

# SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: RB-8      Max. Charge Weight: 500      Date of Blast: 4 30 12  
 Northing: 37°59'10N      Blast Duration: 319ms      Time of Blast: 11:31  
 Easting: 122°27'16W      Blast Number: 1573

SEISMIC INFORMATION	
Seismograph Model	2000
Serial Number	2481
Last Calibration Date	5 24 11
LOCATION INFORMATION	
Location	Micro
Serial Number	4550
Last Calibration Date	5 26 11
GENERAL INFORMATION	
Location	Micro
Serial Number	4578
Last Calibration Date	5 26 11

Location	Via Montebello	San Marino	McNear Park
Northing	37°59'18N	37°59'31N	37°59'30N
Easting	122°27'53W	122°27'30W	122°27'16W
Distance from Blast	3062	2481	2059
Scaled Distance	136	110	92

VELOCITY INFORMATION	
Longitudinal Peak Particle Velocity (ips)	.18
Longitudinal Peak Frequency (Hz)	16.6
Transverse Peak Particle Velocity (ips)	.17
Transverse Peak Frequency (Hz)	20.8
Vertical Peak Particle Velocity (ips)	.25
Vertical Peak Frequency (Hz)	35.7
Peak Vector Sum (ips)	.25
Peak Air Overpressure (db)	114

GENERAL INFORMATION	
Longitudinal Peak Particle Velocity (ips)	.10
Longitudinal Peak Frequency (Hz)	3.9
Transverse Peak Particle Velocity (ips)	.11
Transverse Peak Frequency (Hz)	12.1
Vertical Peak Particle Velocity (ips)	.11
Vertical Peak Frequency (Hz)	12.5
Peak Vector Sum (ips)	.12
Peak Air Overpressure (db)	112

Seismograph Operator: Devin Lopez      Signature: [Signature]

# SAN RAFAEL ROCK QUARRY BLAST REPORT

**BASE DATA:**

Location: PR-8      Date: 4.30.12  
 Northing: 37°59'10N      Time: 11:31  
 Easting: 122°27'16W      Blast Number: 1573  
 Designed Bench Height (ft): 45  
 Rock Density (t/yard<sup>3</sup>): 2.23  
 Relative Rock Hardness: 7

**DESIGN DATA:**

Number of Holes Shot: 16      Hole Dia. (in.): 6 3/4      Loading Time Required (man hrs): S      Deck Type: -  
 Ave. Hole Depth (ft): 47      Burden (ft): 15      Stem Type: 3/4      Staggered Pattern (y or n): N      Length (ft): -  
 Relative Confinement: -      Spacing (ft): 15      Subdrill (ft): 0      Number of Lost Holes: 10/22      Tons Shot: 13,380

**EXPLOSIVES DATA:**

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole):
Ti-Ton 1000	7260	450 gels	32	80.02	16			500
				50.02	16			Blast Duration (sec): 319ms
				42ms	1			Total Charge Wt.: 7292
				17ms	1			

**VIBRATION DATA:**

Nearest Structure: Main Cg      Seismograph Loc.: SURF      Temperature: 72°      Max. Chrg. (lb/8ms): 500  
 Northing: 37°59'19N      Northing: \_\_\_\_\_      Sky Condition: Clear      RPPV: 25  
 Easting: 122°27'22W      Easting: \_\_\_\_\_      Wind Direction: S      Frequency: 35.7  
 Distance Away: 1108      Distance Away: \_\_\_\_\_      Wind Speed: 0.2      Airblast: 14

