

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-8 Max. Charge Weight: 500 Date of Blast: 8-1-12
 Northing: 37° 59' 10N Blast Duration: 495 ms Time of Blast: 11:53
 Easting: 122° 27' 18W Last Calibration Date: 5-17-12 Blast Number: 1583

Seismograph Model	2000	Micro	Micro
Serial Number	2481	4550	4570
Last Calibration Date	5-17-12	5-17-12	5-17-12
Location	Morinas	Via Mont	M Near Park
Northing	37° 59' 19N	37° 59' 18N	37° 59' 30N
Easting	122° 27' 22W	122° 27' 53W	122° 27' 16W
Distance from Blast	950	2904	1953
Scaled Distance	42	130	89

Longitudinal Peak Particle Velocity (ips)	.23
Longitudinal Peak Frequency (Hz)	14.7
Transverse Peak Particle Velocity (ips)	.17
Transverse Peak Frequency (Hz)	29.4
Vertical Peak Particle Velocity (ips)	.30
Vertical Peak Frequency (Hz)	38.4
Peak Vector Sum (ips)	.31
Peak Air Overpressure (db)	119

Seismograph Operator: Ramon Lopez Signature: Ramon Lopez

SAN RAFAEL ROCK QUARRY BLAST REPORT

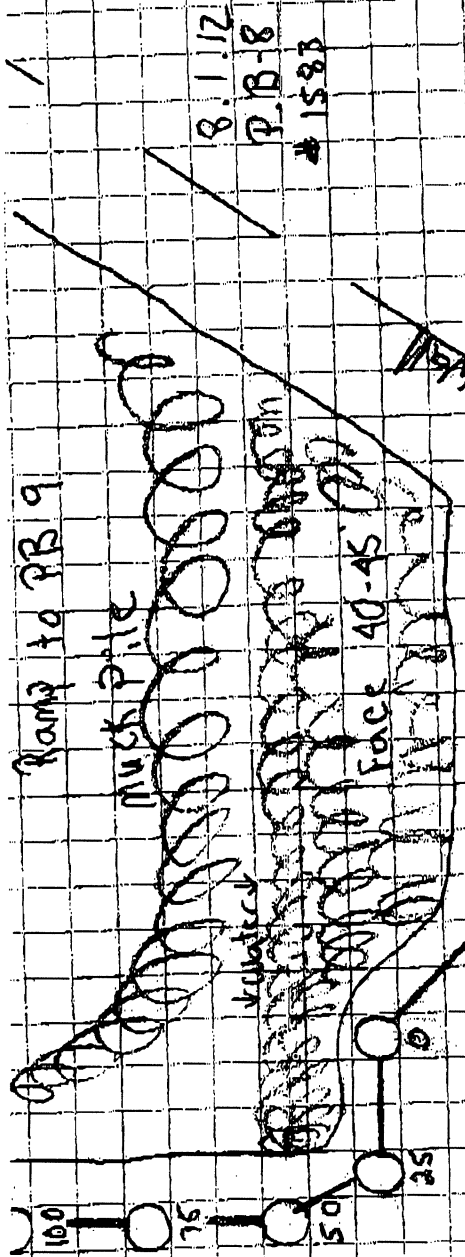
Location: PB-8 Date: 8-1-17
 Designed Bench Height (ft): 45
 Northing: 37°59'10N Time: 11:53
 Rock Density (t/yd³): 2.23
 Easting: 122°27'18W Blast Number: 1583
 Relative Rock Hardness: 7

Number of Holes Shot: 24 Hole Dia. (in.): 6 3/4 Stemming (ft): 18 Loading Time Required (man hrs): 7 Deck Type: -
 Ave. Hole Depth (ft): 48 Burden (ft): 15 Stem Type: 3/4 stems Staggered Pattern (y or n): N Length (ft): -
 Relative Confinement: - Spacing (ft): 15 Subdrill (ft): 3 Number of Lost Holes: 0 Tons Shot: 20,070
 Bulk Explosive Weight Boosters Units Delays Units Misc. Units
Titan 1000 11,100 450g/cm 48 80E2 24 50E2 24 42ms 10 17ms 1
 Max (lb/hole): 500
 Blast Duration (sec): 415 ms
 Total Charge Wt.: 11,148

