

BLAST MONITORING REPORT

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

19th October 2015

Details

Date	19-10-2015
Quarry number	HM22 – Victoria Lines l/o Naxxar
Quarry operator	Ballut Blocks Ltd.
ANFO Supplier	Framegrip Ltd.
Police escort	PC 708 – M Vella

Location and Time of Blasting

Eight blasts were carried out between 10:29 and 10:47 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]
63%	6 Knots E	25C	1014 hPa	clear

[1] As reported by weather.maltairport.com on 19 October 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.

Blasts number 1 and 2, 3 and 4, 5 and 6, and 7 and 8 were organised as one pairs and 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 1 and 2 were strong enough to trigger the instrument.

Readings

Blast Number	1	2	3	4	5	6	7	8
Time	10:29		10:34		10:43		10:47	
No. of Holes	8	8	8	8	10	8	8	5
No. of Delays	8	8	8	8	10	8	8	5
Depth of Holes (m)	10.5	10.5	10.5	10.5	9	7.5	7.5	7.5
Max. Charge/Delay (kg)	19	19	19	19	17.5	16	16	20
Total Charge (kg)	150	150	150	150	175	125	125	100
Dist. from Seismo.(m)	210	210	200	200	180	200	200	200
PPV (mm/s)	<0.50		0.54		0.60		0.89	
Frequency (Hz)	N/a		20.7		18.0		28.4	
Air Overpressure (dB L)	N/a		107.0		107.5		101.9	
Scaled Dist. (m kg ^{-1/2})	48.2	48.2	45.9	45.9	43.0	50.0	50.0	44.7

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 B.Sc.

DATA COLLECTION SHEET

BLASTING SESSION DETAILS

Quarry Name & Number:	HM22 - Wied Flep, 1/0 Naxxar	Quarry Operator:	Ballut Blocks Services Ltd.
Date:	19-10-15	MIC for HM22 is 25Kg	
Quarry personnel charging:	DAVID MUSCAT.		
Police Escort:	No: PC 708 Name: MICHEAL VELLA.		
ANFO suppliers:	Company: FRAME GRIP LTD.	Chief on site: MARIO CALLETA	
Seismograph readings by:	ACINI 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	10:29-40	8	8	210	35	10.5	6	150	19	10.5	NA	NA
2	---	8	8	210	35	10.5	6	150	19	---	---	---
3	10:34-25	8	8	200	35	10.5	6	150	19	0.54	20.7	107.0
4	---	8	8	200	35	10.5	6	150	19	---	---	---
5	10:43-52	10	10	180	30	9	7	175	17.5	0.60	18.0	107.5
6	---	8	8	200	25	7.5	5	125	16	---	---	---
7	10:47-58	8	8	200	25	7.5	5	125	16	0.89	28.4	101.9
8	---	5	5	200	25	7.5	4	100	20	---	---	---
9	---	63	---	---	---	---	45	1125	---	---	---	---
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)	(1-4) 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?	Yes, as indicated, to reduce blasts due to work projects.	
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: [N / S / <input checked="" type="checkbox"/> / W]	