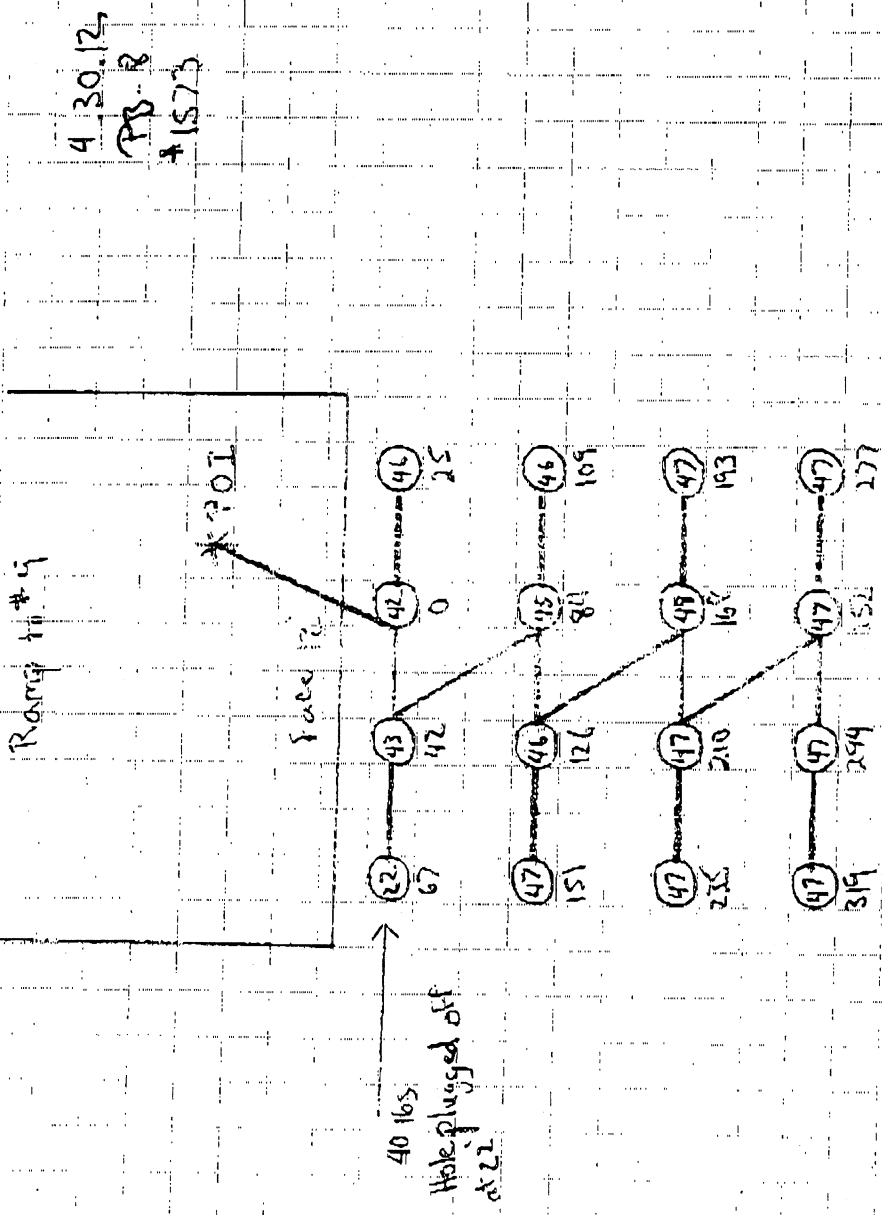
**PERFORMANCE DATA:**

Powder Factor (lb/ton): 5      Displacement: 6 ft lead      Crushability: \_\_\_\_\_  
 Lb/yard<sup>3</sup>: 1.3      Vibration: Controlled      Fines: \_\_\_\_\_  
 Fragmentation: great      Dig ability: \_\_\_\_\_

Comments: Lost hole 67ms at 25 ft from 150 lbs      Blaster in Charge: [Signature]



JOB \_\_\_\_\_ BID ITEM \_\_\_\_\_  
 ITEM \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_  
 DATE \_\_\_\_\_  
 SPEC. \_\_\_\_\_ BY \_\_\_\_\_



4-30-12  
 PB-R  
 #1573

Main 1108  
 Vicom 3062  
 ScanM 2481  
 M<sup>c</sup>M 2059

37° 59' 10" N  
 122° 23' 16" W

No Holes  
 16:00' EZdet  
 16:50' EZdet  
 7:42-MS  
 15:17-MS  
 32: 450 gram Booster

Depth = 47 ft avg  
 19 stations  
 310 lbs per

# Seismic Analysis Velocity Waveform Analysis

Serial Number: 7257  
 Firmware Version: 08-03.23  
 Event Date: 04/30/2012 11:31:39 (UTC -07:00)  
 Event number: 10  
 Recording Time: 5 s  
 Client: COUNTY OF MARIN  
 Operation: SAN RAFAEL ROCK QUARRY  
 Location: 16 MARIN BAY PARK CT.  
 Distance:  
 Operator: VIBRA-TECH GSM  
 Comment: William Hosken Residence  
 Seismic Trigger: 0.03 in/s  
 Sound Trigger: 75.9 DB