VIBRATION DATA

Seismograph Loc: Same Temperature: 78° Max. Chrg. (lb/8ms): 500
 Northing: - Sky Condition: Clear RPPV: 31
 Easting: - Wind Direction: SE Frequency: 38.4
 Distance Away: 950 Wind Speed: 2-4 mph Airblast: 119

Displacement: Great Crushability: -
 Vibration: Good Fines: -
 Dig ability: -
 Powder Factor (lb/ton): .5
 Lb/yd³: 1.3
 Fragmentation: Great
 Comments: holes very wet, with water come out while loading
 Blaster in Charge: R. Lopez



8.1.12
P.B-8
1583

Main 950
Via 2909
SM 2587
MN 1953

37° S 10° N
122° 27' 18" W

Depth 48'
18 stemming

500 lbs per max

all holes very soft

24 Holes
24 = 80' E2
24 = 50' E2
10 = 42' MS

1 = 17 MS
48 = 450

113, 100 lbs

Like
Wood
300#
Back Rail

W-10/10

15 x 15

Seismic Analysis Velocity Waveform Analysis

Serial Number: 8030
Firmware Version: 08-03.23
Event Date: 08/01/2012 11:51:44 (UTC -07:00)
Event number: 5
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):	0.06	0.0425	0.0725
FREQ (HZ):	83.3	29.4	55.6
PD (.001"):	0.4325	0.2725	0.4125
PPA (g):	0.07812	0.04557	0.07161

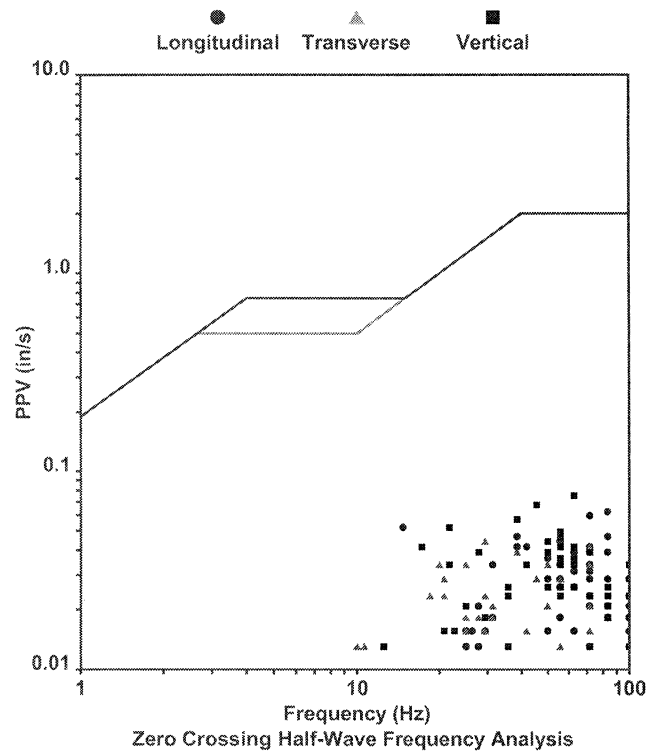
Peak Vector Sum: 0.09 in/s
Peak Air Pressure: 113.3 DB
 0.001461 psi @ 2.4 HZ

Shaketable Calibrated

On: 05/14/2012 (UTC -07:00)
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 8030 Event: 5

