

## **BLAST MONITORING REPORT**

HM13A Hard Stone Quarry at Tat-Tomna, I/o Mellieħa

14th September 2010

### **Details**

Date	14-09-2010
Quarry number	HM13A – Hard stone Quarry at Tat-Tomna, I/o Mellieħa
Quarry operator	A Vella Borg & Sons Ltd.
Shortfirer	Framegrip Ltd.
Police escort	PC87 – G Galea

### **Location and time of blasting**

Three blasts were carried out between 10:54 and 10:57 approximately at the points as indicated on the attached site diagram.

### **Summary of blasting conditions**

Max charge per delay: 50Kg

Recommended vibration limit: <8 mm/s at the nearest WSC Reservoir

### **Site Specific Permit**

Holes were within the quarry's new boundaries and within the permitted depths.

Maximum charge per delay of 50Kg was not exceeded.

### **Comments**

Holes of blast number 1 are at the bottom shelf of the quarry, holes of blasts number 2 and 3 are at the middle shelf of the quarry.

Blasts number 2 and 3 were grouped together and detonated by means of two short-circuit-exploders in very quick sequence and captured as one event by our seismograph. This technique is used to minimise the chance of one blast damaging the wiring of the second.

**Notes**

Seismograph is placed opposite the quarry, on the entrance to Tat-Tomna water reservoir (WSC).

Seismograph was set to trigger at 0.51 mm/s. Seismograph used is a MiniMate Plus, serial number BE9488. The air overpressure sensor of this instrument is with the manufacturer for servicing so the air overpressure reading should be ignored.

**Readings**

<b>Blast number</b>	1	2	3
<b>Time</b>	10:54	10:57	
<b>No. of holes</b>	15	8	8
<b>No. of delays</b>	15	8	8
<b>Depth of holes (m)</b>	10.5	15	15
<b>Max. charge per delay (kg)</b>	25	41	41
<b>Total charge (kg)</b>	375	325	325
<b>Dist. from seismograph (m)</b>	260	240	240
<b>PPV (mm/s)</b>	1.54	1.56	
<b>Frequency (Hz)</b>	25.3	7.1	
<b>Air Overpressure (dB)</b>	N/a	N/a	
<b>Scaled Distance (m kg<sup>-1/2</sup>)</b>	52.0	37.5	37.5

Burden is an average of 2 metres.

Weights in kilograms are rounded-up to the nearest unit, and depths in metres are rounded to the nearest 1/2 unit. Displacement between holes and instrument is accurate to the nearest 10 metres.

**Observations:**

No damage to the surroundings was observed after the blast.

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Anthony Cini B.Sc



**Malta Environment & Planning Authority**

**Hardstone (LC) Quarry Site Plan**

St. Francis Ravelin  
 Floriana  
 PO Box 200, Valletta  
 Tel: 22900000 Fax: 21234846



Quarry No. :-

**HM 13A**

Location :- Tat-Tonna l/o Mellicha

14-9-10  
*[Handwritten Signature]*

Scale :-

**1:2500**

Permitted Quarry Area :- 38130 sqm

Permitted Quarry Depth :- 100 m amsl

Part of Survey Sheet(s): 4078 4079

Date :- 12/7/04

## DATA COLLECTION SHEET

Date:	14-9-10		MIC for HM13A is <b>50Kg</b>
Quarry Name & Number:	HM13A - Tat-Tomna, l/o Mellieha	Quarry Operator:	A Vella Borg & Sons Ltd.
Police Escort:	No: PC 87	Name: GEORGE GALEA.	
Blasting carried out by:	Company: Framegrip Ltd.	Name: MARIO CALLEJA.	
Seismograph readings by:	RAPHAEL MICALLEF		


Blast	Time	Holes	Delays	Dist.		Depth		Total charge		Max. Chrg.	PPV mm/s	Freq. (Hz)	Air (dB)
				(m)	(ft)	(m)	Bags	(kg)					
1	10-54-31	15	15	240	35	10.5	15	375	25	1.54	25.3	91.5	
2	10-57-24	8	8	240	50	15	13	325	41	1.56	7.1	91.5	
3	---	8	8	240	50	15	13	325	41	---	---	---	
4		32					41	1025					
5													
6													
7													
8													
9													

