

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-8 Max. Charge Weight: 480 Date of Blast: 4.5.12
 Northing: 37°59'10N Blast Duration: 403 Time of Blast: 11:38:58
 Easting: 122°27'16W Blast Number: 1571

SEISMOGRAPH INFORMATION		UNIT #	
Seismograph Model	2000	Micro	Micro
Serial Number	2481	4550	4570
Last Calibration Date	5.24.11	5.26.11	5.26.11

LOCATION INFORMATION		UNIT #	
Location	Marina Ag	Via Mont	M Near Park
Northing	37°59'19N	37°59'31W	37°59'30N
Easting	122°27'22W	122°27'30W	122°27'16W
Distance from Blast	1056	2429	2006
Scaled Distance	48	139	91

VIBRATION INFORMATION		UNIT #	
Longitudinal Peak Particle Velocity (ips)	.19	.09	.08
Longitudinal Peak Frequency (Hz)	30.8	16.1	19.2
Transverse Peak Particle Velocity (ips)	.22	.10	.10
Transverse Peak Frequency (Hz)	19.2	13.5	22.7
Vertical Peak Particle Velocity (ips)	.17	.11	.10
Vertical Peak Frequency (Hz)	25.0	14.2	29.4
Peak Vector Sum (ips)	.28	.13	.12
Peak Air Overpressure (db)	106	100	106

Seismograph Operator: Deron Lopes Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB 8 Designed Bench Height (ft): 45' Date: 4 5 12
 Northing: 37° 59' 10 N Rock Density (lb/ft³): 2.23 Time: 11:38
 Easting: 122° 27' 16 W Relative Rock Hardness: 7 Blast Number: 1571

DESIGN DATA:

Number of Holes Shot: 18 Hole Dia. (in.): 6 3/4 Stemming (ft): 19 Loading Time Required (min hrs): 7 Deck Type: -
 Ave. Hole Depth (ft): 47 Burden (ft): 15 Stem Type: 3/4" Stone Staggered Pattern (y or n): N Length (ft): -
 Relative Confinement: - Spacing (ft): 15 Subdrill (ft): 2 Number of Lost Holes: 2 Total Shot: 1572

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/Hole):
TiFex 1000	7960	450 g	36	80E2	18			480
				50E2	18			Blast Duration (sec): 403
				42ms	9			
				17ms	1			Total Charge Wt.: 7996

VIBRATION DATA:

Nearest Structure: None Seismograph Loc: Seismic Temperature: 61° Max. Chrg. (lb/dms): 455
 Northing: 37° 59' 19 N Sky Condition: Clear RPPV: 228
 Easting: 122° 27' 23 W Wind Direction: N Frequency: 214.4
 Distance Away: 1056 Wind Speed: 0.3 Airblast: 106

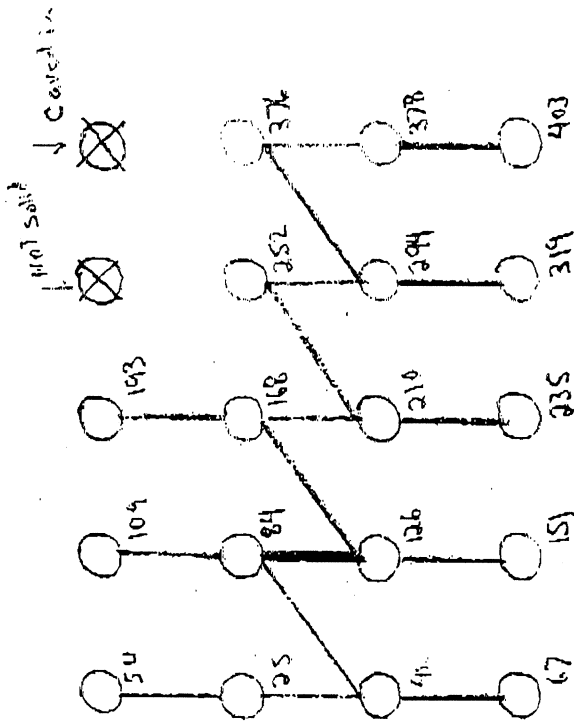
PERFORMANCE DATA:

Powder Factor (lb/ton): .5 Displacement: _____ Crushability: _____
 Lb/yd³: 1.2 Vibration: Good Fines: _____
 Fragmentation: Good Dig ability: _____
 Comments: Swamp shot at holes. Very wet. Hole caved in. Hole to unstable to load Blaster in Charge: D. Ma Jeyla

High Wall

Sump shot

4.5.12
P.B. 8
#1571



18 Holes
18: 80 EZ
18: 50 EZ
9: 42ms
1: 17ms
36: 450s

Depth: 47

19' stemming

480 lbs max

all holes Vertical!!

Min: 1056
V.M: 2062
S.M: 2429
W.M: 2006

37° 59' 10N
122° 27' 16W

7960A

Seismic Analysis Velocity Waveform Analysis

Serial Number: 7178
 Firmware Version: 08-03.23
 Event Date: 04/05/2012 11:38:31 (UTC -07:00)
 Event number: 3
 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: 76 DB

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

Summary Data

	L	T	V
PPV (in/s):	0.018	0.023	0.038
FREQ (HZ):	33.3	29.4	41.7
PD (.001"):	0.16	0.18	0.25
PPA (g):	0.013	0.02	0.026

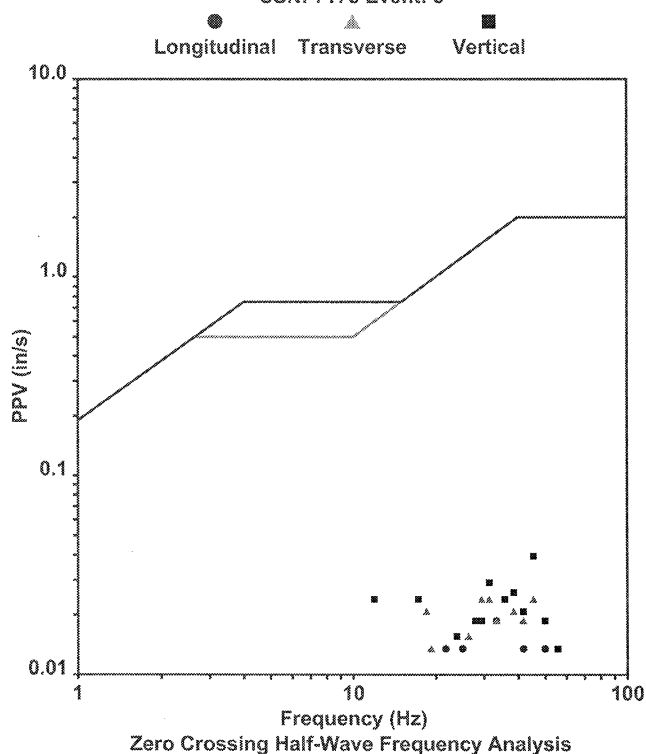
Peak Vector Sum: 0.04 in/s
 Peak Air Pressure: 79 DB
 0.0001 psi @ 21.7 HZ

