

## BLAST MONITORING REPORT

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

3rd December 2012

### Details

Date	03-12-2012
Quarry number	HM22 – Victoria Lines l/o Naxxar
Quarry operator	Ballut Blocks Ltd.
ANFO Supplier	Framegrip Ltd.
Police escort	PC 450 – C Bartolo

### Location and Time of Blasting

Thirteen blasts were carried out between 12:22 and 13:01 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 <sup>[1]</sup>	Wind <sup>[1]</sup>	Temp. <sup>[1]</sup>	Atm. Pressure	Cloud Cover <sup>[2]</sup>
74%	27 Knots, NW	14 C	1017 hPa	100% low cloud, showers

[1] As reported by weather.maltairport.com on 3 December 2012 at 13:15 at Luqa Airport [2] Our observation

### Comments

All holes are at various middle shelves of the quarry in their respective locations.

Blasts number 3 and 4, 5 and 6, 7 and 8, 9 and 10, and 12 and 13 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 our instrument.

## Notes about Monitoring

The seismograph was placed at the Naxxar Local Council for all blasts. The seismograph was set to trigger at 0.51 mm/s. Instrument used is MiniMate Plus, serial number BE9488.

## Readings

Blast Number	1	2	3	4	5	6
Time	12:22	12:30	12:37		12:42	
No. of Holes	6	6	7	6	7	7
No. of Delays	6	6	7	6	7	7
Depth of Holes (m)	6.5	6.5	6.5	6.5	9	9
Max. Charge per Delay (kg)	12.5	12.5	14.5	12.5	21.5	21.5
Total Charge (kg)	75	75	100	75	150	150
Dist. from Seismograph (m)	1050	1050	1050	1050	1050	1050
PPV (mm/s)	<0.50	<0.50	0.60		<0.50	
Frequency (Hz)	N/a	N/a	8.6		N/a	
Air Overpressure (dB L)	N/a	N/a	95.3		N/a	
Scaled Distance (m kg <sup>-1/2</sup> )	297.0	297.0	275.7	297.0	226.4	226.4

Blast Number	7	8	9	10	11	12	13
Time	12:46		12:52		12:56	13:01	
No. of Holes	7	7	6	6	6	6	6
No. of Delays	7	7	6	6	6	6	6
Depth of Holes (m)	9	9	6.5	6.5	6.5	6.5	6.5
Max. Charge per Delay (kg)	18	18	17	17	17	17	17
Total Charge (kg)	125	125	100	100	100	100	100
Dist. from Seismograph (m)	1050	1050	1050	1050	1050	1050	1050
PPV (mm/s)	<0.50		<0.50		<0.50	<0.50	
Frequency (Hz)	N/a		N/a		N/a	N/a	
Air Overpressure (dB L)	N/a		N/a		N/a	N/a	
Scaled Distance (m kg <sup>-1/2</sup> )	247.5	247.5	254.7	254.7	254.7	254.7	254.7

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

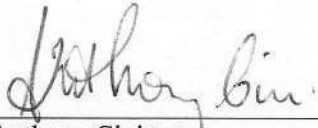
*Weights in kilograms are rounded-up to the nearest ½ unit, and depth in metres is rounded to the nearest ½ unit. Displacement between holes and the seismograph is measured using the online version of MEPA's Map Server and is accurate to the nearest 10 metres. Number of holes, their depth, burden, and the amount of ANFO used are as given by the quarry operator. 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.

MEPA mandated that the instrument be put at the Naxxar local council. The complaint of the council was that the blasts are felt "very strongly" from the first floor, but the instrument has to be placed at the base of a building. The instrument was therefore placed at the base of the building hosting the local council near the main entrance. At the same time we stood up at the middle of council hall which is at the first floor of the building. We felt just the one blast that the instrument recorded but another person in the same room (there were another three persons besides the writer) reported to have felt four blasts in total but reported also that they were "not as strong as usual".

Placing the instrument further away than the usual monitoring spots has shown this time that blasts are not felt stronger than they are felt at 200m, but it also shows that vibration could travel a great distance (1 Kilometre in this case) with little attenuation.



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Anthony Cini B.Sc.

