

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: 9B-7 Max. Charge Weight: 420 Date of Blast: 8.15.12
 Northing: 37° 59' 13" N Blast Duration: 260 Time of Blast: 11:44
 Easting: 122° 27' 11" W Blast Number: 1584

Seismograph Model	Serial Number	Last Calibration Date	Micro	Mico	Mico
2000	4550	5-17-12	4550	4567	4570
			5-17-12	5-17-12	5-17-12

Location	Northing	Easting	Distance from Blast	Scaled Distance
San Rafael	37° 59' 18" N	122° 27' 53" W	3432	10
San Rafael	37° 59' 31" N	122° 27' 30" W	3434	123
San Rafael	37° 59' 30" N	122° 27' 16" W	1901	92

VIBRATION INFORMATION	Longitudinal Peak Particle Velocity (ips)	Longitudinal Peak Frequency (Hz)	Transverse Peak Particle Velocity (ips)	Transverse Peak Frequency (Hz)	Vertical Peak Particle Velocity (ips)	Vertical Peak Frequency (Hz)	Peak Vector Sum (ips)	Peak Air Overpressure (db)
	1.09	9.2	0.05	0.05	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	0.09	9.2	0.05	0.05	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-
	1.61	9.2	0.07	0.07	0.06	2.12	1.0	-

GENERAL COMMENTS

Seismograph Operator: Dennis Lopez Signature: Dennis Lopez

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-7 Date: 8-15-12
 Designed Bench Height (ft): 40
 Northing: 37° 59' 12" N Time: 11:44
 Rock Density (lb/ft³): 2.23
 Easting: 122° 27' 11" W Relative Rock Hardness: 7
 Blast Number: 1584

DESIGN DATA:

Number of Holes Shot: 18 Hole Dia. (in.): 3 3/4 Steaming (ft): 12 Loading Time Required (man hrs): 6 Deck Type: _____
 Ave. Hole Depth (ft): 43 Burden (ft): 15 Blast Type: 3/4" dia Staggered Pattern (Y or N): N Length (ft): _____
 Relative Confinement: - Spacing (ft): 15 Subdrill (ft): 0 Number of Lost Holes: 0 Tons Shot: 13,330

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole):	Blast Duration (sec):
Titanium 1000	7420	450 gms	35	00.02	12			420	260ms
				50.02	18				
				42.15	5				

Total Charge Wt.: 7756

VIBRATION DATA:

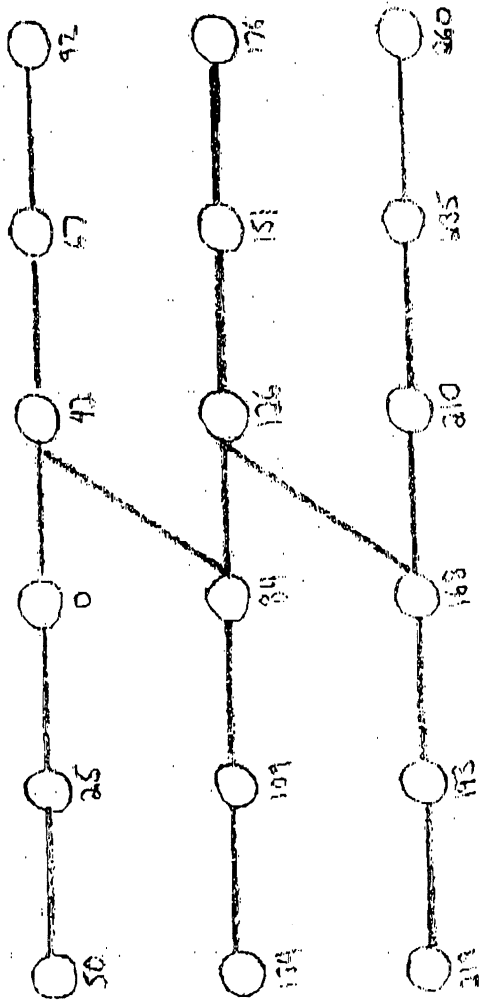
Nearest Structure: 110M 1000 Seismograph: 110M 1000 Temperature: _____ Max. Chg. (lb/ft³): 400
 Northing: 37° 59' 12" N Northing: _____ Sky Condition: Cloudy RPPV: 12
 Easting: 122° 27' 11" W Easting: _____ Wind Direction: SW Frequency: 13.5
 Distance Away: _____ Distance Away: _____ Wind Speed: 17 Airblast: _____

PERFORMANCE DATA:

Powder Factor (lb/ton): 5 Displacement: 40% Crushability: _____
 Lb/yard³: 17 Vibration: 0.01 Fines: _____
 Fragmentation: 500 Dig ability: _____
 Comments: _____ Blaster in Charge: [Signature]

Face A1087

8.15.12
PB-7
#1584



Main 1161
Year 2472
Sum 2534
M 1901

30° 59' 12" N
122° 27' 11" W

Depth 43
18 stations
100 fathoms

18-210123
18-210122
18-210121
5-42ms
26-450gms
7, 420 165 47 fms

Seismic Analysis Velocity Waveform Analysis

Serial Number: 8030
Firmware Version: 08-03.23
Event Date: 08/15/2012 11:43:41 (UTC -07:00)
Event number: 6
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

