

BLAST MONITORING REPORT

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

5th October 2015

Details

Date	5-10-2015
Quarry number	HM22 – Victoria Lines l/o Naxxar
Quarry operator	Ballut Blocks Ltd.
ANFO Supplier	Framegrip Ltd.
Police escort	PC 1015 – J Borg

Location and Time of Blasting

Eight blasts were carried out between 11:29 and 11:53 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]
67%	9 Knots W	27C	1020 hPa	clear

[1] As reported by weather.maltairport.com on 5 October 2015 at 12:15 at Luqa Airport [2] Our observation

Comments

Holes of blasts number 1 to 3 are at the bottom shelf of the quarry and all the other blasts are at middle shelves of the quarry in their respective areas.

Blasts number 2 and 3, 5 and 6, and 7 and 8 were organised as three 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. Neither the ground vibration nor the air overpressure generated by blasts number 5, 6, 7, and 8 were strong enough to trigger the instrument.

Readings

Blast Number	1	2	3	4	5	6	7	8
Time	11:29	11:36		11:41	11:49		11:53	
No. of Holes	7	9	9	11	8	8	5	9
No. of Delays	7	9	9	11	8	8	5	9
Depth of Holes (m)	10.5	10.5	10.5	9	7.5	7.5	7.5	7.5
Max. Charge/Delay (kg)	18	20	20	18.5	17.5	16	15	14
Total Charge (kg)	125	175	175	200	138	125	75	50
Dist. from Seismo.(m)	180	160	160	140	180	180	180	180
PPV (mm/s)	1.67	0.56		1.30	<0.50		<0.50	
Frequency (Hz)	23.5	15.1		16.1	N/a		N/a	
Air Overpressure (dB L)	101.0	108.0		106.0	N/a		N/a	
Scaled Dist. (m kg ^{-1/2})	42.4	35.8	35.8	32.5	43.0	45.0	46.5	48.1

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 ½ unit, and depth in metres is rounded to the nearest ½ 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 ½ 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 Fiep, I/o Nazoqar	Quarry Operator:	Ballut Blocks Services Ltd.
Date:	5-10-15	MJC for HM22 is 25Kg	
Quarry personnel charging:	DAVID MUSCATT		
Police Escort:	No: PC 1015 Name: JASON BORG		
ANFO suppliers:	Company: FRAME GUP LTO	Chief on site: MARCO CALLEJA	
Selamograph readings by:	A PINI RAPHAEL MUCCIELLO		

BLAST DETAILS

Blast No.	Time	Holes	Delays	Dist. (m)	Depth		Total charge		Max. Chrg.	PPV mm/s	Freq. (Hz)	Air (dB)
					(m)	(m)	Bags	(kg)				
1	11:29:38	7	7	180	35	10.5	5	125	18	1.67	23.5	101.0
2	11:46:31	9	9	160	35	10.5	7	175	20	0.56	15.1	108.0
3	---	9	9	160	35	10.5	7	175	20	---	---	---
4	11:41:48	11	11	140	30	9	8	200	18.5	1.30	16.1	106.0
5	11:49:50	8	8	180	25	7.5	5 1/2	137 1/2	17.5	<0.5	NA	NA
6	---	8	8	180	25	7.5	5	125	16	---	---	---
7	11:53:45	5	5	180	25	7.5	3	75	15	<0.5	NA	NA
8	---	9	9	180	25	7.5	5	50	14	---	---	---
9	---	66	---	---	---	---	45 1/2	1137 1/2	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
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)	(1-3) 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?	Yes, as 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: [<input checked="" type="checkbox"/> / light / medium / heavy] showers
	Wind [<input checked="" type="checkbox"/> / calm / light breeze / strong wind]	Approx. direction: [<input checked="" type="checkbox"/> / S / E / W]	