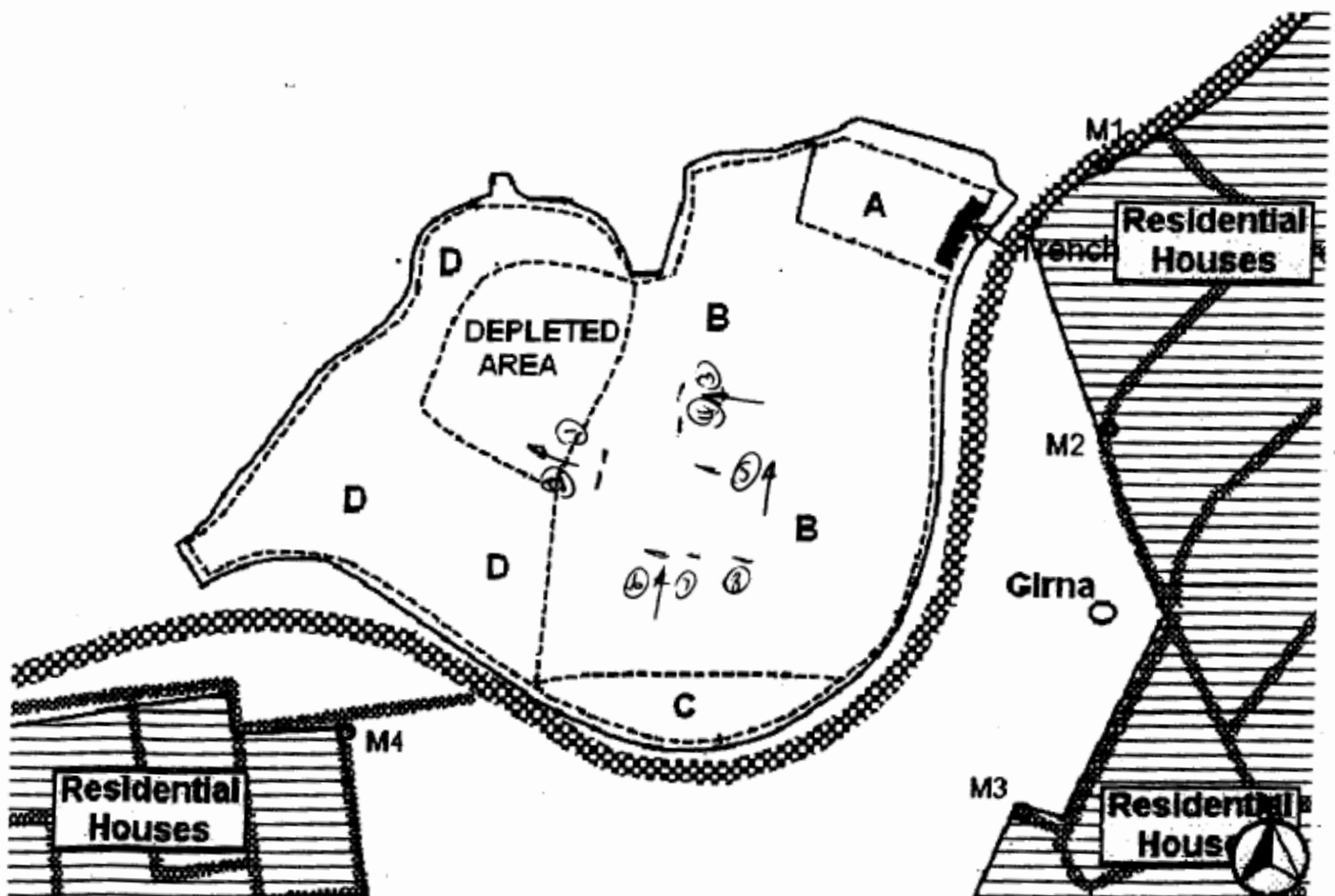
OTHER

Any visitors before/during/after blasts?	<i>Nobody</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-Difiza Civili	<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-Insaqqin

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.

Pc 708 M. V. Vella

[Signature]
Quarry Operator

[Signature]
 Blast monitoring agent

Date/Time Vert at 10:34:25 October 19, 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 6.2 Volts
Unit Calibration August 20, 2015 by Datum Monitoring
File Name K488G2MG.1D0

