

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-7 Max. Charge Weight: 400 Date of Blast: 2.3.12
 Northing: 37° 54' 11" N Blast Duration: 260ms Time of Blast: 11:30
 Easting: 122° 27' 16" W Blast Number: 1567

SEISMOGRAPH INFORMATION			
Seismograph Model	MICRO	MICRO	MICRO
Serial Number	4550	4567	4570
Last Calibration Date	5.26.11	5.26.11	5.26.11

LOCATION INFORMATION			
Location	Via Humboldt	San Marino	off Near Park
Northing	37° 54' 18" N	37° 54' 31" N	37° 54' 30" N
Easting	122° 27' 53" W	122° 27' 30" W	122° 27' 16" W
Distance from Blast	3168	2326	1848
Scaled Distance	50	118	92

VIBRATION INFORMATION			
Longitudinal Peak Particle Velocity (ips)	.12	.06	.09
Longitudinal Peak Frequency (Hz)	31.2	16.6	25.0
Transverse Peak Particle Velocity (ips)	.15	.07	.07
Transverse Peak Frequency (Hz)	21.7	5.3	31.2
Vertical Peak Particle Velocity (ips)	.15	.08	.10
Vertical Peak Frequency (Hz)	27.4	15.1	27.7
Peak Vector Sum (ips)	.18	.09	.12
Peak Air Overpressure (db)	117	106	112

GENERAL COMMENTS

Seismograph Operator: _____ Signature: _____

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-7 Date: 2 3 12
 Northing: 37° 59' 11 N Time: 11:31
 Easting: 122° 27' 15 W Blast Number: 1567
 Designed Bench Height (ft): 37.336/40
 Rock Density (lbd³): 2.23
 Relative Rock Hardness: 7

DESIGN DATA:

Number of Holes Shot: 18 Hole Dia. (in.): 6 3/4 Loading Time Required (man hrs): 5 Deck Type: _____
 Ave. Hole Depth (ft): 34 3/4 Burden (ft): 17 Stemming (ft): 18 20 Staggered Pattern (y or n): N Length (ft): _____
 Relative Containment: _____ Spacing (ft): 14 Subdrill (ft): 2 Number of Lost Holes: 0 Tons Shot: 9 1/2

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Misc.	Units	Max (lb/hole)	Blast Duration (sec)
<u>ANFO</u>	<u>6060</u>	<u>450</u>	<u>36</u>	<u>80.52</u>		<u>18</u>	<u>100</u>	
<u>Dyno AP 3x16</u>	<u>4550</u>			<u>50.52</u>		<u>18</u>		<u>360.5</u>
				<u>420.5</u>		<u>5</u>		
				<u>120.5</u>		<u>1</u>		<u>Total Charge Wt: 6764</u>

VIBRATION DATA:

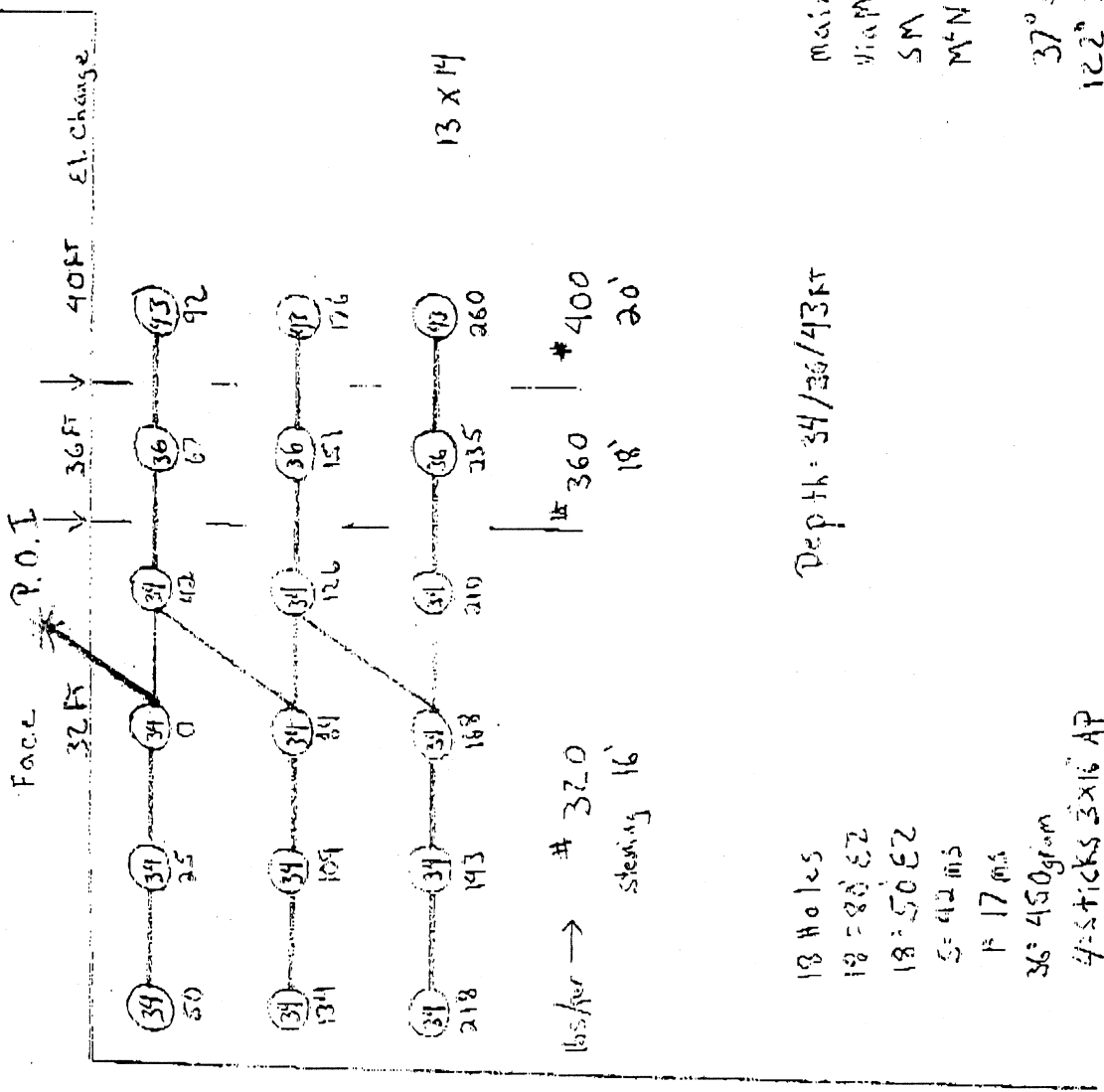
Nearest Structure: MELIN 59 Seismograph Loc.: Same Temperature: 59° Max. Chrg. (lb/8ms): 400
 Northing: 37° 59' 19 N Northing: _____ Sky Condition: Clear RPPV: .18
 Easting: 122° 27' 22 W Easting: _____ Wind Direction: NO Frequency: 29.4
 Distance Away: 1003 Distance Away: _____ Wind Speed: 8-10 mph Airblast: 117

PERFORMANCE DATA:

Powder Factor (lb/ton): .6 Displacement: Great Crushability: _____
 Lb/yd³: 1.4 Vibration: Great Fines: _____
 Fragmentation: Great Dig ability: _____

Comments: _____ Blaster in Charge: [Signature]

2.3.12
 PB-7
 #1567



Comp to PB-8

Main 1003
 VMA 2168
 SM 2376
 MFM 1848
 37° 59' 11N
 122° 27' 15W

Depth = 34/36/43 FT

18 Holes
 18 = 80' EZ
 18 = 50' EZ
 5 = 42' ms
 17 ms
 36 = 450 gram
 4 = sticks 3x16 AP
 60 60 lbs titan

GeoSonics Inc. Seismic Analysis

Stop Event Report

Serial No: 7334 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 114 SAN MARINO DRIVE
Distance:
Operator: VIBRA-TECH GSM
Comment: Veronique Raskin Res.