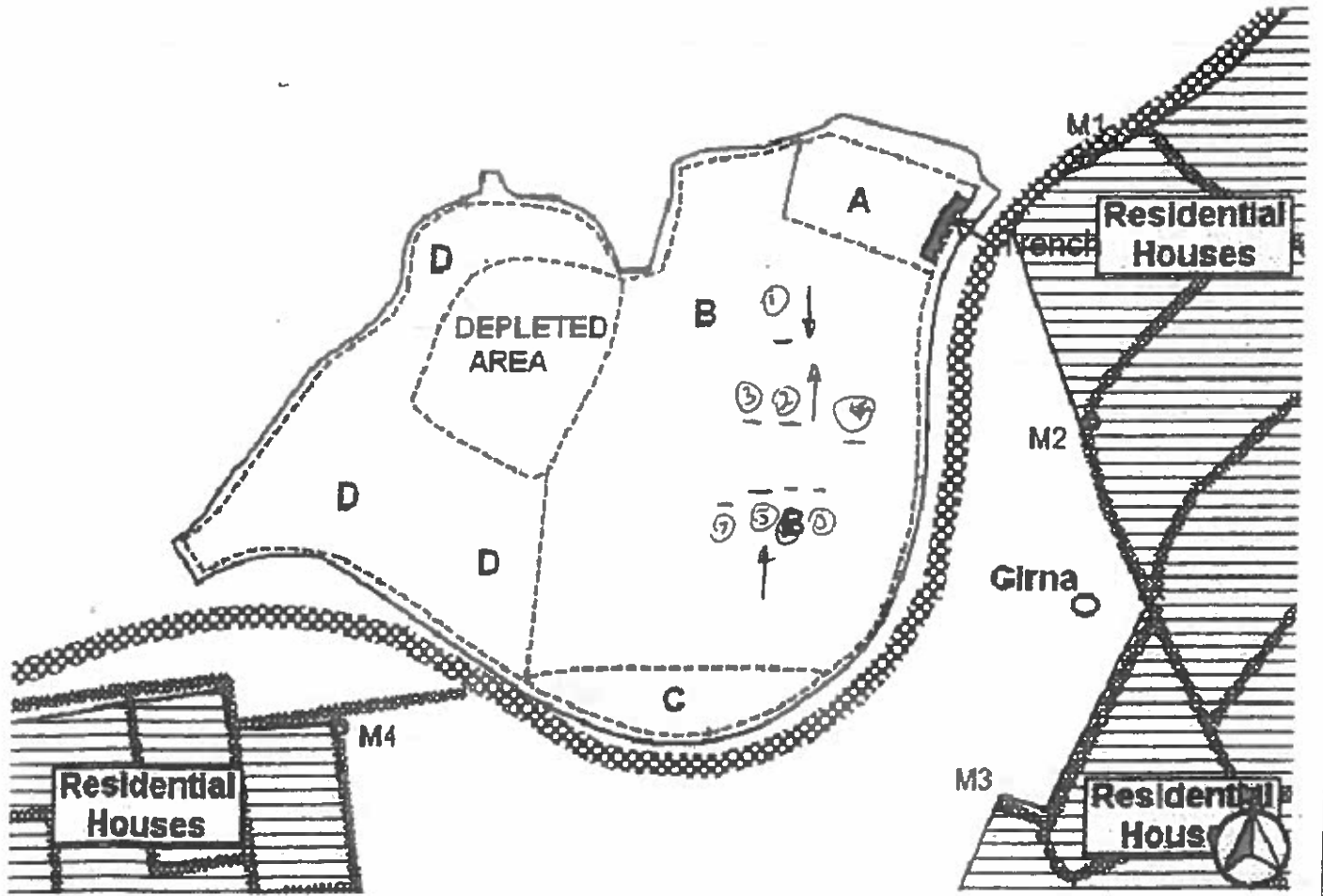
OTHER

Any visitors before/during/after blasts?	<i>None</i>	[If yes, who? Why?]
Any complaints from neighbours?	<i>None reported to us</i>	[names/organizations]

MONITORING DETAILS

Location of Seismograph	<input type="checkbox"/> M1: Front of Villa Nordani, Triq id-Difza 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:	<i>No damage observed</i>	[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 1] *[Signature 2]* *[Signature 3]*

Date/Time Long at 11:29:39 October 5, 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 6.0 Volts
 Unit Calibration August 20, 2015 by Datum Monitoring
 File Name K488G1WL9F0