Notes

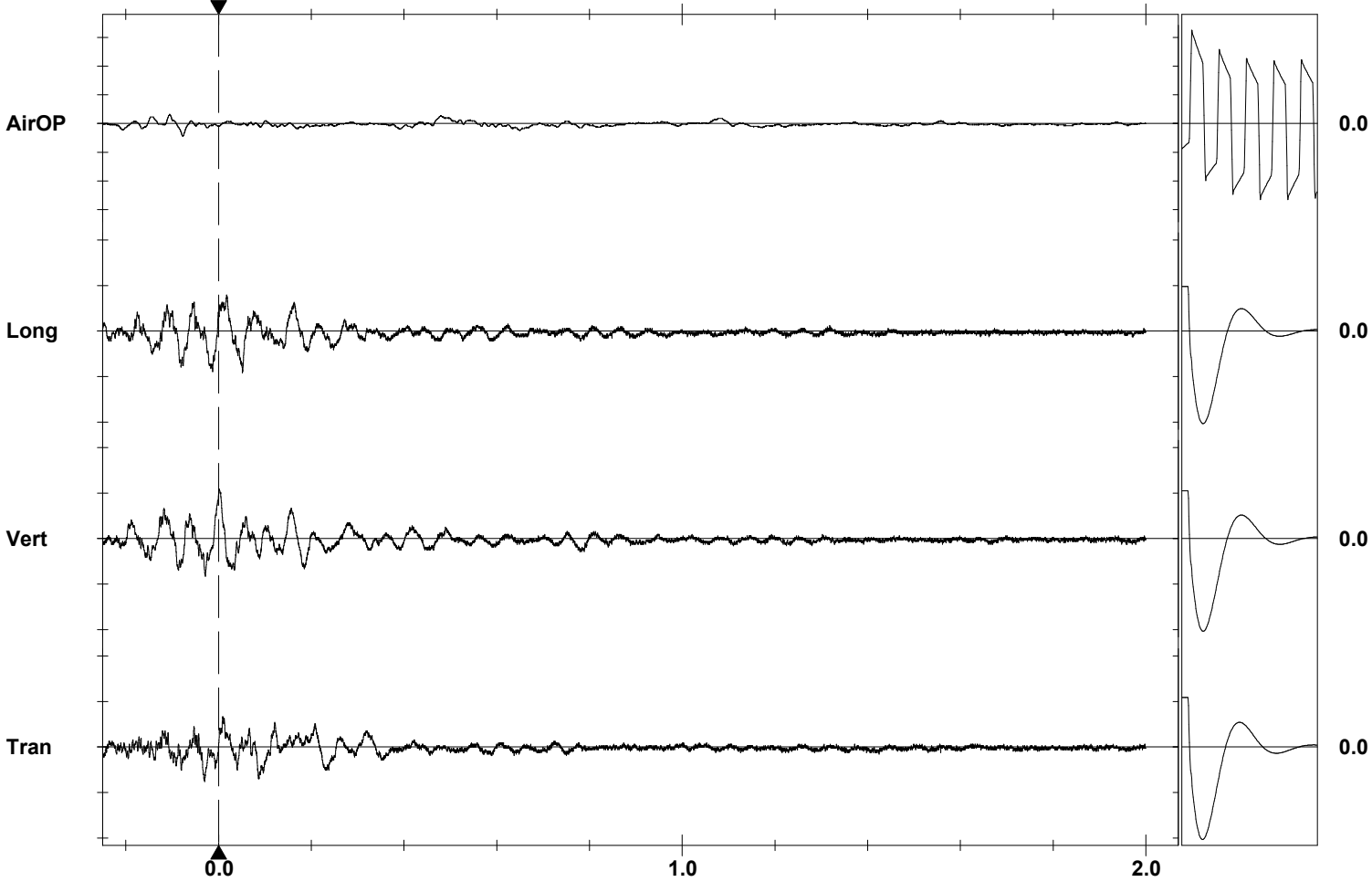
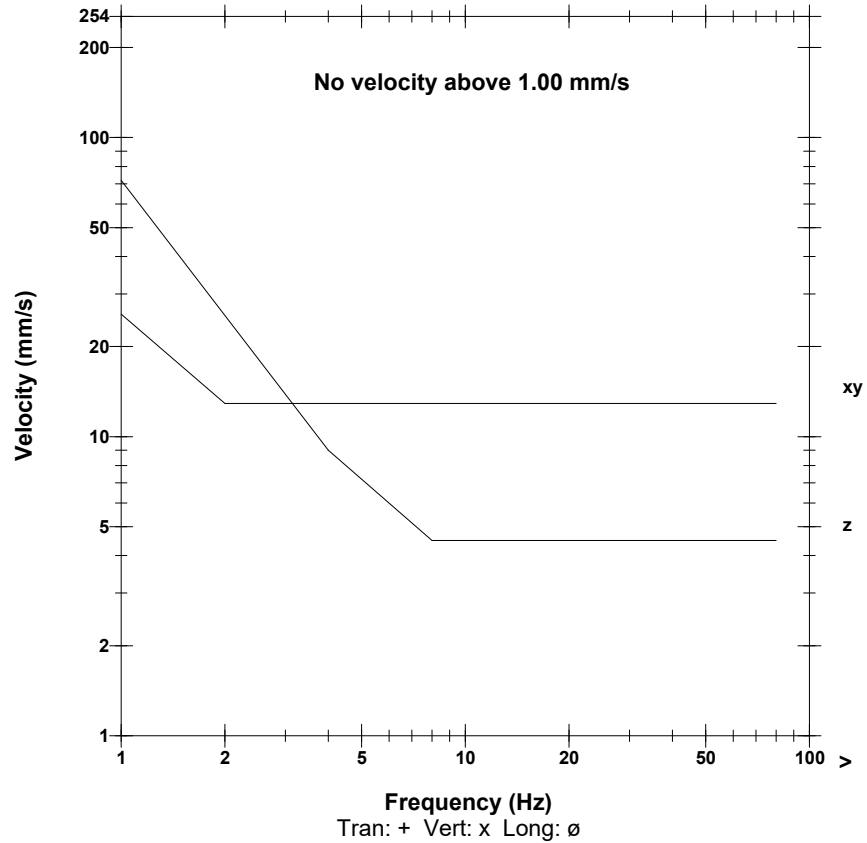
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 107.0 dB(L) 4.500 pa.(L) at -0.077 sec
ZC Freq 20.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 564 mv)

