

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-7 Max. Charge Weight: 210 Date of Blast: 10-14-11
 Northing: 37° 59' 12.4 N Blast Duration: 309 ms Time of Blast: 12:03
 Easting: 122° 27' 17 W Blast Number: 1560

Seismograph Model	2000	MICRO	MICRO	M.C.C.O
Serial Number	4181	4550	4567	4570
Last Calibration Date	5-24-11	5-26-11	5-26-11	5-26-11

Location	Marina Bay	Ves. Montebello	San Marino	M ^c Near Park
Northing	37° 59' 19.4 N	37° 59' 18.4 N	37° 59' 31.1 N	37° 59' 30.4 N
Easting	122° 27' 22.4 W	122° 27' 53.4 W	122° 27' 30.4 W	122° 27' 16.4 W
Distance from Blast	298	295	220	1848
Scaled Distance	61	203	156	127

Longitudinal Peak Particle Velocity (ips)	.10	.06	.04
Longitudinal Peak Frequency (Hz)	26.3	26.3	30.0
Transverse Peak Particle Velocity (ips)	.12	.07	.05
Transverse Peak Frequency (Hz)	20.8	.6	17.8
Vertical Peak Particle Velocity (ips)	.13	.07	.06
Vertical Peak Frequency (Hz)	62.5	4.2	41.6
Peak Vector Sum (ips)	.14	.10	.07
Peak Air Overpressure (db)	109	100	106

Seismograph Operator: Ren Joo Signature: Ren Joo

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA

Location: PB-7 Designed Bench Height (ft): 40' Date: 10.17.11
 Northing: 32° 51' 12 N Rock Density (lb/ft³): 2.7 Time: 12:03
 Easting: 122° 27' 17 W Relative Rock Hardness: 7 Blast Number: * 1560

DESIGN DATA

Number of Holes Shot: 15 Hole Dia. (in.): 6 3/4 Stemming (ft): 18 Loading Time Required (min hrs): 6 Deck Type: 3/4" slabs
 Ave. Hole Depth (ft): 43 Burden (ft): 15 Stem Type: 3/4" slabs Staggered Pattern (y or n): N Length (ft): 5
 Relative Confinement: _____ Spacing (ft): 15 Subdrill (ft): 5 Number of Lost Holes: 0 Tons Shot: 11,150

EXPLOSIVES DATA

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole):
<u>TRICAL MIN</u>	<u>6000</u>	<u>450g</u>	<u>30</u>	<u>80.62</u>	<u>15</u>			<u>400</u>
				<u>50.62</u>	<u>15</u>			<u>Blast Duration (sec): 309ms</u>
				<u>40ms</u>	<u>2</u>			
				<u>17ms</u>	<u>1</u>			<u>Total Charge Wt.: 6050</u>

VIBRATION DATA

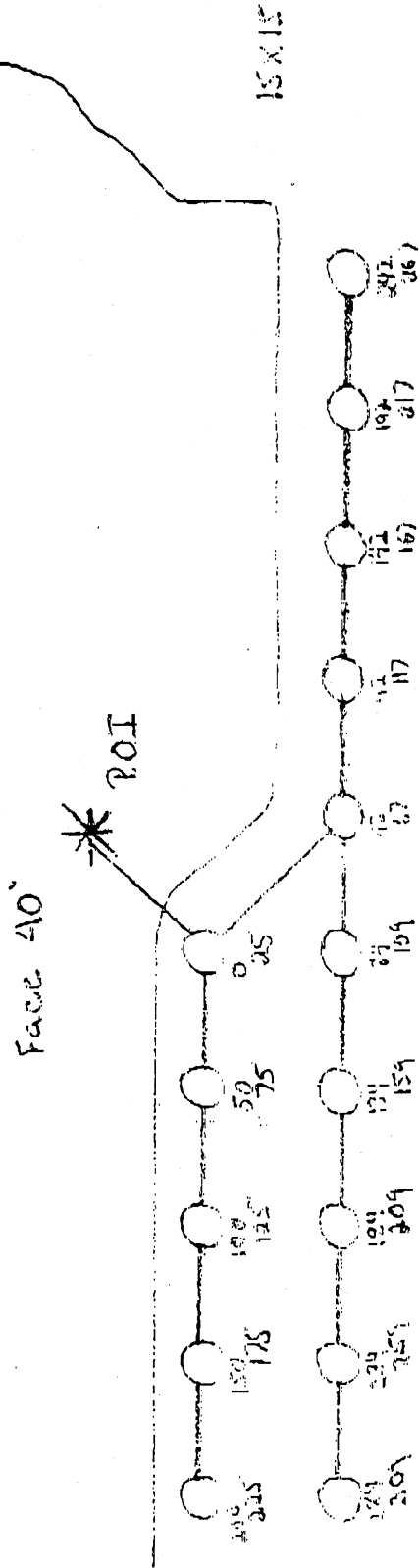
Nearest Structure: Quarry Seismograph Loc.: 56416 Temperature: 82° Max. Chrg. (lb/ft³ms): 210
 Northing: 32° 51' 12 N Northing: _____ Sky Condition: Clear RPPV: 14
 Easting: 122° 27' 17 W Easting: _____ Wind Direction: W Frequency: 62.5
 Distance Away: 818 Distance Away: _____ Wind Speed: 0.1 Airblast: 109

