

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

BLAST INFORMATION
 Location: RD-7 Max. Charge Weight: 340 lbs Date of Blast: 11.1.13
 Northing: 37° 59' 11" N Blast Duration: 309 ms Time of Blast: 11:32
 Easting: 122° 27' 04" W Blast Number: 1601

SEISMOGRAPH INFORMATION		UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Seismograph Model	2000	MICRO	MICRO	MICRO	MICRO	MICRO
Serial Number	2481	4880	4881	4882	4883	4884
Last Calibration Date	5 3 10	5 3 10	5 3 13	5 3 13	5 3 13	5 3 13

LOCATION INFORMATION		UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Location	Montaballe	San Mateo	San Mateo	San Mateo	San Mateo	San Mateo
Northing	37° 59' 19" N	37° 59' 18" N	37° 59' 31" N	37° 59' 31" N	37° 59' 31" N	37° 59' 31" N
Easting	122° 27' 22" W	122° 27' 53" W	122° 27' 30" W	122° 27' 30" W	122° 27' 30" W	122° 27' 30" W
Distance from Blast	1689'	3960'	2109'	2109'	2112'	2112'
Scaled Distance	91	214	157	157	157	157

VIBRATION INFORMATION		UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
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)	✓	✓	✓	✓	✓	✓

GENERAL COMMENTS: ONLY ONE MICRO FOUND

Seismograph Operator: Debra Lopez Signature: [Signature]
 Date: 11/1/13

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PR37 Designed Bench Height (ft): 40 Date: 11-13
 Northing: 37° 59' 11" N Rock Density (pcf): 2.23 Time: 11:37
 Easting: 122° 20' 04" W Relative Rock Hardness: 7 Blast Number: 1601

DESIGN DATA:

Number of Holes Shot: 28 Hole Dia. (in.): 4 3/4 Stemming (ft): 23 Loading Time Required (man hrs): 6 Deck Type: ---
 Ave. Hole Depth (ft): 47 Burden (ft): 12 Stem Type: 3/4" steel Staggered Pattern (y or n): Y Length (ft): ---
 Relative Confinement: --- Spacing (ft): 3 Subdrill (ft): 3 Number of Lost Holes: 0 Tons Shot: 31639

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Misc.	Units
<u>1.5 ton DDM</u>	<u>9,100</u>	<u>4 S2g/100</u>	<u>56</u>	<u>8082</u>	<u>---</u>	<u>28</u>
<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>5082</u>	<u>---</u>	<u>28</u>
<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>4145</u>	<u>---</u>	<u>1</u>
<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>1745</u>	<u>---</u>	<u>2</u>

Max (lb/holes): 340 Blast Duration (sec): 309ms

VIBRATION DATA:

Increase Structure: WALLS Seismograph Loc: --- Temperature: 68 Max. Chrg. (lb/blast): 740
 Northing: --- Easting: --- Sky Condition: CLD RPTV: ---
 Easting: --- Distance Away: --- Wind Direction: --- Fragments: ---
 Distance Away: --- Wind Speed: --- Airburst: ---

PERFORMANCE DATA:

Powder Factor (lb/ton): --- Displacement: --- Catchability: ---
 15 yd³: --- Vibration: --- Fines: ---
 Fragmentation: --- Dig ability: ---
 Comments: Good shot. Good day. Blaster in Charge: [Signature]

Seismic Analysis Velocity Waveform Analysis

Serial Number: 9808
 Firmware Version: 08-03.23
 Event Date: 11/01/2013 11:32:03 (UTC -07:00)
 Event number: 23
 Recording Time: 5 s
 Client: COUNTY OF MARIN
 Operation: SAN RAFAEL ROCK QRY
 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