Notes

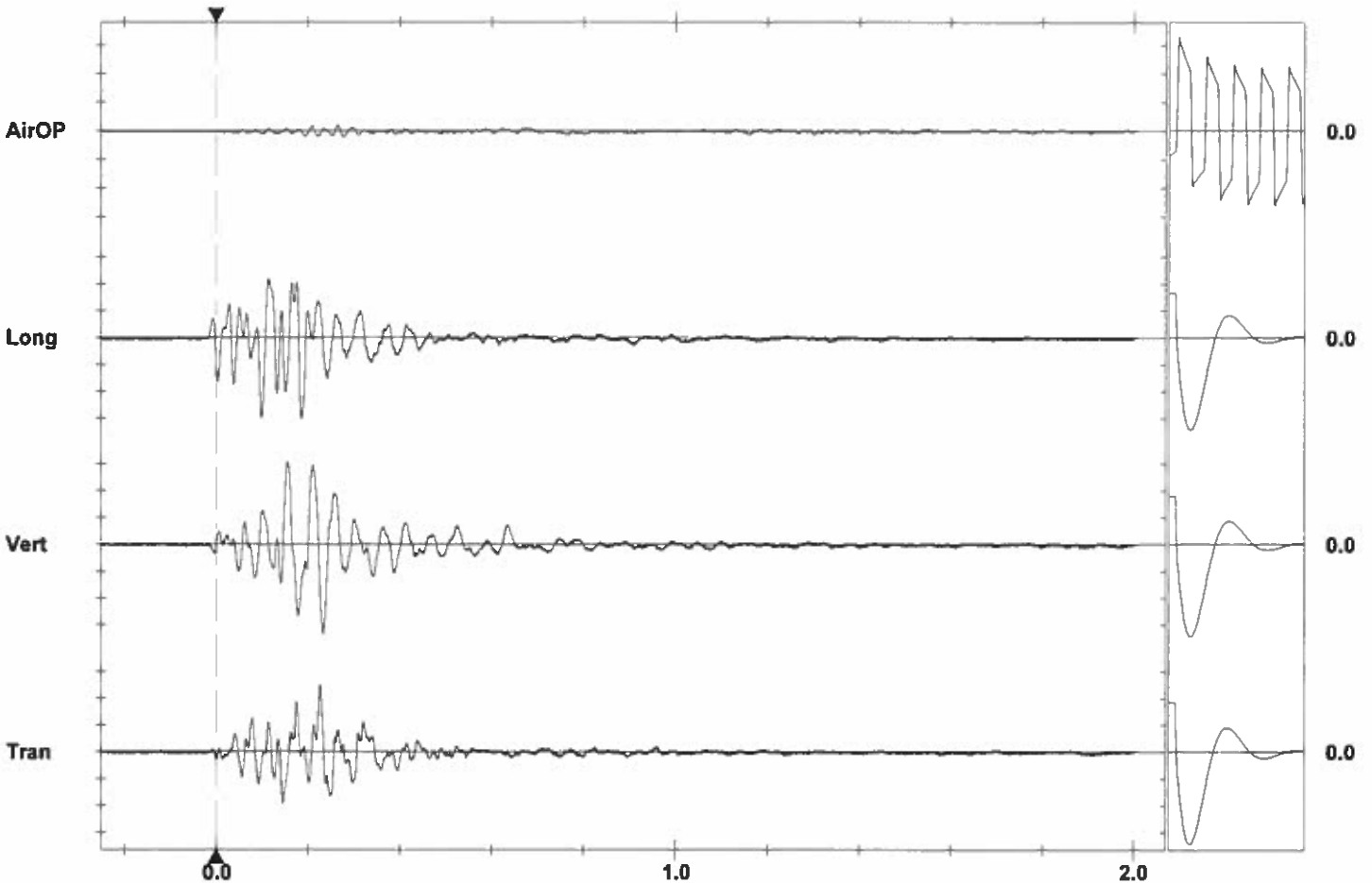
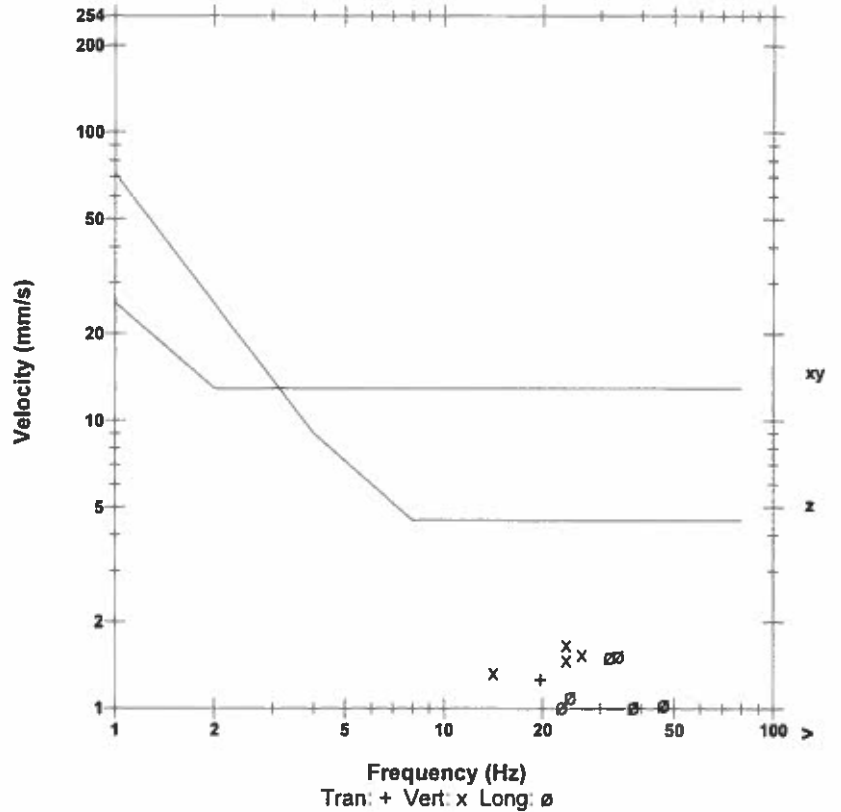
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
 PSPL 101.0 dB(L) 2.250 pa.(L) at 0.276 sec
 ZC Freq 32.0 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 491 mv)