Additional Info:  
 j-GEO-01252  
 N37 59.524, W122 27.373

### Summary Data

	L	T	V
PPV (in/s):	0.0475	0.0375	0.0825
FREQ (HZ):	20.8	23.8	23.8
PD (.001"):	0.4025	0.27	0.5075
PPA (g):	0.02604	0.01953	0.05208

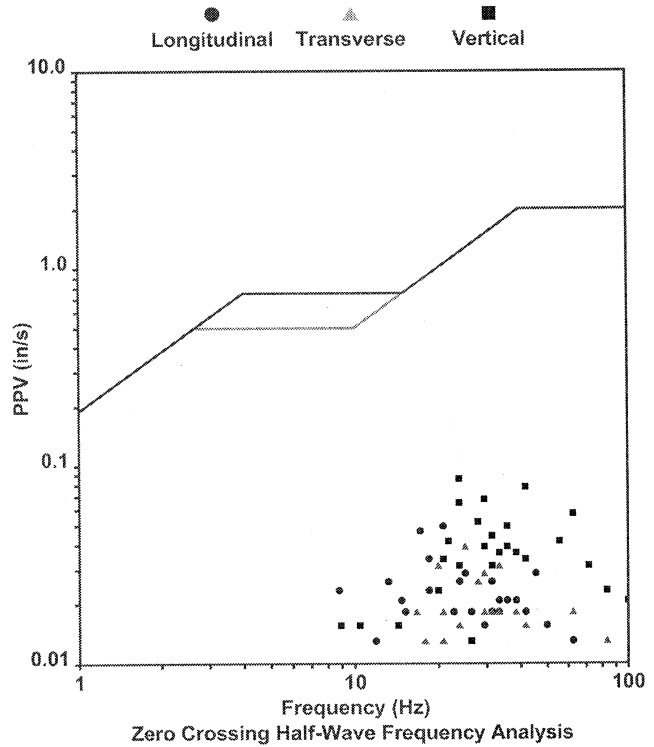
Peak Vector Sum: 0.085 in/s  
 Peak Air Pressure: 107.5 DB  
 0.0007485 psi @ 5.4 HZ

### Shaketable Calibrated

On: 01/13/2012 (UTC -07:00)  
 By: Vibra-Tech, Inc.  
 2700 Holloway Road - Suite 113  
 Louisville, KY 40203 U.S.A.

### USBM Safe Blasting Levels

SSN: 7257 Event: 10

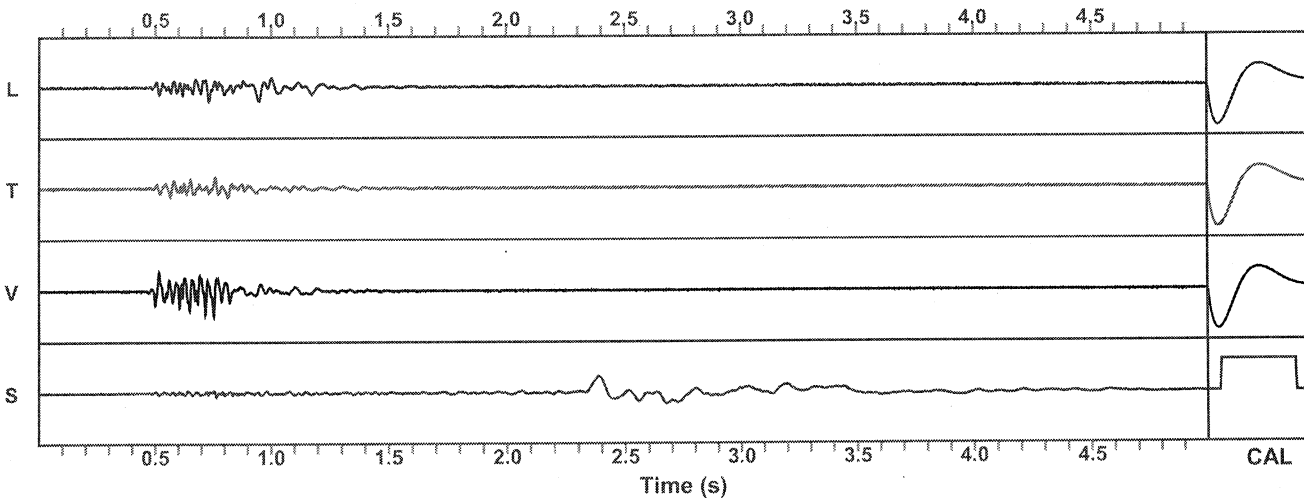


### Waveform Graph Scale

Time Scale: 0.1 s  
 Seismic Scale: +/- 0.165 in/s  
 Sound Scale: +/- 0.0023 psi