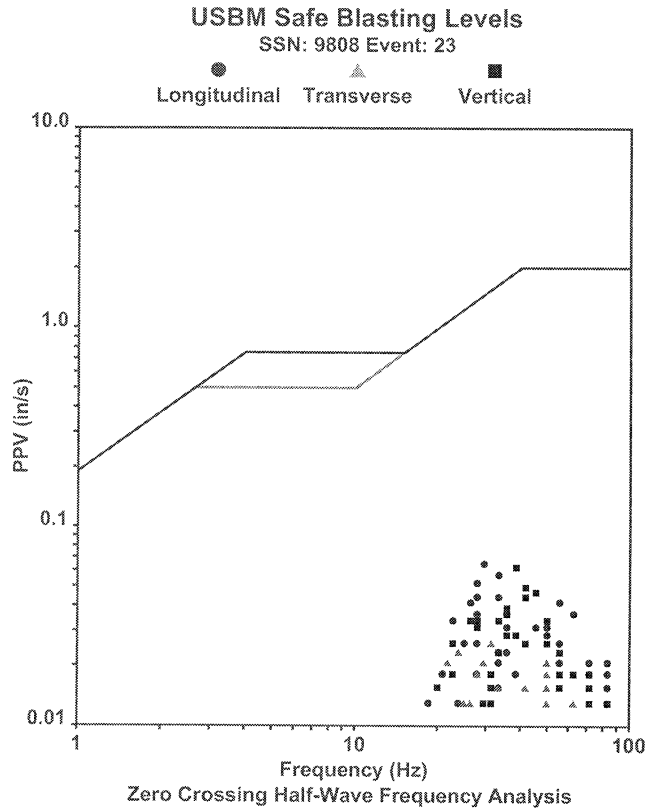
Summary Data

	L	T	V
PPV (in/s):	0.0625	0.025	0.06
FREQ (HZ):	29.4	29.4	38.5
PD (.001"):	0.3725	0.205	0.3025
PPA (g):	0.04557	0.01953	0.04557

Peak Vector Sum: 0.0675 in/s
 Peak Air Pressure: 108.4 DB
 0.000802 psi @ 3.2 HZ

Shaketable Calibrated

On: 02/20/2013 (UTC -07:00)
 By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

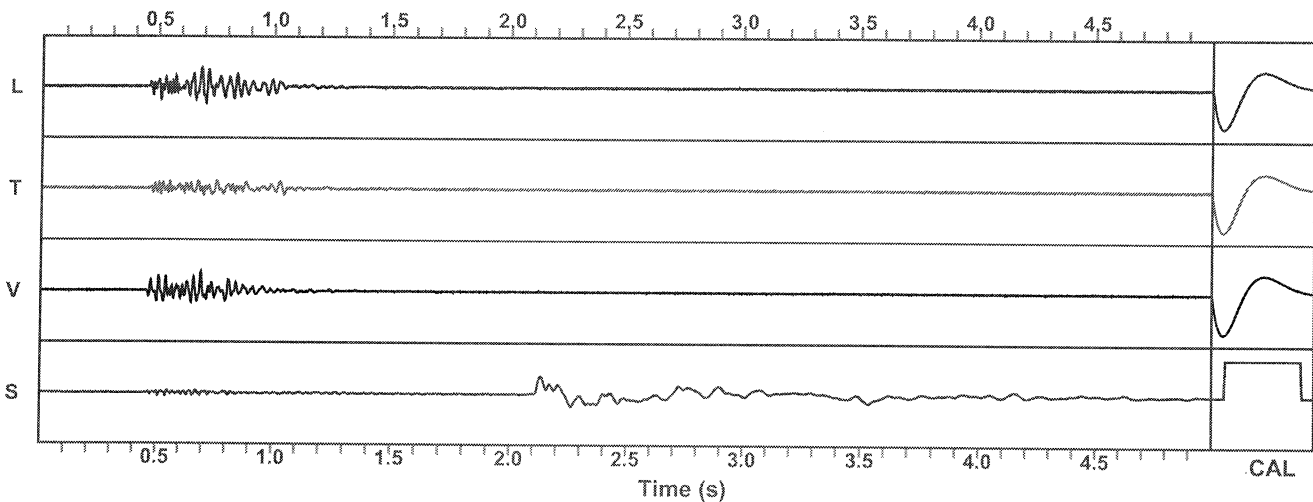


Waveform Graph Scale

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

Velocity Waveform

SSN: 9808 Event: 23





Vibra-Tech Inc. Seismic Analysis

Stop Event Report

Serial No: 9591 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QRY
Location: 16 MARIN BAY PARK CT.
Distance:
Operator: VIBRA-TECH GSM
Comment: WILLIAM HOSKEN RES.

Begin Date: 11/01/2013 11:30:46 (UTC-7)
End Date: 11/01/2013 12:08:47 (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: 8.8

Additional Info:

j-GEO-01252
N37 59.524, W122 27.373

Shaketable Calibrated: 02/20/2013
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 at 16 Marin Bay Park Court (S/N 9591) did not trigger during the shot on November 1, 2013 at approximately 11:32 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.