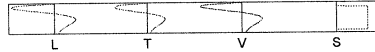
Begin Date: 02/03/2012 06:00:50 (UTC-8)
End Date: 02/03/2012 12:19:22 (UTC-8)
Events over Trigger: 0 (5-4)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.9

Additional Info:

j-GEO-01254
N37 59.395, W122 27.700

Shaketable Calibrated: 01/16/2012
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 7334) did not trigger during the shot on February 3, 2012 at approximately 11:30 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: 7179 v3.23
Date: 02/03/2012 11:30:24 (UTC-8)
Event No: 2
Record Time: 5.0 s
Client: COUNTY OF 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: 7179 Event: 2

	Summary Data		
	L	T	V
PPV (in/s)	0.040	0.028	0.055
FREQ (Hz)	35.7	20.8	31.3
PD (.001")	0.20	0.47	0.29
PPA (g)	0.033	0.026	0.052
Peak Vector Sum :	0.055 in/s		
Peak Air Pressure:	110 db		
	0.00089 PSI @ 1.8 Hz		

Additional Info:

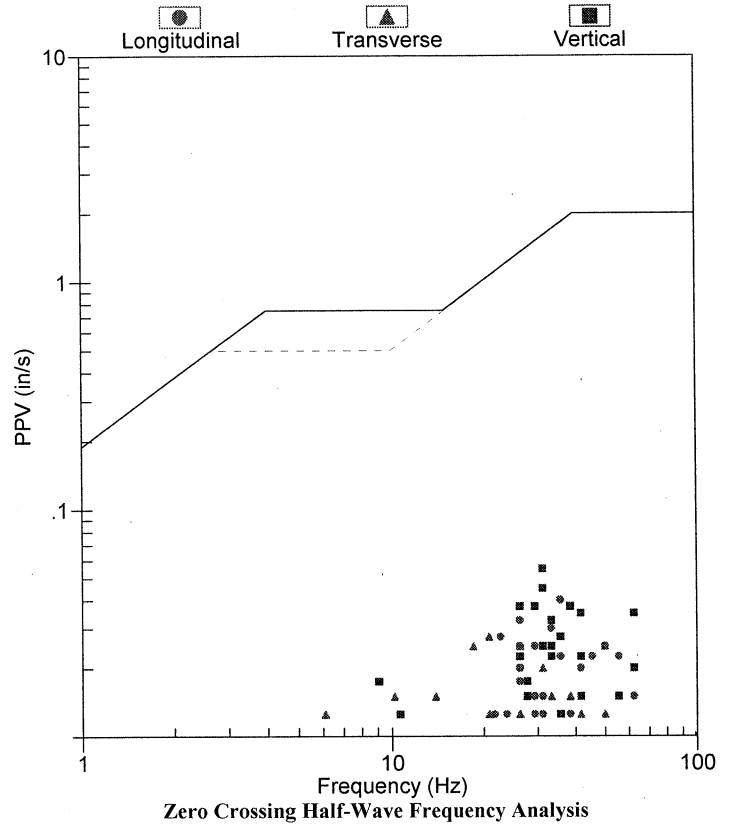
