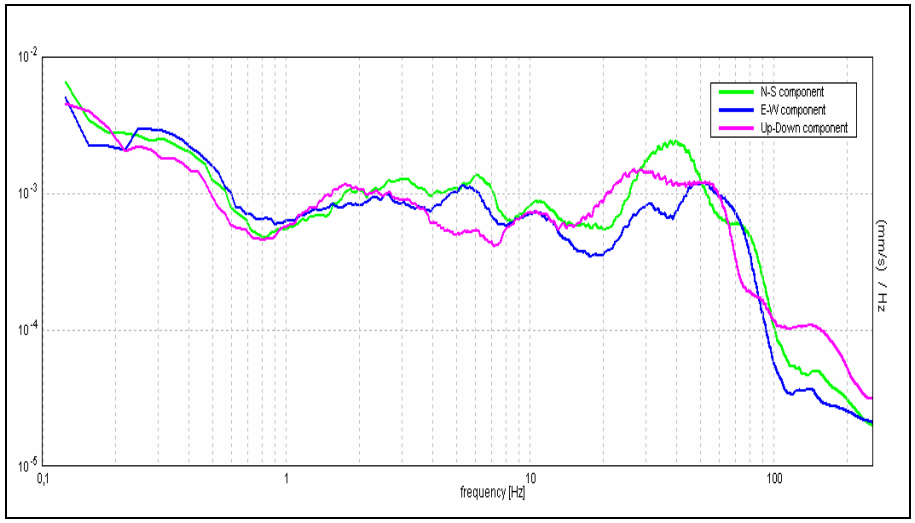

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

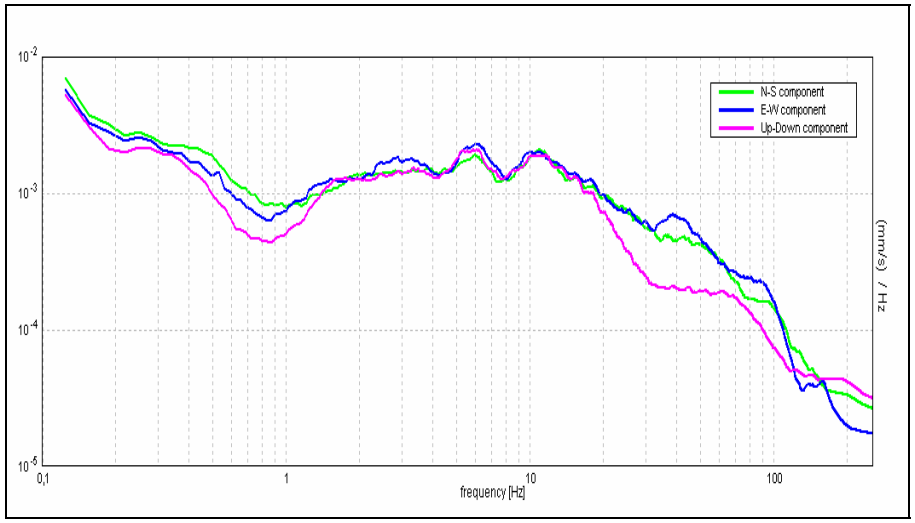
Tr 17

Tr 18


Max. HVSR at 5,28 ± 0,75 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

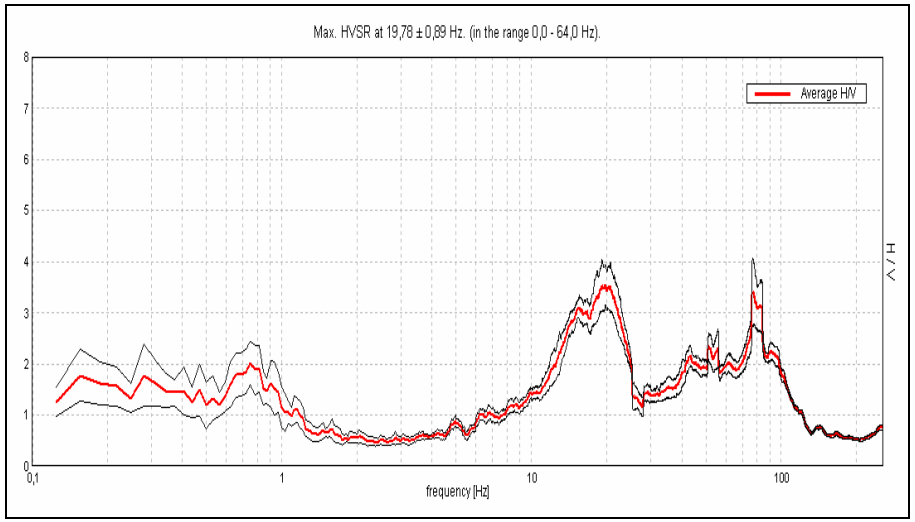

Max. HVSR at 26,88 ± 5,13 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

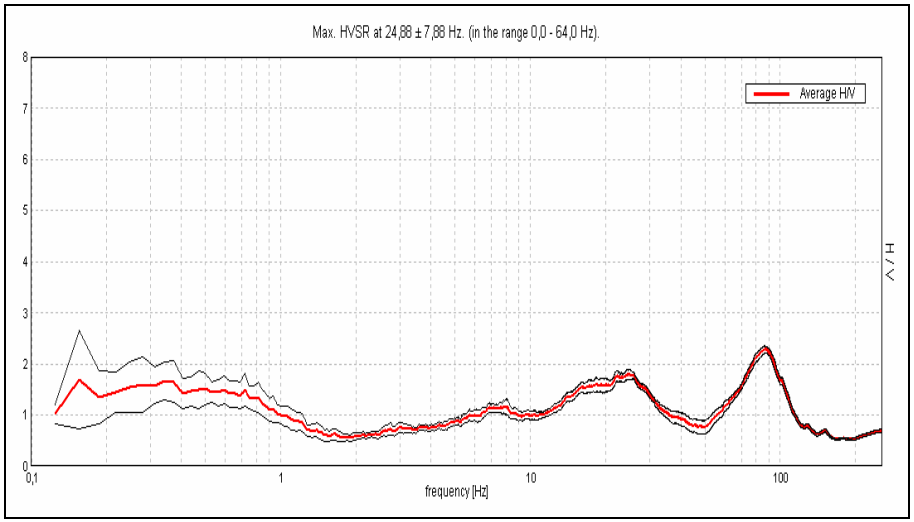

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