### Velocity Waveform

SSN: 7257 Event: 10



# Seismic Analysis Velocity Waveform Analysis

Serial Number: 7179  
 Firmware Version: 08-03.23  
 Event Date: 04/30/2012 11:31:39 (UTC -07:00)  
 Event number: 10  
 Recording Time: 5 s  
 Client: COUNTY OF MARIN  
 Operation: SAN RAFAEL ROCK QUARRY  
 Location: ON QUARRY PROPERTY  
 Distance:  
 Operator: VIBRA-TECH GSM  
 Comment:  
 Seismic Trigger: 0.03 in/s  
 Sound Trigger: 75.9 DB

Additional Info:  
 j-GEO-01253  
 N37 59.481, W122 27.256

### Summary Data

	L	T	V
PPV (in/s):	0.0375	0.035	0.07
FREQ (HZ):	15.2	17.2	17.9
PD (.001"):	0.395	0.31	0.4975
PPA (g):	0.03255	0.01953	0.03906

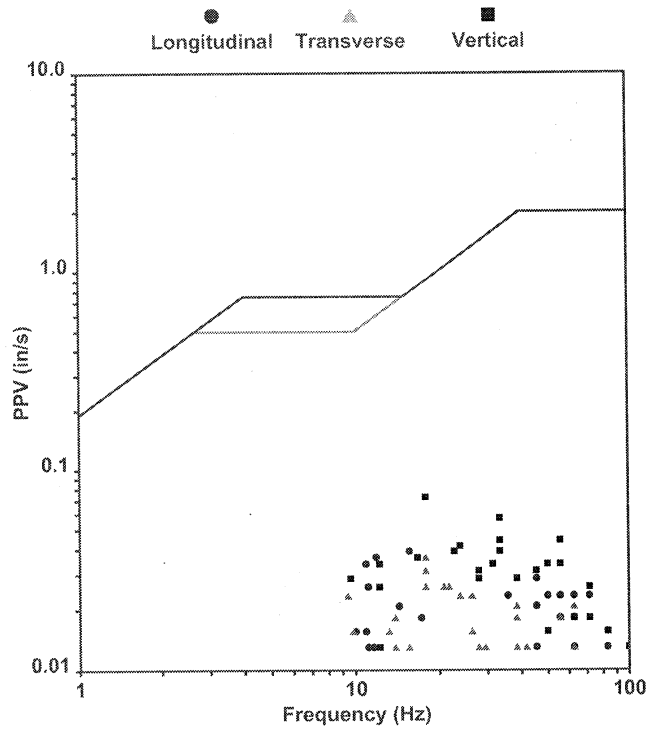
Peak Vector Sum: 0.0775 in/s  
 Peak Air Pressure: 111 DB  
 0.001087 psi @ 7.1 HZ

### Shaketable Calibrated

On: 01/13/2012 (UTC -07:00)  
 By: Vibra-Tech, Inc.  
 2700 Holloway Road - Suite 113  
 Louisville, KY 40203 U.S.A.

### USBM Safe Blasting Levels

SSN: 7179 Event: 10



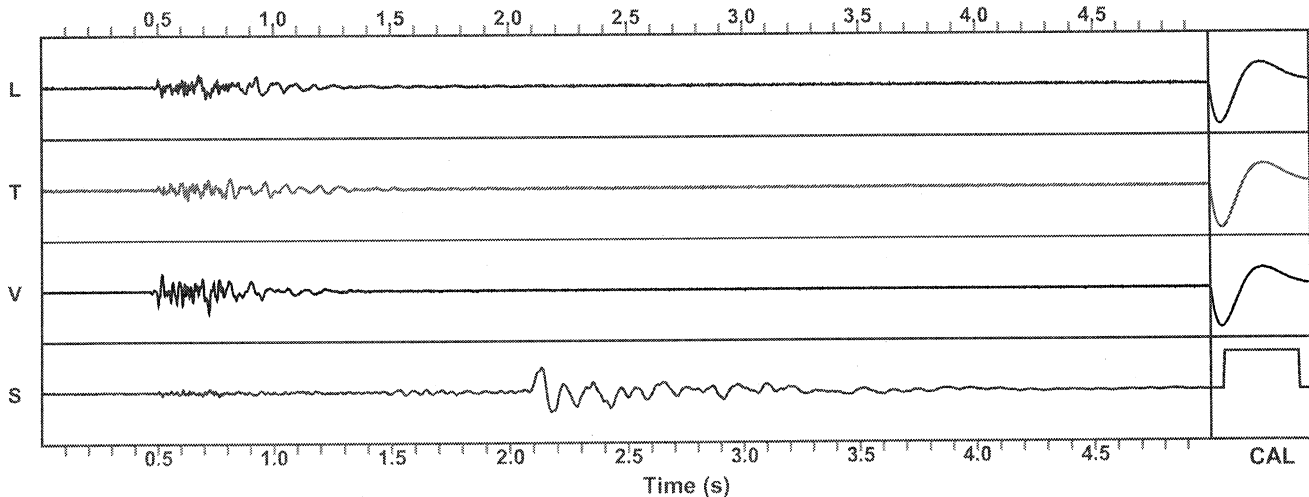
Zero Crossing Half-Wave Frequency Analysis