	Tran	Vert	Long	
PPV	0.381	0.540	0.460	mm/s
PPV	42.62	45.64	44.26	dB
ZC Freq	30.1	20.7	16.5	Hz
Time (Rel. to Trig)	-0.030	0.001	0.051	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.003	0.004	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 0.624 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 Tran at 10:43:52 October 19, 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 K488G2MG.H40

Notes

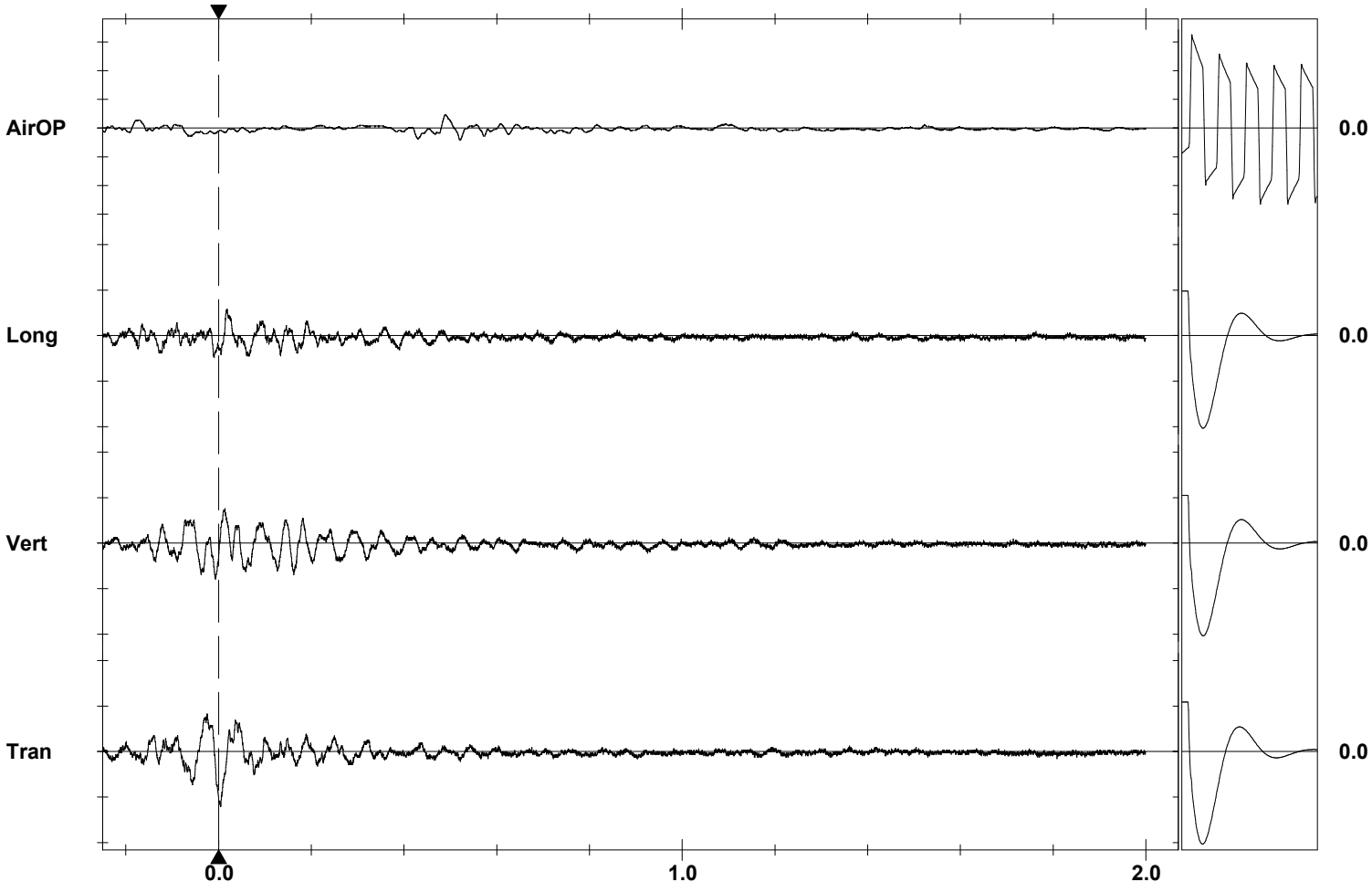
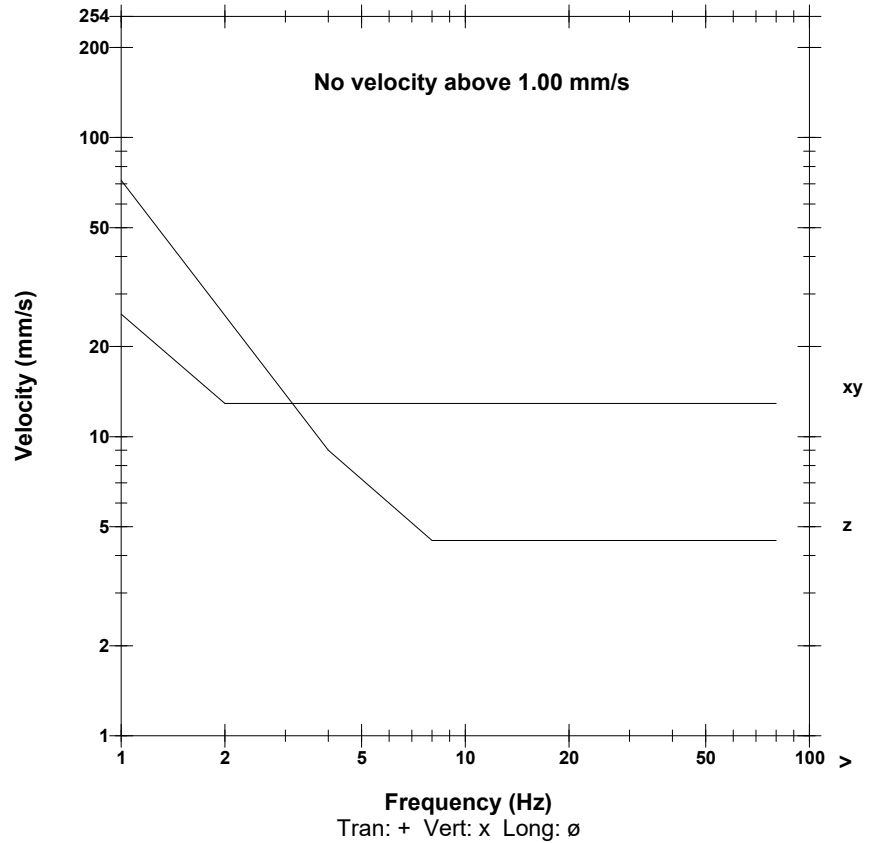
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 107.5 dB(L) 4.750 pa.(L) at 0.489 sec
ZC Freq 19.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 564 mv)