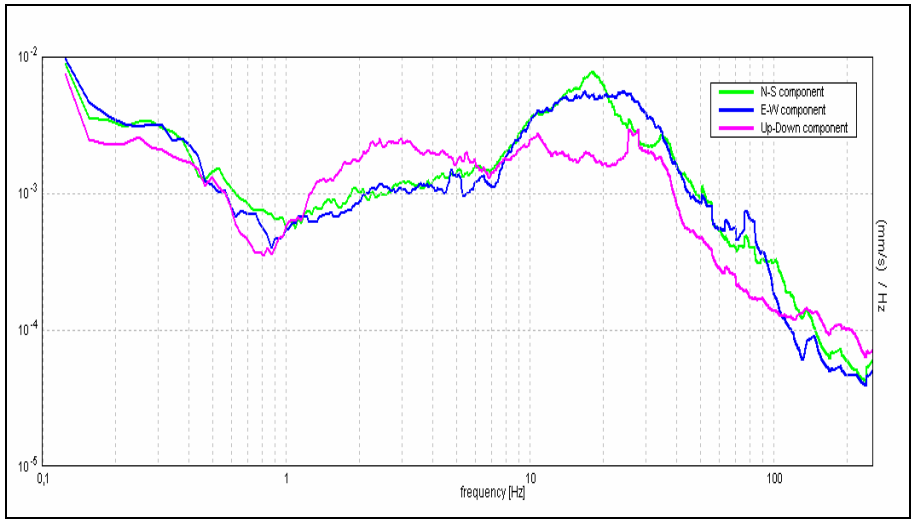

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

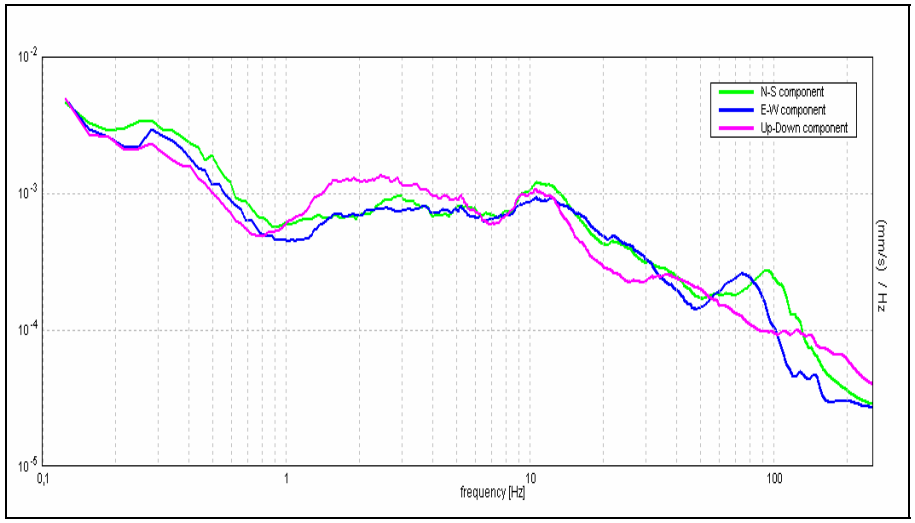
Tr 19

Tr 20


Max. HVSR at 19,78 ± 0,89 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
frequency [Hz]
H / V

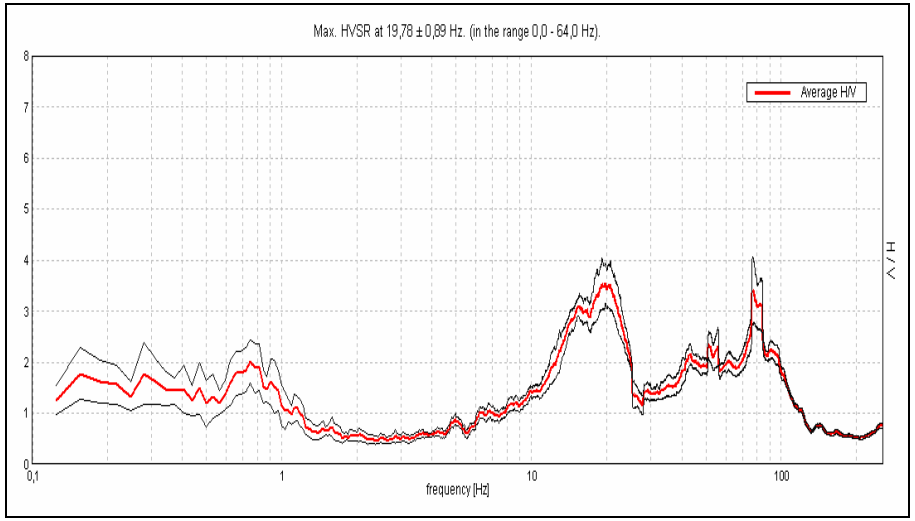

Max. HVSR at 24,88 ± 7,88 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
frequency [Hz]
H / V