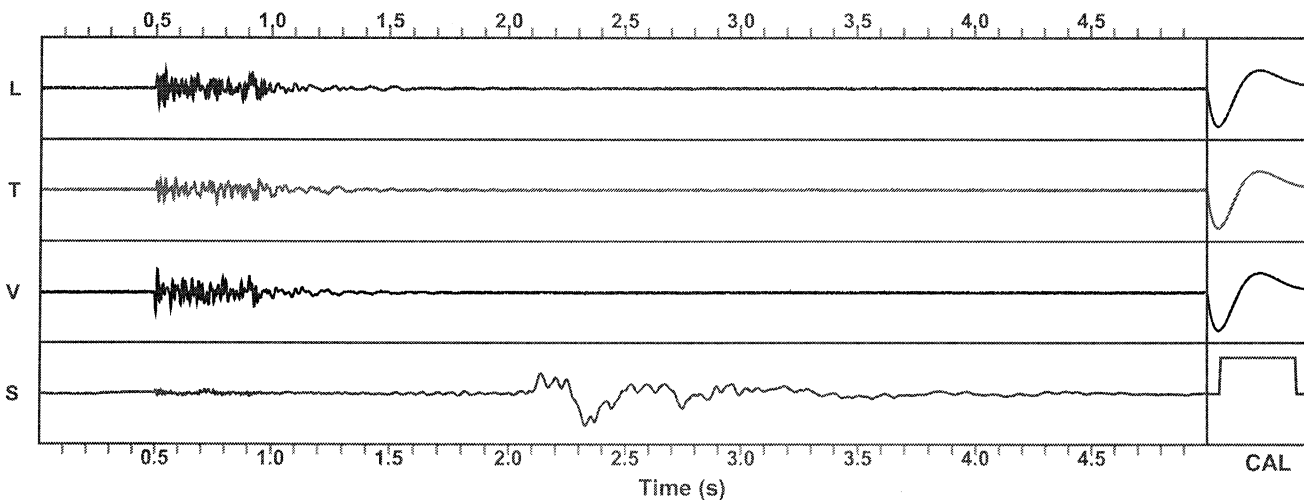


Waveform Graph Scale

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

Velocity Waveform

SSN: 8030 Event: 5



Seismic Analysis Velocity Waveform Analysis

Serial Number: 8021
 Firmware Version: 08-03.23
 Event Date: 08/01/2012 11:51:45 (UTC -07:00)
 Event number: 15
 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):	0.03	0.035	0.035
FREQ (HZ):	29.4	38.5	31.3
PD (.001"):	0.2075	0.185	0.2575
PPA (g):	0.01953	0.02604	0.03255

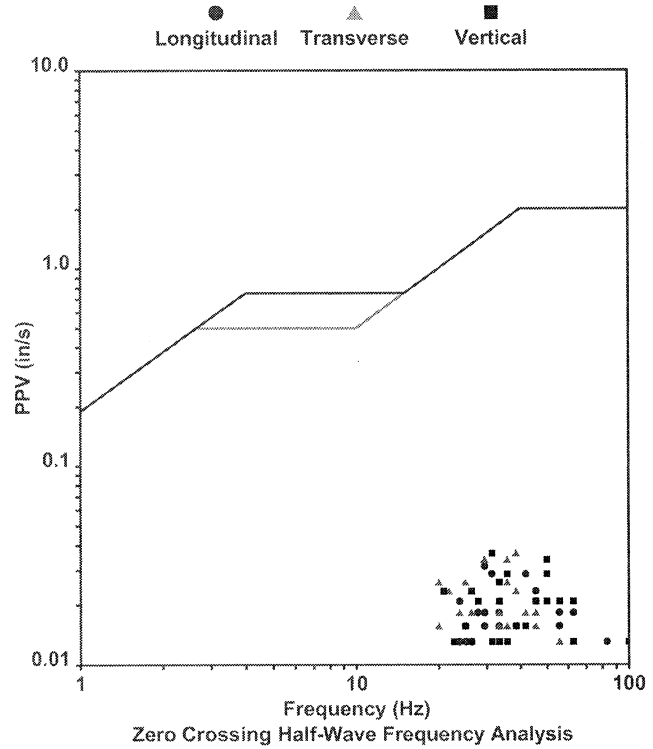
Peak Vector Sum: 0.04 in/s
 Peak Air Pressure: 111.2 DB
 0.001105 psi @ 2.1 HZ

Shaketable Calibrated

On: 05/11/2012 (UTC -07:00)
 By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 8021 Event: 15