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: 3

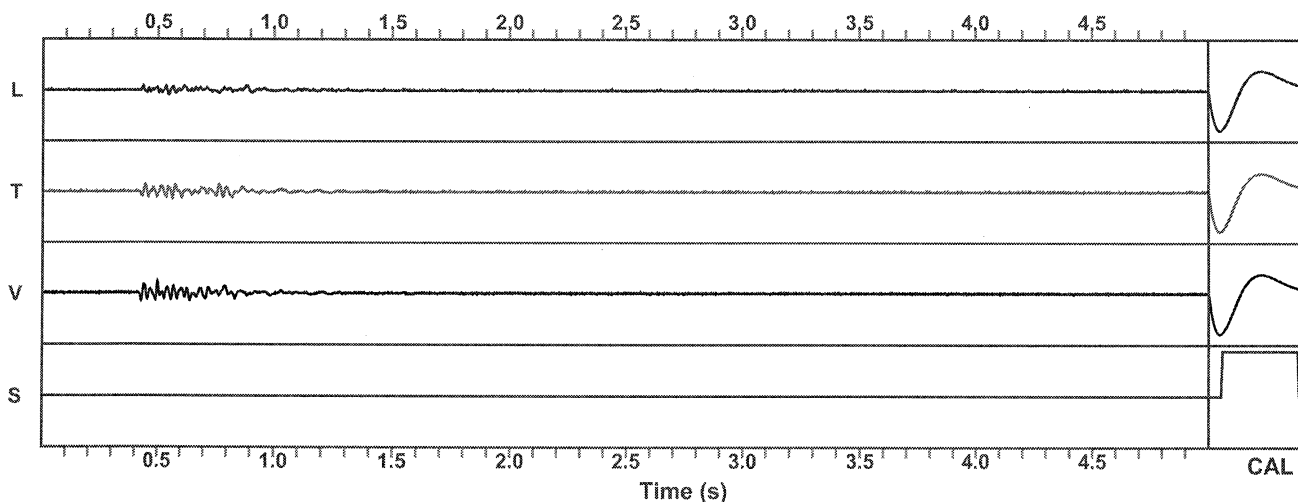


Waveform Graph Scale

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

Velocity Waveform

SSN: 7178 Event: 3



Seismic Analysis Velocity Waveform Analysis

Serial Number: 7179
 Firmware Version: 08-03.23
 Event Date: 04/05/2012 11:38:31 (UTC -07:00)
 Event number: 8
 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: 76 DB

Additional Info:

j-GEO-01253
 N37 59.481, W122 27.256

Summary Data

	L	T	V
PPV (in/s):	0.033	0.025	0.053
FREQ (HZ):	11.4	45.5	33.3
PD (.001"):	0.3	0.31	0.44
PPA (g):	0.026	0.02	0.046

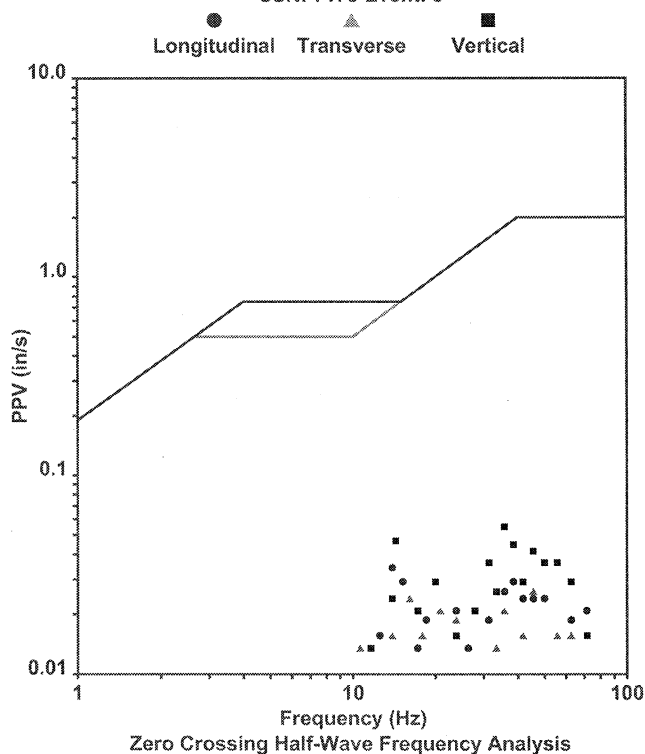
Peak Vector Sum: 0.06 in/s
 Peak Air Pressure: 101 DB
 0.0004 psi @ 4.1 HZ