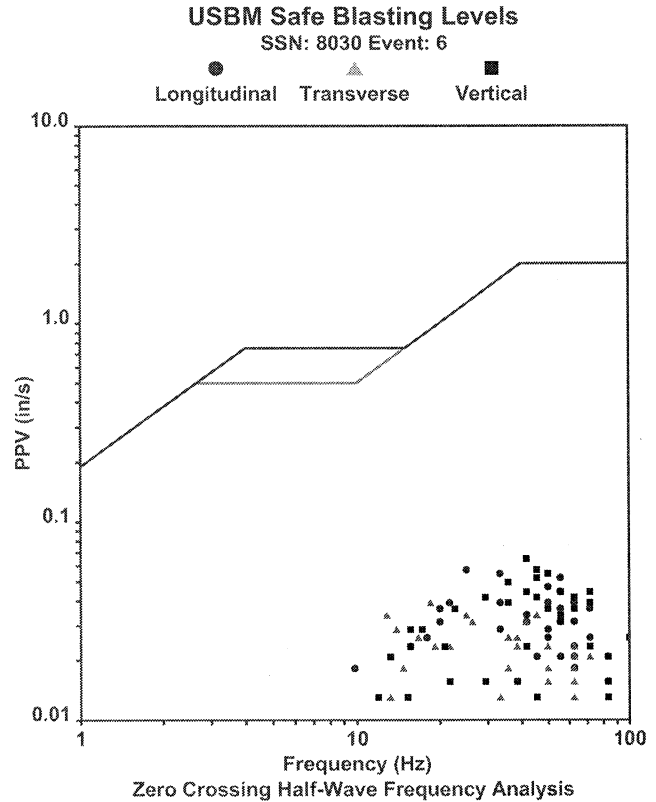
Summary Data

	L	T	V
PPV (in/s):	0.055	0.0375	0.0625
FREQ (HZ):	22.7	17.9	41.7
PD (.001"):	0.3775	0.48	0.37
PPA (g):	0.05208	0.03255	0.0651

Peak Vector Sum: 0.07 in/s
Peak Air Pressure: 111.6 DB
 0.001176 psi @ 3.6 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.

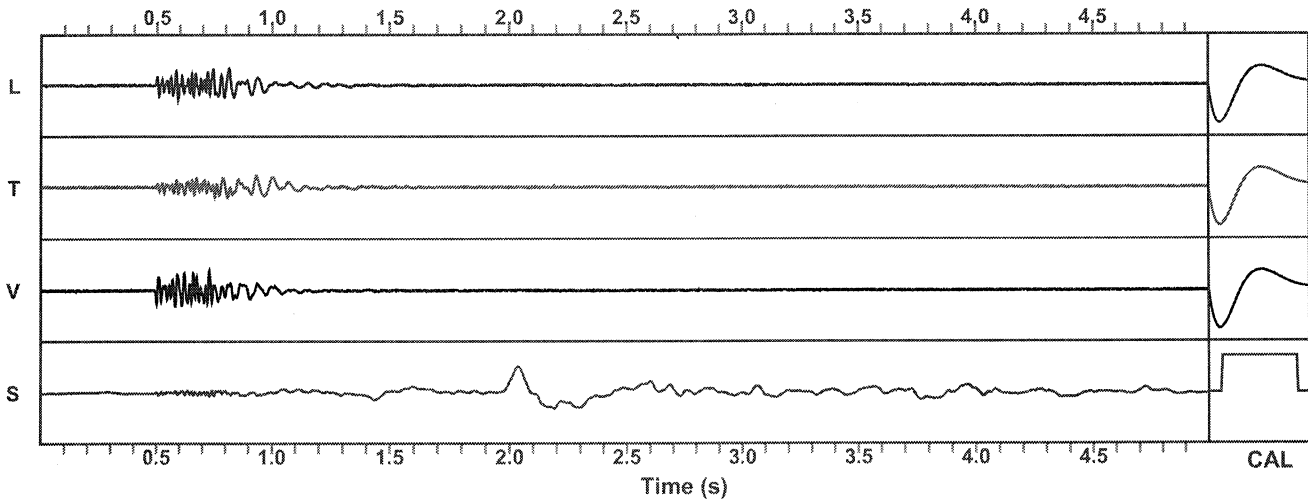


Waveform Graph Scale

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

Velocity Waveform

SSN: 8030 Event: 6



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: 08/15/2012 06:00:50 (UTC-7)
End Date: 08/15/2012 12:13:04 (UTC-7)
Events over Trigger: 0 (16-15)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.8

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 August 15, 2012 at approximately 11:43 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.

GeoSonics Inc. Seismic Analysis

Stop Event Report

Serial No: 8056 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 16 MARIN BAY PARK CT.
Distance:
Operator: VIBRA-TECH GSM
Comment: WILLIAM HOSKEN RES.

Begin Date: 08/15/2012 07:00:50 (UTC-7)
End Date: 08/15/2012 12:22:40 (UTC-7)
Events over Trigger: 0 (5-4)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 9.1

Additional Info:

j-GEO-01252
N37 59.524, W122 27 373

Shaketable Calibrated: 05/16/2012
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 located across the street from 16 Marin Bay Park Court (S/N 8056) did not trigger during the blast on August 15, 2012 at approximately 11:43 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.