Location of Seismograph	<input checked="" type="checkbox"/> At the entrance to Tat-Tomna (WSC) water reservoir	<input type="checkbox"/> Other location: _____
Burden	Distance between boreholes: 25 m	Distance from rock face (burden): 2 m
Notes	Any horizontal holes? <u>No</u> Any blast made up of holes of different-depth? <u>No</u> Why? <u>✓</u> Any blasts grouped together and detonated using multiple (almost simultaneous) short-circuit exploders? <u>Yes</u> Why? <u>*</u> Any visitors before/during/after blast? <u>Nobody</u> (note names and organizations) Any complaints from neighbours? <u>None</u> (note names, number of persons/households?) Note levels of holes: <u>(1) Bottom shelf (2,3) Middle shelf</u> Flyrock observation: <u>None Outside</u> Any damage to quarry surroundings? <u>None Observed</u>	
Further Comments	* To minimize the possibility of damaging second blast after first is detonated.	

(use overleaf if more space is required)

### Signatures

  
Police escort

  
f/ Quarry operator

  
f/ ems

**Date/Time** Vert at 10:54:31 September 14, 2010  
**Trigger Source** Geo: 0.500 mm/s  
**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** 6.0 Volts  
**Calibration** September 9, 2010 by Datum Monitoring  
**File Name** K488DEW6.AV0