PERFORMANCE DATA

Powder Factor (lb/ton): 1.5 Displacement: Great Crushability: _____
 Lb/yd³: 1.20 Vibration: Great Fines: _____
 Fragmentation: Great Dig ability: _____

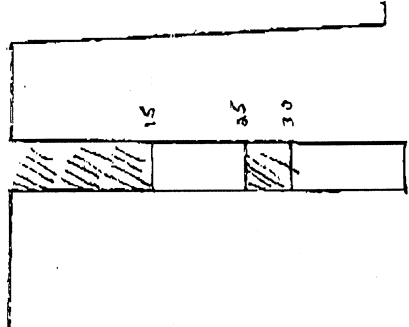
Comments: Decked Blaster in Charge: [Signature]

10.H.11
PB-7
#1560



15. Holes
15 = 80' EZ
15 = 50' EZ
2 = 42MS
1 = 17MS
6,020 lbs

Depth = 43'



Main: 898
V.M. = 2556
SM = 2270
M.N. = 1848
37° 59' 12" N
122° 27' 17" W

GeoSonics Inc. Seismic Analysis

Stop Event Report

Serial No: 9669 v3.23
Client: COUNTY MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 114 SAN MARINO DRIVE
Distance:
Operator: VIBRA-TECH GSM
Comment: VERONIQUE RASKIN

Begin Date: 10/14/2011 07:00:50 (UTC-7)
End Date: 10/14/2011 12:41:34 (UTC-7)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.9

Additional Info:

j-GEO-01254
N37 59.395, W122 27.700

Shaketable Calibrated: 01/26/2011
By: Vibra-Tech, Inc.
2700 Holloway Road - Suite 113
Louisville, KY 40299 U.S.A.
TEL: 502.240.9900 FAX: 502.240.9902

Dynamic Calibration Graph:



Cal Test Results:

Longitudinal: Pass
Transverse: Pass
Vertical: Pass
Sound: Pass

The seismograph at 114 San Marino Drive (S/N 9669) did not trigger during the shot on October 14, 2011 at approximately 12:00 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.

