

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-1 Max. Charge Weight: 485 Date of Blast: 5.15.12
 Northing: 37°59'19"N Blast Duration: 276ms Time of Blast: 11:31
 Easting: 122°27'09"W Blast Number: 1576

Seismograph Model	2000	2000	2000	7000
Serial Number	2609	2148	2174	2348
Last Calibration Date	4 27 12	4 27 12	4 27 12	4 27 12
Location	Marina C.S.	Vico Buntacelles	San Mateo J.	M ^o Naval Park
Northing	37°59'19"N	37°59'18"N	37°59'31"N	37°59'30"W
Easting	122°27'22"W	122°27'53"W	122°27'30"W	122°27'16"W
Distance from Blast	1056	3184	2112	1267
Scaled Distance	48	158	96	57

Longitudinal Peak Particle Velocity (ips)	.12	/		.07
Longitudinal Peak Frequency (Hz)	7.1			12.8
Transverse Peak Particle Velocity (ips)	.06	/		.07
Transverse Peak Frequency (Hz)	41.6			18.5
Vertical Peak Particle Velocity (ips)	.06	/		.05
Vertical Peak Frequency (Hz)	11.6			8.0
Peak Vector Sum (ips)	.12	/		.09
Peak Air Overpressure (db)	125			118

Seismographs out for calibration. Using rentals

Seismograph Operator: Deon Lopes Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-1 Date: 5.15.12
 Designed Bench Height (ft): 50
 Northing: 375919M Time: 11:31
 Rock Density (t/yd³): 2.23
 Easting: 1722101W Blast Number: 1576
 Relative Rock Hardness: 7

DESIGN DATA:

Number of Holes Shot: 17 Hole Dia. (in.): 6 3/4 Loading Time Required (min hrs): 6 Deck Type: _____
 Ave. Hole Depth (ft): 50 Burden (ft): 16 Stem Type: 4 1/2" dia Staggered Pattern (y or n): N Length (ft): _____
 Relative Confinement: _____ Spacing (ft): 11 Subdrill (in): 0 Number of Lost Holes: 0 Tons Shot: 19,095

EXPLOSIVES DATA:

Rulk Explosive	Weight	Boosters	Units	Delays	Misc.	Units	Max (lb/hole)
<u>1165-1000</u>	<u>9000</u>	<u>450</u>	<u>34</u>	<u>8000</u>		<u>12</u>	<u>185</u>
				<u>5000</u>		<u>17</u>	<u>Blast Duration (sec): 27/600</u>
				<u>4000</u>		<u>3</u>	
				<u>1700</u>		<u>1</u>	<u>Total Charge Wt.: 8274</u>

VIBRATION DATA:

Seismograph Loc.: San Mateo Temperature: 17 Max. Chrg. (lb/8ms): 485
 Nearest Structure: Northing Sky Condition: Clear RPPV: 12
 Northing: 375919M Easting: _____ Wind Direction: NW Frequency: 41.6
 Easting: 1722101W Distance Away: _____ Wind Speed: 3-5 Airblast: 125

PERFORMANCE DATA:

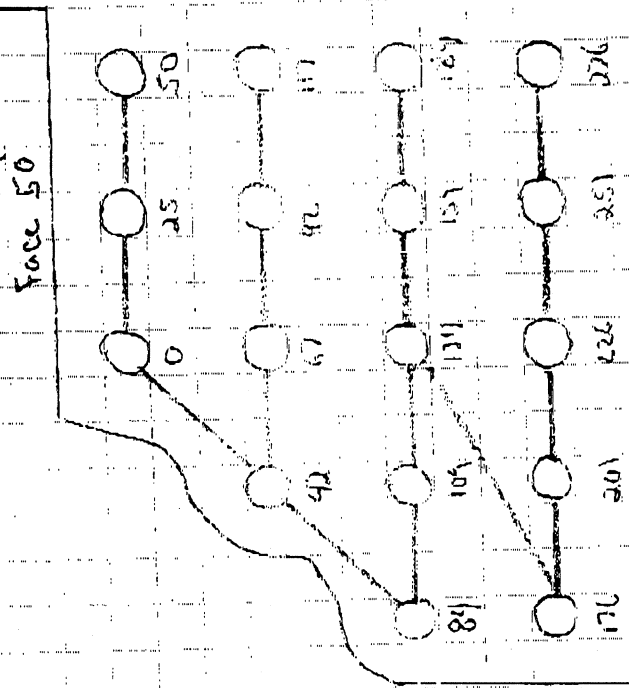
Powder Factor (lb/ton): 4 Displacement: Great Crushability: _____
 Lb/yd³: 9 Vibration: Correct Fines: _____
 Fragmentation: Great Dig ability: _____
 Comments: Brown Rock Blaster in Charge: Blardgo

