

# SAN RAFAEL ROCK QUARRY VIBRATION REPORT

**BLAST INFORMATION**  
 Location: PB-7 to 8 Camp      Max. Charge Weight: 2.20      Date of Blast: 1.9.14  
 Northing: 33° 55' 13.11"      Blast Duration: 39.3 sec      Time of Blast: 01:39  
 Easting: 122° 27' 53.11"      Blast Number: 1901

SEISMOGRAPH INFORMATION	UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Seismograph Model	8000	8000	8000	8000	8000
Serial Number	1000	1000	1000	1000	1000
Last Calibration Date	5.3.13	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	1000	1000	1000	1000	1000
North	33° 55' 13.11"	33° 55' 13.11"	33° 55' 13.11"	33° 55' 13.11"	33° 55' 13.11"
East	122° 27' 53.11"	122° 27' 53.11"	122° 27' 53.11"	122° 27' 53.11"	122° 27' 53.11"
Distance from Blast	1584	250	378	1401	16
Scaled Distance	94	233	167		

VIBRATION INFORMATION	UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Longitudinal Peak Particle Velocity (ips)			.04		
Longitudinal Peak Frequency (Hz)			2.6		
Transverse Peak Particle Velocity (ips)			.05		
Transverse Peak Frequency (Hz)			15.6		
Vertical Peak Particle Velocity (ips)			.05		
Vertical Peak Frequency (Hz)			11.7		
Peak Vector Sum (ips)	0	0	.06	0	0
Peak Air Overpressure (db)	-	0	106	-	-

**GENERAL COMMENTS**

Seismograph Operator: Don Lopez      Signature: [Signature]

# SAN RAFAEL ROCK QUARRY BLAST REPORT

## BASE DATA:

Location: PR 77-825 Date: 10/19  
Northing: 37° 59' 31.11 N Time: 11:39  
Easting: 122° 27' 22.00 W Blast Number: 4772  
Designed Bench Height (ft): 32-211'  
Rock Density (tyd<sup>3</sup>): 2.73  
Relative Rock Hardness: \_\_\_\_\_

## DESIGN DATA:

Number of Holes Shot: 32 Hole Dia (in.): 6 7/8 Stemming (ft): 71-112 Loading Time Required (man hrs): \_\_\_\_\_  
Ave. Hole Depth (ft): 25 Burden (ft): 15 Stem Type: 2 1/2" steel Saggered Pattern (y or n): \_\_\_\_\_  
Relative Confinement: \_\_\_\_\_ Spacing (ft): 15 Subdrill (ft): \_\_\_\_\_ Number of Lost Holes: \_\_\_\_\_ Tons Shot: 6,968  
Deck Type: \_\_\_\_\_  
Length (ft): \_\_\_\_\_

## EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc	Units	Max (lb/dolex)	Blast Duration (sec)
<u>Titan 10002</u>	<u>2500</u>	<u>450 gels</u>	<u>64</u>	<u>80 EZ-4</u>	<u>56</u>			<u>23.2</u>	
				<u>50 EZ-4</u>	<u>32</u>				
				<u>5100</u>	<u>5</u>				

Total Charge Wt.: 5679

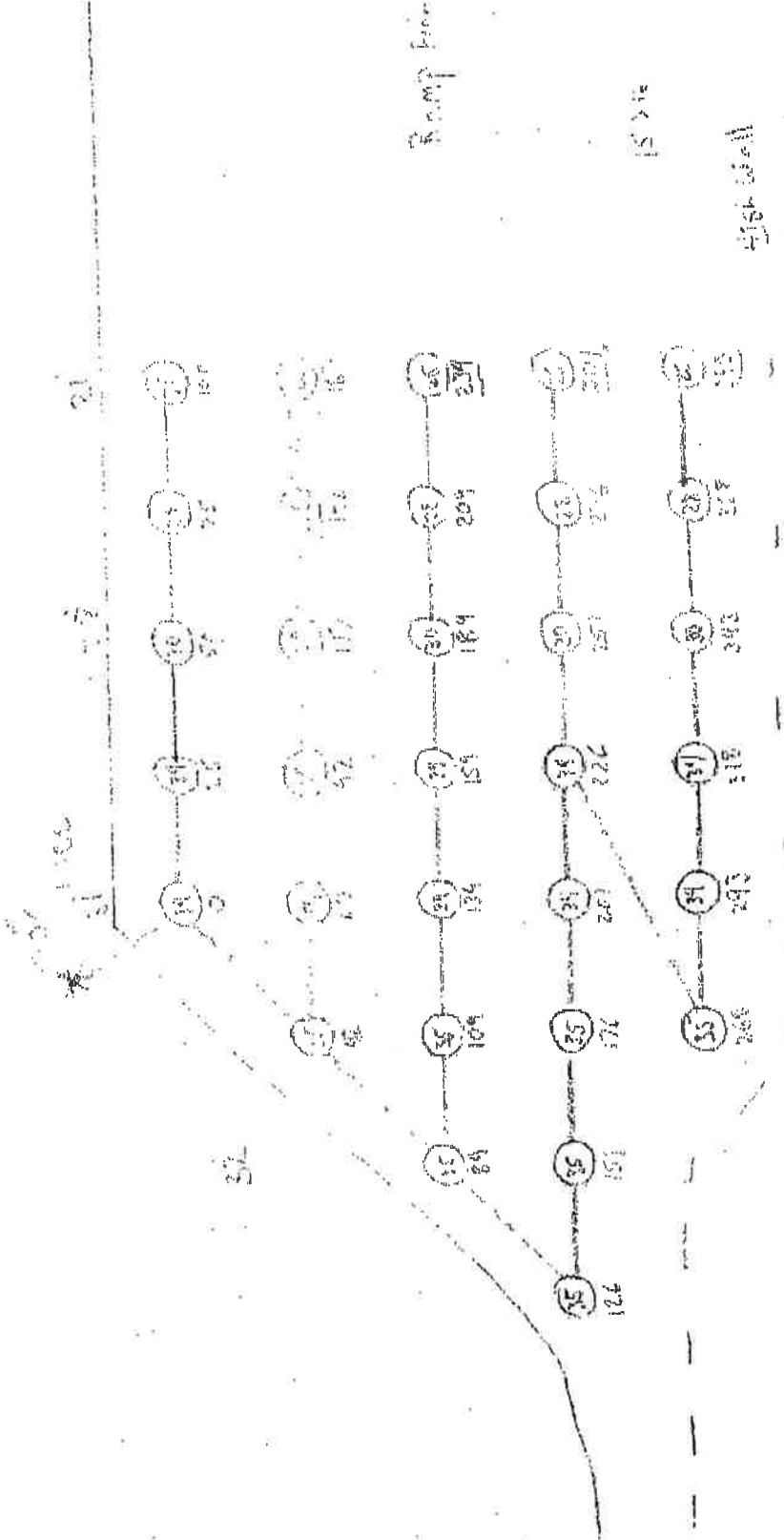
## VIBRATION DATA:

