

BLAST MONITORING REPORT

HG12 Hard Stone Quarry at Ta' Klement, l/o Qala Gozo

28th January 2013

Details

Date	28-01-2013
Quarry number	HG12 – Ta' Klement, l/o Qala Gozo
Quarry operator	Ballut Blocks Ltd.
ANFO Supplier	Road Constructions Co. Ltd.
Police escort	PC1127 – F Bonello

Location and Time of Blasting

Two blasts were carried out at 11:47 at the points as approximately indicated on the attached site diagram.

Summary of Blasting Conditions

Maximum charge per delay: 70-90m: 13Kg; 90-110m: 21Kg; 110-130m: 32Kg, 139-150m: 45Kg; 150m+: 60Kg. These distances are to be measured from the “slipway” and the “girna”.

Vibration limit: 4 mm/s (20 to 40Hz) at the nearest “girna” or the natural arch near the “slipway”.

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]	Temperature ^[1]	Cloud Cover ^[2]
68%	10 Knots SW by W	14 C	c. 100% low cloud coverage

[1] As reported by weather.maltairport.com on 28 January 2013 at 11:15 at Luqa Airport

[2] Our observation

Comments

All holes are at the top shelf of the quarry in their respective location.

The two blasts were organised as one pair and 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 entrance to the “girma”. The seismograph was set to trigger at 0.51 mm/s. Instrument used is MiniMate Plus, serial number BE9488.

Readings

Blast Number	1	2
Time	11:47	
No. of Holes	11	11
No. of Delays	11	11
Depth of Holes (m)	18	18
Max. Charge per Delay (kg)	55	55
Total Charge (kg)	600	600
Dist. from Seismograph (m)	210	210
PPV (mm/s)	7.76	
Frequency (Hz)	44	
Air Overpressure (dB L)	129.7	
Scaled Distance (m kg^{-1/2})	28.3	28.3

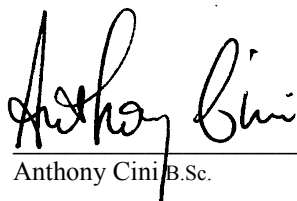
Burden is an average of 2 metres, and distance between holes is an average of 2.5 metres.

Weights in kilograms are rounded-up to the nearest unit, and depth in metres is rounded to the nearest 1/2 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 1/2 meter.

Observations

There was no flyrock outside the quarry boundaries. No damage to the surroundings was observed after the blast.

The air overpressure measured is almost 10db above limit. The ground vibration is also above the new limits of 4mm/s but within the previous limit of 8mm/s which the present blasting procedure is designed to observe. The quarry needs to change their blasting procedures and drill shallower bore-holes to keep with the new regulations. The trial blasts carried out in 2006 suggest that the maximum charge per delay should be of around 23Kg to keep PPV below 4mm/s at 200 metres (with 90% confidence). This is less than half the charge used for this blasting session.



Anthony Cini B.Sc.

DATA COLLECTION SHEET

Date:	28 Jan 2013		MIC for HG12 is varies with dist. from girna
Quarry Name & Number:	HG12 - Ta' Klement, 1/o Qala Gozo	Quarry Operator:	Road Constructions Ltd.
Police Escort:	No: PC 1127	Name:	F Bonello
Blasting carried out by:	Company: FrameGrip Ltd.	Name:	MARIO CALLEJA
Seismograph readings by:	A CINI RAPHAEL MICALLEF		

Blast	Time	Holes	Delays	Dist. (m)	Depth		Total charge		Max. Chrg.	PPV mm/s	Freq. (Hz)	Air (dB)
					(ft)	(m)	Bags	(kg)				
1	11:47	11	11	210	60	18	{48	{1200	55	7.76	44	129.7
2	—	11	11	210	60	18	{48	{1200	55	—	—	—
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

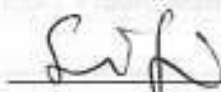
Location of Seismograph	<input checked="" type="checkbox"/> Nearest Girma (in the NE direction)	<input type="checkbox"/> Natural arch rock formation on coast (in the NNE direction)	<input type="checkbox"/> Other:
Burden	Distance between boreholes: 2 m Distance from rock face (burden): 1.5 m		
Notes	Any horizontal holes? <input checked="" type="checkbox"/> Any blast made up of holes of different-depth? <input checked="" type="checkbox"/> Why? <input checked="" type="checkbox"/> Any blasts grouped together and detonated using multiple (almost simultaneous) short-circuit exploders? <input checked="" type="checkbox"/> Why? ... Any visitors before/during/after blast? <input checked="" type="checkbox"/> No (note names and organizations) Any complaints from neighbours? <input checked="" type="checkbox"/> No (note names, number of persons/households?) Note levels of holes: top Flyrock observation: in quarry only Any damage to quarry surroundings? None observed		
Further Comments	100% low cloud.		

