

BLAST MONITORING REPORT

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

1st December 2015

Details

Date	01-12-2015
Quarry number	HG12 – Ta' Klement, l/o Qala Gozo
Quarry operator	Road Constructions Co. Ltd.
ANFO Supplier	Framegrip Ltd.
Police escort	PC 1142 – P Farrugia

Location and Time of Blasting

Two blasts were carried out at 11:36 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]	Atmospheric Pressure	Temperature ^[1]	Cloud Cover ^[2]
63%	19 Knots NW	1028 hPa	18 C	100% high cloud

[1] As reported by weather.maltairport.com on 1 Dec 2015 at 12:10 at Luqa Airport

[2] Our observation

Comments

All holes are at the top shelf of the quarry. The two blasts were grouped as one pair and detonated by two short circuit exploders in quick sequence and captured as one event by the seismograph.

Notes about Monitoring

The seismograph was placed at the entrance to the “girna”. 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	11:36	
No. of Holes	16	16
No. of Delays	16	16
Depth of Holes (m)	21	21
Max. Charge per Delay (kg)	48	48
Total Charge (kg)	763	763
Dist. from Seismograph (m)	160	160
PPV (mm/s)	1.62	
Frequency (Hz)	42	
Air Overpressure (dB L)	122.5	
Scaled Distance (m kg^{-1/2})	23.1	23.1

Burden is an average of 2 metres, and distance between holes is an average of 2.3 metres.

Weights in kilograms are rounded-up to the nearest 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.

Anthony Cini B.Sc.

DATA COLLECTION SHEET

Date:	1-12-15		MIC for HG12 is varies with dist. from girna
Quarry Name & Number:	HG12 - Ta' Klement, l/o Qala Gozo	Quarry Operator:	Road Constructions Ltd.
Police Escort:	No: PC1142 Name: PIERRE FARRUGIA.		
Blasting carried out by:	Company: FRANK GRIP LTD. Name: MARIO CALLEJA		
Seismograph readings by:	ACINI, RAPHAEL NICALEF.		


Blast	Time	Holes	Delays	Dist. (m)	Depth		Total charge		Max. Chrg.	PPV mm/s	Freq. (Hz)	Air (dB)
					(ft)	(m)	Bags	(kg)				
1	11:36:40	16	16	160	70	21	30 1/2	762 1/2	48	1.62	42	122.5
2		16	16	160	70	21	30 1/2	762 1/2	48			
3		32					61	1525				
4												
5												
6												
7												
8												
9												
10												
11												
12												

Location of Seismograph	<input checked="" type="checkbox"/> Nearest Girna (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: 2.5 m Distance from rock face (burden): 2 m		
Notes	Any horizontal holes? ... No... Any blast made up of holes of different-depth? ... No... Why? ... Any blasts grouped together and detonated using multiple (almost simultaneous) short-circuit exploders? ... Yes... Why? ... Any visitors before/during/after blast? ... Nobody... (note names and organizations) Any complaints from neighbours? ... None Reported to us... (note names, number of persons/households?) Note levels of holes: ... (1,2) Top Shell Flyrock observation: ... None Outside... Any damage to quarry surroundings? ... None Observed		
Further Comments	* Yes, as indicated, to reduce blasts due to work process. * Cloud Cover - 100% high clouds.		