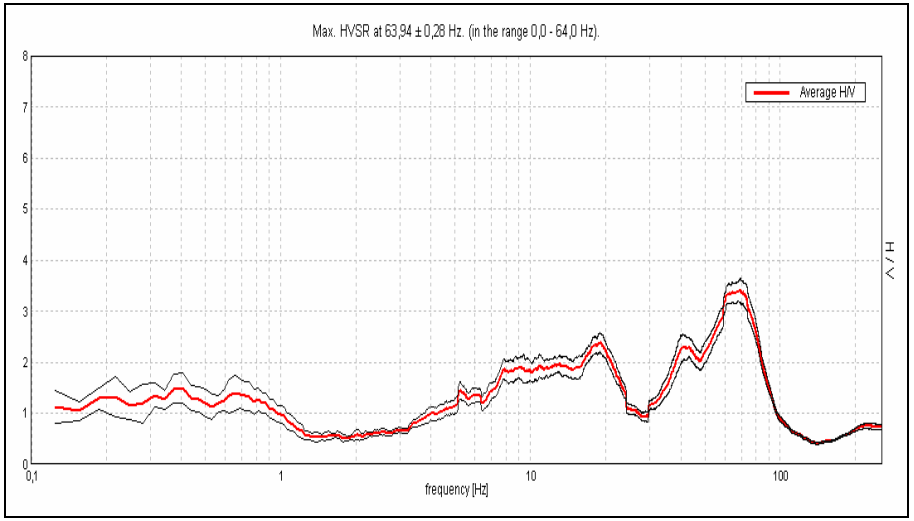

N-S component
E-W component
Up-Down component
frequency [Hz]
(mm/s) / Hz

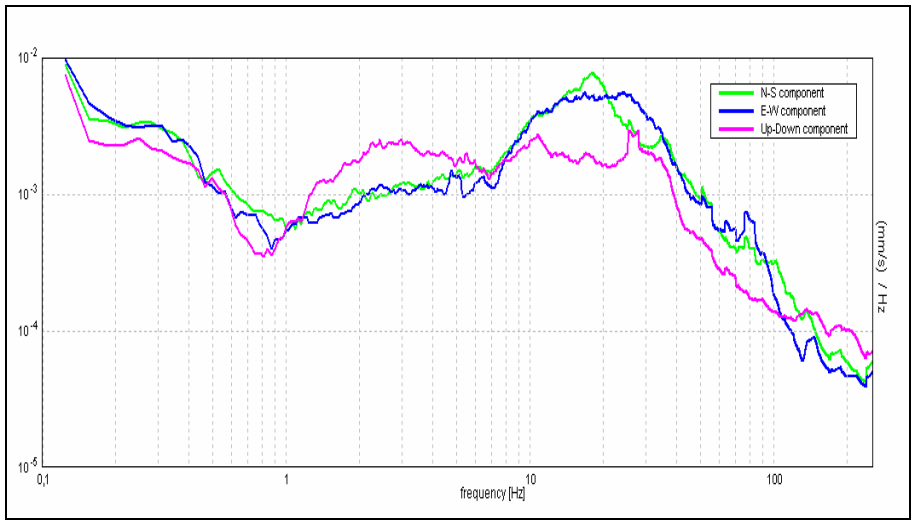

N-S component
E-W component
Up-Down component
frequency [Hz]
(mm/s) / Hz

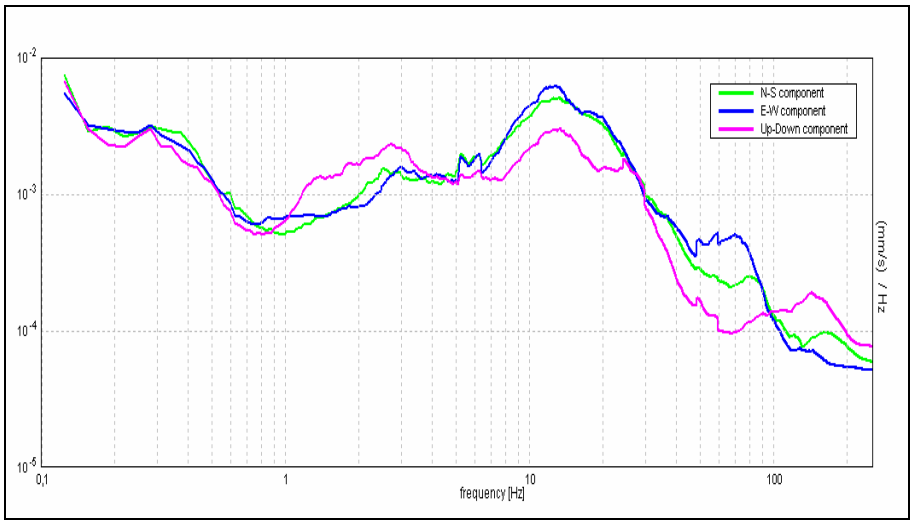
Tr 21

Tr 22


Max. HVSR at 19,78 ± 0,89 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

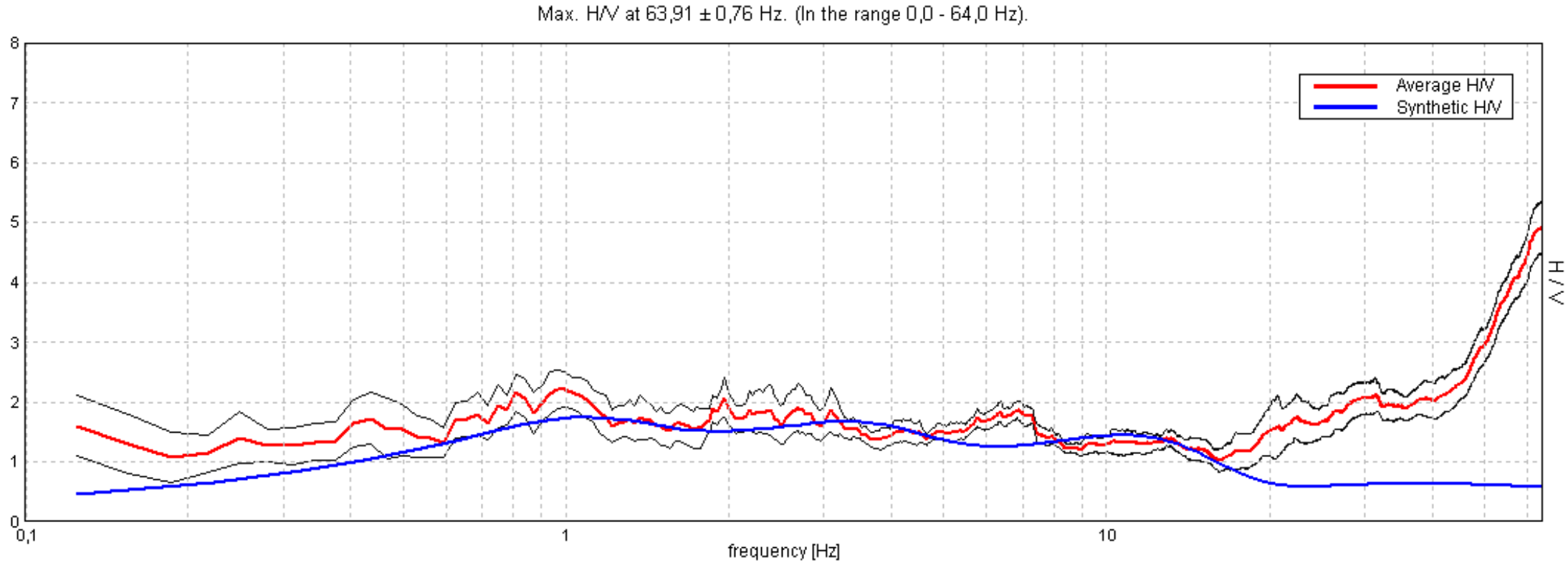

Max. HVSR at 63,94 ± 0,28 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
H / V
frequency [Hz]

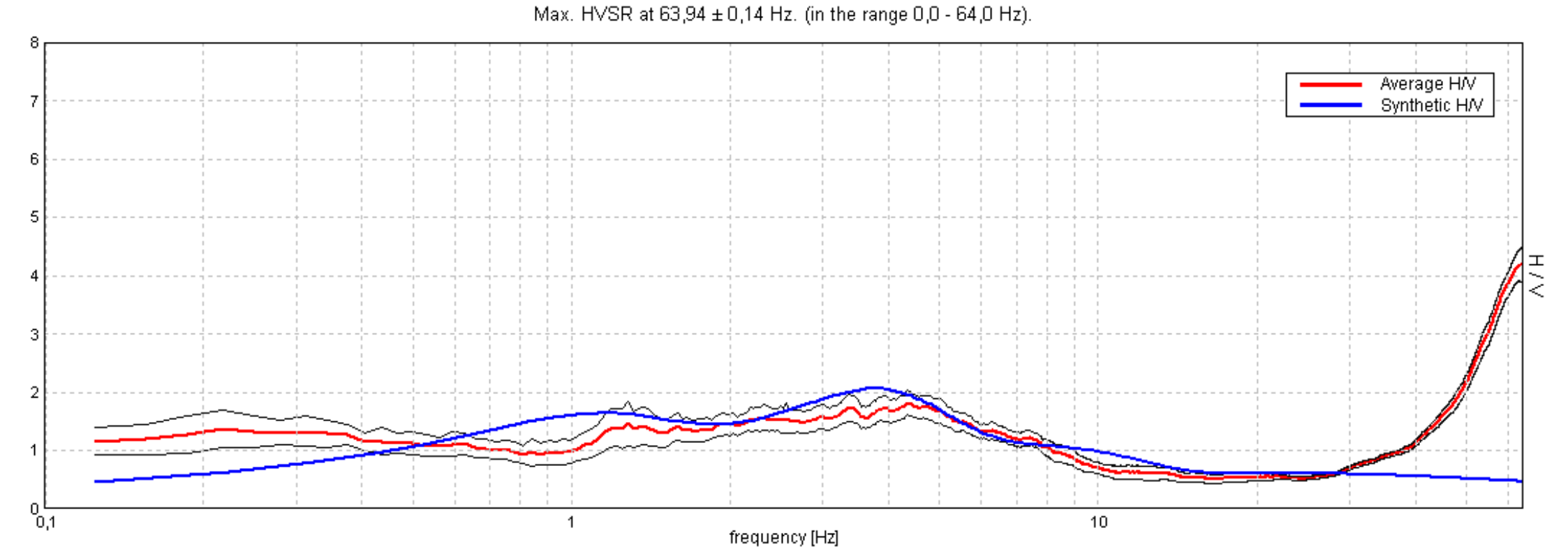

N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]


N-S component
E-W component
Up-Down component
(mm/s) / Hz
frequency [Hz]