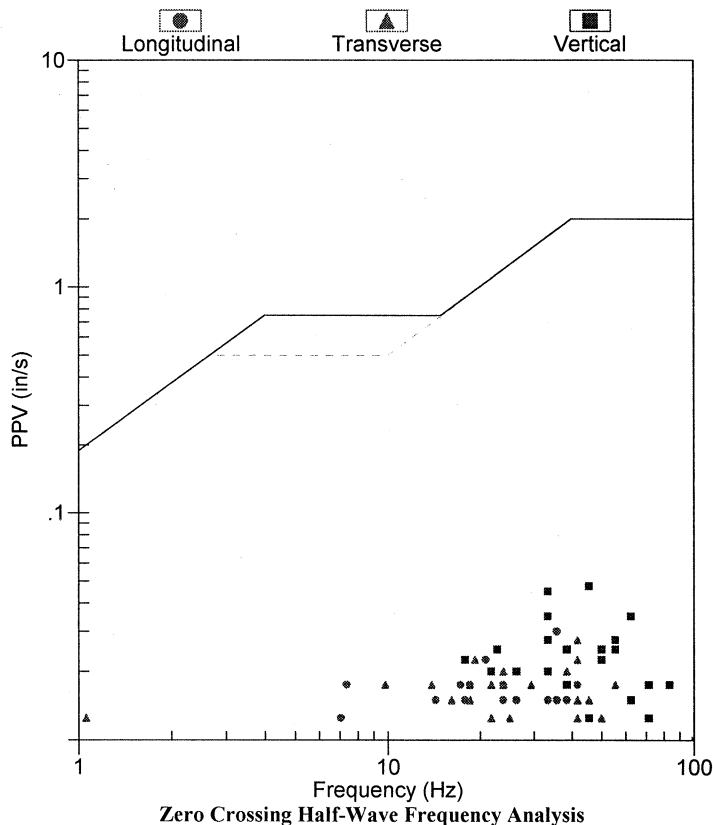
GeoSonics Inc. Seismic Analysis

Velocity Waveform Analysis

Serial No: 7155 v3.23
Date: 10/14/2011 12:00:28 (UTC-7)
Event No: 9
Record Time: 5.0 s
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 16 MARIN BAY PARK CT.
Distance:
Operator: VIBRA-TECH GSM
Comment: WILLIAM HOSKEN RESIDENC
Seismic Trigger: 0.030 in/s

USBM Safe Blasting Levels

SN: 7155 Event: 9



	Summary Data		
	L	T	V
PPV (in/s)	0.030	0.028	0.048
FREQ (Hz)	35.7	41.7	45.5
PD (.001")	0.22	0.18	0.24
PPA (g)	0.020	0.026	0.033
Peak Vector Sum :	0.050 in/s		
Peak Air Pressure:	102 db		
	0.00043 PSI @ 2.4 Hz		

Additional Info:

j-GEO-01252
N37 59.524, W122 27.373

Shaketable Calibrated: 01/26/2011

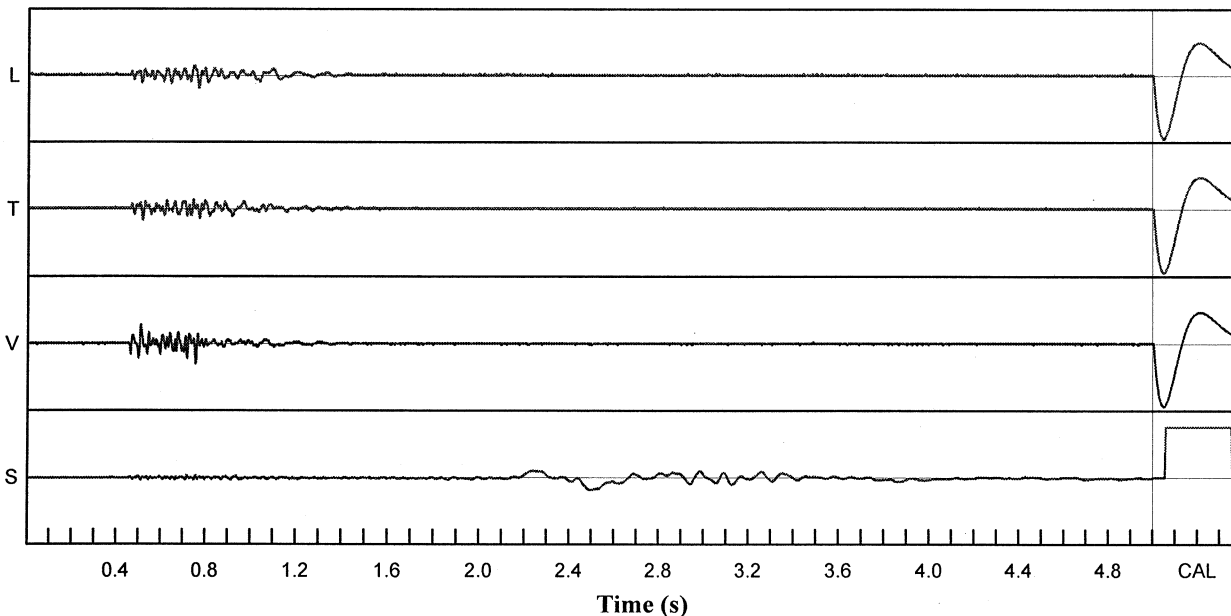
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40299 U.S.A.
 TEL: 502.240.9900 FAX: 502.240.9902