	Tran	Vert	Long	
PPV	1.254	1.667	1.524	mm/s
PPV	52.97	55.44	54.66	dB
ZC Freq	19.7	23.5	34.1	Hz
Time (Rel. to Trig)	0.226	0.232	0.186	sec
Peak Acceleration	0.033	0.040	0.046	g
Peak Displacement	0.007	0.011	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.8	4.0	4.2	

Peak Vector Sum 1.777 mm/s at 0.175 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

Sensor Check

Date/Time Vert at 11:36:31 October 5, 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 6.0 Volts
 Unit Calibration August 20, 2015 by Datum Monitoring
 File Name K488G1WL.KVO

Notes

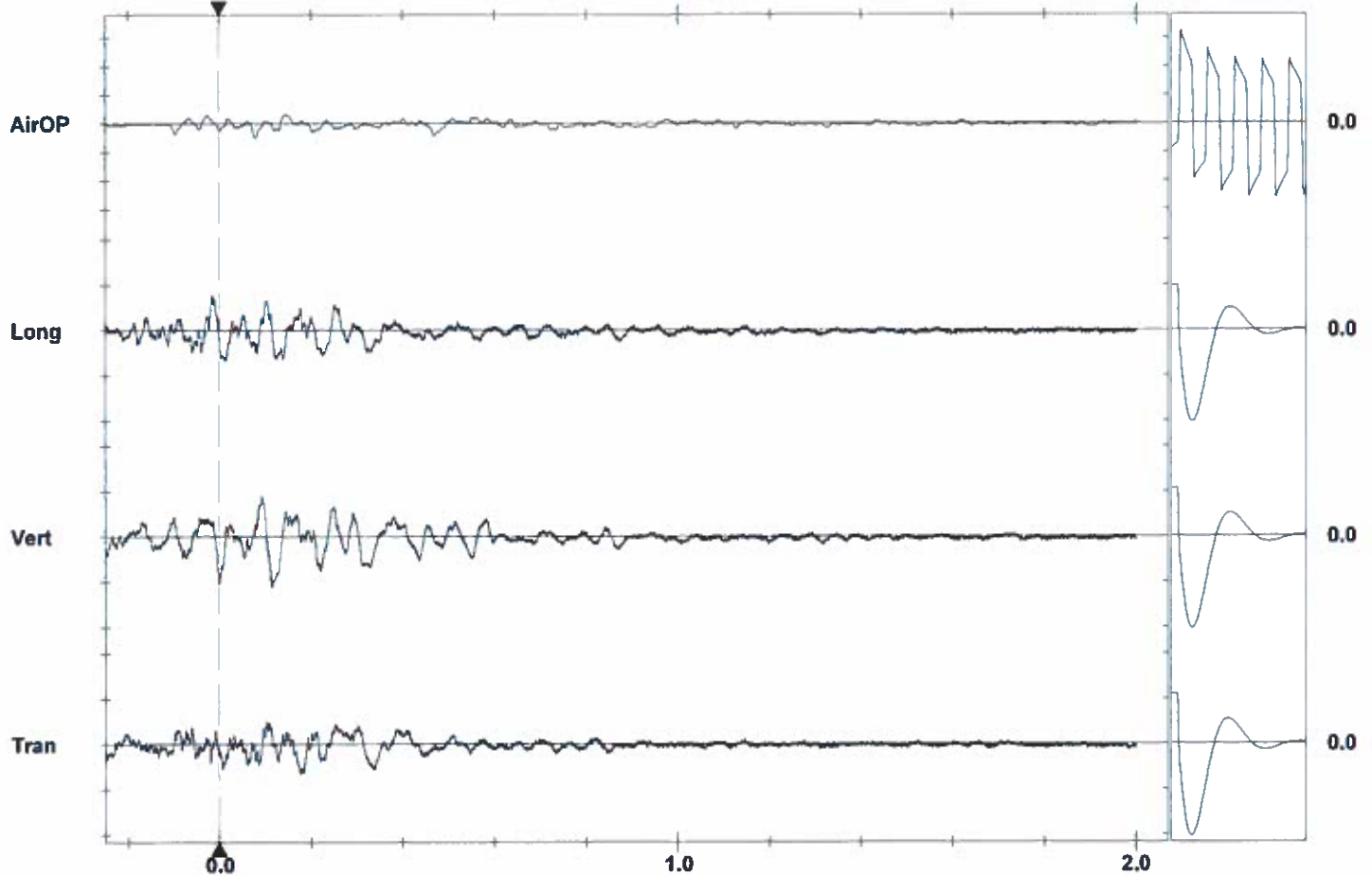
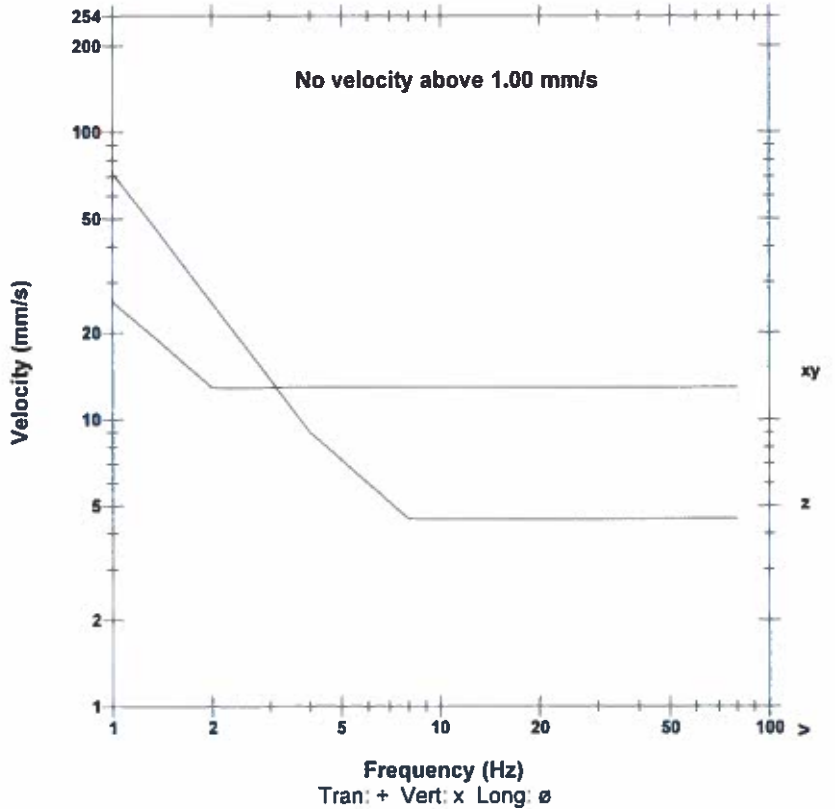
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
 PSPL 108.0 dB(L) 5.000 pa.(L) at 0.078 sec
 ZC Freq 20.5 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 491 mv)