BID ITEM _____
 SHEET _____ OF _____
 DATE _____
 BY _____

JOS _____
 ITEM _____
 SPEC. _____



5.15.12
 P.B.1
 1576



Main 1056
 Via M 3484
 SM 2112
 M'N 1267
 37° 59' 19" N
 122° 27' 09" W

Depth 50

480 lbs per
 d. 3 stems

11 Holes wet

17 Holes
 17: 80 g Z
 17: 50 g Z
 3: 42 m
 1: 17 m
 34: 450 gram

Titan 1000 G. 8.240

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GeoSonics Inc. Seismic Analysis

Stop Event Report

Serial No: 7178 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: 05/15/2012 06:00:50 (UTC-7)
End Date: 05/15/2012 12:00:18 (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: 8.9

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

Shaketable Calibrated: 01/16/2012
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 at 114 San Marino Drive (S/N 7178) did not trigger during the shot on May 15, 2012 at approximately 11:31 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.

Seismic Analysis Velocity Waveform Analysis

Serial Number: 7257
Firmware Version: 08-03.23
Event Date: 05/15/2012 11:31:20 (UTC -07:00)
Event number: 12
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: 75.9 DB

Additional Info:

j-GEO-01252
 N37 59.524, W122 27.373

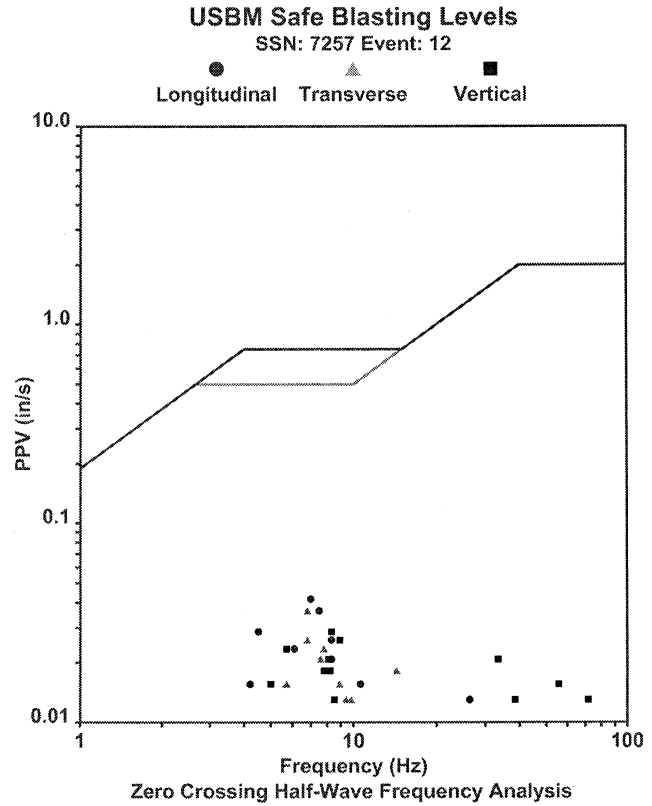
Summary Data

	L	T	V
PPV (in/s):	0.04	0.035	0.0275
FREQ (HZ):	7	6.5	8.2
PD (.001"):	0.835	0.845	0.5775
PPA (g):	0.01302	0.01302	0.01953

Peak Vector Sum: 0.0425 in/s
Peak Air Pressure: 116.7 DB
 0.002014 psi @ 1.6 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.

