

BLAST MONITORING REPORT

HM22 Hard Stone Quarry at Wied Filep, I/o Naxxar

18th September 2015

Details

Date	18-09-2015
Quarry number	HM22 – Victoria Lines I/o Naxxar
Quarry operator	Ballut Blocks Ltd.
ANFO Supplier	Framegrip Ltd.
Police escort	PC 293 – JP Vella

Location and Time of Blasting

Ten blasts were carried out between 11:41 and 12:12 at the points as approximately indicated on the attached site diagram.

Summary of Blasting Conditions

Maximum charge per delay: upper area: 12.5 Kg, lower area: 25 Kg

Vibration limit: 4 mm/s (20 to 40Hz) at the nearest residential areas within 200 metres.

Air overpressure limit: 120 dB(L).

Site Specific Permit

All holes were within quarry boundaries and within the maximum depth allowed. Maximum charge per delay was not exceeded. Blasting is carried out according to site specifications.

Weather Conditions

Humidity ^[1]	Wind ^[1]	Temp. ^[1]	Atm. Pressure ^[1]	Cloud Cover ^[2]
55%	3 Knots SW	31C	1015 hPa	clear

[1] As reported by weather.maltairport.com on 18 September 2015 at 12:15 at Luqa Airport [2] Our observation

Comments

Holes of blasts number 1 to 4 are at the bottom shelf of the quarry and all the other blasts are at middle shelves of the quarry in their respective areas.

The ten blasts were organised as five pairs and each pair was detonated by means of two short-circuit exploders in very quick sequence and captured as one event by the seismograph.

Notes about Monitoring

The seismograph was placed at monitoring point M2 (Triq Brydone). The seismograph used is MiniMate Plus, serial number BE9488.

Readings

Blast Number	1	2	3	4	5	6	7	8	9	10
Time	11:41		11:50		11:57		12:05		12:12	
No. of Holes	7	7	6	5	5	5	8	9	9	9
No. of Delays	7	7	6	5	5	5	8	9	9	9
Depth of Holes (m)	10.5	10.5	7.5	7.5	12	12	7.5	7.5	7.5	7.5
Max. Charge/Delay (kg)	18	18	17	20	25	25	12.5	11.5	14	14
Total Charge (kg)	125	125	100	100	125	125	100	100	125	125
Dist. from Seismo.(m)	210	210	220	220	180	180	190	190	170	170
PPV (mm/s)	1.00		1.16		1.17		0.52		0.68	
Frequency (Hz)	16.1		18.5		19.0		17.5		17.2	
Air Overpress. (dB L)	98.8		98.8		109.5		112.3		104.9	
Scaled Dist. (m kg ^{-1/2})	49.5	49.5	53.4	49.2	36.0	36.0	53.7	56.0	45.4	45.4

Burden is an average of 2 metres, and distance between holes is an average of 2.5 metres.

Weights in kilograms are rounded-up to the nearest 1/2 unit, and depth in metres is rounded to the nearest 1/2 unit. The plotting of the position of the holes on the attached site-diagram in relation to quarry shape and other landmarks is not accurate and no site survey was carried out to plot these. Displacement between the holes (as plotted on the diagram) and the seismograph is measured using the online version of MEPA's Map Server and is accurate to the nearest 10 metres. Number of holes, their depth, burden, and the amount of ANFO used are as given by the quarry operator (signed document attached). Scaled distance and maximum charge per delay are calculated from the primary data. Weights are rounded-up to the nearest kilogram and the depth is rounded to the nearest 1/2 meter.

Observations

There was no flyrock outside the quarry boundaries. No damage to the surroundings was observed after the blast. The ground vibration and air overpressure measured for all blasts are within the limits.



**Anthony
Cini**

Anthony Cini B.Sc.

DATA COLLECTION SHEET

BLASTING SESSION DETAILS

Quarry Name & Number:	HM22 - Wied Fieq, I/o Naxos	Quarry Operator:	Ballut Blocks Services Ltd.
Date:	18-9-15.		MIC for HM22 is 25Kg
Quarry personnel charging:	DAVID MUSCAT.		
Police Escort:	No: PC 293 Name: JEANPAUL VELLA.		
ANFO suppliers:	Company: FRAME BEIF LTD. Chief on site: MARIO CALLEJA.		
Seismograph readings by:	A CINI RAPHAEL NICALIEF		

BLAST DETAILS

Blast No.	Time	Holes	Delays	Dist. (m)	Depth		Total charge		Max. Chrg.	PPV mm/s	Freq. (Hz)	Air (dB)
					(ft)	(m)	Bags	(kg)				
1	11-41-28	7	7	210	35	10.5	5	125	18	1.00	16.1	98.8
2	---	7	7	210	35	10.5	5	125	18	---	---	---
3	11-50-16	6	6	220	25	7.5	4	100	17	1.16	18.5	98.8
4	---	5	5	220	25	7.5	4	100	20	---	---	---
5	11-57-48	5	5	180	40	12	5	125	25	1.17	19.0	109.5
6	---	5	5	180	40	12	5	125	25	---	---	---
7	12-05-41	8	8	190	25	7.5	4	100	10.5	0.52	17.5	112.3
8	---	9	9	190	25	7.5	4	100	11.5	---	---	---
9	12-12-50	9	9	170	25	7.5	5	125	14	0.68	17.2	104.9
10	---	9	9	170	25	7.5	5	125	14	---	---	---
11	---	70	---	---	---	---	46	1150	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---

BLAST CHARACTERISTICS

Burden	Distance between boreholes: 2.5 m	Distance from rock face (burden): 2 m
Levels of holes: (top/mid/low shelves)	(1-4) Bottom Shelf (other) Middle Shelf	
Any horizontal holes?	No	[If yes, which? why?]
Any blast has holes of varying depths?	No	[If yes, which? Why?]
Any grouping of blasts?	Legal indicated, to reduce blasts due to work process [If yes, which? Why?]	
Notes	[expand on any of the above]	