	Tran	Vert	Long	
PPV	0.333	0.556	0.381	mm/s
PPV	41.46	45.90	42.62	dB
ZC Freq	16.9	15.1	25.3	Hz
Time (Rel. to Trig)	0.177	0.115	-0.015	sec
Peak Acceleration	0.020	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	3.8	4.0	4.2	

Peak Vector Sum 0.568 mm/s at 0.115 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 11:41:48 October 5, 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 6.0 Volts
 Unit Calibration August 20, 2015 by Datum Monitoring
 File Name K488G1WL.T00

Notes

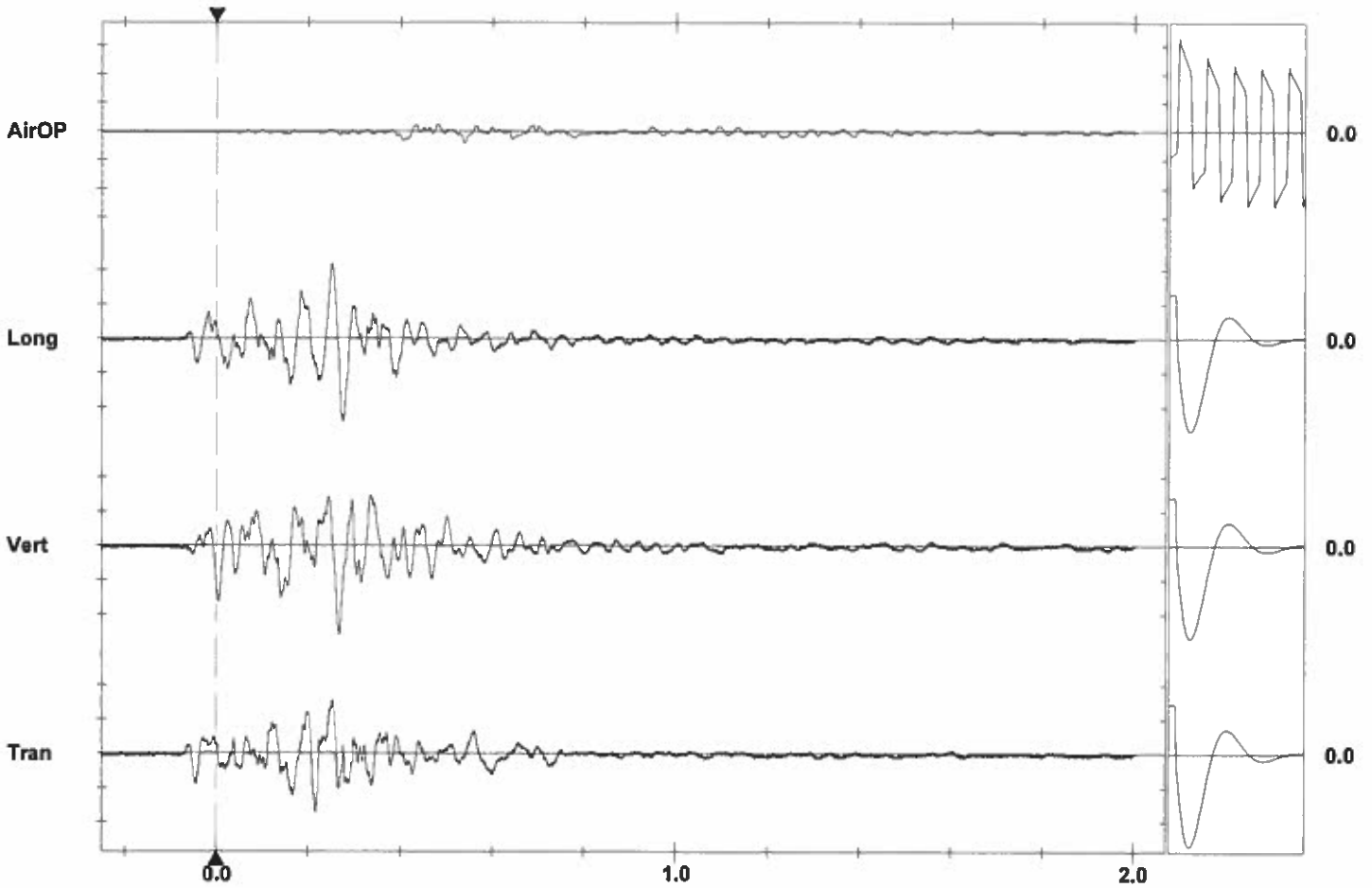