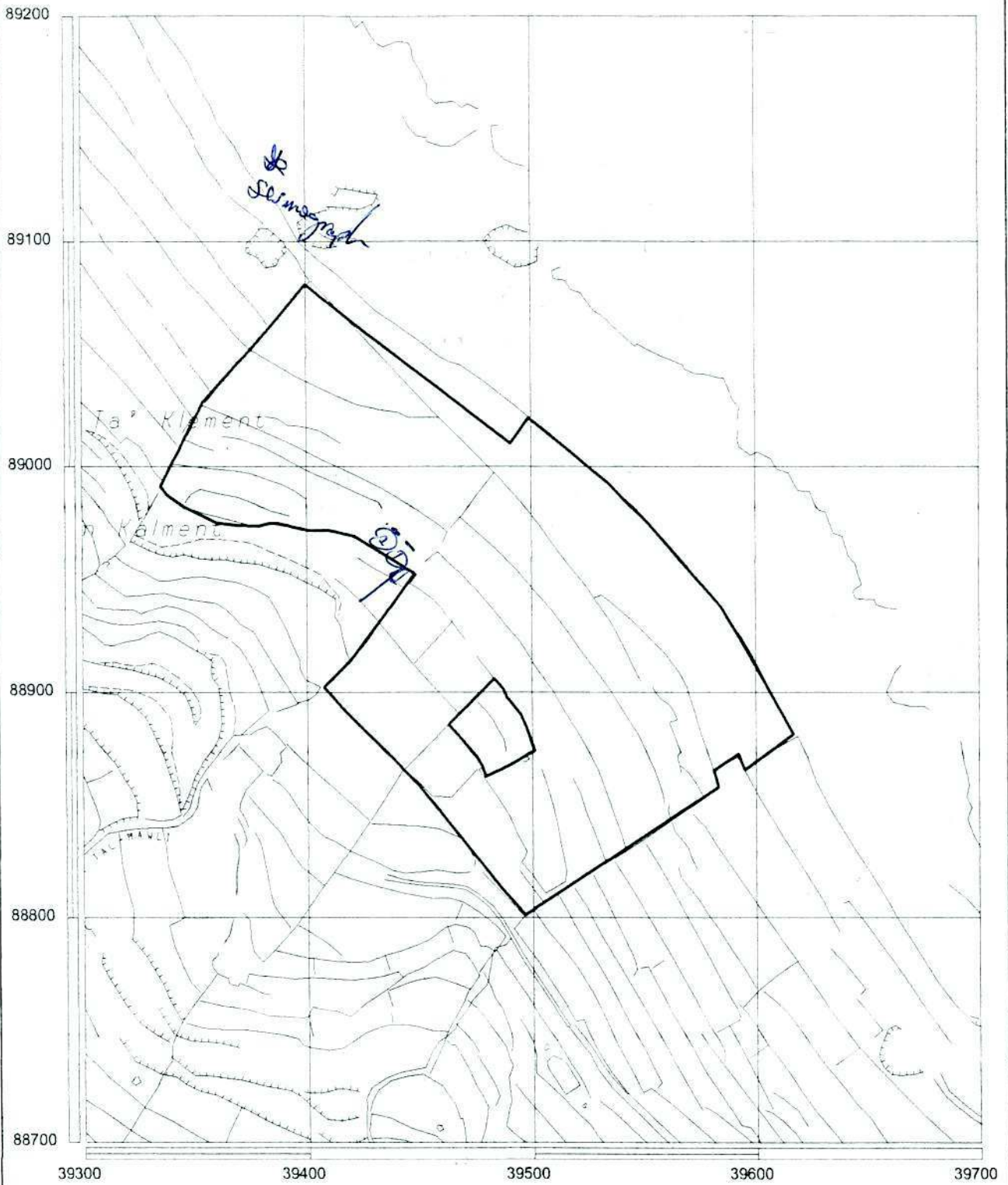
(use overleaf if more space is required)

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

Permitted Quarry Area :- 34010 sqm

Scale :- 1:2500

Permitted Quarry Depth :- 5 m amsl

Part of Survey Sheet(s): 3888 3889

Date :- 11/9/06

1-12-15

Date/Time Long at 11:36:40 December 1, 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 K488G4U5.L40