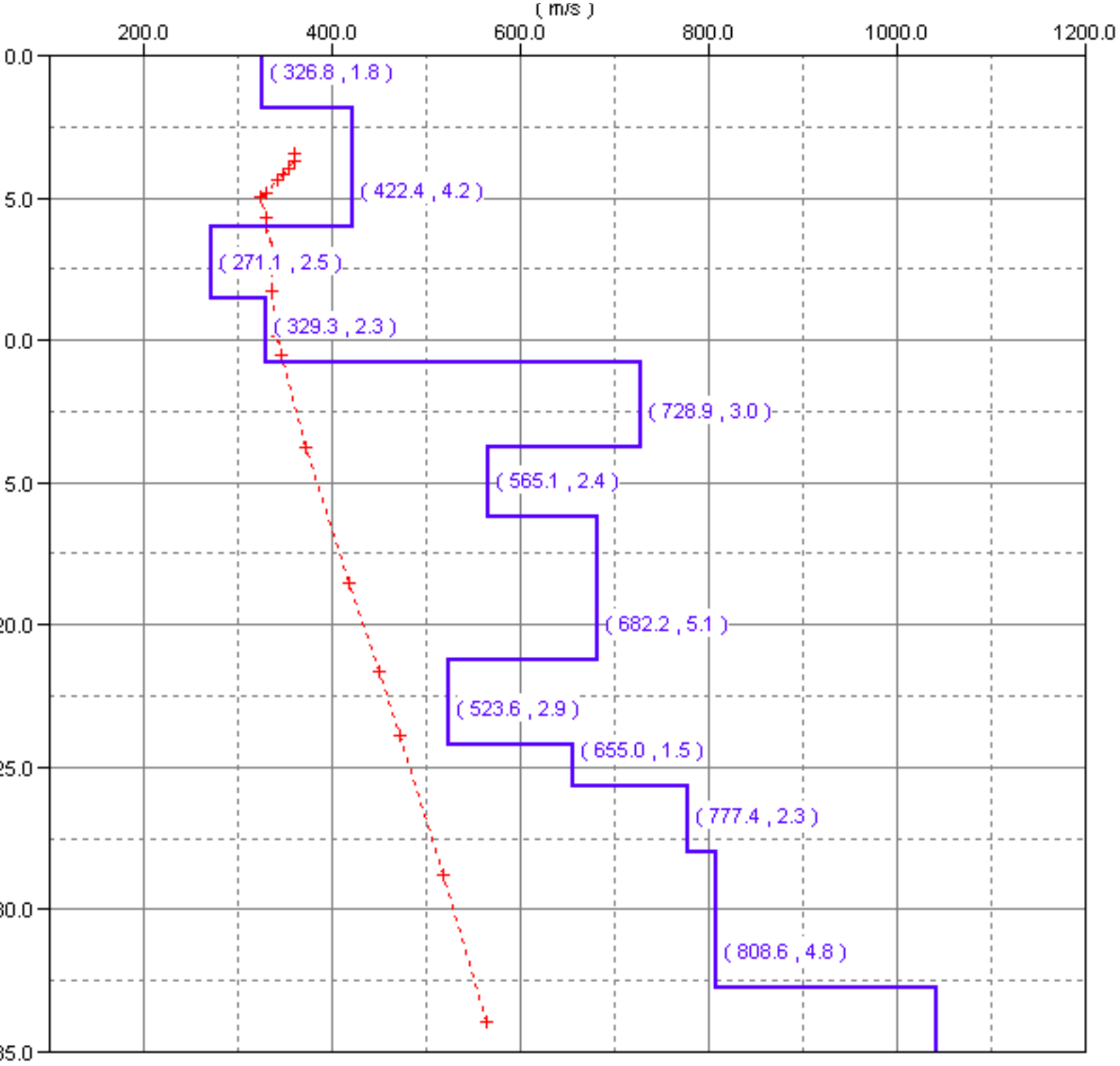
Tr 23

Tr 24

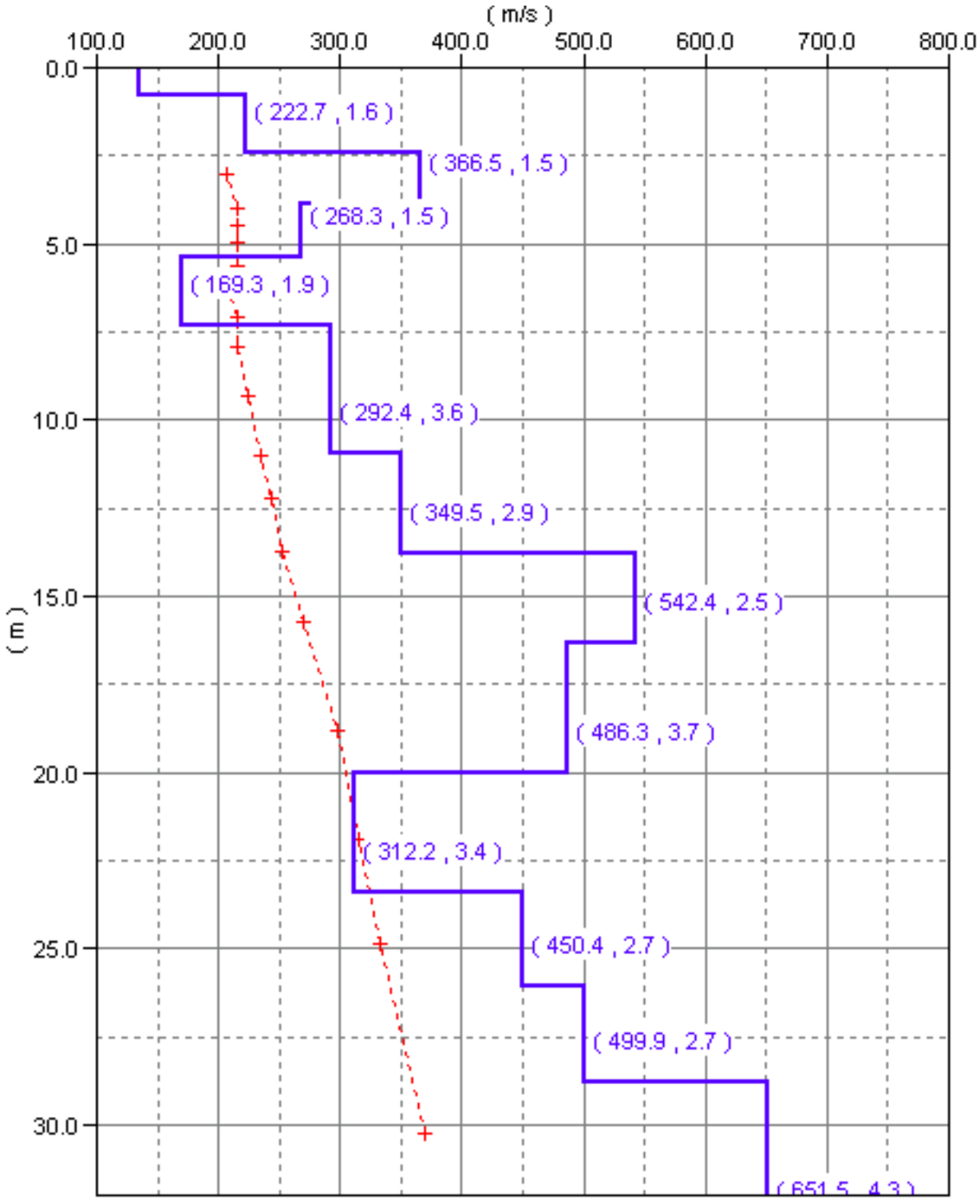

Max. H/V at 63,91 ± 0,76 Hz. (In the range 0,0 - 64,0 Hz).
Average H/V
Synthetic H/V
H / V
frequency [Hz]
0,1
1
10
0
1
2
3
4
5
6
7
8


Max. HVSR at 63,94 ± 0,14 Hz. (in the range 0,0 - 64,0 Hz).
Average H/V
Synthetic H/V
H / V
frequency [Hz]
0,1
1
10
0
1
2
3
4
5
6
7
8