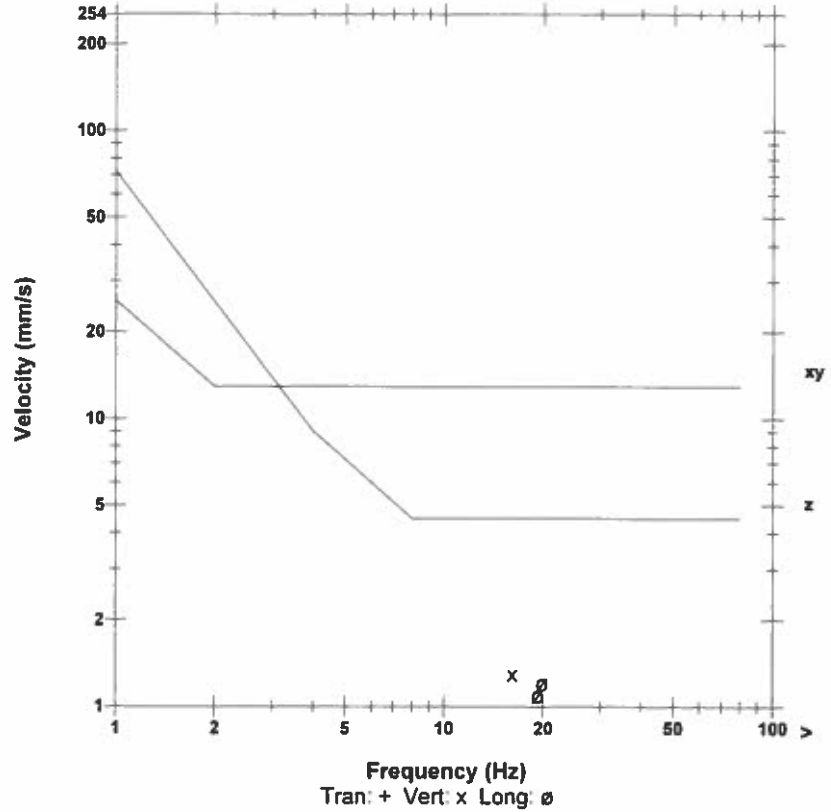
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
 PSPL 106.0 dB(L) 4.000 pa.(L) at 0.537 sec
 ZC Freq 13.1 Hz
 Channel Test Passed (Freq = 20.1 Hz Amp = 491 mv)

	Tran	Vert	Long	
PPV	0.857	1.302	1.206	mm/s
PPV	49.66	53.29	52.63	dB
ZC Freq	32.5	16.1	19.9	Hz
Time (Rel. to Trig)	0.216	0.267	0.274	sec
Peak Acceleration	0.033	0.027	0.033	g
Peak Displacement	0.007	0.010	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.8	4.0	4.2	

Peak Vector Sum 1.540 mm/s at 0.269 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