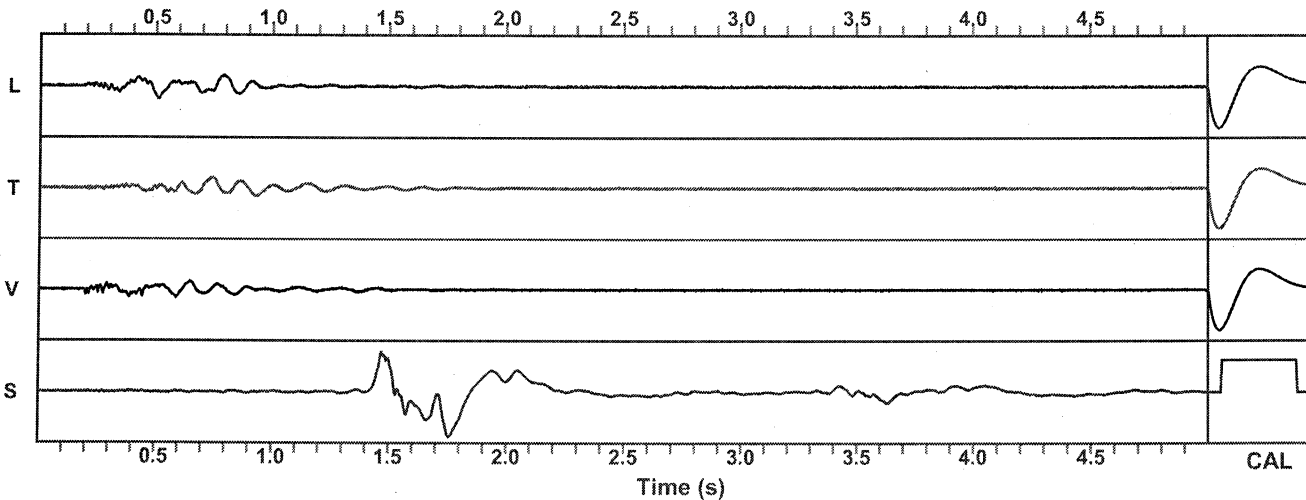


Waveform Graph Scale

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

Velocity Waveform

SSN: 7257 Event: 12



Seismic Analysis Velocity Waveform Analysis

Serial Number: 7179
 Firmware Version: 08-03.23
 Event Date: 05/15/2012 11:31:18 (UTC -07:00)
 Event number: 13
 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

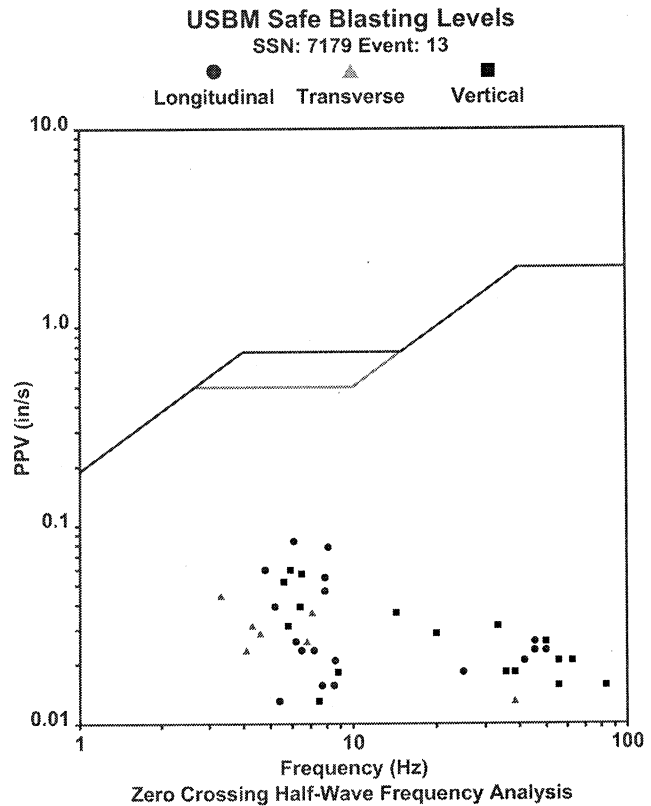
Summary Data

	L	T	V
PPV (in/s):	0.08	0.0425	0.0575
FREQ (HZ):	6	3.1	5.9
PD (.001"):	1.968	1.1	1.343
PPA (g):	0.02604	0.01302	0.02604

Peak Vector Sum: 0.095 in/s
 Peak Air Pressure: 118.5 DB
 0.002549 psi @ 1.7 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.



Waveform Graph Scale

Time Scale: 0.1 s
 Seismic Scale: +/- 0.16 in/s
 Sound Scale: +/- 0.002549 psi

Velocity Waveform

SSN: 7179 Event: 13

