

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: FB.7 Max. Charge Weight: 400 Date of Blast: 7-19-12
 Northing: 37° 59' 12" N Time of Blast: 12:08
 Easting: 122° 27' 13" W Blast Duration: 403 ms Blast Number: 1582

SEISMOGRAPH INFORMATION	
Seismograph Model	2000
Serial Number	3481
Last Calibration Date	5-17-12

LOCATION INFORMATION	
Location	Via Montebello
Northing	37° 59' 12" N
Easting	122° 27' 13" W
Distance from Blast	100.5
Scaled Distance	50

VIBRATION INFORMATION	
Longitudinal Peak Particle Velocity (ips)	.12
Longitudinal Peak Frequency (Hz)	25.0
Transverse Peak Particle Velocity (ips)	.11
Transverse Peak Frequency (Hz)	16.6
Vertical Peak Particle Velocity (ips)	.13
Vertical Peak Frequency (Hz)	41.6
Peak Vector Sum (ips)	.15
Peak Air Overpressure (db)	112

COMMENTS	
Micro	Micro
4550	4570
5-17-12	5-17-12
San Marino	PPV Near Park
37° 59' 12" N	37° 59' 30" N
122° 27' 13" W	122° 27' 16" W
252.0	174.7
.16	.16
.08	.08
3.6	3.6
.08	.08
9.2	9.2
.08	.08
4.9	4.9

Seismograph Operator: D. DuLopos Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PR-7 Date: 7-19-12
 Designed Bench Height (ft): 40
 Northing: 37° 59' 12" W Time: 12:08
 Rock Density (lb/ft³): 2.23
 Easting: 172° 27' 13" W Relative Rock Hardness: 7
 Blast Number: 1582

DESIGN DATA:

Number of Holes Shot: 27 Hole Dia. (in.): 6 3/4 Loading Time Required (man hrs): 6 Deck Type: -
 Ave. Hole Depth (ft): 43 Stem Type: 3/8" Dia Staggered Pattern (y or n): N Length (ft): -
 Relative Confinement: - Spacing (ft): 15 Number of Lost Holes: 0 Total Shot: 80070

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max. (lb./hole)	Blast Duration (sec)
Tetra 1000	10380	450g	34	5002	27			160	403
				5002	27				
				40ms	19				
				DAS	1				
									Total Charge Wt.: <u>DASH</u>

VIBRATION DATA:

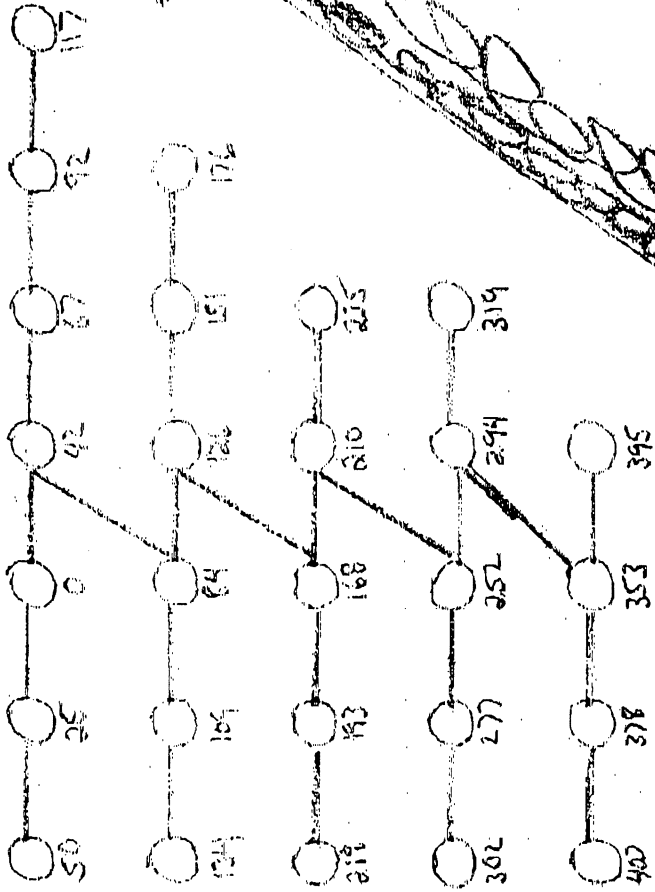
Nearest Structure: Mountain City Seismograph Location: 64m Temperature: 79° Max. Chrg. (lb/8ms): 400
 Northing: 37° 59' 19" W Easting: - Sky Condition: Clear RPPV: 15
 Easting: 172° 27' 12" W Wind Direction: South Frequency: 41.6
 Distance Away: 1003 Wind Speed: 0-2 Airblast: 112

PERFORMANCE DATA:

Powder Factor (lb./ton): 1.5 Displacement: good Crushability: -
 Lb./yd³: 1.2 Vibration: 6 feet Fines: -
 Fragmentation: good Digability: -
 Comments: - Blaster in Charge: R. M. [Signature]

7.17.12
 P.B. 7
 1582

Face 40'