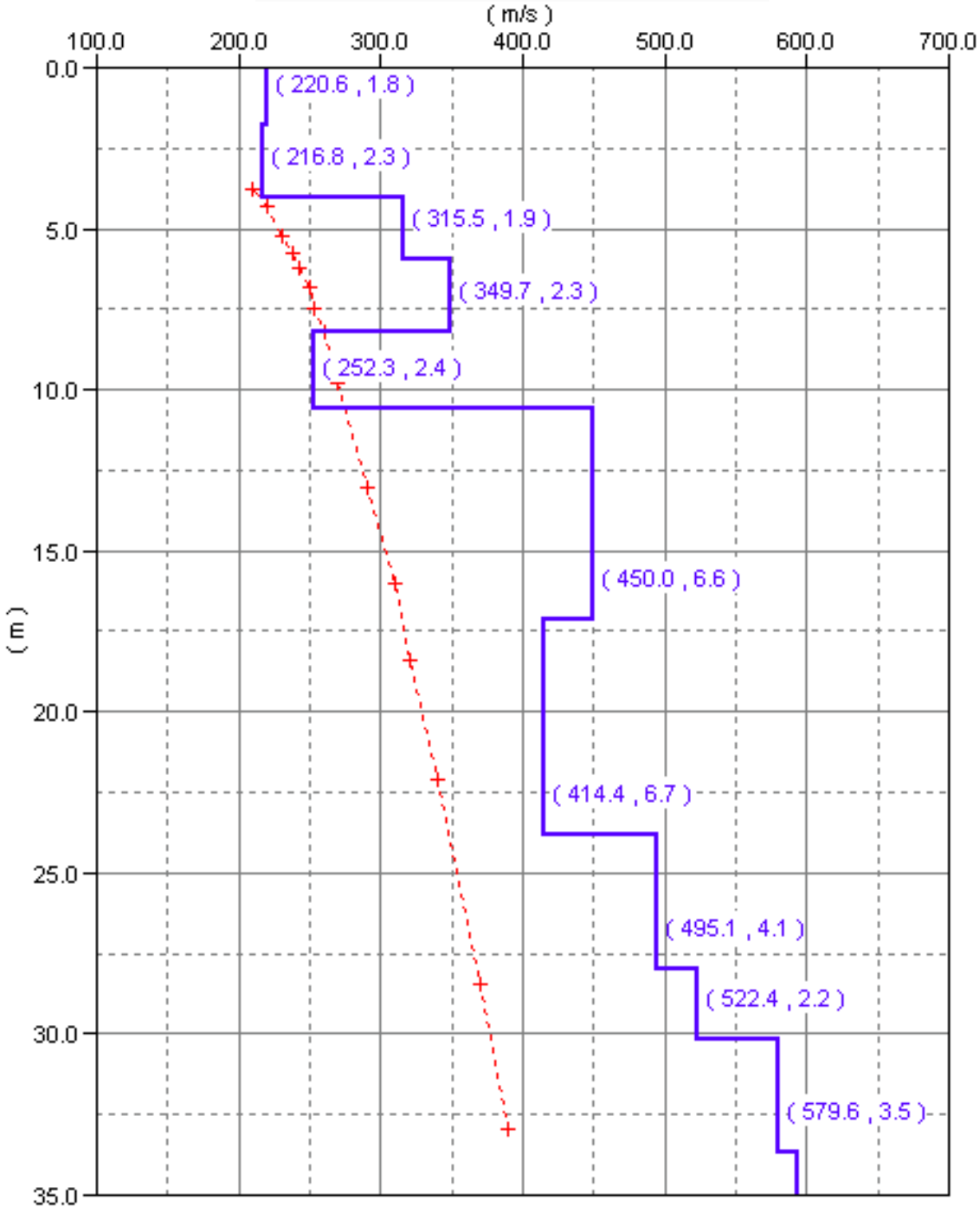
MASW-ReMi 1


(m/s)
200.0
400.0
600.0
800.0
1000.0
1200.0
0.0
5.0
0.0
5.0
20.0
25.0
30.0
35.0
(326.8 , 1.8)
(422.4 , 4.2)
(271.1 , 2.5)
(329.3 , 2.3)
(728.9 , 3.0)
(565.1 , 2.4)
(682.2 , 5.1)
(523.6 , 2.9)
(655.0 , 1.5)
(777.4 , 2.3)
(808.6 , 4.8)

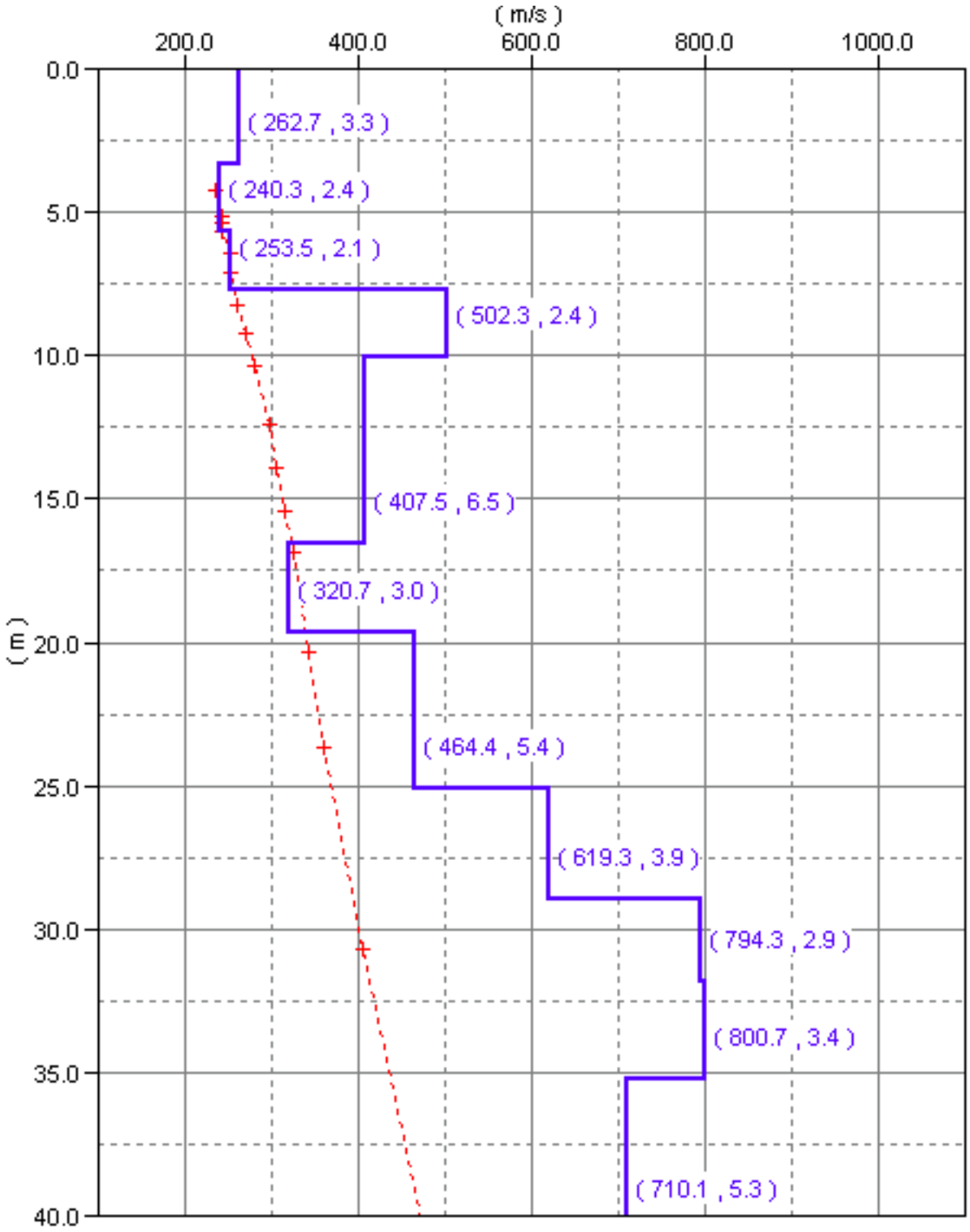
MASW 2


(m/s)
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
(m)
(222.7 , 1.6)
(366.5 , 1.5)
(268.3 , 1.5)
(169.3 , 1.9)
(292.4 , 3.6)
(349.5 , 2.9)
(542.4 , 2.5)
(486.3 , 3.7)
(312.2 , 3.4)
(450.4 , 2.7)
(499.9 , 2.7)

MASW-ReMi 3


(m/s)
100.0
200.0
300.0
400.0
500.0
600.0
700.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
(m)
(220.6 , 1.8)
(216.8 , 2.3)
(315.5 , 1.9)
(349.7 , 2.3)
(252.3 , 2.4)
(450.0 , 6.6)
(414.4 , 6.7)
(495.1 , 4.1)
(522.4 , 2.2)
(579.6 , 3.5)

MASW 4


(m/s)
200.0
400.0
600.0
800.0
1000.0
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
(m)
(262.7 , 3.3)
(240.3 , 2.4)
(253.5 , 2.1)
(502.3 , 2.4)
(407.5 , 6.5)
(320.7 , 3.0)
(464.4 , 5.4)
(619.3 , 3.9)
(794.3 , 2.9)
(800.7 , 3.4)
(710.1 , 5.3)

