

# SAN RAFAEL ROCK QUARRY VIBRATION REPORT

**BLAST INFORMATION**  
 Location: 99057 Max. Charge Weight: 240 Date of Blast: 9/16/13  
 Northing: 37°55'11"N Blast Duration: 6.06 sec Time of Blast: 1:27  
 Easting: 128°55'00"W Blast Number: 507

**SEISMOGRAPH INFORMATION**

Seismograph Model	Model	Manufacturer	Serial Number	Last Calibration Date
3600	3600	3600	3600	5/3/13
3600	3600	3600	3600	5/3/13

**LOCATION INFORMATION**

Location	Latitude (N/S)	Longitude (E/W)	Distance from Blast	Scaled Distance
Northing	37°55'18"N	128°55'31"W	200E	180
Easting	128°55'33"W	128°55'30"W	153	98
Distance from Blast				
Scaled Distance				

**VIBRATION INFORMATION**

Parameter	Value
Longitudinal Peak Particle Velocity (ips)	0.05
Longitudinal Peak Frequency (Hz)	26.3
Transverse Peak Particle Velocity (ips)	0.04
Transverse Peak Frequency (Hz)	41.6
Vertical Peak Particle Velocity (ips)	0.05
Vertical Peak Frequency (Hz)	45.4
Peak Vector Sum (ips)	0.07
Peak Air Overpressure (db)	109

Seismograph Operator: Rafael Rap Signature: [Signature]

# SAN RAFAEL ROCK QUARRY BLAST REPORT

**BASE DATA:**

Location: 3750      Designed Bench Height (ft): 40      Date: 9-18-83  
 Northing: 3759.11      Rock Density (lb/ft<sup>3</sup>): 2.32      Time: 11:30  
 Easting: 1177.00      Relative Rock Hardness: 7      Blast Number: 1044

**DESIGN DATA:**

Number of Holes Shot: 18      Hole Dia. (in.): 1.25      Swarming (ft): 10      Loading Time Required (man hrs): 1.5      Deck Type: 1.5  
 Avg. Hole Depth (ft): 27      Burden (ft): 30      Stem Type: 30      Staggered Pattern (Y or N): Y      Length (ft): 24  
 Relative Confinement: \_\_\_\_\_      Spacing (ft): 15      Submill (ft): \_\_\_\_\_      Number of Lost Holes: \_\_\_\_\_      Tons Shot: 1.157

**EXPLOSIVES DATA:**

Bulk Explosive	Weight	Bags	Units	Delays	Misc.	Units	Max. (lb/hole)	Blast Duration (sec)
<u>Titanium</u>	<u>4.00</u>	<u>1</u>	<u>1</u>	<u>3000</u>		<u>1</u>	<u>1.40</u>	<u>5.00</u>

**VIBRATION DATA:**

Nearest Structure: Residential      Seismograph Location: \_\_\_\_\_      Temperature: \_\_\_\_\_      Max. Chg. (lb/ft<sup>3</sup>): \_\_\_\_\_  
 Northing: 3759.11      Northing: \_\_\_\_\_      Sky Condition: Cloudy      RPPV: \_\_\_\_\_  
 Easting: 1177.00      Easting: \_\_\_\_\_      Wind Direction: SE      Frequency: 60  
 Distance Away: 250      Distance Away: \_\_\_\_\_      Wind Speed: 10      Airblast: \_\_\_\_\_

**PERFORMANCE DATA:**

Powder Factor (lb/ton): 72      Displacement: 1.5      Crushability: \_\_\_\_\_  
 Lb/ft<sup>3</sup>: 1.6      Vibration: 1.5      Fines: \_\_\_\_\_  
 Fragmentation: good      Dig ability: \_\_\_\_\_  
 Comments: Rip Rap shot. Good hole in big case      Blaster in Charge: [Signature]





# 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.

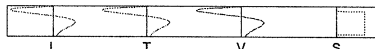
**Begin Date:** 08/27/2013 07:00:50 (UTC-7)  
**End Date:** 08/27/2013 20:00:00 (UTC-7)  
**Events over Trigger:** 0 (3-2)  
**Record Time:** 5.0 s  
**Seismic Trigger:** 0.030 in/s  
**Sound Trigger:** N/A  
**Battery Level:** 8.6

### 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 September 10, 2013 at approximately 11:33 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:**

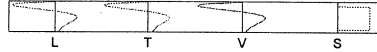
**Begin Date:** 09/10/2013 06:00:50 (UTC-7)  
**End Date:** 09/10/2013 20:00:00 (UTC-7)  
**Events over Trigger:** 0 (22-21)  
**Record Time:** 5.0 s  
**Seismic Trigger:** 0.030 in/s  
**Sound Trigger:** N/A  
**Battery Level:** 8.7

**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 September 10, 2013 at approximately 11:33 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.