Velocity Waveform Graph Scale

Time Scale: 0.100 s
Seismic Scale: +/- 0.160 in/s
Sound Scale: +/- 0.0023 PSI

Velocity Waveform

SN: 7155 Event: 9



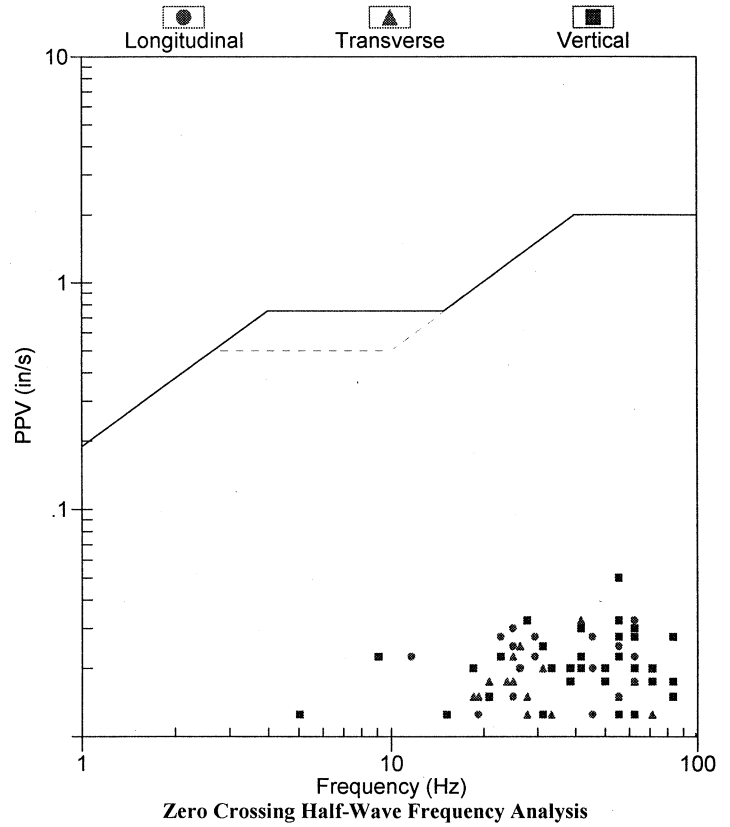
GeoSonics Inc. Seismic Analysis

Velocity Waveform Analysis

Serial No: 9856 v3.23
Date: 10/14/2011 12:00:32 (UTC-7)
Event No: 8
Record Time: 5.0 s
Client: COUNTY MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance:
Operator: VIBRA-TECH GSM
Comment:
Seismic Trigger: 0.030 in/s

USBM Safe Blasting Levels

SN: 9856 Event: 8



	Summary Data		
	L	T	V
PPV (in/s)	0.033	0.033	0.050
FREQ (Hz)	62.5	41.7	55.6
PD (.001")	0.28	0.20	0.30
PPA (g)	0.033	0.033	0.046
Peak Vector Sum :	0.058 in/s		
Peak Air Pressure:	107 db		
	0.00071 PSI @ 8.2 Hz		

Additional Info:

j-GEO-01253
N37 59.481, W122 27.256

Shaketable Calibrated: 01/27/2011

By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40299 U.S.A.
 TEL: 502.240.9900 FAX: 502.240.9902

Velocity Waveform Graph Scale

Time Scale: 0.100 s
Seismic Scale: +/- 0.160 in/s
Sound Scale: +/- 0.0023 PSI

Velocity Waveform

SN: 9856 Event: 8