**D A T A C O L L E C T I O N S H E E T**

**BLASTING SESSION DETAILS**

Quarry Name & Number:	HM22 – Wied Filep, l/o Naxxar	Quarry Operator:	Ballut Blocks Services Ltd.
Date:	3-12-12	MIC for HM22 is 25Kg	
Quarry personnel charging:	DAVID MUSCAT.		
Police Escort:	No: PC 450	Name:	CHRIS BARTOLO
ANFO suppliers:	Company: FrameGrip Ltd.	Chief on site:	MARIO CALLEJA
Seismograph readings by:	RAPHAEL MICALLEF		

**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	12:22	6	6	1050	22	6.5	3	75	12.5	<0.50	N/A	N/A
2	12:30	6	6	1050	22	6.5	3	75	12.5	<0.50	N/A	N/A
3	12:37	7	7	1050	22	6.5	4	100	14.5	0.60	8.6	95.3
4	—	6	6	1050	22	6.5	3	75	12.5	—	—	—
5	12:42	7	7	1050	30	9	6	150	21.5	<0.50	N/A	N/A
6	—	7	7	1050	30	9	6	150	21.5	<0.50	N/A	N/A
7	12:46	7	7	1050	30	9	5	125	18	<0.50	N/A	N/A
8	—	7	7	1050	30	9	5	125	18	<0.50	N/A	N/A
9	12:52	6	6	1050	22	6.5	4	100	17	<0.50	N/A	N/A
10	—	6	6	1050	22	6.5	4	100	17	<0.50	N/A	N/A
11	12:56	6	6	1050	22	6.5	4	100	17	<0.50	N/A	N/A
12	13:01	6	6	1050	22	6.5	4	100	17	<0.50	N/A	N/A
13	—	6	6	1050	22	6.5	4	100	17	<0.50	N/A	N/A
14		83					55	1375				
15												

**BLAST CHARACTERISTICS**

Burden	Distance between boreholes: 2.5 m	Distance from rock face (burden): 2 m
Levels of holes: (top/mid/low shelves)	(1-13) Middle Shelf	
Any horizontal holes?	No	
Any blast has holes of varying depths?	No	
Any grouping of blasts?	Yes as indicated, to reduce blasts and speed up work	
Notes	We stood at the centre of Council hall at first floor of the building hosting the local council. We felt one event (blast No.3) but another <del>person</del> individual in the same room felt four events.	

**WEATHER CONDITIONS**

<b>Weather conditions observation:</b>	[ 100 ] % cloud cover	[ High / Low ] Cloud	Rain: [ no / light / medium / heavy ] showers
	Wind [ calm / light breeze / strong wind ]	Approx. direction: [ N / S / E / W ]	