Slide Area

Litic 1600
 →
 300 lbs

High Wall 730

Main 1003
 V. a 3220
 SPM 2323
 M/N 1797
 37° 59' 12" N
 122° 27' 13" W

Depth 43'
 16' stemming
 400 lbs per

27 Holes
 27 = 86' EZ
 27 = 50' EZ
 9 = 42 MS
 1 = 17 MS
 SH = 450₃
 10,380 lbs

Seismic Analysis

Velocity Waveform Analysis

Serial Number: 8056
Firmware Version: 08-03.23
Event Date: 07/19/2012 12:09:26 (UTC -07:00)
Event number: 3
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):	0.035	0.04	0.05
FREQ (HZ):	45.5	35.7	45.5
PD (.001"):	0.2	0.2175	0.2875
PPA (g):	0.03255	0.02604	0.03906

Peak Vector Sum: 0.055 in/s
Peak Air Pressure: 105.2 DB
 0.000606 psi @ 1.6 HZ

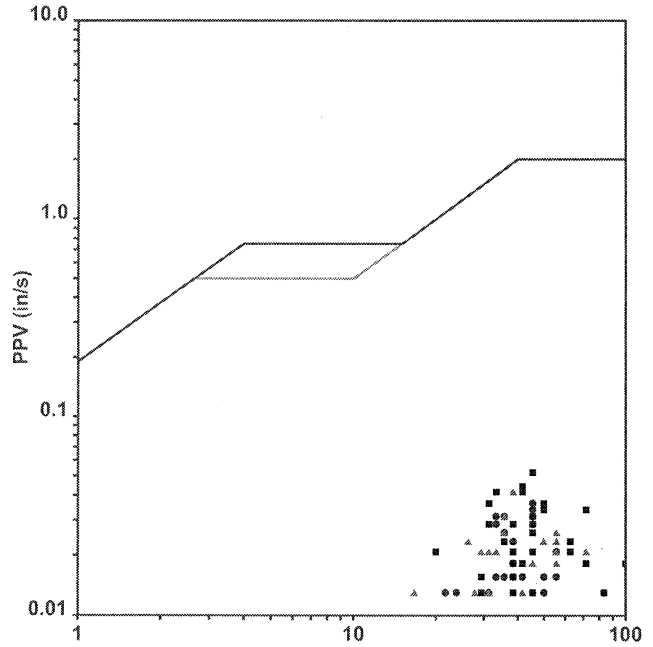
Shaketable Calibrated

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: 3

● Longitudinal ▲ Transverse ■ Vertical



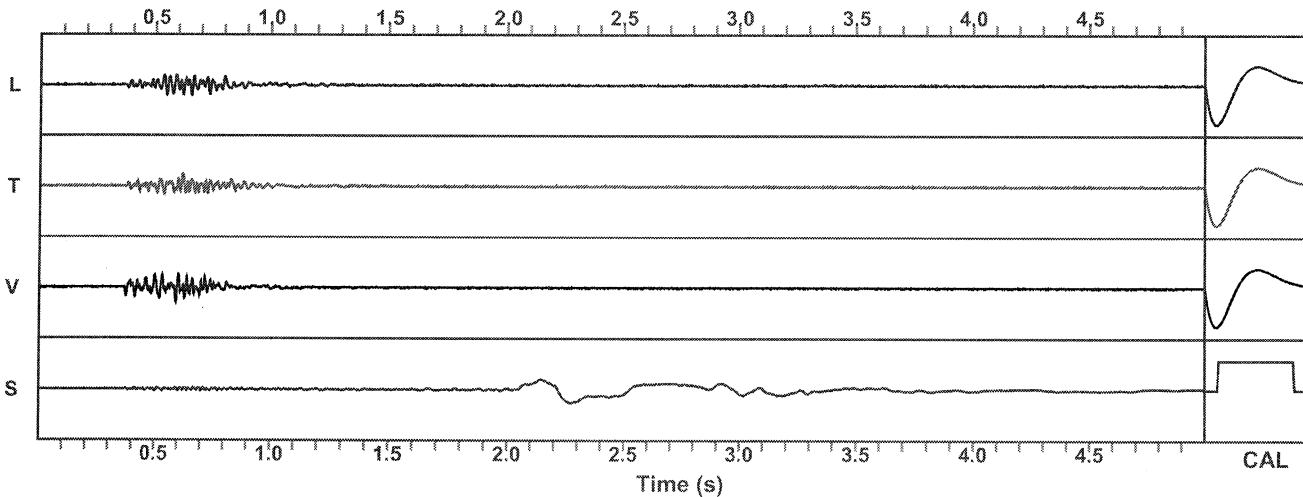
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

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

Velocity Waveform

SSN: 8056 Event: 3



Seismic Analysis

Velocity Waveform Analysis

Serial Number: 8030
 Firmware Version: 08-03.23
 Event Date: 07/19/2012 12:09:26 (UTC -07:00)
 Event number: 4
 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