WEATHER CONDITIONS

Weather conditions observation:	<input checked="" type="checkbox"/> % cloud cover	[High / Low] Cloud	Rain: [po / light / medium / heavy] showers
	Wind [calm / light breeze / strong wind]	Approx. direction: [N / S / E / W]	

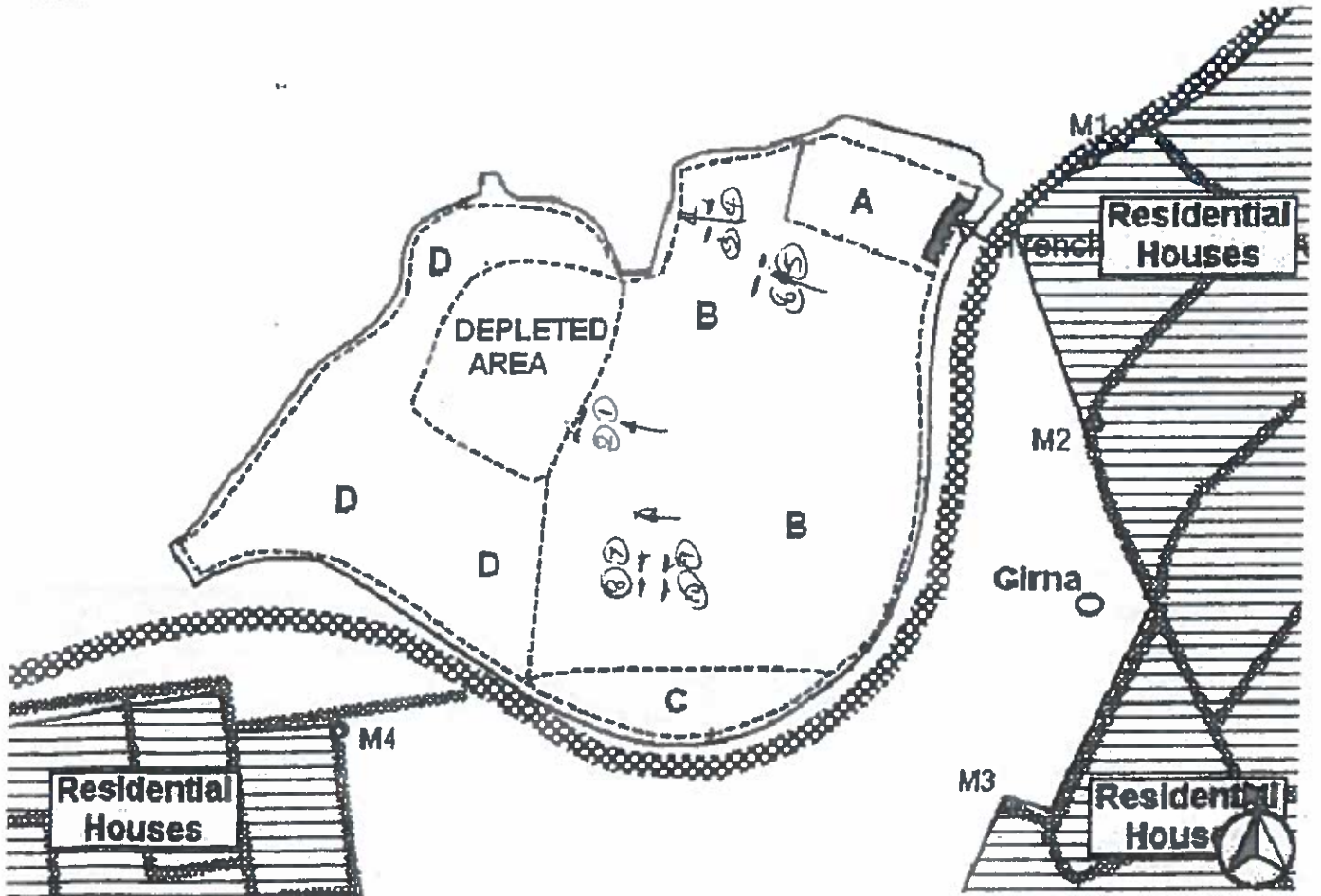
OTHER

Any visitors before/during/after blasts?	Nobody	[If yes, who? Why?]
Any complaints from neighbours?	None reported to us	[names/organizations]

MONITORING DETAILS

Location of Seismograph	<input type="checkbox"/> M1: Front of Villa Nordani, Triq Id-Difiza Civill	<input checked="" type="checkbox"/> M2: Corner of Triq Brydone
	<input type="checkbox"/> M3: Front of No. 7, Melitta hse, Triq Sir Arturo Mercieca	<input type="checkbox"/> M4: Triq l-Imtaqqin

Indicate location of blasts on the diagram below after having observed their location in relation to the quarry boundaries. Number them in the order that they will be detonated. Indicate the location of the instrument at any of the four points indicated as M1, M2, M3, or M4.



Observations after blast:	No damage observed	[Flyrock/damage to surroundings]
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Signatures - By signing here you are agreeing with the information given by you above. Please check the information again before signing.

