

BLAST MONITORING REPORT

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

7th December 2015

Details

Date	07-12-2015
Quarry number	HM22 – Victoria Lines l/o Naxxar
Quarry operator	Ballut Blocks Ltd.
ANFO Supplier	Framegrip Ltd.
Police escort	PC 1393 – K Farrugia

Location and Time of Blasting

Six blasts were carried out between 09:43 and 10:02 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]
70%	7 Knots SE	19C	1034 hPa	50% high cloud

[1] As reported by weather.maltairport.com on 7 Dec 2015 at 11:50 at Luqa Airport [2] Our observation

Comments

Blasts 1 to 5 are at bottom shelves and blast 6 is at a middle shelf of the quarry in their respective locations.

Blasts number 1 and 2, and 3 and 4 were organised as two 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 blast number 6 was strong enough to trigger the instrument.

Readings

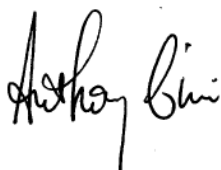
Blast Number	1	2	3	4	5	6
Time	09:43		09:49		09:56	10:02
No. of Holes	8	8	9	9	8	8
No. of Delays	8	8	9	9	8	8
Depth of Holes (m)	10.5	10.5	10.5	10.5	10.5	10.5
Max. Charge/Delay (kg)	20.5	20.5	22.5	22.5	20.5	20.5
Total Charge (kg)	163	163	200	200	163	163
Dist. from Seismo. (m)	150	150	200	200	180	210
PPV (mm/s)	1.24		0.59		0.92	<0.50
Frequency (Hz)	16.1		20.5		17.2	N/a
Air Overpressure (dB L)	98.8		100.0		97.5	<115
Scaled Dist. (m kg ^{-1/2})	33.1	33.1	42.2	42.2	39.8	46.4

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 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.



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DATA COLLECTION SHEET

BLASTING SESSION DETAILS

Quarry Name & Number:	HM22 - Wied Fiep, 1/0 Naxos	Quarry Operator:	Ballut Blocks Services Ltd.
Date:	7-12-15	MIC for HM22 is 25Kg	
Quarry personnel charging:	DAVID MUSCAT.		
Police Escort:	No: AS 1393 Name: KURT PARREGINA.		
ANFO suppliers:	Company: FRAME GRIP LTD Chief on site: MARIO CALLESA.		
Seismograph readings by:	KAPHAEL NICALLIEF.		

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	09:43.15	8	8	150	35	10.5	6 1/2	162 1/2	20.5	1.24	16.1	98.8
2	—	8	8	150	35	10.5	6 1/2	162 1/2	20.5	—	—	—
3	09:49.31	9	9	200	35	10.5	8	200	22.5	0.59	20.5	100.0
4	—	9	9	200	35	10.5	8	200	22.5	—	—	—
5	09:55.39	8	8	180	35	10.5	6 1/2	162 1/2	20.5	0.92	17.2	97.5
6	10:02.21	8	8	210	35	10.5	6 1/2	162 1/2	20.5	20.5	NA	NA
7	—	50	—	—	—	—	42	1050	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—	—	—
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)	(1-5) Bottom Shelf (6) 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:	[50] % cloud cover	[High / Low] Cloud	Rain: [no / light / medium / heavy] showers
	Wind [calm / light breeze / strong wind]	Approx. direction: [N / S / E / W]	