### Waveform Graph Scale

Time Scale: 0.1 s  
 Seismic Scale: +/- 0.16 in/s  
 Sound Scale: +/- 0.0023 psi

### Velocity Waveform

SSN: 7179 Event: 10



# Seismic Analysis Velocity Waveform Analysis

Serial Number: 7178  
 Firmware Version: 08-03.23  
 Event Date: 04/30/2012 11:31:40 (UTC -07:00)  
 Event number: 4  
 Recording Time: 5 s  
 Client: COUNTY OF MARIN  
 Operation: SAN RAFAEL ROCK QUARRY  
 Location: 114 SAN MARINO DRIVE  
 Distance:  
 Operator: VIBRA-TECH GSM  
 Comment: VERONIQUE RASKIN  
 Seismic Trigger: 0.03 in/s  
 Sound Trigger: 75.9 DB

Additional Info: RESIDENCE  
 j-GEO-01254  
 N37 59.395, W122 27.700

### Summary Data

	L	T	V
PPV (in/s):	0.015	0.0425	0.035
FREQ (HZ):	33.3	23.8	29.4
PD (.001"):	0.155	0.2725	0.21
PPA (g):	0.01302	0.02604	0.02604

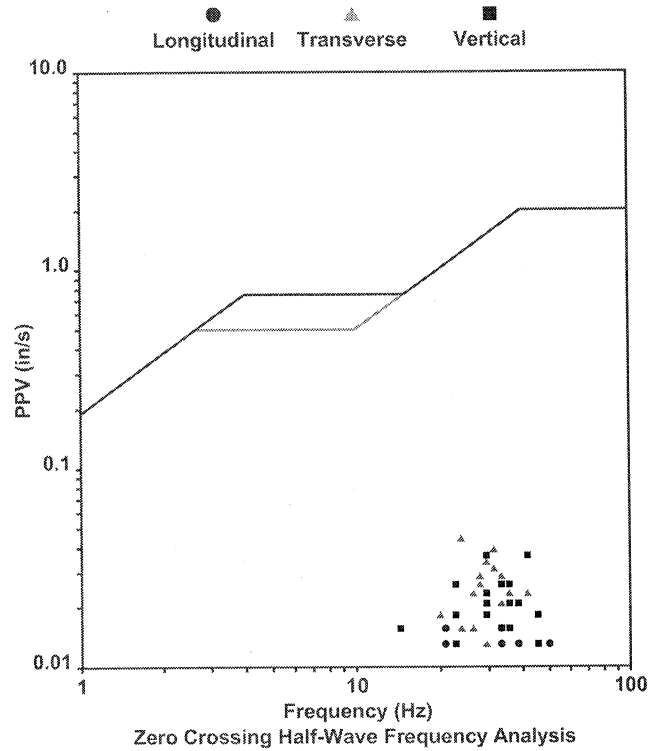
Peak Vector Sum: 0.045 in/s  
 Peak Air Pressure: 79.1 DB  
 5.347E-5 psi @ 4.1 HZ

#### Shaketable Calibrated

On: 01/16/2012 (UTC -07:00)  
 By: Vibra-Tech, Inc.  
 2700 Holloway Road - Suite 113  
 Louisville, KY 40203 U.S.A.

### USBM Safe Blasting Levels

SSN: 7178 Event: 4



#### Waveform Graph Scale

Time Scale: 0.1 s  
 Seismic Scale: +/- 0.16 in/s  
 Sound Scale: +/- 0.0023 psi

### Velocity Waveform

SSN: 7178 Event: 4