Seismograph Loc.: Same Temperature: 63° Max. Chrg. (lb/ft<sup>2</sup>): 430  
Northing: 37° 59' 19.11 N Sky Condition: Cls. of RFPV: 06  
Easting: 122° 27' 22.00 W Wind Direction: N Frequency: 15.6  
Distance Away: 1580 Wind Speed: 0.2 Airblast: 106

## PERFORMANCE DATA:

Powder Factor (lb/ton): 0.4 Displacement: good Crushability: \_\_\_\_\_  
Lo/tyd<sup>3</sup>: 9 Vibration: Good Fires: \_\_\_\_\_  
Fragmentation: good Dig ability: \_\_\_\_\_  
Comments: Part of the Roof was Pic. Shot Blaster in Charge: Alan Lopez

19.1A  
 P.B. 7-18-58  
 #1602



Comp. from P.B. 7-18-58

15' 1/2

High 10' 1/2

↑  
 30' 1/2  
 40' 1/2

Point 15 2/4  
 17 1/2  
 27 1/8  
 19 3/4  
 37° S 13° N  
 122° 21' 04" W

Depth 25-26

Stems 21-17

Hole # 234 ms No powder just 3 frames  
 30 ms  
 383 ms

2 Holes  
 32: B0 C2 det  
 32: S0 E2 det  
 4: 42 ms  
 64: ASD system  
 5560 lbs ft/m

## San Rafael Quarry

SEIS#	RESIDENCE	COORDINATES	DISTANCE IN METERS	DISTANCE IN FEET
9591	16 Marin Bay	N 37 59 31.92 W 122 27 18.6	683.5312287	2242
9808	Quarry Property	N 37 59 29.28 W 122 27 11.64	535.4519184	1756
			Multiply by 3.28	
	Blast Coordinates	37°	59'	11.000"
		-122°	27'	7.000"
		Revised April 13, 2004		



# 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:** 01/09/2014 07:05:12 (UTC-8)  
**End Date:** 01/09/2014 20:00:00 (UTC-8)  
**Events over Trigger:** 0 (6-5)  
**Record Time:** 5.0 s  
**Seismic Trigger:** 0.030 in/s  
**Sound Trigger:** N/A  
**Battery Level:** 8.7

**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 January 9, 2014 at approximately 11:39 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.



# Vibra-Tech Inc. Seismic Analysis

## Stop Event Report

**Serial No:** 9808 v3.23  
**Client:** COUNTY OF MARIN  
**Operation:** SAN RAFAEL ROCK QRY  
**Location:** ON QUARRY PROPERTY  
**Distance:**  
**Operator:** VIBRA-TECH GSM  
**Comment:**

**Begin Date:** 01/09/2014 07:27:01 (UTC-8)  
**End Date:** 01/09/2014 12:23:39 (UTC-8)  
**Events over Trigger:** 0 (25-24)  
**Record Time:** 5.0 s  
**Seismic Trigger:** 0.030 in/s  
**Sound Trigger:** N/A  
**Battery Level:** 8.7

**Additional Info:**

j-GEO-01253  
N37 59.481, W122 27.256

**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:**

<b>Longitudinal:</b>	<b>Pass</b>
<b>Transverse:</b>	<b>Pass</b>
<b>Vertical:</b>	<b>Pass</b>
<b>Sound:</b>	<b>Pass</b>

The seismograph on Quarry Property (S/N 9808) did not trigger during the shot on January 9, 2014 at approximately 11:39 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.

## Maggie Heffelfinger

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**From:** Maggie Heffelfinger <maggieh@vibratechinc.com>  
**Sent:** Monday, January 13, 2014 9:48 AM  
**To:** 'Davidson, Berenice'  
**Cc:** 'jsemerad@co.marin.ca.us'; 'Simonitch, Richard'  
**Subject:** San Rafael Quarry Blast Data 01/09/2014

**Importance:** High

Attached please find the seismic analysis for the blast at the San Rafael Quarry. Should you have any questions please feel free to contact me.



01-09\_San\_Rafael\_  
Qua...

Thank you,

**Maggie Heffelfinger**  
Administrative Assistant

570-455-5861 Office

570-455-6783 Fax



109 E. 1st Street  
PO Box 577  
Hazleton, PA 18201  
[www.vibratechinc.com](http://www.vibratechinc.com)

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