**Notes**

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

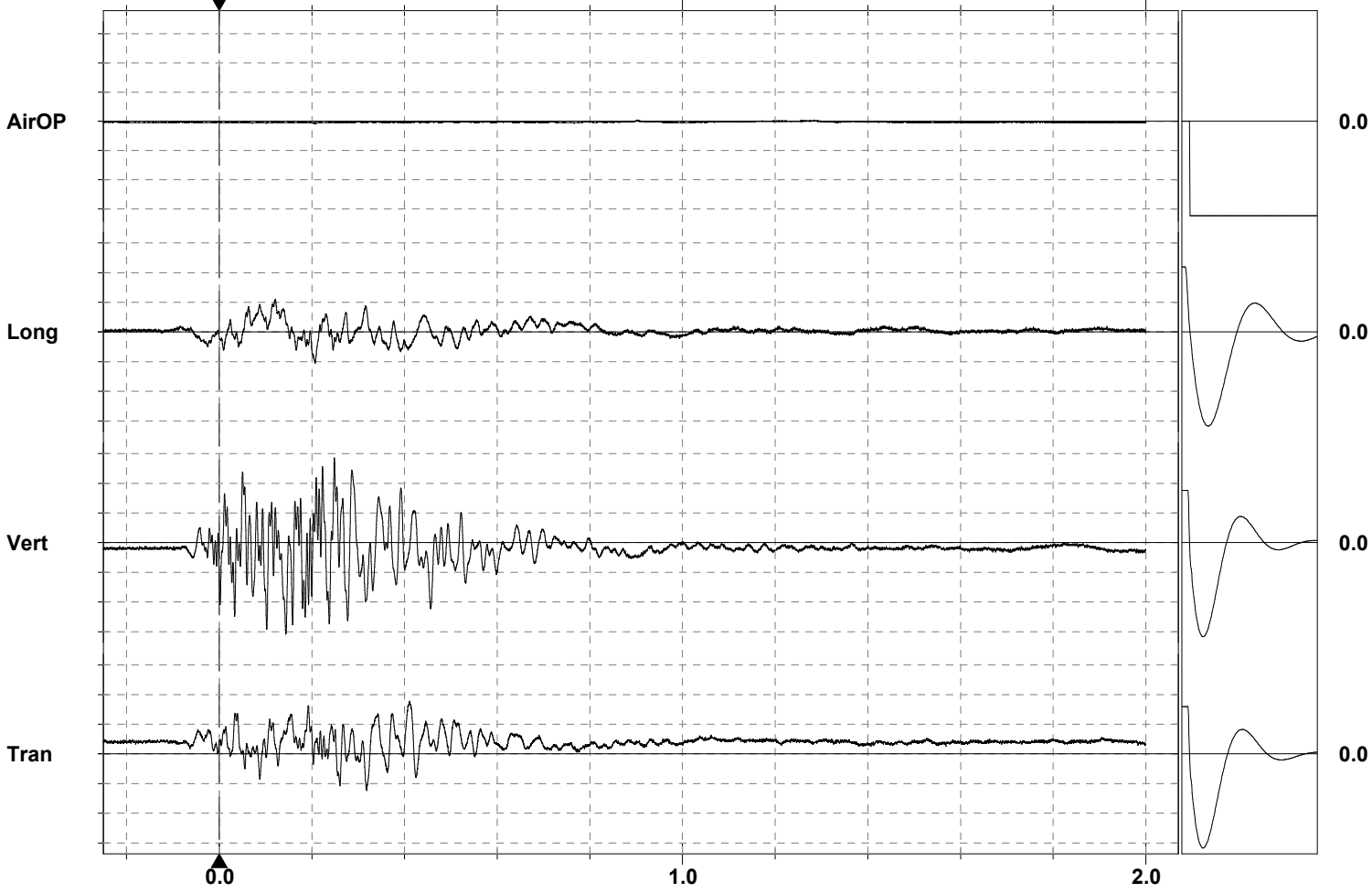
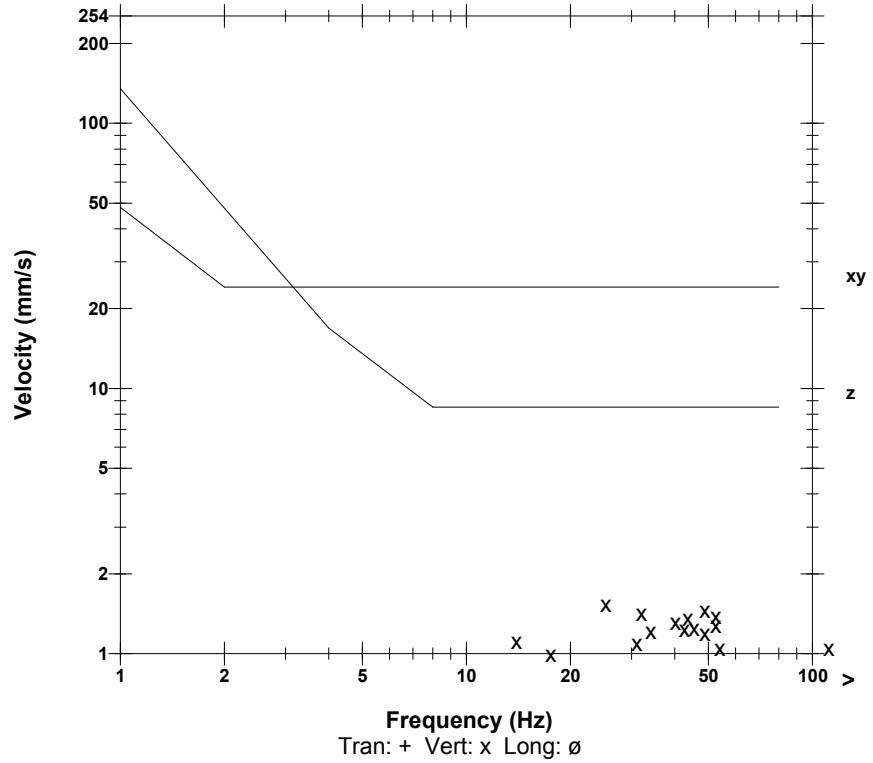
**Post Event Notes**