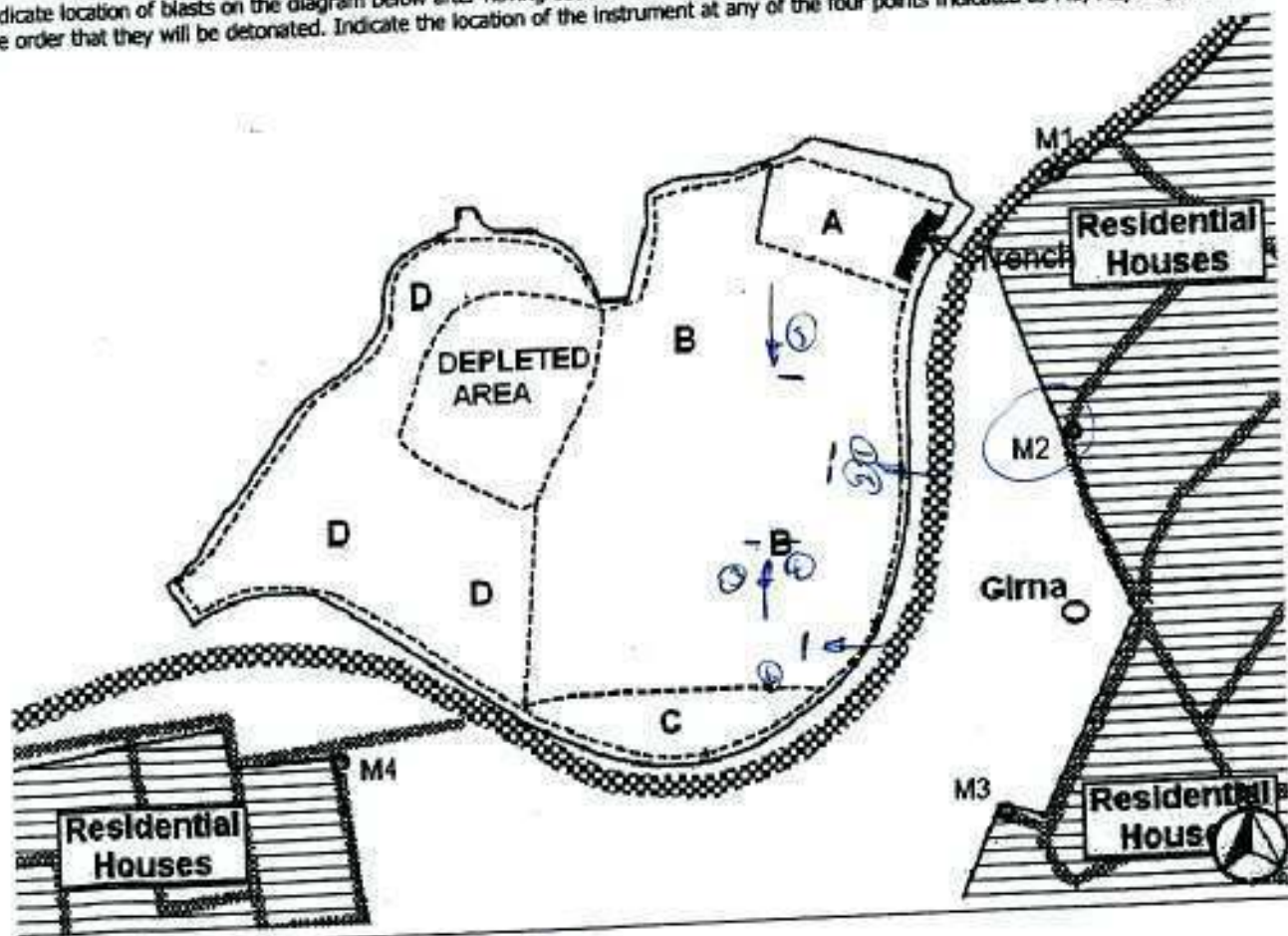
OTHER

Any visitors before/during/after blasts?	None	[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 Civili	<input checked="" type="checkbox"/> M2: Corner of Triq Brydone
	<input type="checkbox"/> M3: Front of No. 7, Melitta hse, Triq Sir Arturo Mercleca	<input type="checkbox"/> M4: Triq l-Imaqqin

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.

PS1393
[Signature]
Quarry operator
[Signature]
Blast monitoring agent

Date/Time Long at 09:43:15 December 7, 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 K488G554.C30