	Tran	Vert	Long	
PPV	0.603	0.397	0.286	mm/s
PPV	46.61	42.97	40.12	dB
ZC Freq	18.0	26.9	28.4	Hz
Time (Rel. to Trig)	0.004	-0.007	0.017	sec
Peak Acceleration	0.027	0.027	0.020	g
Peak Displacement	0.005	0.003	0.002	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 0.661 mm/s at 0.005 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 10:47:58 October 19, 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 6.2 Volts
Unit Calibration August 20, 2015 by Datum Monitoring
File Name K488G2MG.NYO

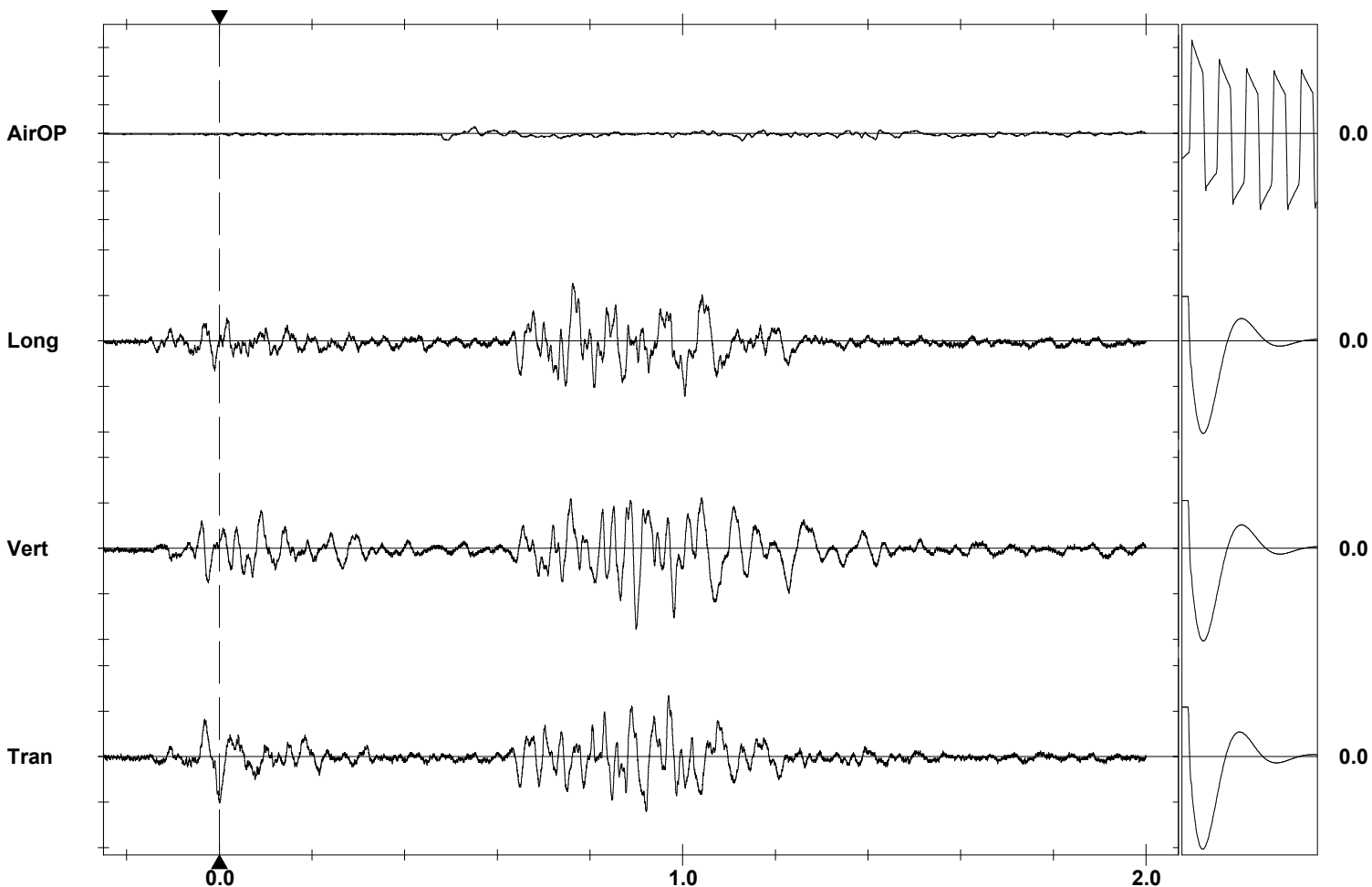
