

BLAST MONITORING REPORT

HM33 Hard Stone Quarry at Ta' Bellula, l/o Siggiewi

17th December 2015

Details

Date	17-12-2015
Quarry number	HM33 – Hard Stone Quarry at Ta' Bellula, Għar Lapsi, l/o Siggiewi
Quarry operator	Polidano Bros. Ltd.
ANFO Supplier	Framegrip Ltd
Police escort	PC 818 – J Farrugia

Location and time of blasting

Four blasts were carried out, at 11:51 at approximately the points as indicated on the attached site diagram.

Summary of blasting conditions

Maximum charge per delay: 25 Kg

Vibration limits: 4 mm/s (20 to 40Hz) at the nearest sensitive point within 200m

Air overpressure limit: 120dB (L)

Site Specific Permit

All holes were within quarry boundaries and within maximum depth.

Maximum charge per delay of 25Kg was not exceeded.

Weather Conditions

Humidity ^[1]	Wind ^[1]	Temp. ^[1]	Atm. Pressure	Cloud Cover ^[2]
58%	10 Knots NE	16C	1026 hPa	Clear

[1] As reported by weather.maltairport.com on 17 Dec 2015 at 11:40 at Luqa Airport [2] Our observation

Comments

All holes are at the middle shelf of the quarry.

The four blasts were grouped as two pairs and each pair was detonated by means of two short-circuit-exploders in very quick sequence and captured as one event by the instrument.

Notes

Seismograph was placed outside the walls of the quarry at the west-most part of the quarry up the country-road off the main-road. Seismograph was set to trigger at 0.50 mm/s. Seismograph used is a MiniMate+ serial number BE9488. Neither the ground vibration nor the air overpressure was strong enough to trigger the instrument for blasts number 3 and 4.

Readings

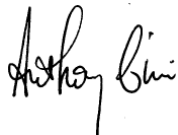
Blast number	1	2	3	4
Time	11:51		11:51	
No. of holes	14	14	14	14
No. of delays	14	14	14	14
Depth of holes (m)	9.5	9.5	9.5	9.5
Max. Charge per delay (kg)	25	25	25	25
Total charge (kg)	350	350	350	350
Dist. from seismograph (m)	220	220	220	220
PPV (mm/s)	1.13		<0.50	
Frequency (Hz)	19.7		N/a	
Air Overpressure (dB)	119.1		<115	
Scaled Distance (m kg^{-1/2})	44.0	44.0	44.0	44.0

Burden is an average of 2 metres, and distance between bore-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 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 and Recommendations

There was no flyrock outside quarry boundaries. No damage to the surroundings of the quarry was observed during a brief inspection after the blasting.



**Anthony
Cini**

Anthony Cini B.Sc.

DATA COLLECTION SHEET

Date:	17 Dec 2015		MIC for HM33 is 25Kg
Quarry Name & Number:	HM33 - Ta' Bellula, I/o Siggiewi	Quarry Operator:	Polidano Bros. Ltd.
Police Escort:	No: PC 818 Name: J. Farrugia		
Blasting carried out by:	Company: FRAMEGRIP LTD.	Name:	
Seismograph readings by:	A CINI		

BLAST DETAILS

Blast	Time	Holes	Delays	Dist. (m)	Depth		Total charge		Max. Chrg.	PPV mm/s	Freq. (Hz)	Air (dB)	
					(ft)	(m)	Bags	(kg)					
1	11:51	14	14	220	30		14	350	25	1.13	19.7	119.1	
2	---	14	14	220	30		14	350	25				
3	11:51	14	14	220	30		14	350	25	20.80	N/A	<115	
4	---	14	14	220	30		14	350	25				
5	/								1400	1400			
6	/												
7	/												
8	/												
9	/												
10	/												
11	/												

BLAST CHARACTERISTICS

Burden	Distance between boreholes: 2.5 m Distance from rock face (burden): 2 m
Levels of holes: (top/mid/low shelves)	Mid Shelf
Note any horizontal holes?	None
Note any blasts having holes of varying depths	None
Note any grouping of blasts?	Yes. 1+2, 3+4: Two explosives. operational seasons. speed of process
Any other notable blasts characteristics	None.