Notes

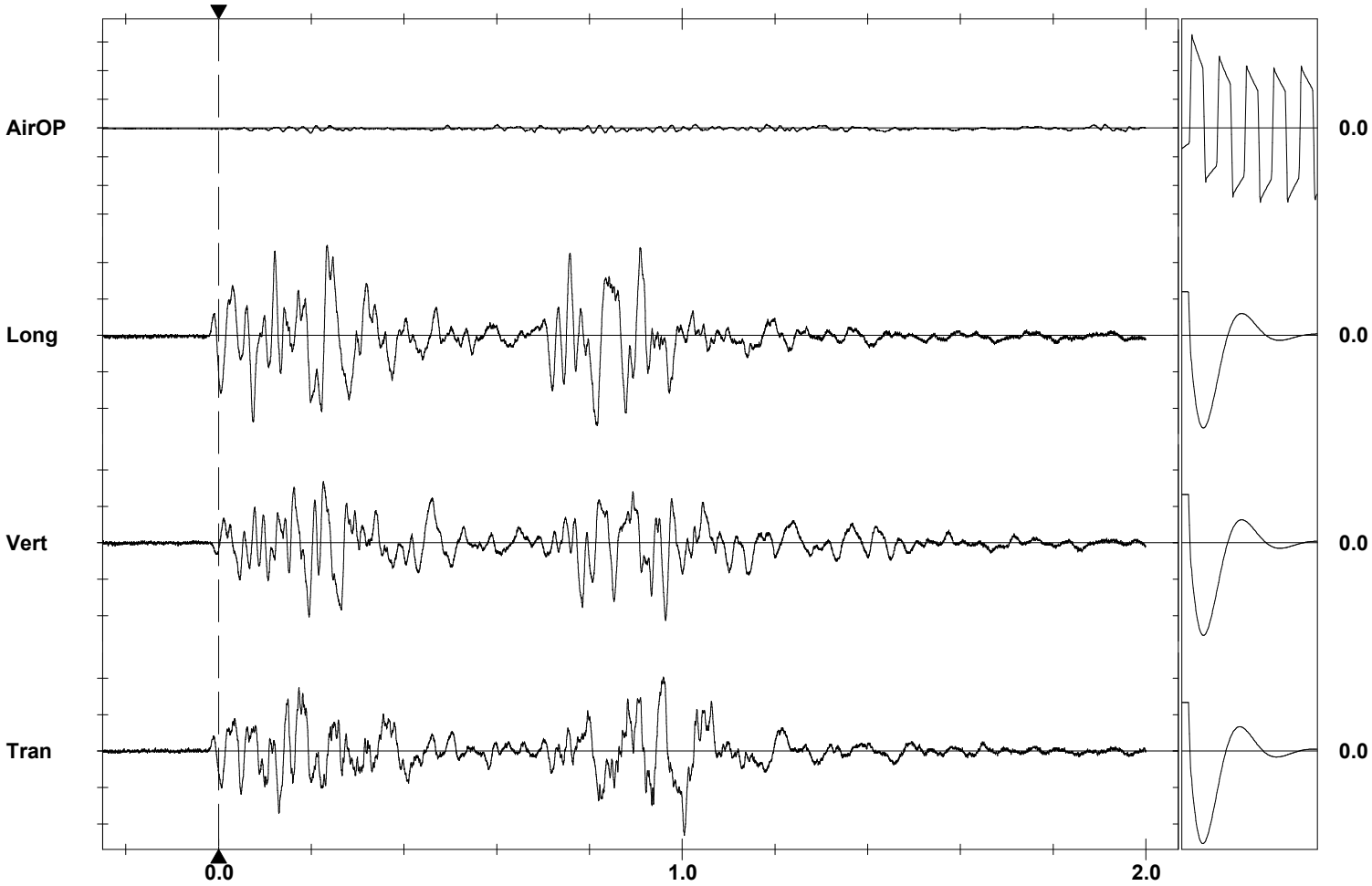
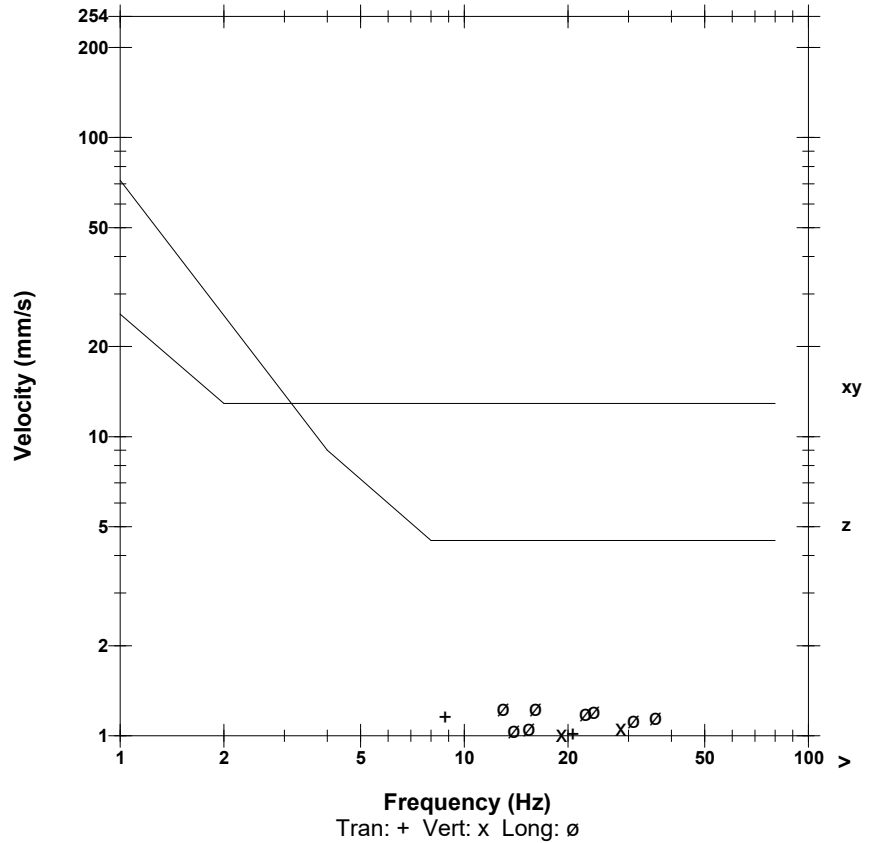
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 98.8 dB(L) 1.750 pa.(L) at 0.197 sec
ZC Freq 32.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 612 mv)