[Signature]
 12/93

[Signature]

[Signature]
 Blast monitoring agent

Date/Time Vert at 11:41:28 September 18, 2015
 Trigger Source Geo: 0.510 mm/s
 Range Geo: 31.75 mm/s
 Record Time 2.0 sec at 4096 sps

Serial Number BE9488 V 10.72-8.17 MiniMate Plus
 Battery Level 6.1 Volts
 Unit Calibration August 20, 2015 by Datum Monitoring
 File Name K488G114.H40

Notes

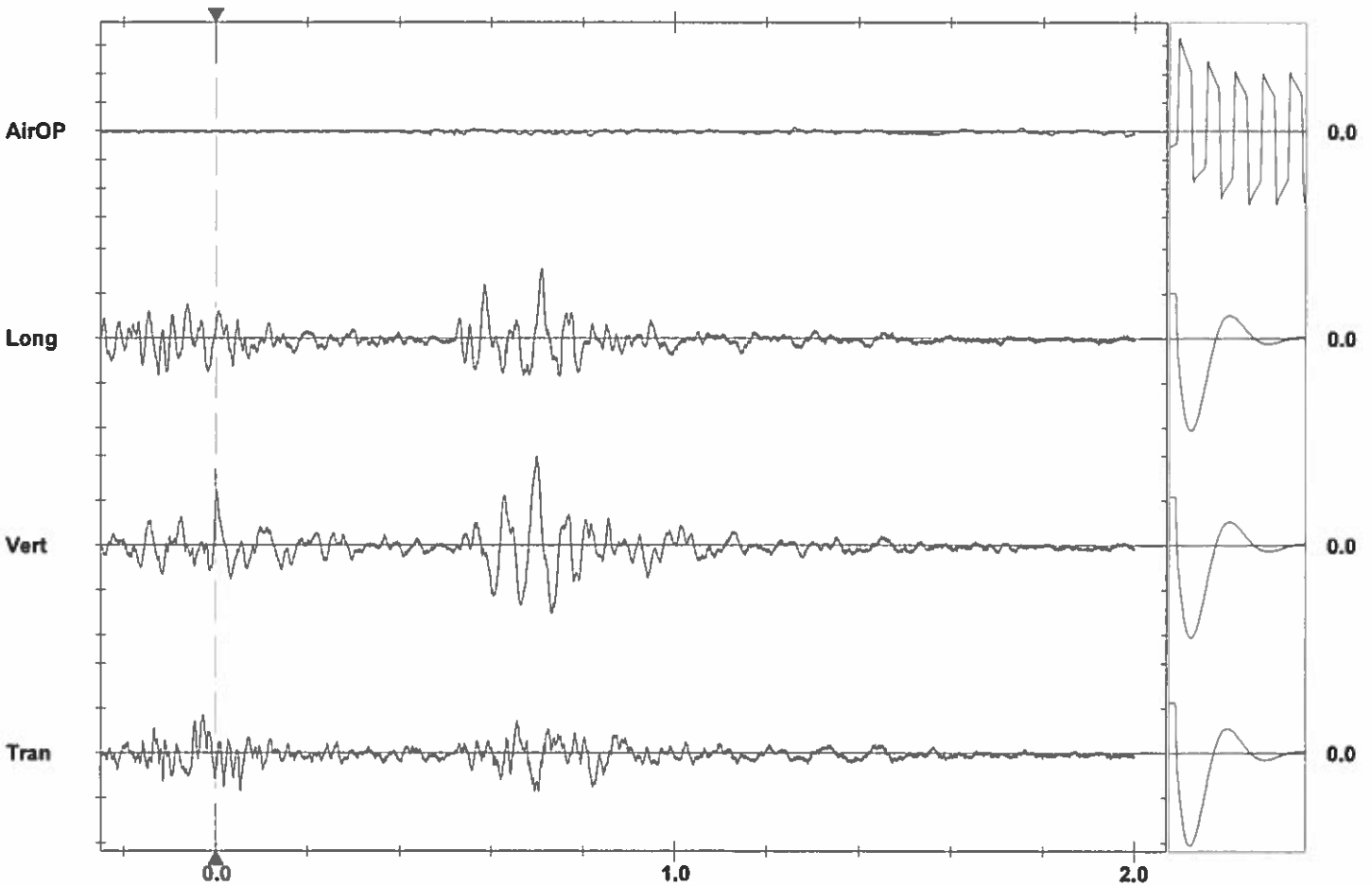
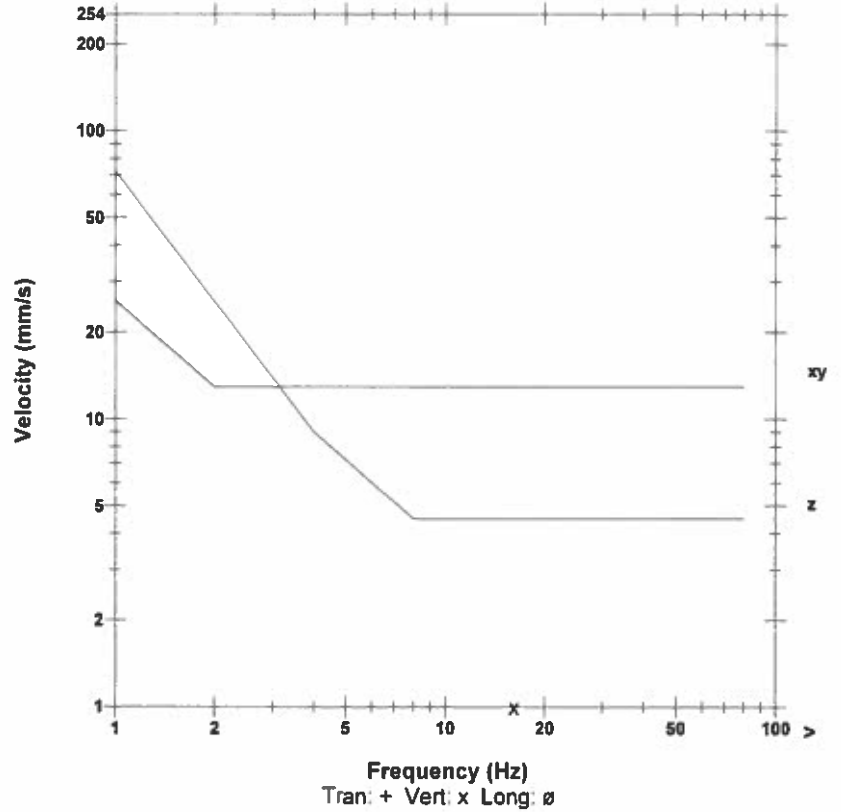
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
 PSPL 98.8 dB(L) 1.750 pa.(L) at 0.816 sec
 ZC Freq 20.5 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 524 mv)