**Microphone** Linear Weighting  
**PSPL** 91.5 dB(L) at 0.071 sec  
**ZC Freq** 37.2 Hz  
**Channel Test** Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	0.889	1.54	0.556	mm/s
ZC Freq	23.0	25.3	5.1	Hz
Time (Rel. to Trig)	0.411	0.144	0.121	sec
Peak Acceleration	0.0331	0.0862	0.0265	g
Peak Displacement	0.0263	0.0210	0.0135	mm
Sensorcheck	Passed	Passed	Check	
Frequency	7.3	7.5	5.8	Hz
Overswing Ratio	3.9	3.6	3.3	

**Peak Vector Sum** 1.59 mm/s at 0.144 sec

**BS 6472:1992 CURVE 60**



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

Sensorcheck

**Date/Time** Vert at 10:57:24 September 14, 2010  
**Trigger Source** Geo: 0.500 mm/s  
**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** 6.0 Volts  
**Calibration** September 9, 2010 by Datum Monitoring  
**File Name** K488DEW6.F00

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

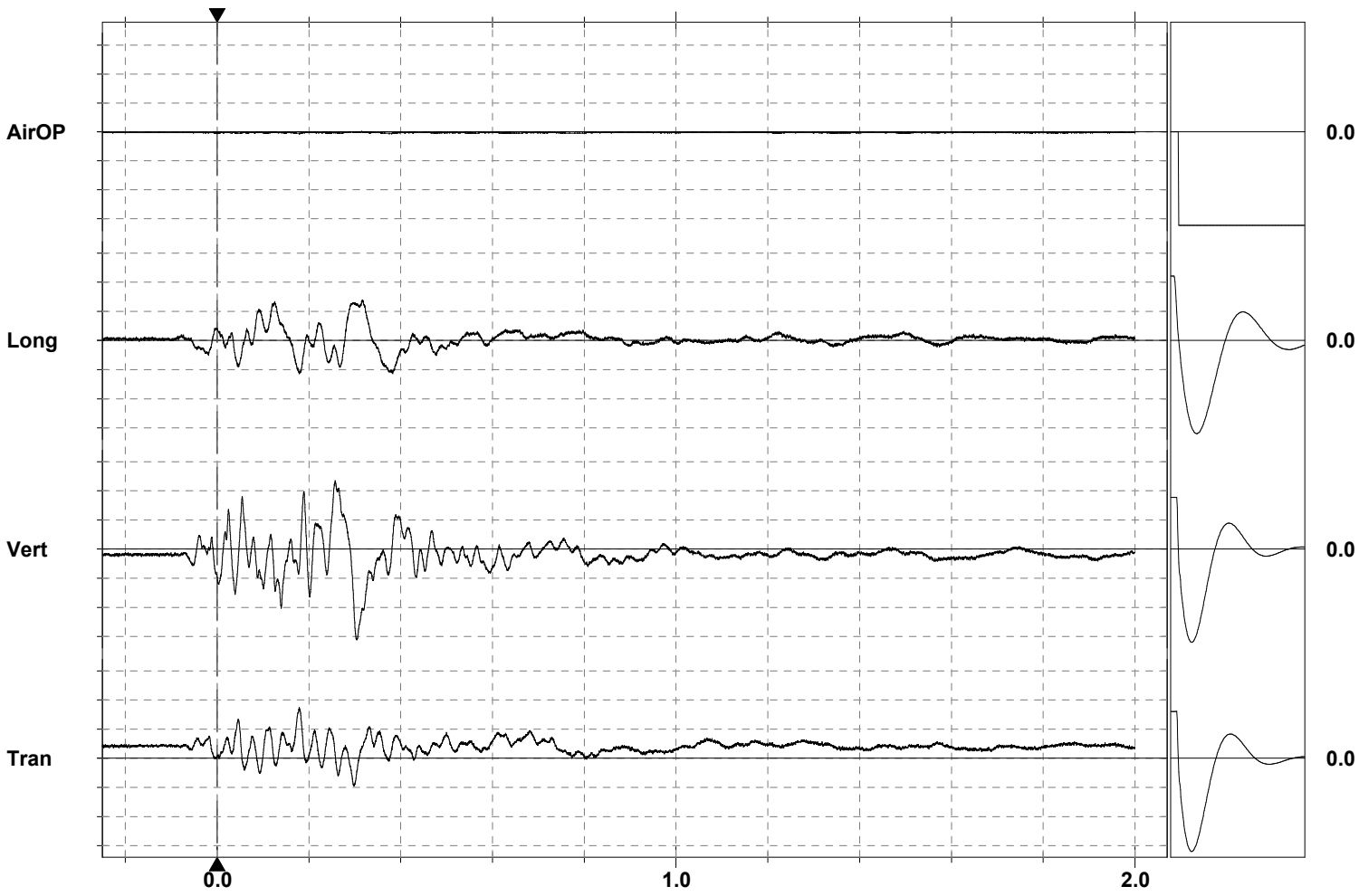
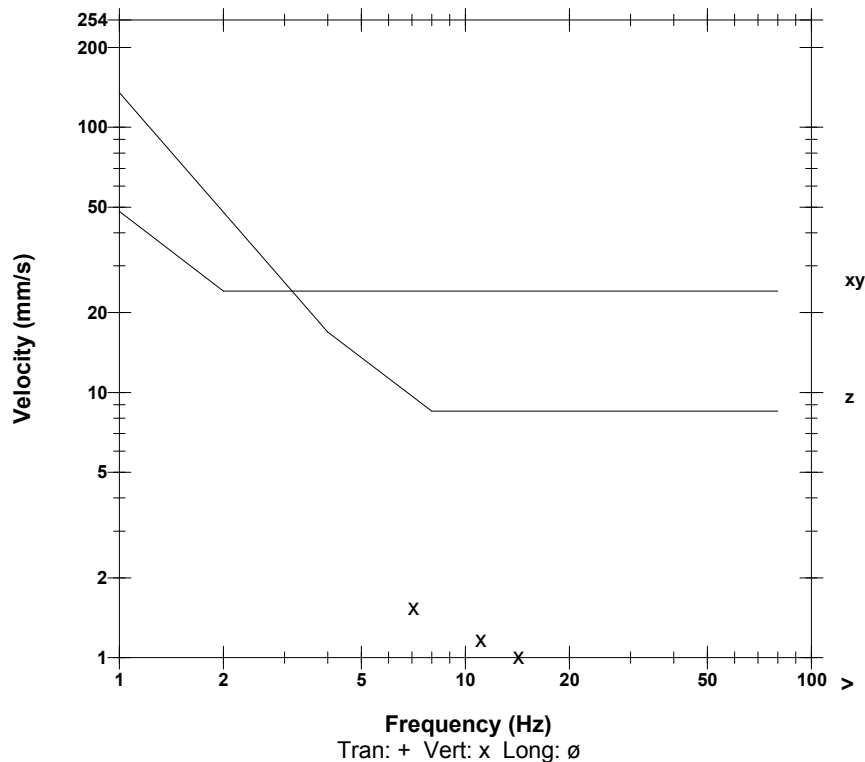
**Post Event Notes**

**Microphone** Linear Weighting  
**PSPL** 91.5 dB(L) at 0.179 sec  
**ZC Freq** 53 Hz  
**Channel Test** Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
<b>PPV</b>	0.873	1.56	0.698	mm/s
<b>ZC Freq</b>	8.7	7.1	8.4	Hz
<b>Time (Rel. to Trig)</b>	0.179	0.303	0.316	sec
<b>Peak Acceleration</b>	0.0265	0.0331	0.0265	g
<b>Peak Displacement</b>	0.0422	0.0236	0.0143	mm
<b>Sensorcheck</b>	Passed	Passed	Check	
<b>Frequency</b>	7.3	7.5	5.8	Hz
<b>Overswing Ratio</b>	3.9	3.6	3.3	

**Peak Vector Sum** 1.70 mm/s at 0.303 sec

**BS 6472:1992 CURVE 60**



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

Sensorcheck