	Tran	Vert	Long	
PPV	1.159	1.064	1.238	mm/s
PPV	52.28	51.54	52.86	dB
ZC Freq	8.8	28.4	16.1	Hz
Time (Rel. to Trig)	1.004	0.964	0.234	sec
Peak Acceleration	0.033	0.033	0.040	g
Peak Displacement	0.013	0.008	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.2	Hz
Overswing Ratio	3.9	4.1	4.3	

Peak Vector Sum 1.439 mm/s at 0.910 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 09:49:31 December 7, 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 K488G554.MJ0

Notes

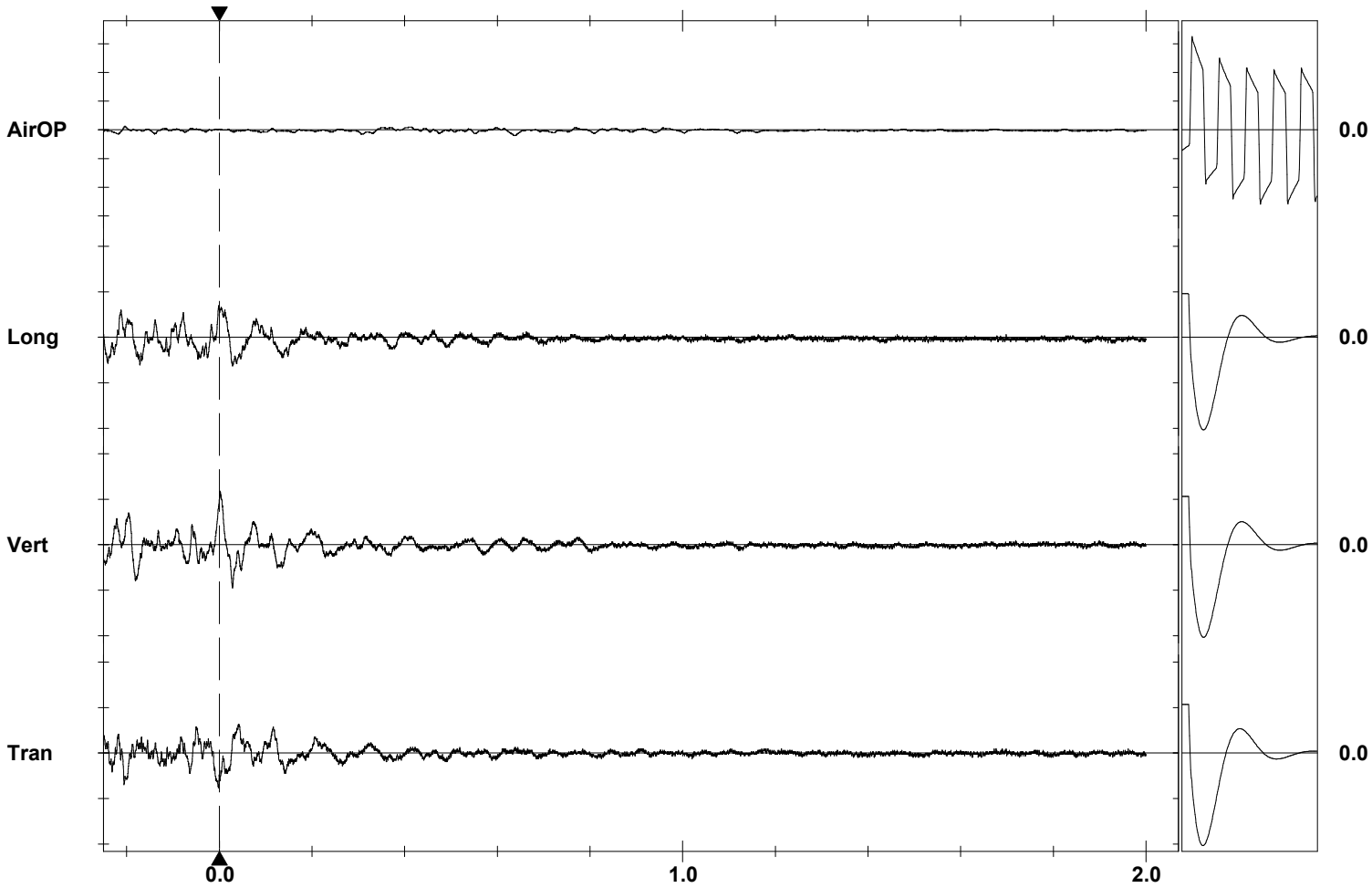
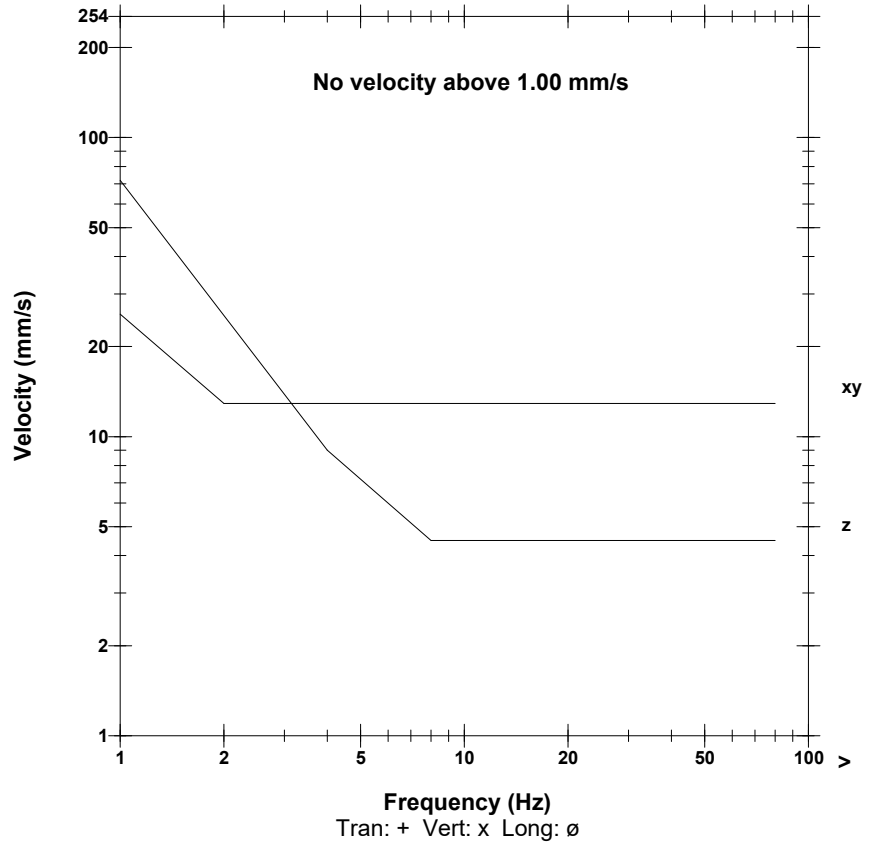
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 100.0 dB(L) 2.000 pa.(L) at 0.635 sec
ZC Freq 16.7 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 612 mv)