	Tran	Vert	Long	
PPV	0.429	1.000	0.778	mm/s
PPV	43.64	51.00	48.82	dB
ZC Freq	18.6	16.1	15.8	Hz
Time (Rel. to Trig)	-0.028	0.699	0.708	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.004	0.009	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.7	4.0	4.1	

Peak Vector Sum 1.066 mm/s at 0.699 sec

BS 6472:1992 CURVE 32



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div
 Trigger =

Sensor Check

Date/Time Vert at 11:50:16 September 18, 2015
Trigger Source Geo: 0.510 mm/s
Range Geo: 31.75 mm/s
Record Time 2.0 sec at 4096 sps

Serial Number BE9488 V 10.72-8.17 MiniMate Plus
Battery Level 6.1 Volts
Unit Calibration August 20, 2015 by Datum Monitoring
File Name K488G114.VS0

Notes

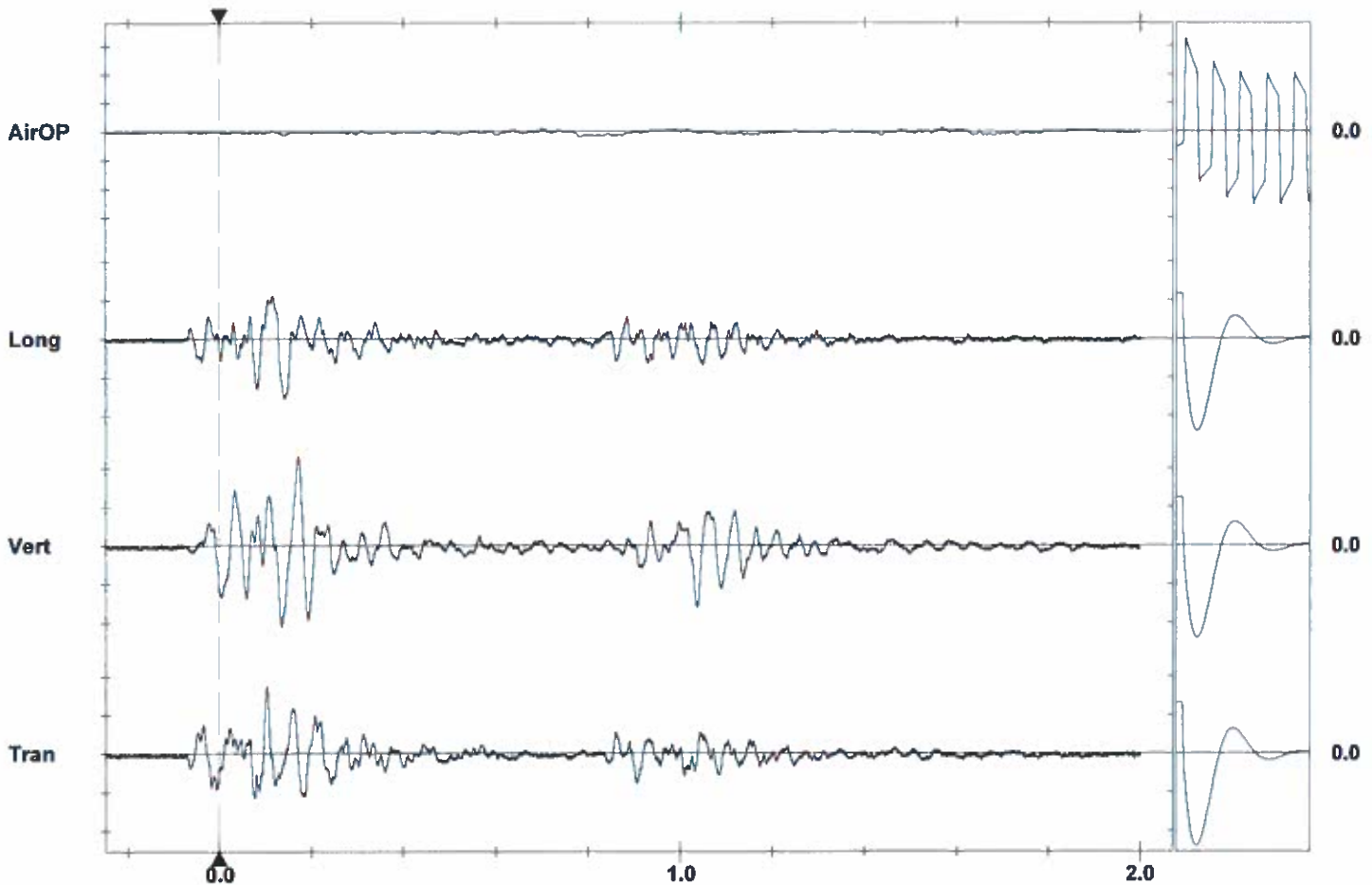
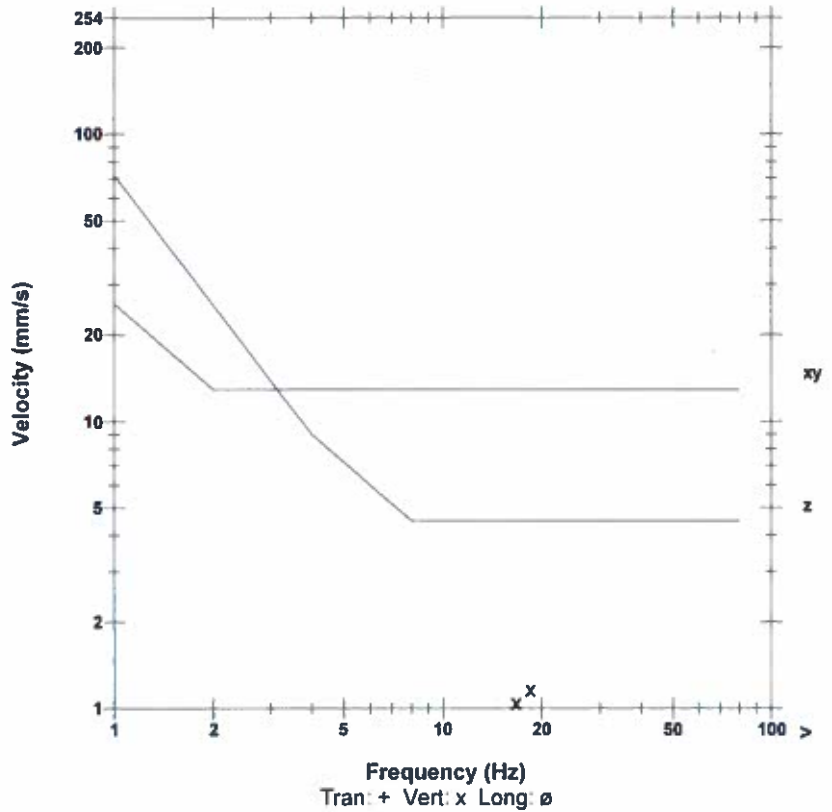
Location: Quarry Blasting
Client:
User Name: ems
General:

Microphone Linear Weighting
PSPL 98.8 dB(L) 1.750 pa.(L) at 0.780 sec
ZC Freq 4.2 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 524 mv)

	Tran	Vert	Long	
PPV	0.873	1.159	0.778	mm/s
PPV	49.82	52.28	48.82	dB
ZC Freq	34.1	18.5	18.8	Hz
Time (Rel. to Trig)	0.104	0.171	0.141	sec
Peak Acceleration	0.033	0.027	0.027	g
Peak Displacement	0.005	0.009	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.7	4.0	4.1	

Peak Vector Sum 1.217 mm/s at 0.135 sec

BS 6472:1992 CURVE 32



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Sensor Check

Date/Time Tran at 11:57:48 September 18, 2015
Trigger Source Geo: 0.510 mm/s
Range Geo: 31.75 mm/s
Record Time 2.0 sec at 4096 sps

Serial Number BE9488 V 10.72-8.17 MiniMate Plus
Battery Level 6.1 Volts
Unit Calibration August 20, 2015 by Datum Monitoring
File Name K488G115.8C0

Notes

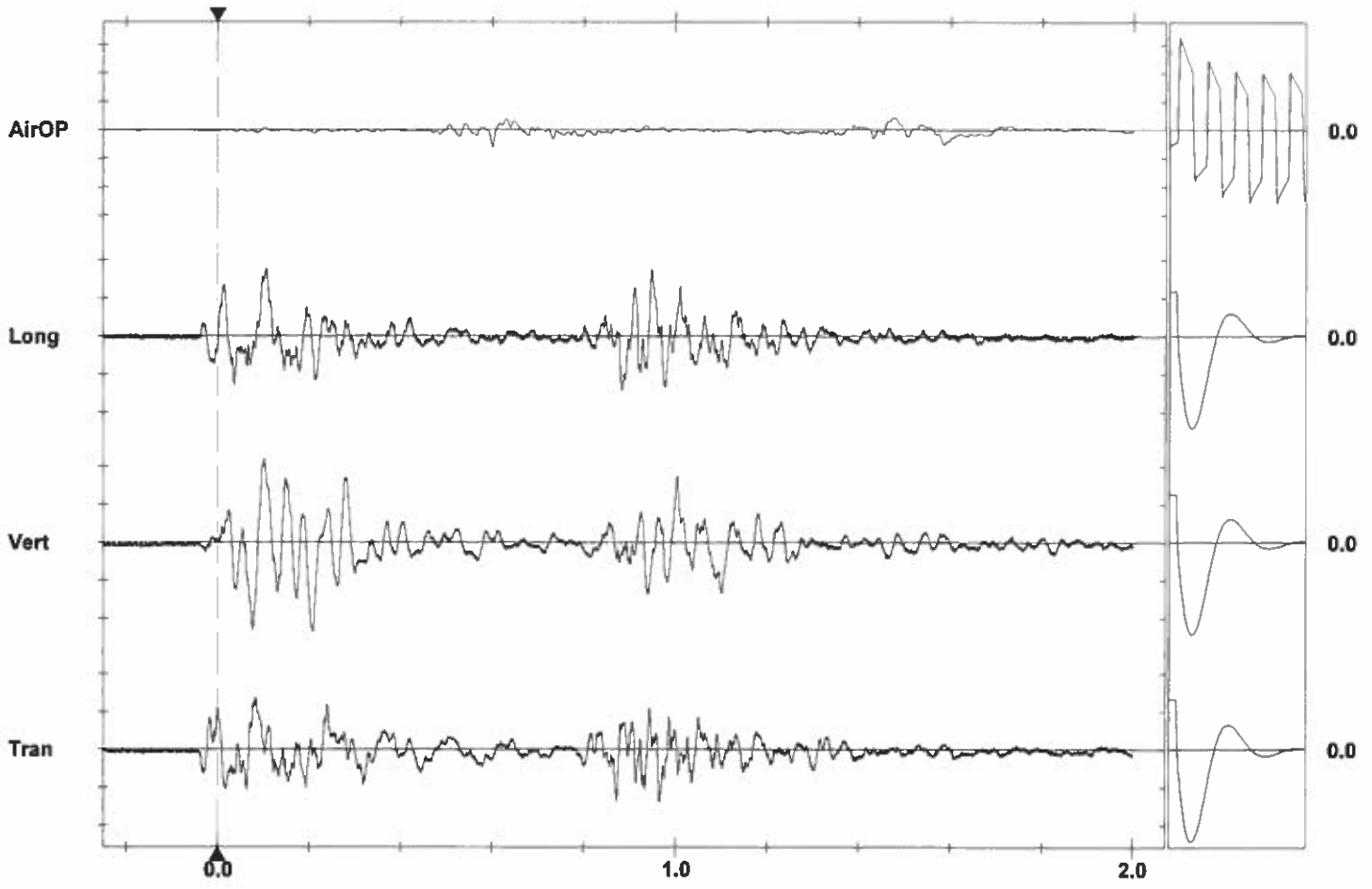
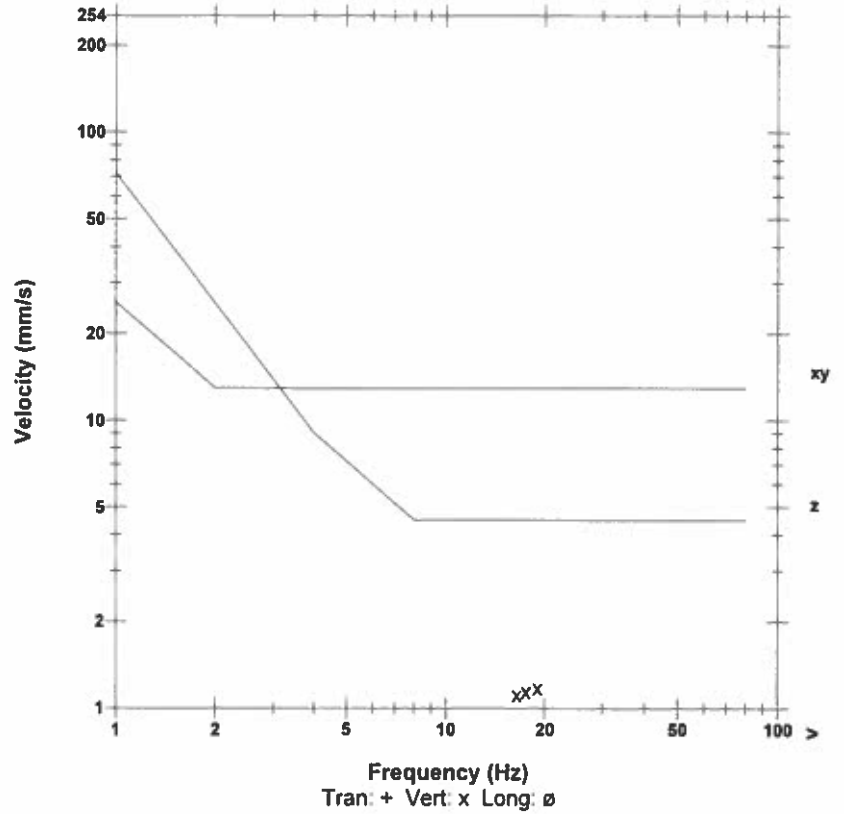
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 0.599 sec
ZC Freq 29.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 524 mv)