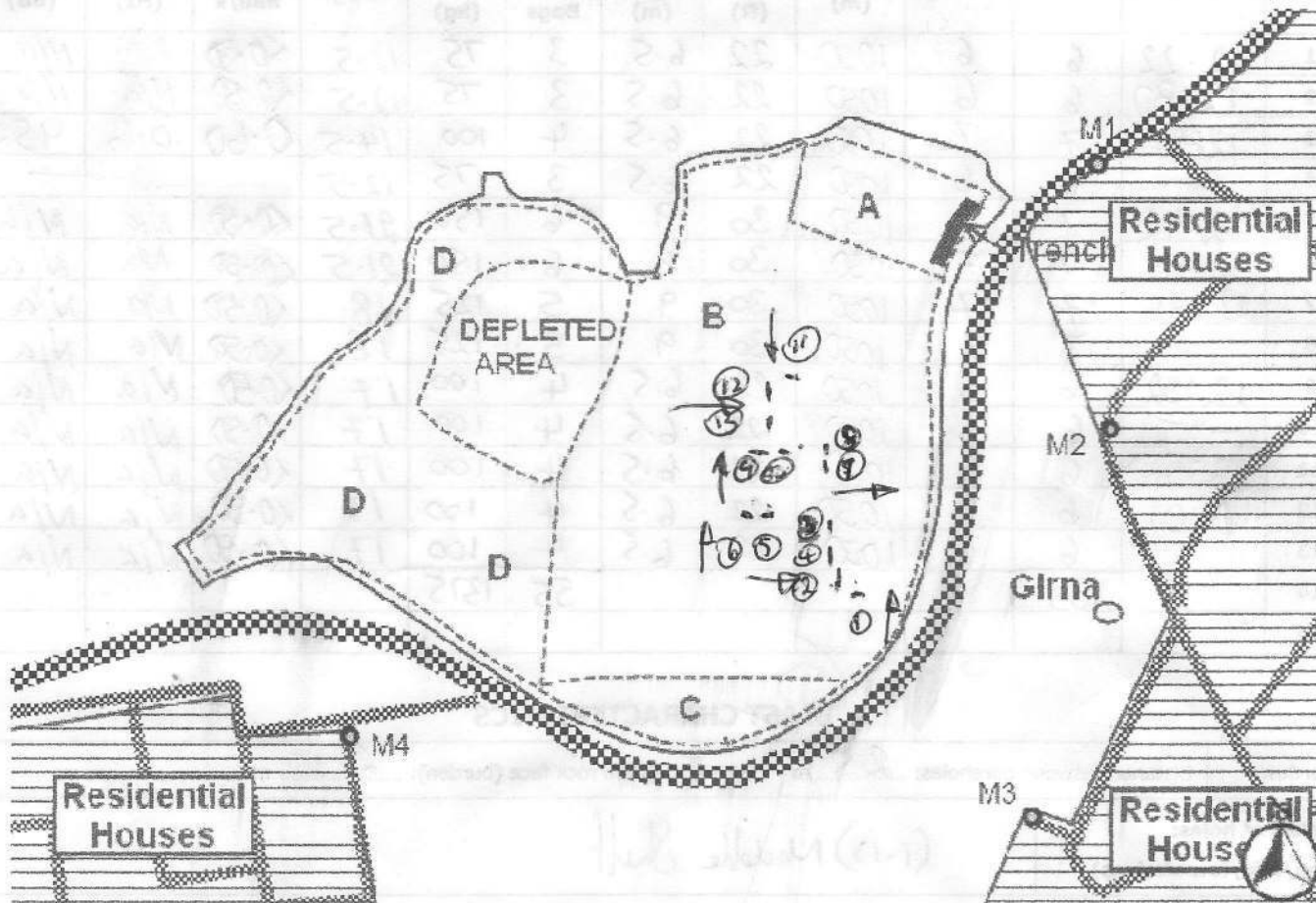
**OTHER**

<b>Any visitors before/during/after blasts?</b>	No	[if yes, who? Why?]
<b>Any complaints from neighbours?</b>	No	[names/organizations]

**MONITORING DETAILS**

<b>Location of Seismograph</b>	<input type="checkbox"/> M1: Front of Villa Nordani, Triq id-Difiza Civili	<input type="checkbox"/> M2: Corner of Triq Brydone
	<input type="checkbox"/> M3: Front of No. 7, Melitta hse, Triq Sir Arturo Mercieca	<input checked="" type="checkbox"/> M4: Triq l-Imsaqfin Other: Local Council Naxxos

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.



<b>Observations after blast:</b>	[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.

PC450 *[Signature]*

*[Signature]*

*[Signature]*

**Date/Time** Long at 12:37:51 December 3, 2012  
**Trigger Source** Geo: 0.510 mm/s  
 Mic: 118 dB(L)  
**Range** Geo :31.7 mm/s  
**Record Time** 2.0 sec at 4096 sps

**Serial Number** BE9488 V 8.01-8.0 MiniMate Plus  
**Battery Level** 5.8 Volts (Battery Low)  
**Calibration** September 3, 2012 by Datum Monitoring  
**File Name** K488EKM5.R30