	Tran	Vert	Long	
PPV	0.381	0.587	0.349	mm/s
PPV	42.62	46.38	41.86	dB
ZC Freq	13.0	20.5	18.3	Hz
Time (Rel. to Trig)	-0.002	0.002	-0.001	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.004	0.004	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.2	Hz
Overswing Ratio	3.9	4.1	4.3	

Peak Vector Sum 0.726 mm/s at 0.002 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 Long at 09:55:39 December 7, 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 K488G554.WR0

Notes

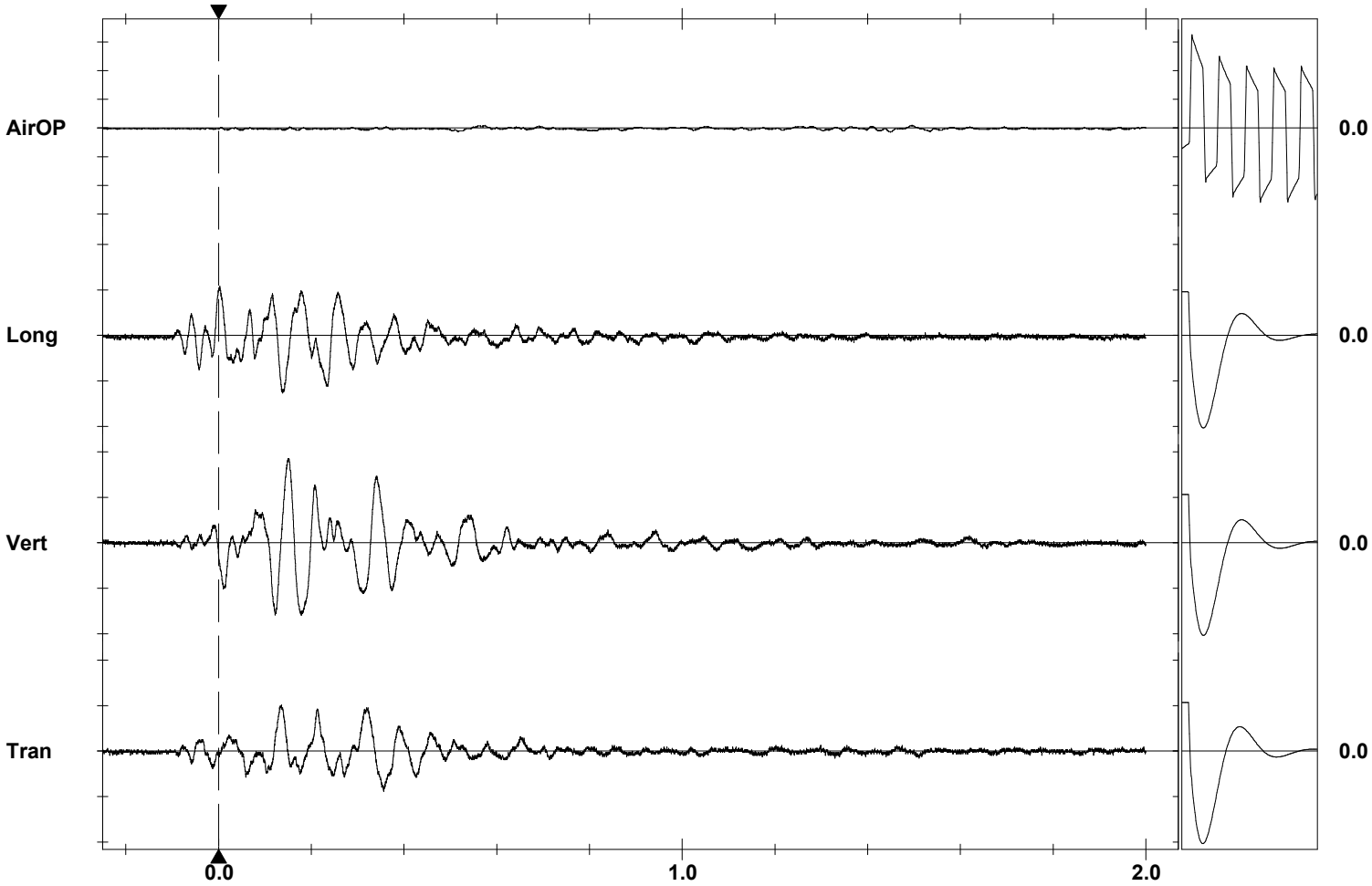
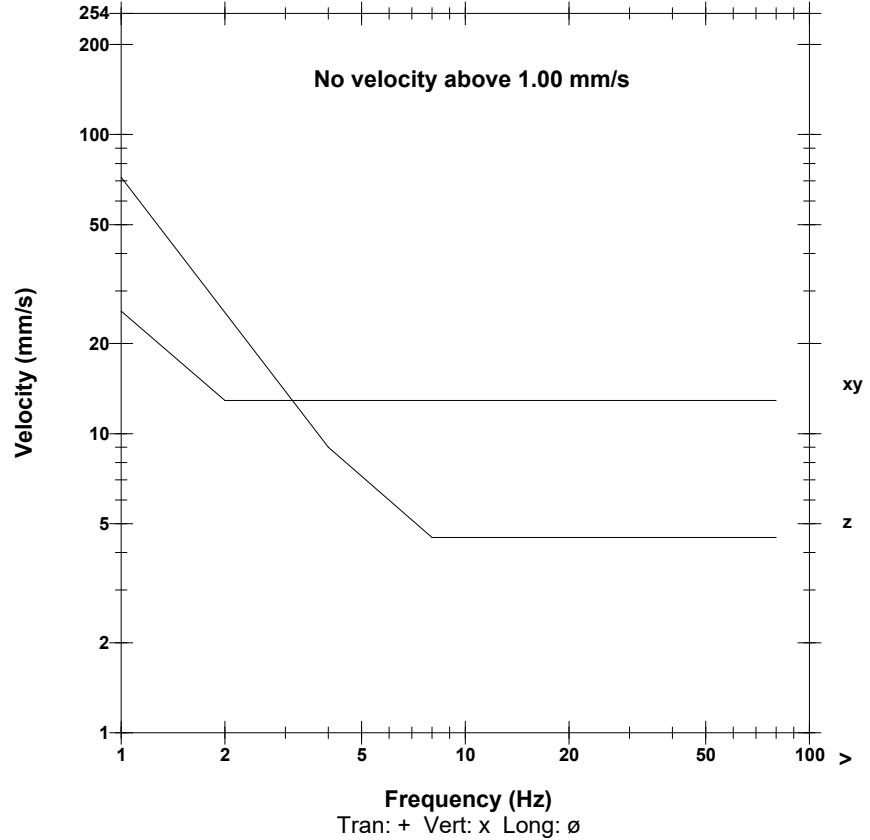
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 97.5 dB(L) 1.500 pa.(L) at 1.449 sec
ZC Freq 25.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 612 mv)

	Tran	Vert	Long	
PPV	0.508	0.921	0.635	mm/s
PPV	45.12	50.28	47.06	dB
ZC Freq	17.5	17.2	18.0	Hz
Time (Rel. to Trig)	0.136	0.149	0.138	sec
Peak Acceleration	0.020	0.027	0.027	g
Peak Displacement	0.005	0.010	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.2	Hz
Overswing Ratio	3.9	4.1	4.3	

Peak Vector Sum 0.964 mm/s at 0.149 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