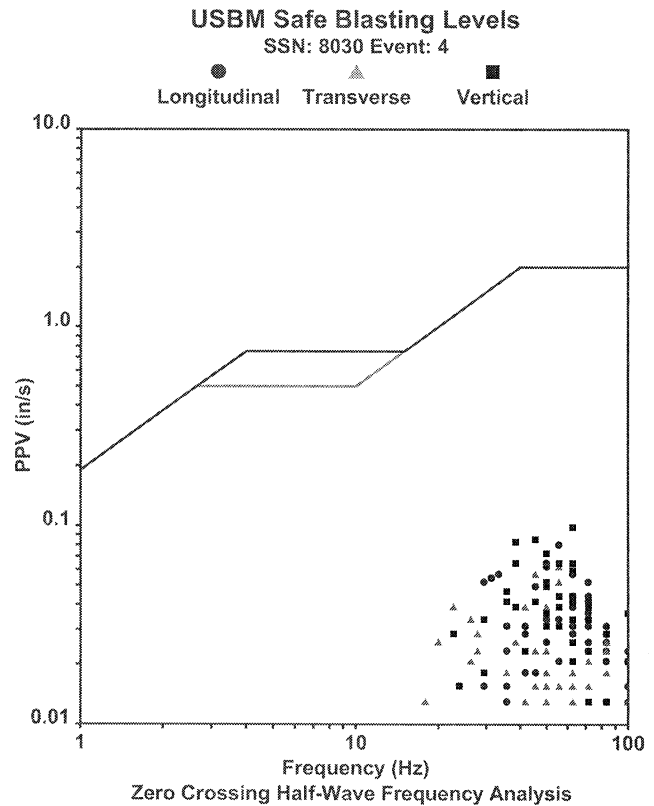
Summary Data

	L	T	V
PPV (in/s):	0.0775	0.06	0.095
FREQ (HZ):	55.6	50	62.5
PD (.001"):	0.3825	0.2575	0.475
PPA (g):	0.07161	0.05208	0.08464

Peak Vector Sum: 0.1 in/s
 Peak Air Pressure: 104.9 DB
 0.0005881 psi @ 2.6 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.

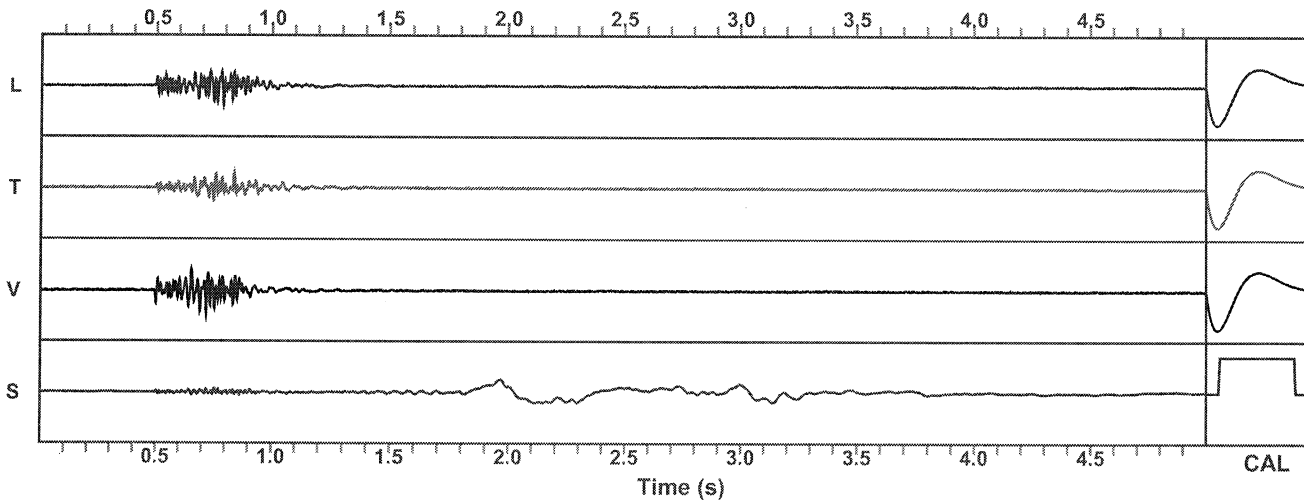


Waveform Graph Scale

Time Scale: 0.1 s
 Seismic Scale: +/- 0.19 in/s
 Sound Scale: +/- 0.0023 psi

Velocity Waveform

SSN: 8030 Event: 4



GeoSonics Inc. Seismic Analysis

Stop Event Report

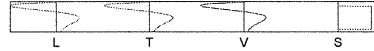
Serial No: 8021 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 114 SAN MARINO DRIVE
Distance:
Operator: VIBRA-TECH GSM
Comment: VERONIQUE RASKIN*

Begin Date: 07/19/2012 06:00:50 (UTC-7)
End Date: 07/19/2012 20:00:00 (UTC-7)
Events over Trigger: 0 (15-14)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.9

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

Shaketable Calibrated: 05/11/2012
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 8021) did not trigger during the shot on July 19, 2012 at approximately 12:09 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.