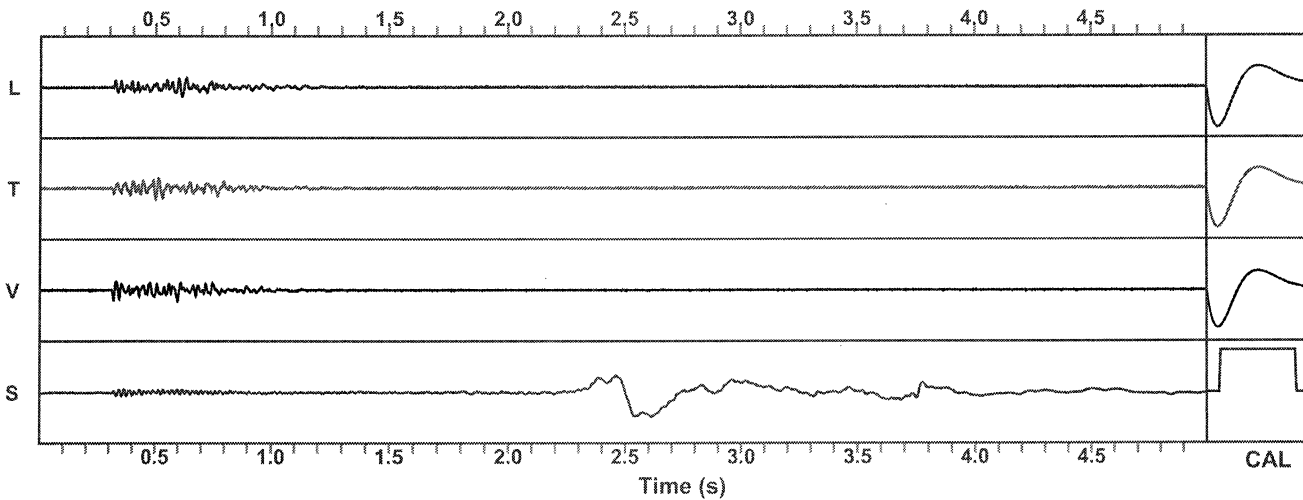


Waveform Graph Scale

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

Velocity Waveform

SSN: 8021 Event: 15



Seismic Analysis Velocity Waveform Analysis

Serial Number: 8056
Firmware Version: 08-03.23
Event Date: 08/01/2012 11:51:44 (UTC -07:00)
Event number: 4
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 RES.
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	0.0475	0.0575
FREQ (HZ):	27.8	45.5	38.5
PD (.001"):	0.4275	0.2675	0.3475
PPA (g):	0.03255	0.03906	0.05859

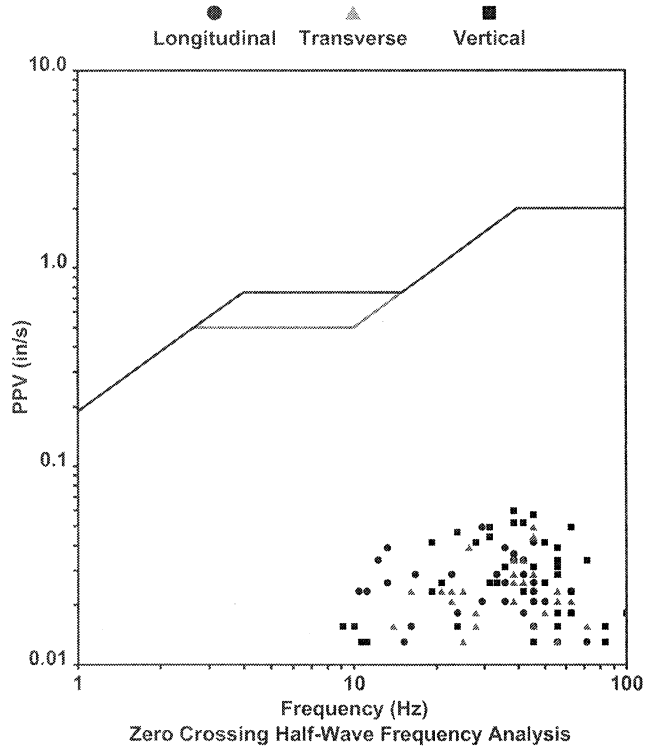
Peak Vector Sum: 0.065 in/s
Peak Air Pressure: 112.9 DB
 0.00139 psi @ 2.5 HZ

Shaketable Calibrated

On: 05/16/2012 (UTC -07:00)
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 8056 Event: 4



Waveform Graph Scale

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

Velocity Waveform

SSN: 8056 Event: 4