	Tran	Vert	Long	
PPV	0.698	1.175	0.889	mm/s
PPV	47.88	52.40	49.98	dB
ZC Freq	15.5	19.0	14.3	Hz
Time (Rel. to Trig)	0.084	0.208	0.106	sec
Peak Acceleration	0.046	0.027	0.040	g
Peak Displacement	0.006	0.010	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.7	4.0	4.1	

Peak Vector Sum 1.369 mm/s at 0.103 sec

BS 6472:1992 CURVE 32



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div
 Trigger = > <

Sensor Check

Date/Time Vert at 12:05:47 September 18, 2015
 Trigger Source Geo: 0.510 mm/s
 Range Geo: 31.75 mm/s
 Record Time 2.0 sec at 4096 sps

Serial Number BE9488 V 10.72-8.17 MiniMate Plus
 Battery Level 6.1 Volts
 Unit Calibration August 20, 2015 by Datum Monitoring
 File Name K488G115.LN0

Notes

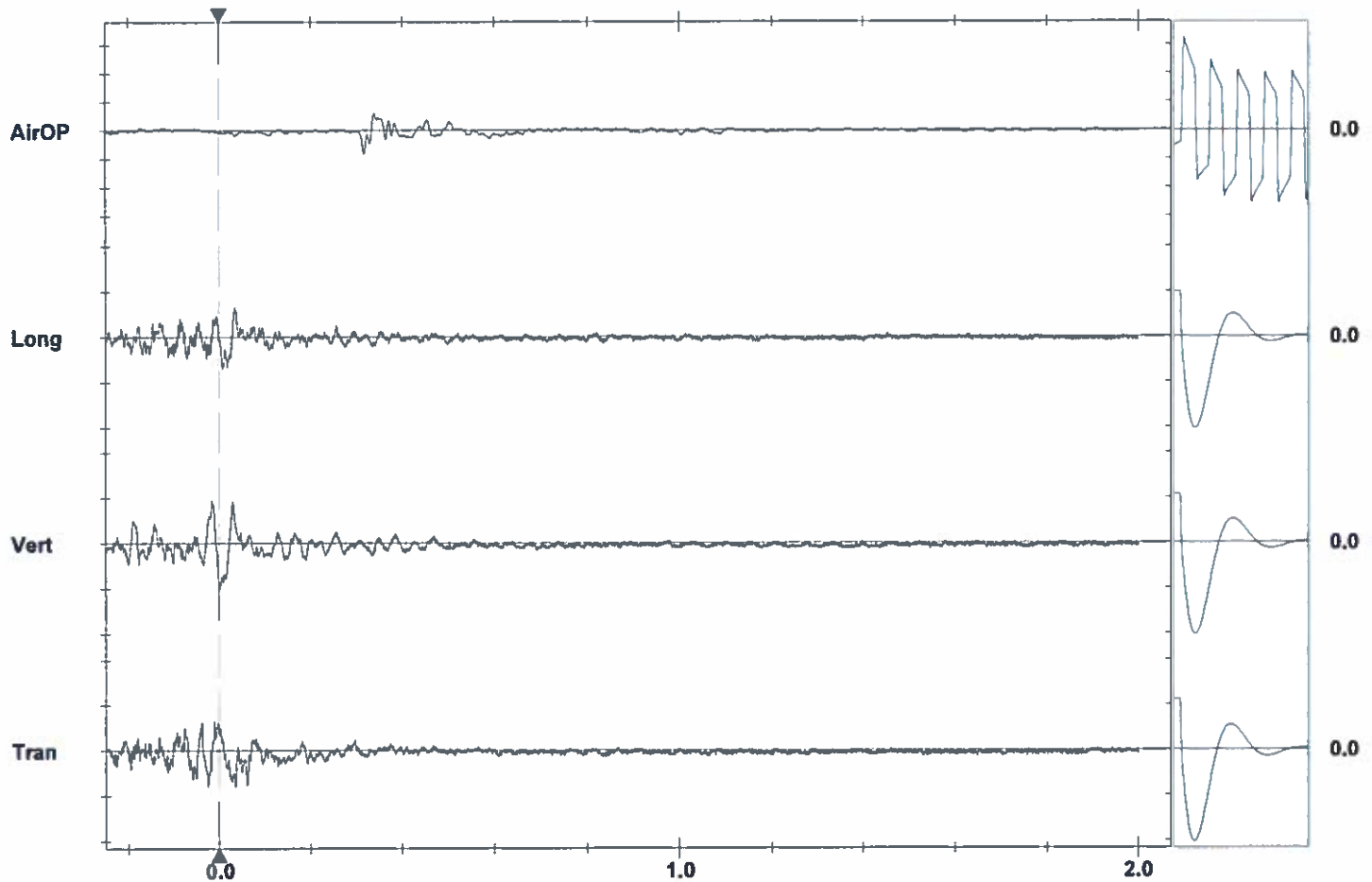
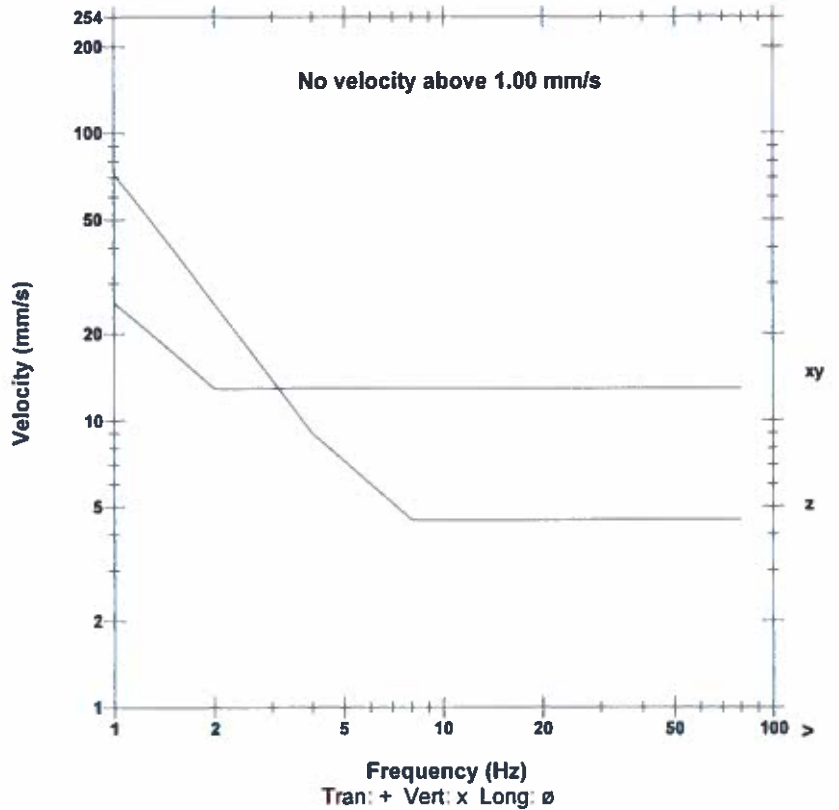
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
 PSPL 112.3 dB(L) 8.250 pa.(L) at 0.316 sec
 ZC Freq 16.8 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 524 mv)

	Tran	Vert	Long	
PPV	0.397	0.524	0.349	mm/s
PPV	42.97	45.38	41.86	dB
ZC Freq	30.1	17.5	18.6	Hz
Time (Rel. to Trig)	-0.024	0.000	0.008	sec
Peak Acceleration	0.033	0.027	0.027	g
Peak Displacement	0.003	0.005	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.7	4.0	4.1	

Peak Vector Sum 0.583 mm/s at 0.000 sec

BS 6472:1992 CURVE 32



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div
 Trigger =

Sensor Check

Date/Time Vert at 12:12:50 September 18, 2015
 Trigger Source Geo: 0.510 mm/s
 Range Geo: 31.75 mm/s
 Record Time 2.0 sec at 4096 sps

Serial Number BE9488 V 10.72-8.17 MiniMate Plus
 Battery Level 6.1 Volts
 Unit Calibration August 20, 2015 by Datum Monitoring
 File Name K488G115.XE0