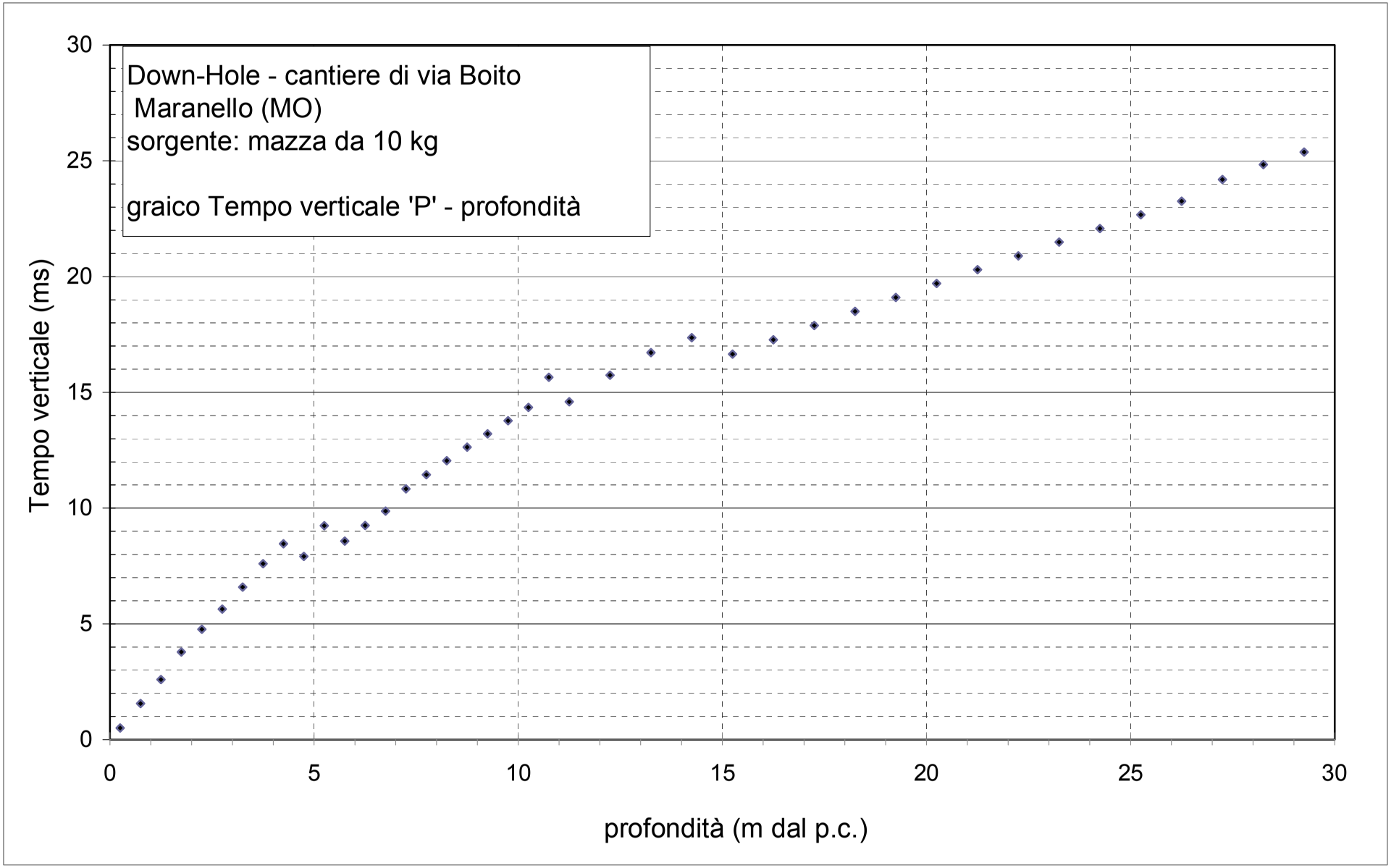
Indagine geofisica
Prova Down-Hole
Comune di Maranello (MO)

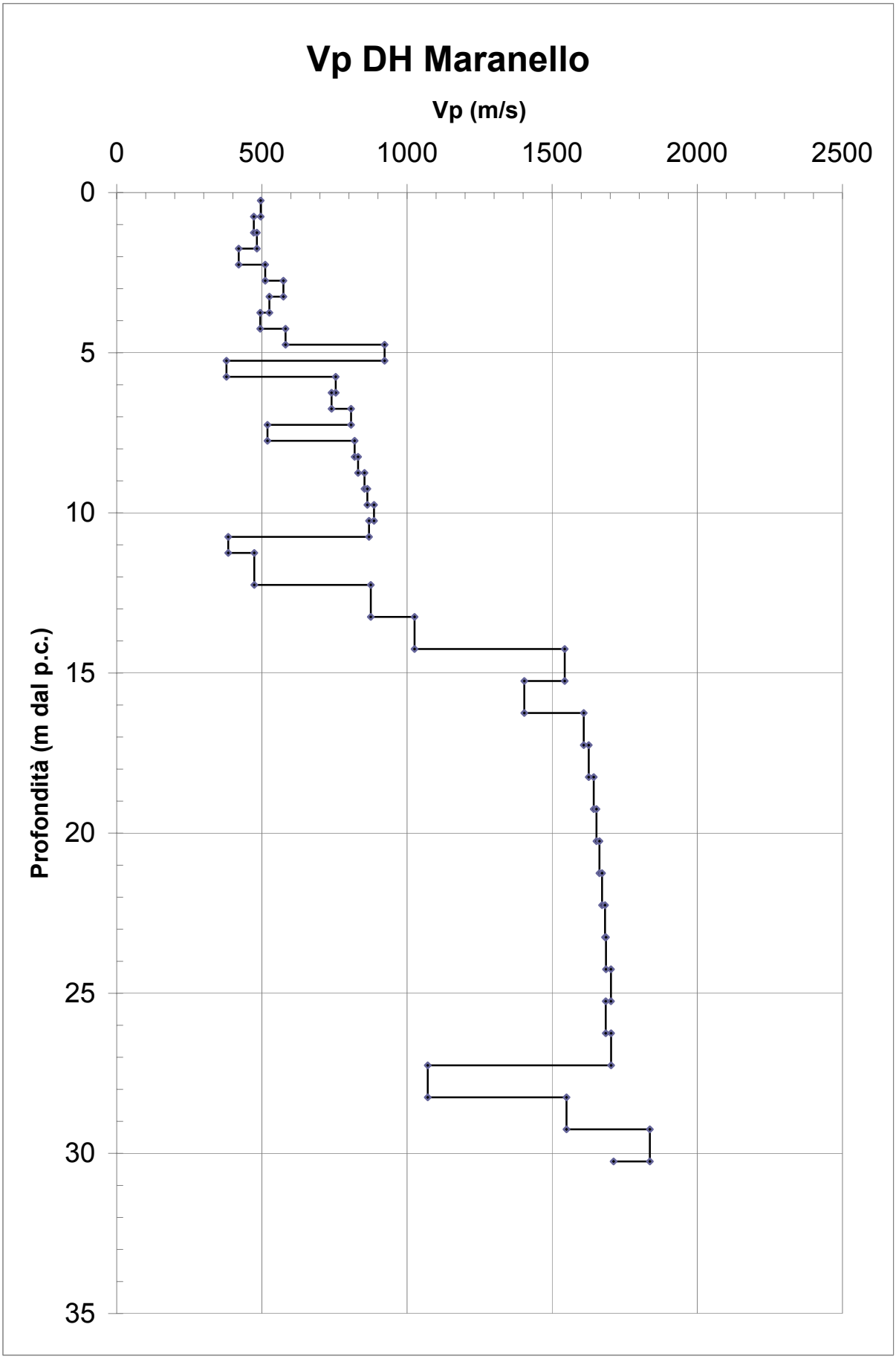
- Risultati -

Te.Am. Geofisica *s.r.l. - Via Cosmè Tura, 32 - 44034 Copparo (FE)*
Tel. 0532-871495 Cap. Soc. Parz. Vers. 10.000 euro
Iscr. Reg. Impr. N. 178610 - P. IVA e Cod. Fisc. 01568060386
e-Mail: info@teamgeofisica.com WEB: www.teamgeofisica.com