**Notes**

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

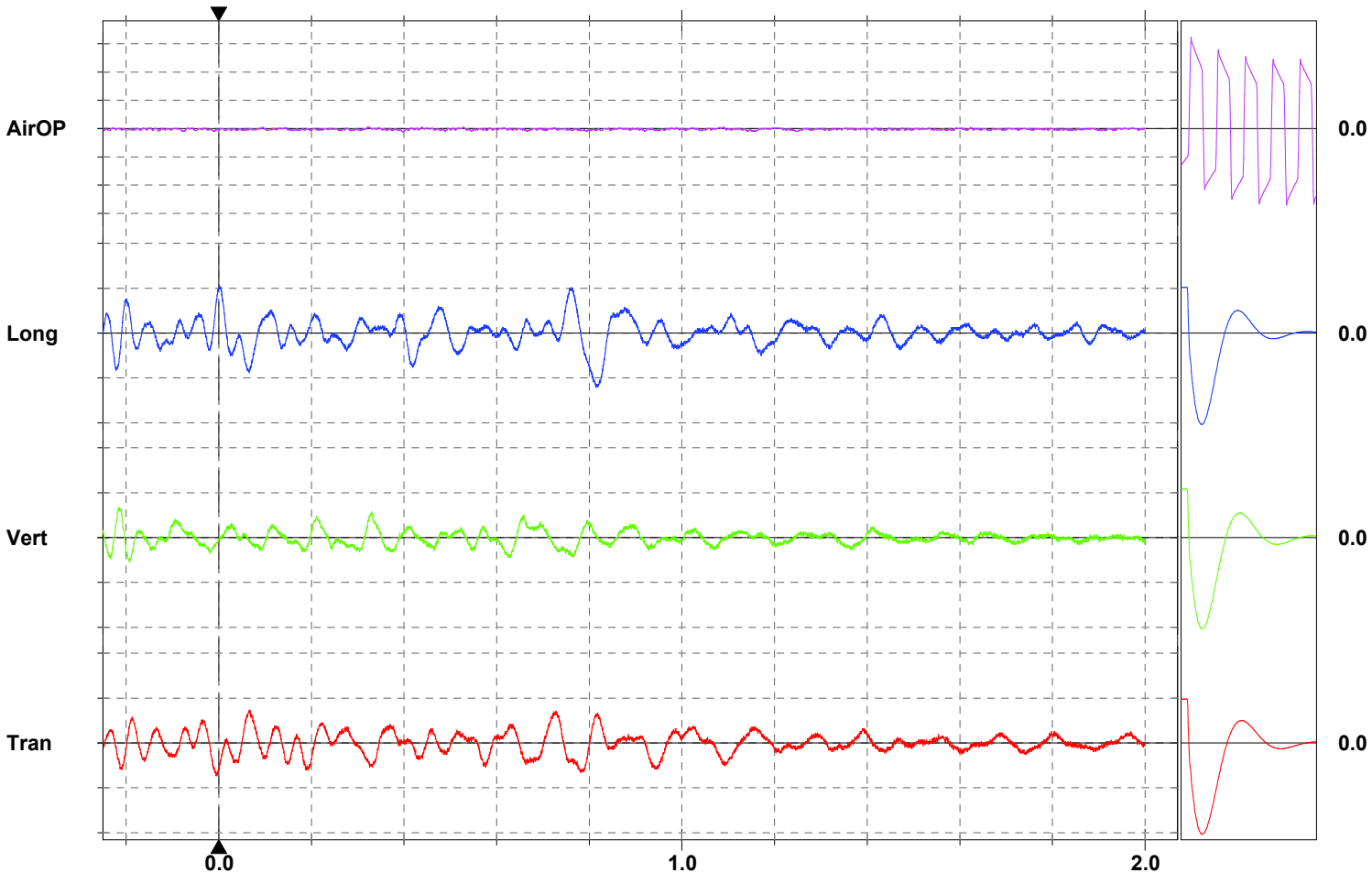
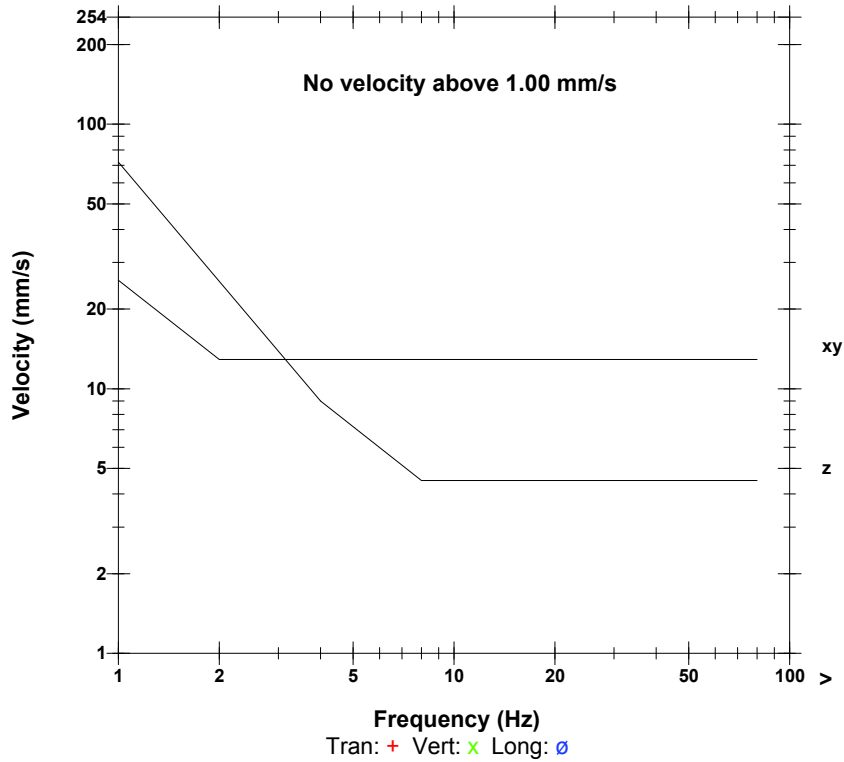
**Post Event Notes**

**Microphone** Linear Weighting  
**PSPL** 95.9 dB(L) 1.25 pa.(L) at 0.397 sec  
**ZC Freq** 49 Hz  
**Channel Test** Passed (Freq = 20.1 Hz Amp = 577 mv)

	Tran	Vert	Long	
<b>PPV</b>	0.365	0.333	0.603	mm/s
<b>ZC Freq</b>	15.8	23.8	8.6	Hz
<b>Time (Rel. to Trig)</b>	-0.006	-0.217	0.814	sec
<b>Peak Acceleration</b>	0.0265	0.0199	0.0199	g
<b>Peak Displacement</b>	0.00578	0.00416	0.0106	mm
<b>Sensorcheck</b>	Passed	Passed	Passed	
<b>Frequency</b>	7.2	7.5	7.7	Hz
<b>Overswing Ratio</b>	4.1	3.7	4.1	

**Peak Vector Sum** 0.682 mm/s at 0.815 sec

**BS 6472:1992 CURVE 32**



**Time Scale:** 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.00 pa.(L)/div  
**Trigger =** ▶ ◀

Sensorcheck