Notes

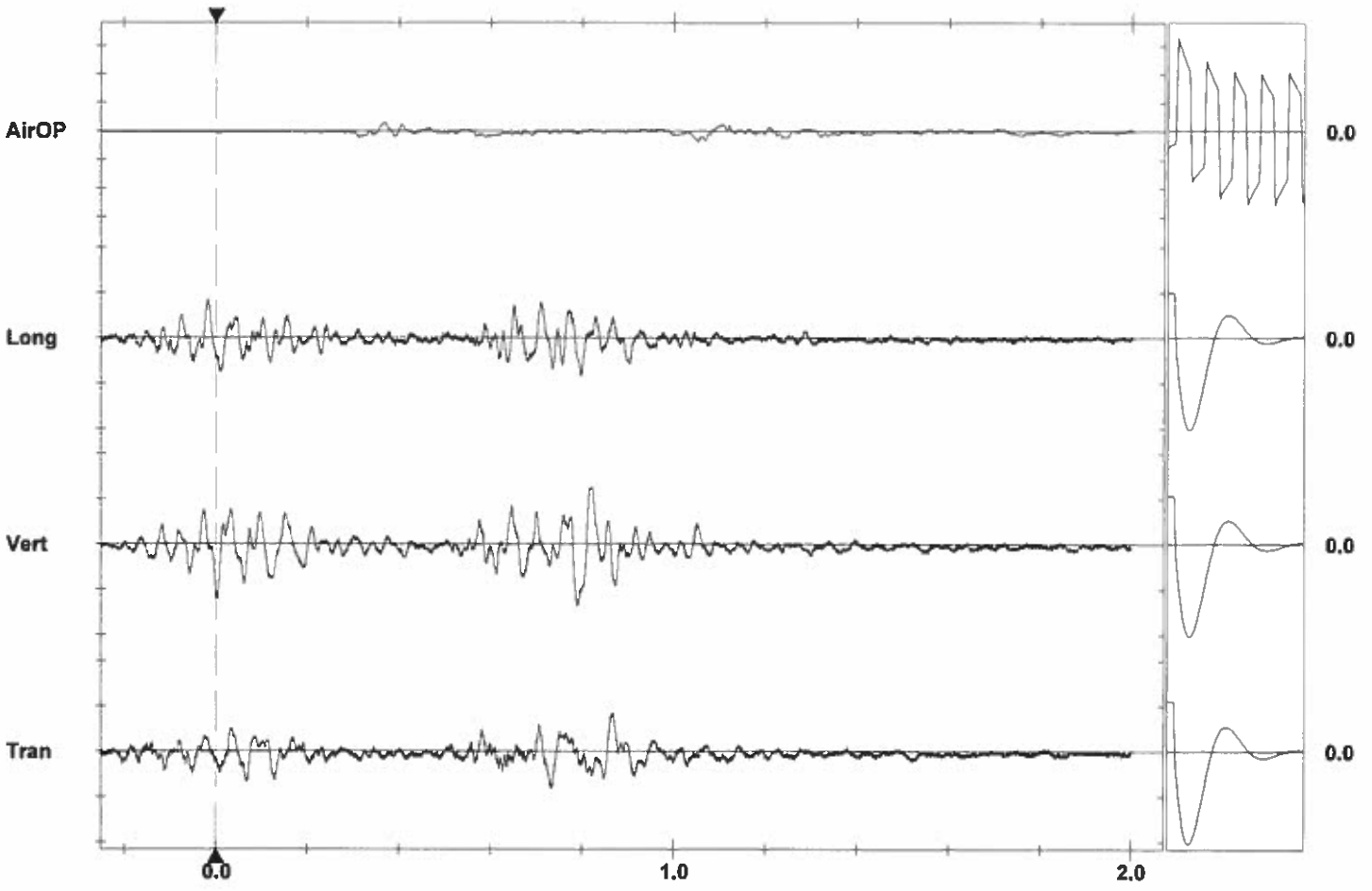
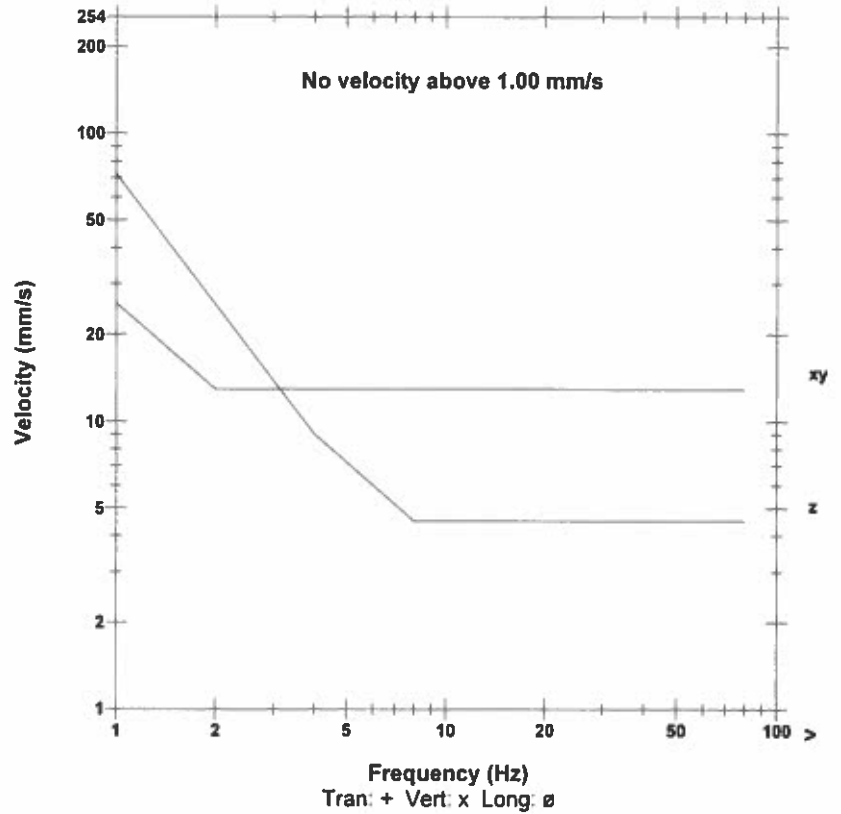
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
 PSPL 104.9 dB(L) 3.500 pa.(L) at 1.050 sec
 ZC Freq 9.6 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 524 mv)

	Tran	Vert	Long	
PPV	0.429	0.683	0.429	mm/s
PPV	43.64	47.68	43.64	dB
ZC Freq	21.8	17.2	28.8	Hz
Time (Rel. to Trig)	0.866	0.790	-0.018	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.004	0.006	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.7	4.0	4.1	

Peak Vector Sum 0.719 mm/s at 0.790 sec

BS 6472:1992 CURVE 32



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div
 Trigger = \blacktriangleleft \blacktriangleright

Sensor Check