j-GEO-01253
N37 59.481, W122 27.256

Shaketable Calibrated: 01/13/2012

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

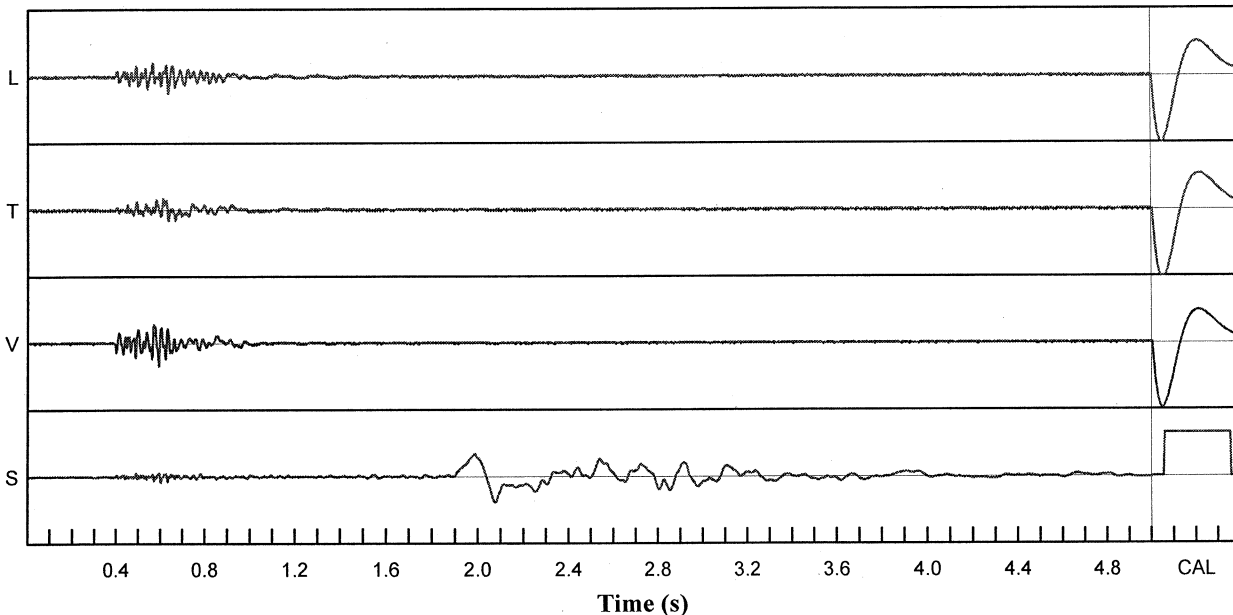
Velocity Waveform Graph Scale

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



Velocity Waveform

SN: 7179 Event: 2



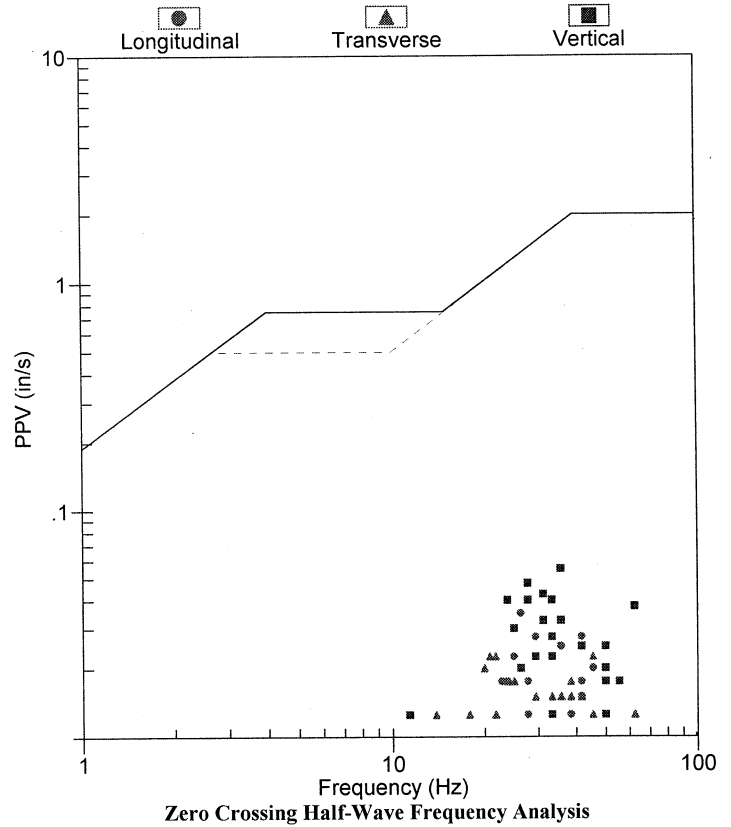
GeoSonics Inc. Seismic Analysis

Velocity Waveform Analysis

Serial No: 7257 v3.23
Date: 02/03/2012 11:30:25 (UTC-8)
Event No: 2
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: 7257 Event: 2



	Summary Data		
	L	T	V
PPV (in/s)	0.035	0.023	0.055
FREQ (Hz)	26.3	45.5	35.7
PD (.001")	0.21	0.25	0.28
PPA (g)	0.020	0.020	0.052
Peak Vector Sum :	0.055 in/s		
Peak Air Pressure:	109 db		
	0.00086 PSI @ 1.4 Hz		

Additional Info:

j-GEO-01252
N37 59.524, W122 27.373

Shaketable Calibrated: 01/13/2012

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: 7257 Event: 2