Notes

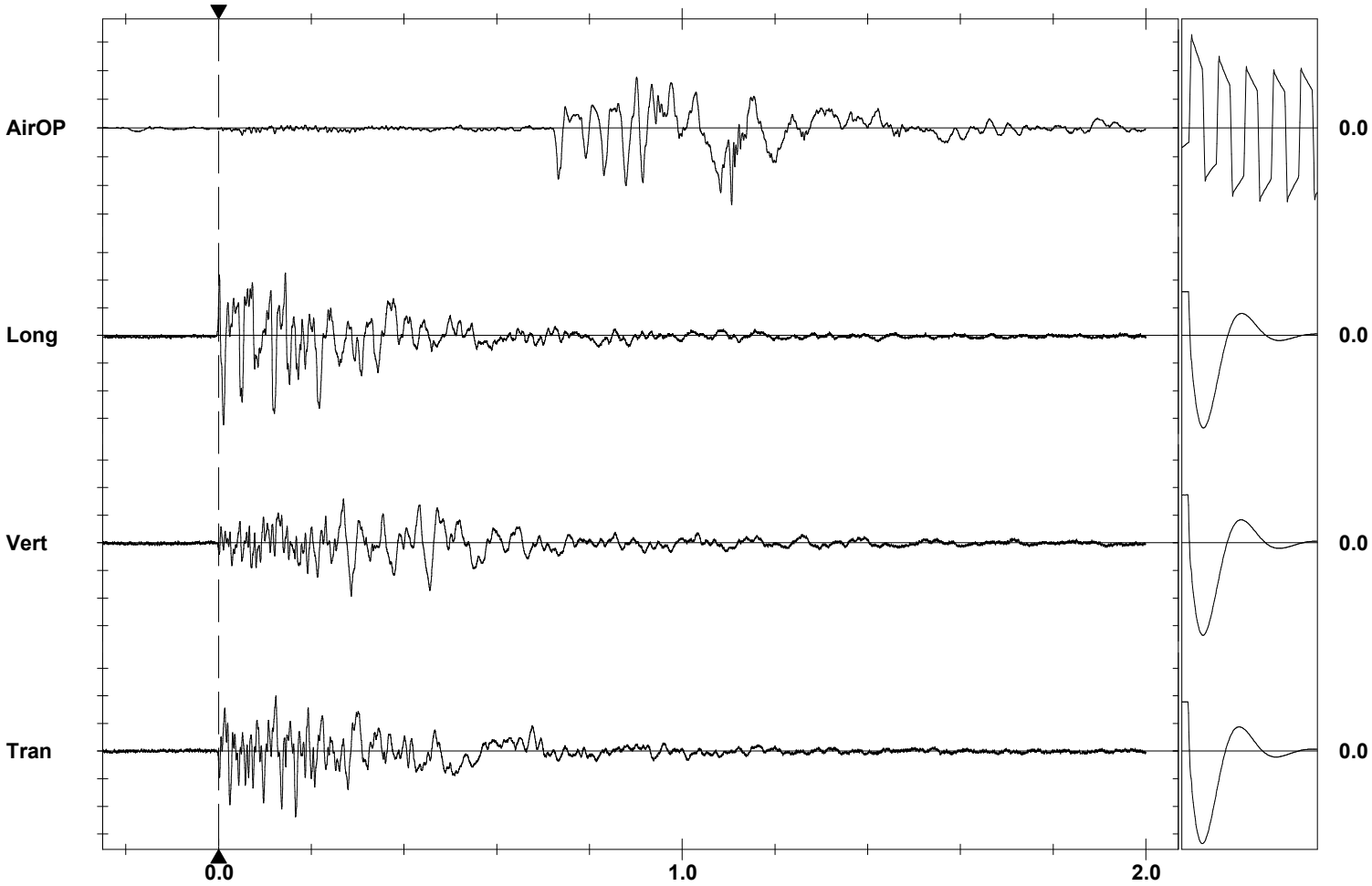
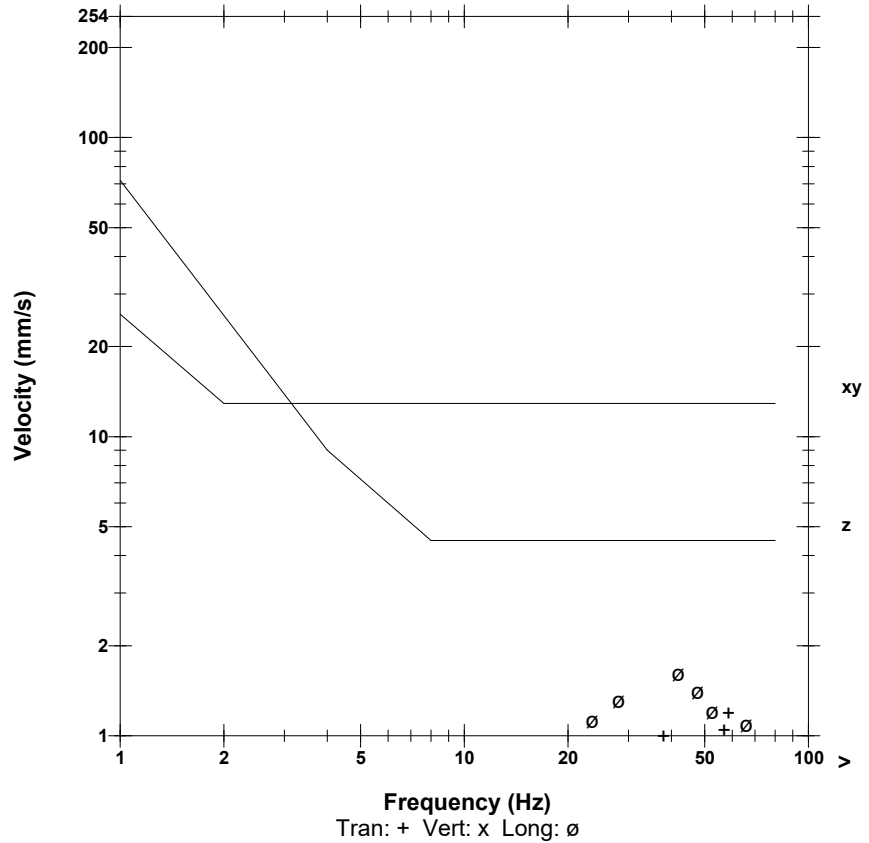
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 122.5 dB(L) 26.75 pa.(L) at 1.107 sec
ZC Freq 6.0 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 509 mv)

	Tran	Vert	Long	
PPV	1.191	0.968	1.619	mm/s
PPV	52.52	50.72	55.19	dB
ZC Freq	59	24.4	42	Hz
Time (Rel. to Trig)	0.166	0.286	0.011	sec
Peak Acceleration	0.053	0.040	0.080	g
Peak Displacement	0.010	0.006	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.3	7.2	Hz
Overswing Ratio	3.9	4.1	4.3	

Peak Vector Sum 1.691 mm/s at 0.011 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