OBSERVATION OF WEATHER CONDITIONS

Cloud Cover% [High / Low] Cloud	clear	Precipitation	(No) Light / Medium / Heavy] showers
Wind	[calm / light breeze] strong wind]		Approx. direction:	[N / S] E / W / / N/A]

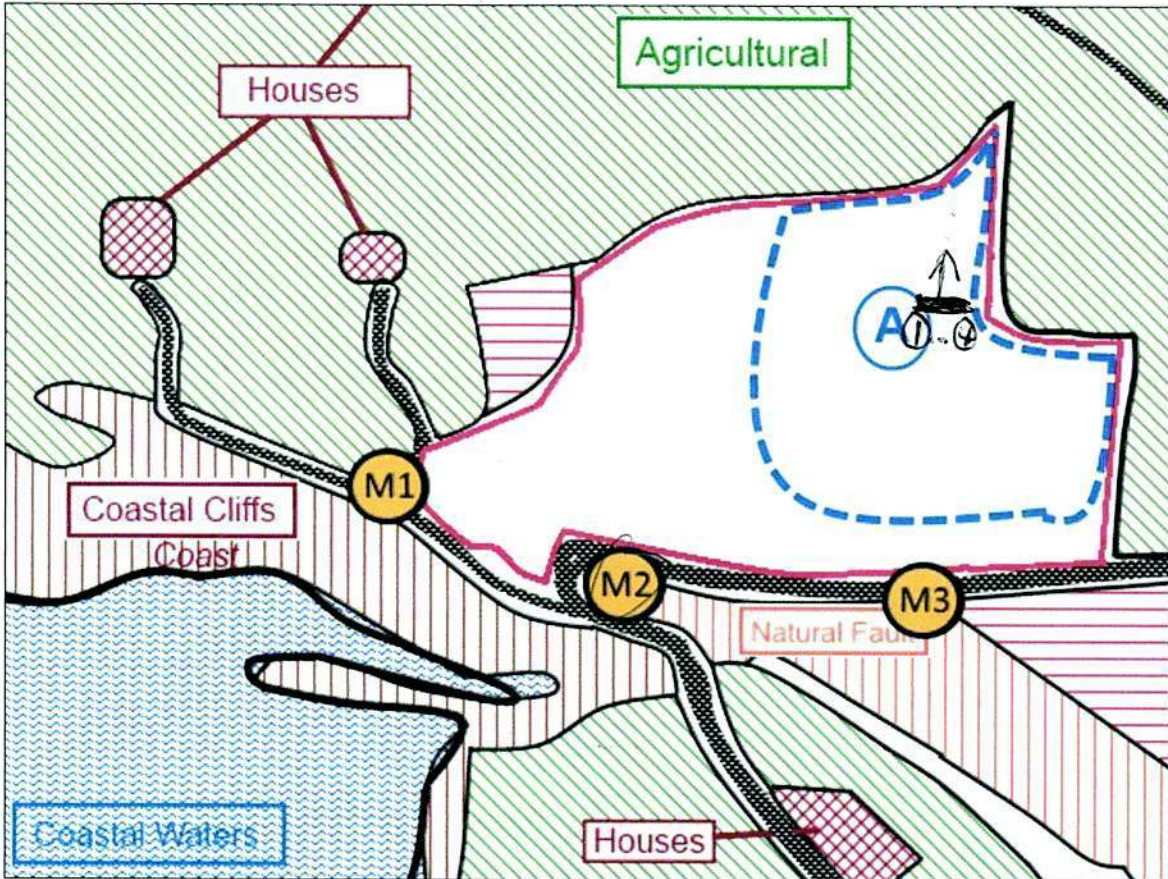
OTHER

Any visitors before/during/after blasts?	No body. [if yes, who? why?]
Any complaints from neighbours?	None reported to us [names/organisations]

MONITORING DETAILS

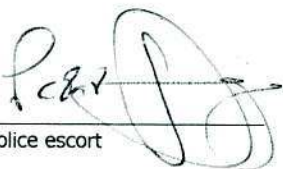
Location of Seismograph	<input type="checkbox"/> M1: West side of quarry	<input checked="" type="checkbox"/> M2: at the twist of the main-road (Triq Ghar Lapsi)
	<input type="checkbox"/> M3: Just outside quarry walls, along the road (Triq Ghar Lapsi)	<input type="checkbox"/> Other:

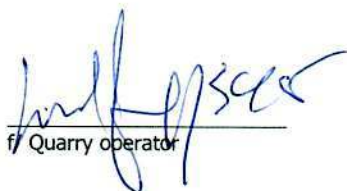
Indicate location of blasts on the diagram below after having observed their location in respect to quarry boundaries and other landmarks. Number each blast in the order that they are planned to be detonated and include rock-face direction. Indicate the location of the instrument.