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: 8



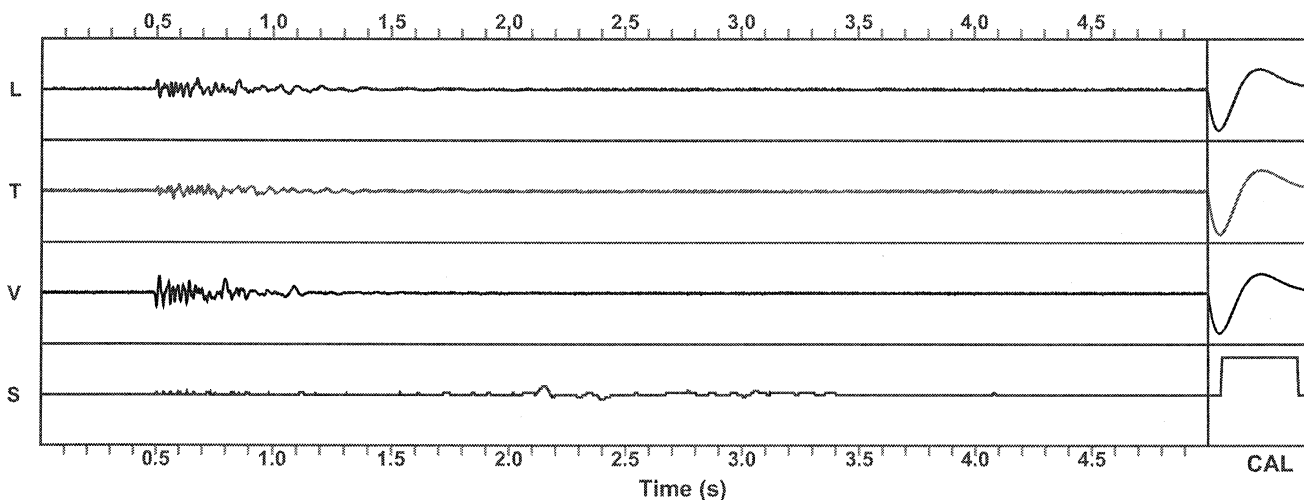
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

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

Velocity Waveform

SSN: 7179 Event: 8



Seismic Analysis Velocity Waveform Analysis

Serial Number: 7257
 Firmware Version: 08-03.23
 Event Date: 04/05/2012 11:38:33 (UTC -07:00)
 Event number: 8
 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: 76 DB

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

Summary Data

	L	T	V
PPV (in/s):	0.043	0.03	0.05
FREQ (HZ):	17.9	41.7	41.7
PD (.001"):	0.34	0.34	0.46
PPA (g):	0.026	0.026	0.046

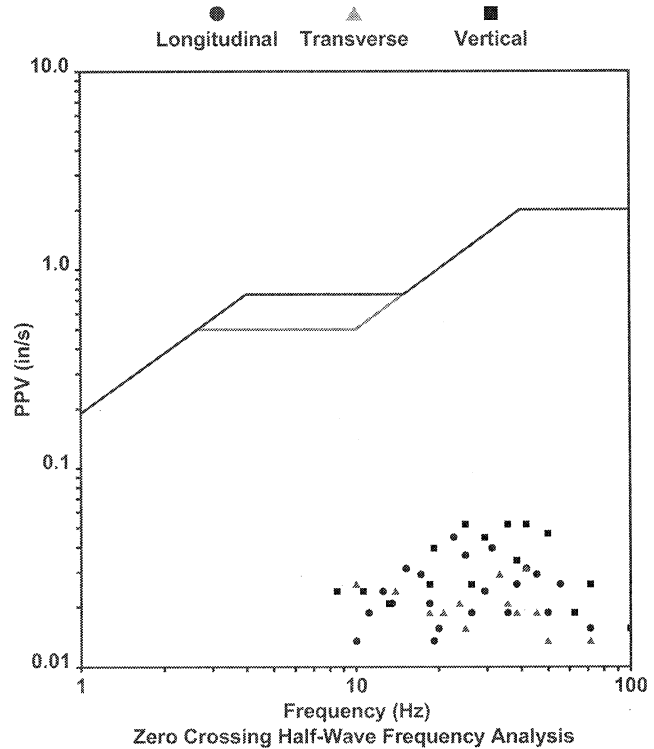
Peak Vector Sum: 0.055 in/s
 Peak Air Pressure: 100 DB
 0.0003 psi @ 2.4 HZ

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: 8



Waveform Graph Scale

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

Velocity Waveform

SSN: 7257 Event: 8