Altezza foro	0.3 m	Punto scoppio	4 m	ONDE	P

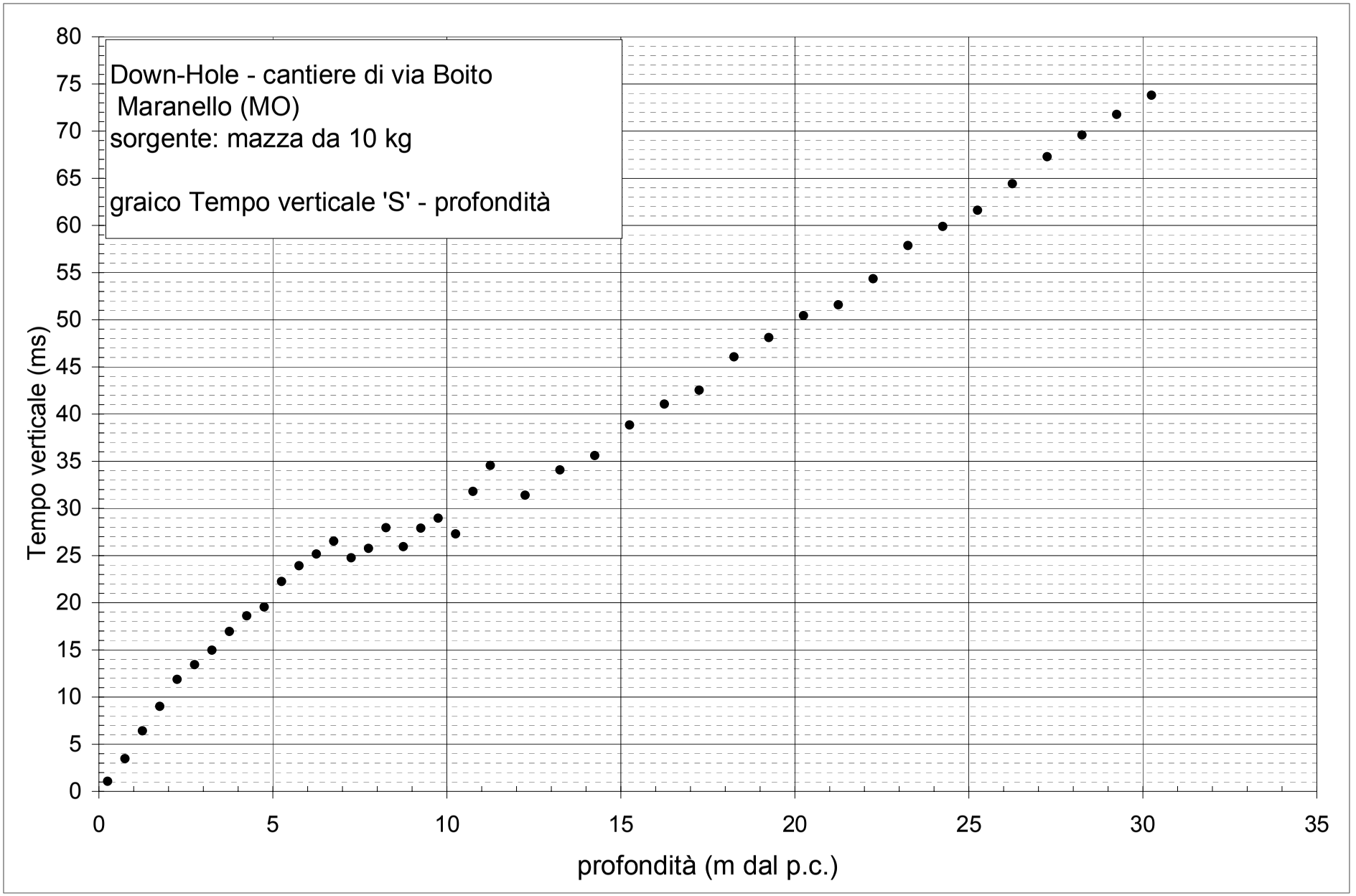
Profondità (m dal p.c.)	T misura (ms)	cos(t)	Tcorretto (ms)	V_P intervallo (m/s)
0.25	8.08	0.0624	0.50	496
0.75	8.48	0.1843	1.56	472
1.25	8.71	0.2983	2.60	483
1.75	9.45	0.4008	3.79	420
2.25	9.72	0.4903	4.77	512
2.75	9.95	0.5665	5.64	574
3.25	10.45	0.6306	6.59	526
3.75	11.11	0.6839	7.60	494
4.25	11.62	0.7282	8.46	582
4.75	10.35	0.7649	7.92	923
5.25	11.62	0.7954	9.24	378
5.75	10.45	0.8209	8.58	754
6.25	10.99	0.8423	9.25	740
6.75	11.48	0.8603	9.87	807
7.25	12.37	0.8756	10.83	519
7.75	12.88	0.8886	11.44	819
8.25	13.39	0.8998	12.05	832
8.75	13.89	0.9095	12.63	853
9.25	14.39	0.9179	13.21	864
9.75	14.89	0.9252	13.77	886
10.25	15.40	0.9316	14.35	869
10.75	16.70	0.9372	15.65	384
11.25	15.49	0.9422	14.60	474
12.25	16.56	0.9506	15.74	875
13.25	17.46	0.9573	16.71	1026
14.25	18.03	0.9628	17.36	1543
15.25	17.21	0.9673	16.65	1404
16.25	17.79	0.9710	17.27	1609
17.25	18.36	0.9742	17.89	1626
18.25	18.93	0.9768	18.49	1643
19.25	19.51	0.9791	19.10	1653
20.25	20.08	0.9810	19.70	1663
21.25	20.66	0.9827	20.30	1672
22.25	21.23	0.9842	20.89	1682
23.25	21.80	0.9855	21.49	1686
24.25	22.37	0.9867	22.07	1702
25.25	22.95	0.9877	22.67	1685
26.25	23.52	0.9886	23.26	1703
27.25	24.45	0.9894	24.19	1072
28.25	25.08	0.9901	24.83	1549
29.25	25.62	0.9908	25.38	1837
30.25	26.19	0.9914	25.96	1712

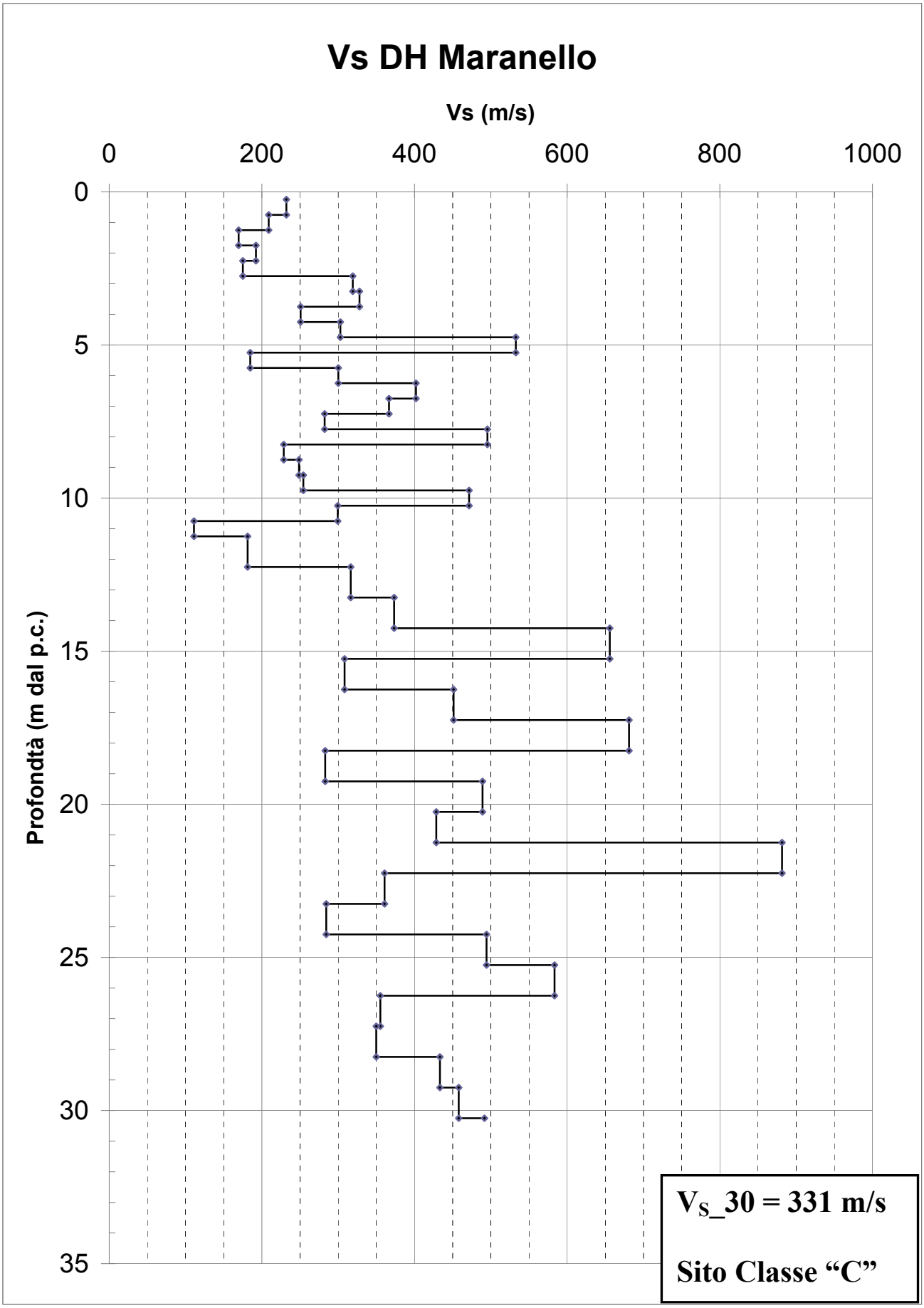

Down-Hole - cantiere di via Boito
Maranello (MO)
sorgente: mazza da 10 kg
graico Tempo verticale 'P' - profondità
Tempo verticale (ms)
profondità (m dal p.c.)
0
5
10
15
20
25
30