(use overleaf if more space is required)

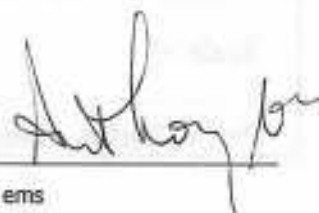
Signatures



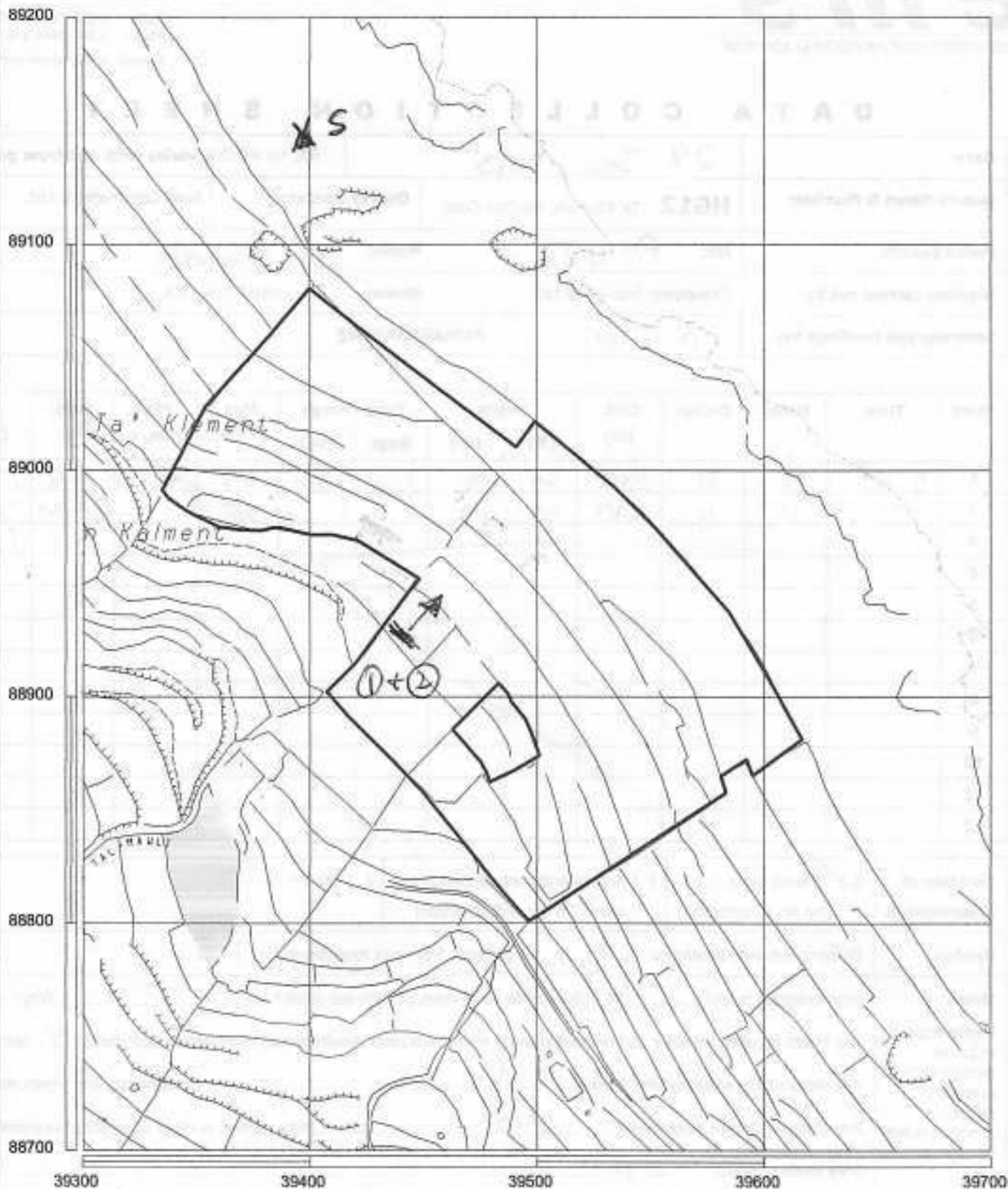
Police escort



f/ Quarry operator



f/ ems



Malta Environment & Planning Authority

Hardstone Quarry Site Plan

St. Francis Ravelin
 Floriana
 PO Box 200, Valletta
 Tel:22900000 Fax:21224846



Quarry No. :-

HG 12

Location :- Ta' Klement

Scale :-

1:2500

Permitted Quarry Area :- 34010 sqm

Permitted Quarry Depth :- 5 m amsl

Part of Survey Sheet(s): 3888 3889

Date :- 11/9/06

Date/Time Tran at 11:47:50 January 28, 2013
Trigger Source Geo: 0.510 mm/s, Mic: 17.8 pa.(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 6.1 Volts
Unit Calibration September 3, 2012 by Datum Monitoring
File Name K488ENHS.RQ0