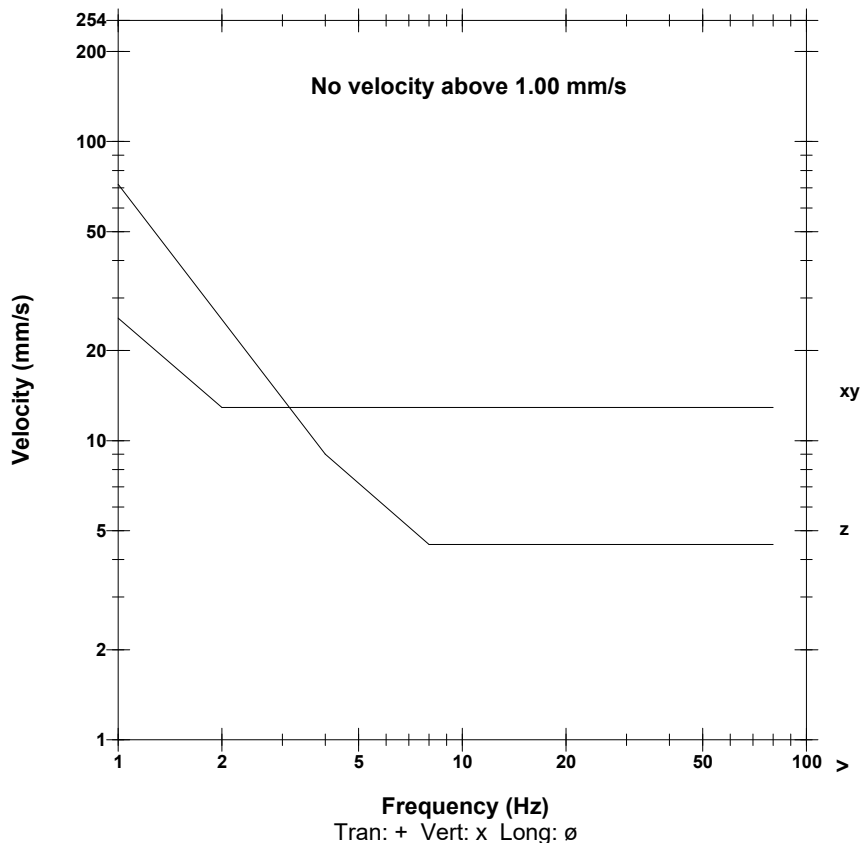
Notes
 Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 101.9 dB(L) 2.500 pa.(L) at 1.127 sec
ZC Freq 13.6 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 564 mv)

	Tran	Vert	Long	
PPV	0.667	0.889	0.635	mm/s
PPV	47.48	49.98	47.06	dB
ZC Freq	30.1	28.4	19.1	Hz
Time (Rel. to Trig)	0.969	0.899	0.762	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.004	0.007	0.006	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 0.925 mm/s at 0.899 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