Vp DH Maranello
Vp (m/s)
0
500
1000
1500
2000
2500
Profondità (m dal p.c.)
0
5
10
15
20
25
30
35

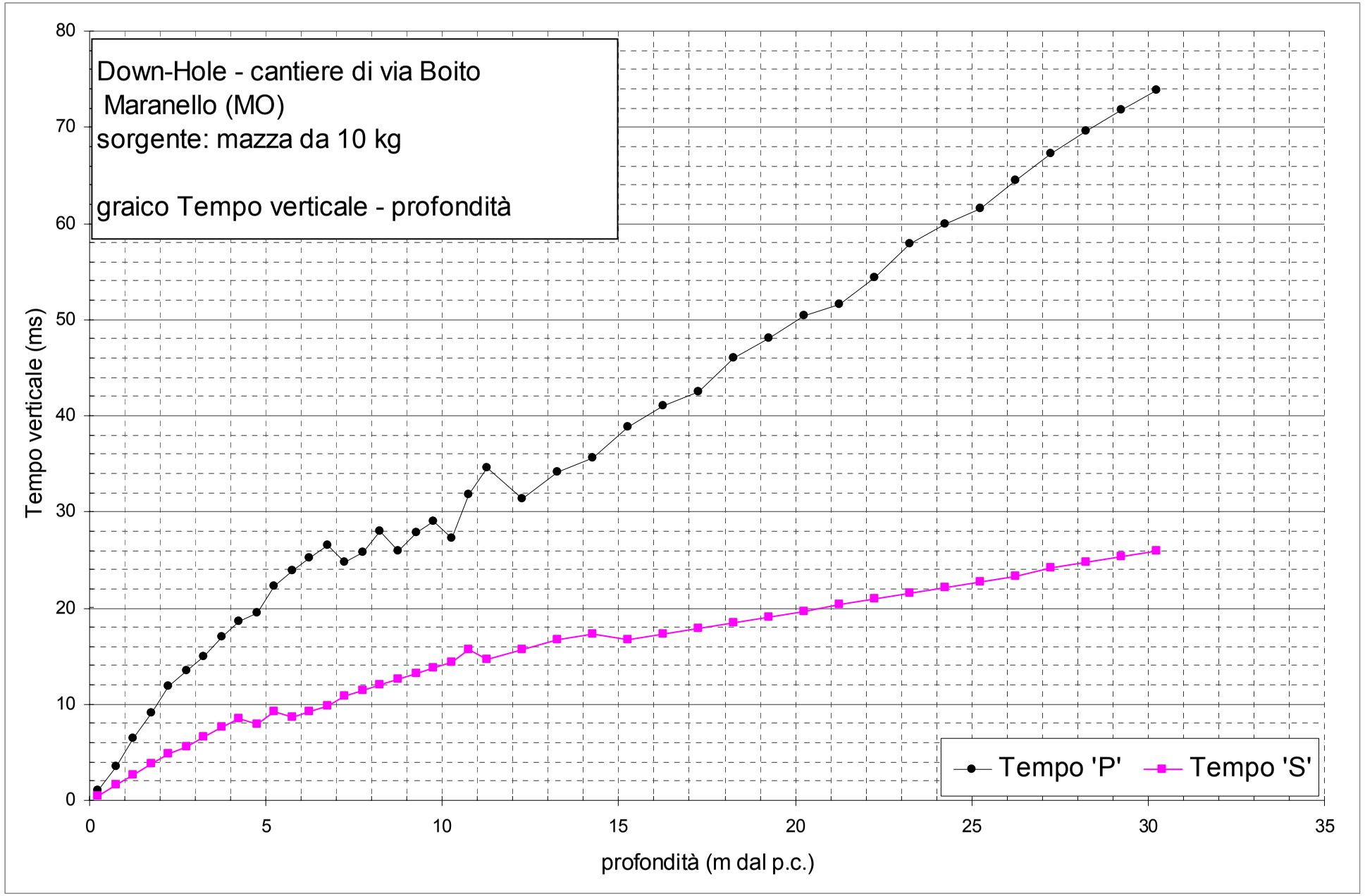
Altezza foro	0.3 m	Punto scoppio	4 m	ONDE	S

Profondità (m dal p.c.)	T misura (ms)	cos(t)	Tcorretto (ms)	V_S intervallo (m/s)
0.25	17.27	0.0624	1.08	232
0.75	18.83	0.1843	3.47	209
1.25	21.52	0.2983	6.42	170
1.75	22.50	0.4008	9.02	192
2.25	24.22	0.4903	11.87	175
2.75	23.73	0.5665	13.44	319
3.25	23.73	0.6306	14.97	328
3.75	24.80	0.6839	16.96	251
4.25	25.56	0.7282	18.61	303
4.75	25.56	0.7649	19.55	533
5.25	27.98	0.7954	22.25	185
5.75	29.14	0.8209	23.92	300
6.25	29.88	0.8423	25.16	402
6.75	30.84	0.8603	26.53	366
7.25	28.28	0.8756	24.76	282
7.75	29.00	0.8886	25.77	496
8.25	31.07	0.8998	27.95	229
8.75	28.52	0.9095	25.94	249
9.25	30.41	0.9179	27.91	254
9.75	31.31	0.9252	28.97	471
10.25	29.30	0.9316	27.30	299
10.75	33.93	0.9372	31.80	111
11.25	36.68	0.9422	34.56	181
12.25	33.03	0.9506	31.40	316
13.25	35.60	0.9573	34.08	373
14.25	36.98	0.9628	35.60	656
15.25	40.16	0.9673	38.85	308
16.25	42.29	0.9710	41.06	451
17.25	43.66	0.9742	42.53	681
18.25	47.16	0.9768	46.07	283
19.25	49.14	0.9791	48.11	489
20.25	51.42	0.9810	50.44	428
21.25	52.48	0.9827	51.58	882
22.25	55.22	0.9842	54.35	361
23.25	58.72	0.9855	57.87	284
24.25	60.70	0.9867	59.89	494
25.25	62.37	0.9877	61.60	583
26.25	65.16	0.9886	64.42	355
27.25	68.00	0.9894	67.28	350
28.25	70.28	0.9901	69.59	433
29.25	72.44	0.9908	71.77	458
30.25	74.45	0.9914	73.80	492


Down-Hole - cantiere di via Boito
Maranello (MO)
sorgente: mazza da 10 kg
graico Tempo verticale 'S' - profondità
Tempo verticale (ms)
profondità (m dal p.c.)
0
5
10
15
20
25
30
35
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80


Vs DH Maranello
Vs (m/s)
0
200
400
600
800
1000
Profondtà (m dal p.c.)
0
5
10
15
20
25
30
35
$V_{S}\_30 = 331$ m/s
Sito Classe "C"

Profondità (m dal p.c.)	V_S intervallo (m/s)	hi/vi
0.25	232	0.00108
0.75	209	0.00239
1.25	170	0.00295
1.75	192	0.00260
2.25	175	0.00286
2.75	319	0.00157
3.25	328	0.00152
3.75	251	0.00199
4.25	303	0.00165
4.75	533	0.00094
5.25	185	0.00271
5.75	300	0.00167
6.25	402	0.00124
6.75	366	0.00136
7.25	282	0.00177
7.75	496	0.00101
8.25	229	0.00219
8.75	249	0.00201
9.25	254	0.00197
9.75	471	0.00106
10.25	299	0.00167
10.75	111	0.00451
11.25	181	0.00276
12.25	316	0.00316
13.25	373	0.00268
14.25	656	0.00152
15.25	308	0.00324
16.25	451	0.00222
17.25	681	0.00147
18.25	283	0.00353
19.25	489	0.00204
20.25	428	0.00233
21.25	882	0.00113
22.25	361	0.00277
23.25	284	0.00352
24.25	494	0.00202
25.25	583	0.00171
26.25	355	0.00282
27.25	350	0.00286
28.25	433	0.00231
29.25	458	0.00218
30.25	492	0.00153
V_S 30 =	**30 / Σ (hi/vi) =**	**331 m/s**


Down-Hole - cantiere di via Boito
Maranello (MO)
sorgente: mazza da 10 kg
graico Tempo verticale - profondità
Tempo verticale (ms)
profondità (m dal p.c.)
Tempo 'P'
Tempo 'S'
0
10
20
30
40
50
60
70
80
0
5
10
15
20
25
30
35