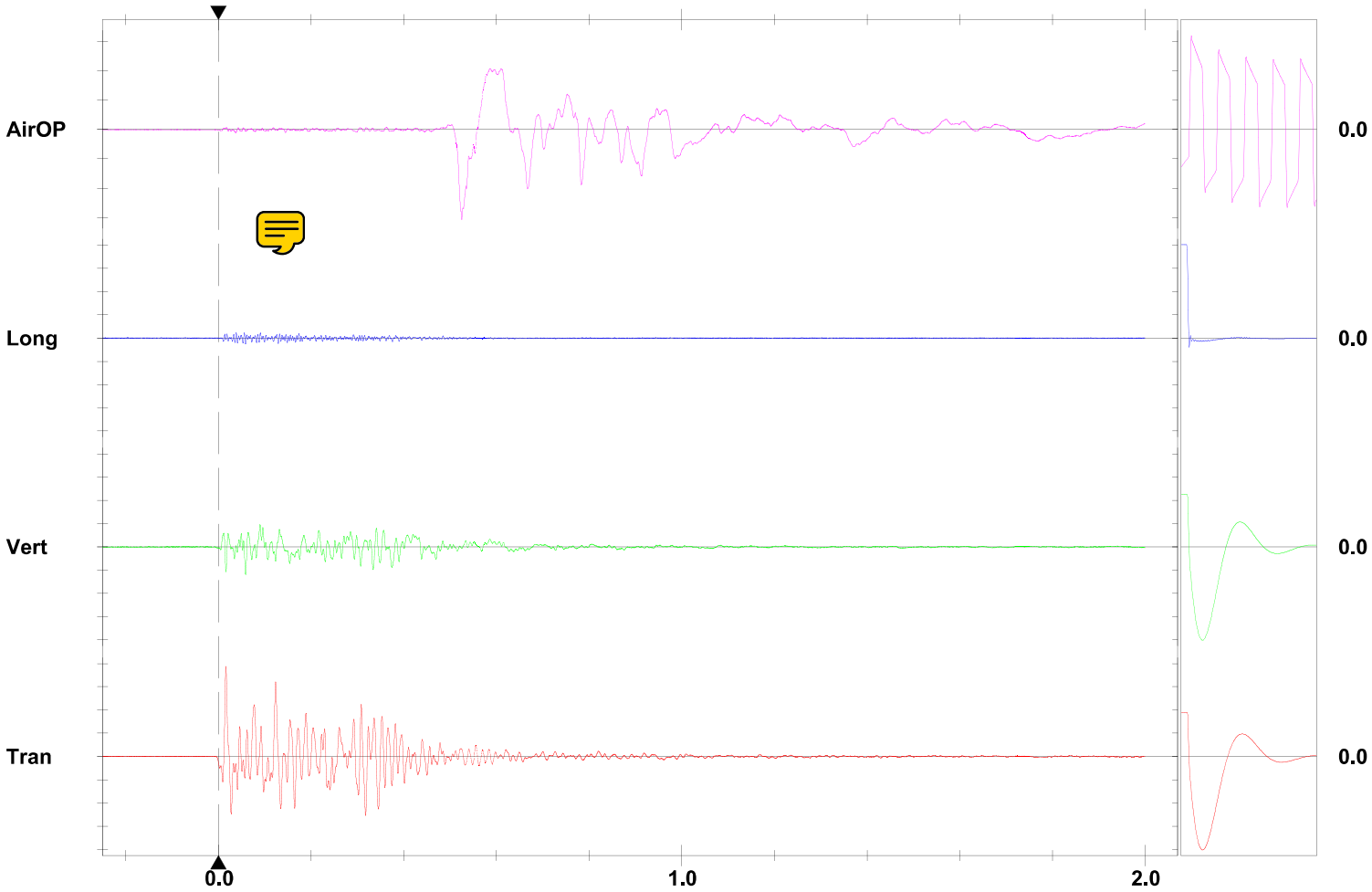
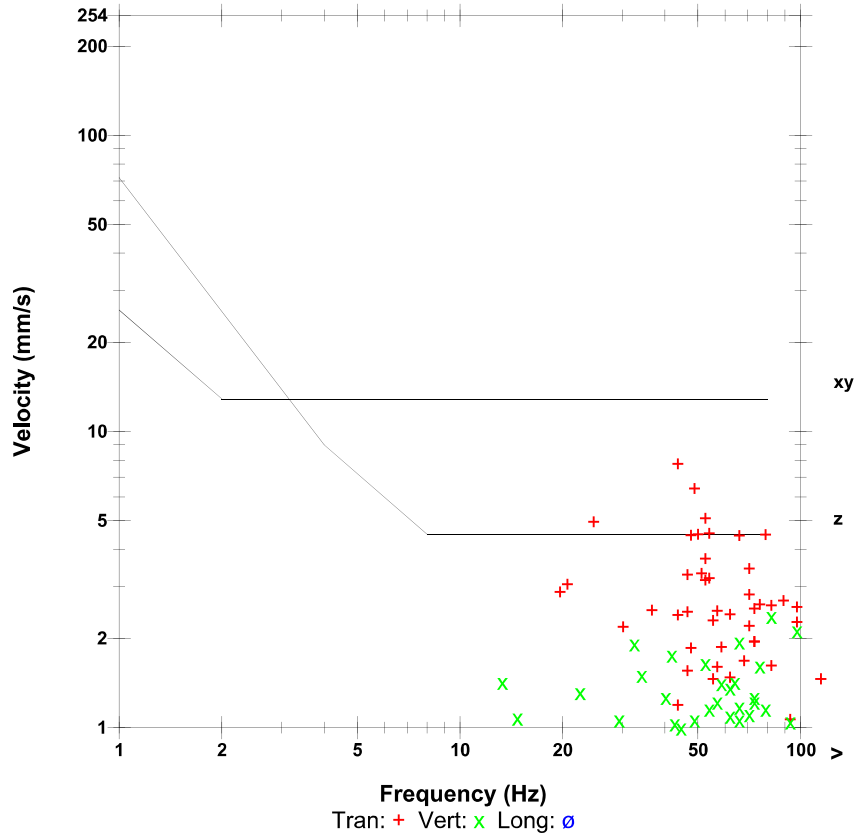
Notes
 Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 61.3 pa.(L) at 0.525 sec
ZC Freq 10.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 646 mv)

	Tran	Vert	Long	
PPV	7.76	2.38	0.492	mm/s
ZC Freq	44	82	186	Hz
Time (Rel. to Trig)	0.016	0.059	0.058	sec
Peak Acceleration	0.245	0.126	0.0597	g
Peak Displacement	0.0209	0.0124	0.00049	mm
Sensor Check	Passed	Passed	Check	
Frequency	7.1	7.4	7.5	Hz
Overswing Ratio	4.2	3.8	5.5	

Peak Vector Sum 8.05 mm/s at 0.016 sec

BS 6472:1992 CURVE 32



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.00 mm/s/div Mic: 20.0 pa.(L)/div
Trigger =

Sensor Check