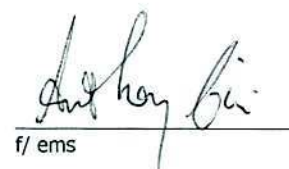


Observation after blast:	No flyrock outside quarry, No damage observed. [Note any flyrock outside quarry, excessive noise, dust clouds, and damage to surroundings]
--------------------------	--

Signatures


Police escort


f/ Quarry operator


f/ ems

Date/Time Long at 11:51:22 December 17, 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 5.9 Volts
Unit Calibration August 20, 2015 by Datum Monitoring
File Name K488G5NS.XM0

Notes

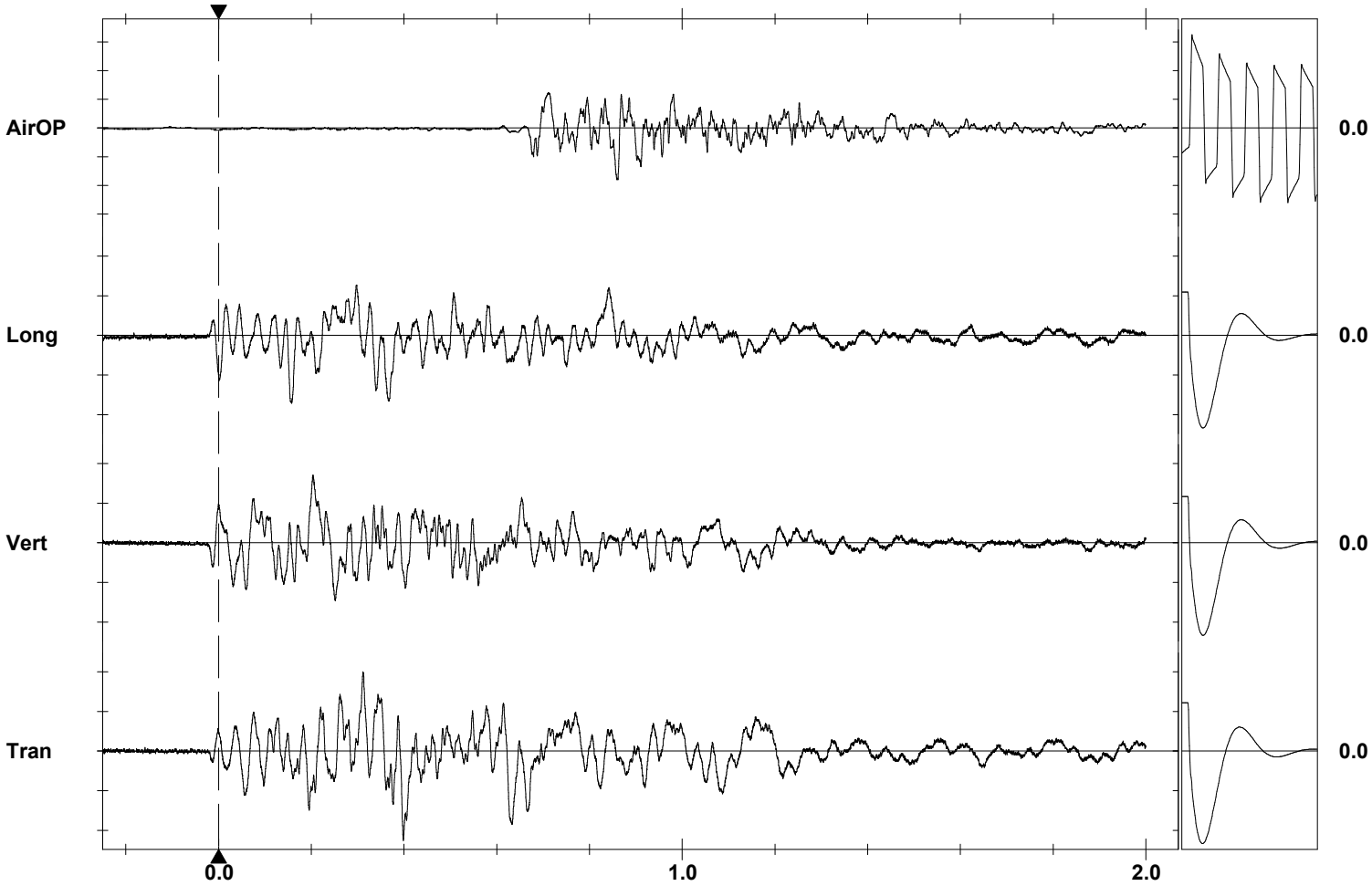
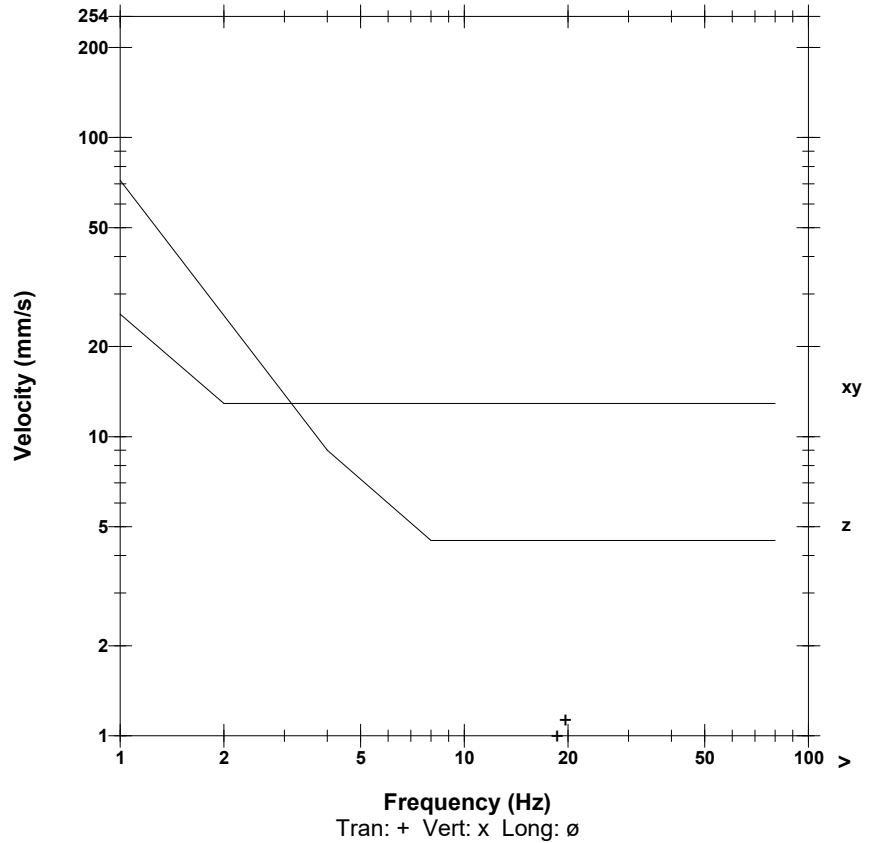
Location: Quarry Blasting
 Client:
 User Name: ems
 General:

Microphone Linear Weighting
PSPL 119.1 dB(L) 18.00 pa.(L) at 0.859 sec
ZC Freq 22.3 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 620 mv)

	Tran	Vert	Long	
PPV	1.127	0.857	0.857	mm/s
PPV	52.04	49.66	49.66	dB
ZC Freq	19.7	15.8	29.3	Hz
Time (Rel. to Trig)	0.399	0.204	0.158	sec
Peak Acceleration	0.040	0.027	0.027	g
Peak Displacement	0.010	0.007	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.3	7.3	Hz
Overswing Ratio	3.9	4.1	4.3	

Peak Vector Sum 1.210 mm/s at 0.399 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