

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

BLAST INFORMATION

Location: BB-72 Max. Charge Weight: 160 Date of Blast: 6.27.13
 Northing: 37°59'14 N Blast Duration: 436 ms Time of Blast: 12:05
 Easting: 122°27'06 W Blast Number: 1595

SEISMOGRAPH INFORMATION

Seismograph Model	2000	Mico	Mico
Serial Number	2481	4550	4567
Last Calibration Date	5 3 13	5 3 13	5 3 13

LOCATION INFORMATION

Location	Marin Ag	Via Montalbello	San Marinodr	M'Near Park
Northing	37°59'19 N	37°59'18 N	37°59'31 N	37°59'30 N
Easting	122°27'22 W	122°27'53 W	122°27'30 W	122°27'16 W
Distance from Blast	1428	3801	2587	1796
Scaled Distance	112	300	204	141

VIBRATION INFORMATION

Longitudinal Peak Particle Velocity (ips)	.05		
Longitudinal Peak Frequency (Hz)	13.5		
Transverse Peak Particle Velocity (ips)	.04		
Transverse Peak Frequency (Hz)	14.7		
Vertical Peak Particle Velocity (ips)	.04		
Vertical Peak Frequency (Hz)	20.0		
Peak Vector Sum (ips)	.06		
Peak Air Overpressure (db)	109		

GENERAL COMMENTS

Seismograph Operator: Devin Lopez Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-72 Designed Bench Height (ft): 21 Date: 6 27 13
 Northing: 37° 59' 14 N Rock Density (t/yard³): 2.23 Time: 12:05
 Easting: 122° 27' 06 W Relative Rock Hardness: 7 Blast Number: 1595

DESIGN DATA:

Number of Holes Shot: 40 Hole Dia. (in.): 3 1/4 Steaming (ft): 15 Loading Time Required (man hrs): 2 Deck Type: -
 Ave. Hole Depth (ft): 24 Burden (ft): 14 Stem Type: 3/4" Stone Staggered Pattern (y or n): N Length (ft): -
 Relative Confinement: - Spacing (ft): 14 Subdrill (ft): 3 Number of Lost Holes: 0 Tons Shot: 13,598

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole):
Ti ₂ sn 1000	5060	450g	40	5082	40			160
				41ms	8			Blast Duration (sec): <u>436ms</u>

Total Charge Wt.: 5100

VIBRATION DATA:

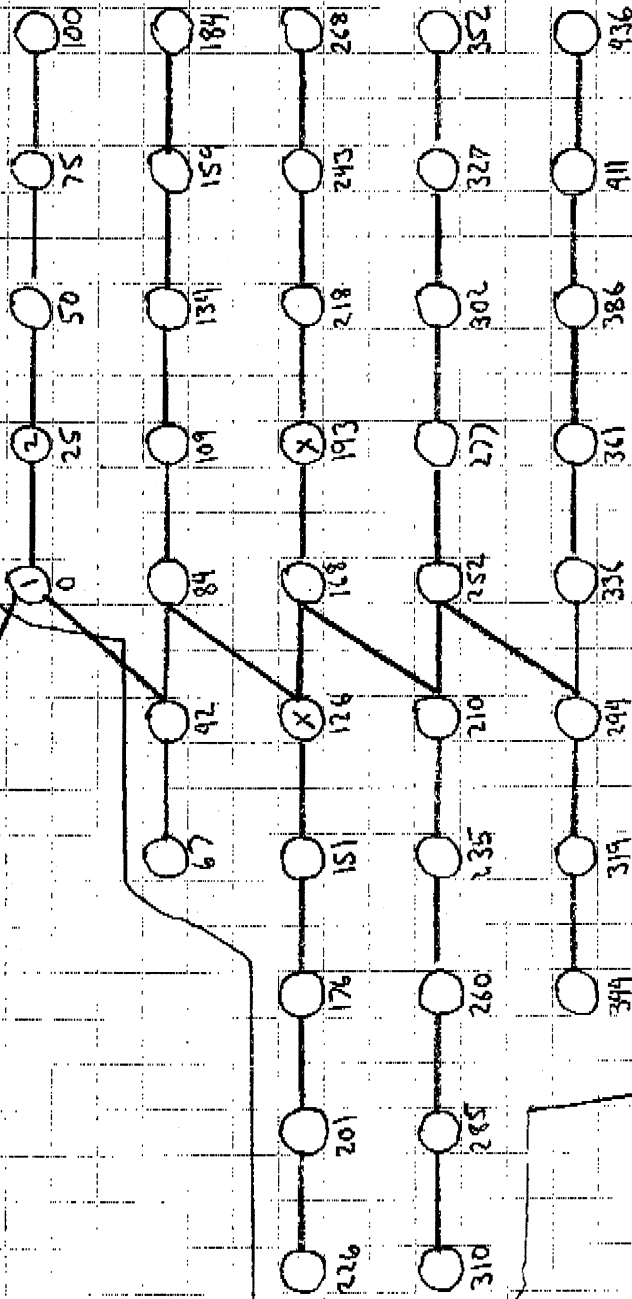
Nearest Structure: Main ag Seismograph Loc.: Same Temperature: 81° Max. Cmg. (lb/8ms): 160
 Northing: 37° 59' 19 N Northing: _____ Sky Condition: Clear RPPV: .06
 Easting: 122° 27' 22 W Easting: _____ Wind Direction: SE Frequency: 20.0
 Distance Away: 1428 Distance Away: _____ Wind Speed: 0-2 Airblast: 109

PERFORMANCE DATA:

Powder Factor (lb/ton): 1.4 Displacement: Great Crushability: _____
 Lb/yard³: 1.01 Vibration: Great Fines: _____
 Fragmentation: Great Dig ability: _____
 Comments: _____ Blaster in Charge: [Signature]

6.27.13
PB: 7 1/2
* 1595

POI *
Face 21



40 Holes
40 = 50' EZ det
8 = 42" nseZTL
40 = 450 gram

5060 lbs titan

depth 24

160 lbs Max
15' stemming

(X) 60# per big void
Powder never came up

(1) - (2) = Lt. load 20#
Hole thin at bottom

Main 1428
Titan 3861
SM 2587
MtN 1795

3759 MtN
12227 OK W

Highway

Seismic Analysis Velocity Waveform Analysis

Serial Number: 9808
Firmware Version: 08-03.23
Event Date: 06/27/2013 12:06:14 (UTC -07:00)
Event number: 18
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

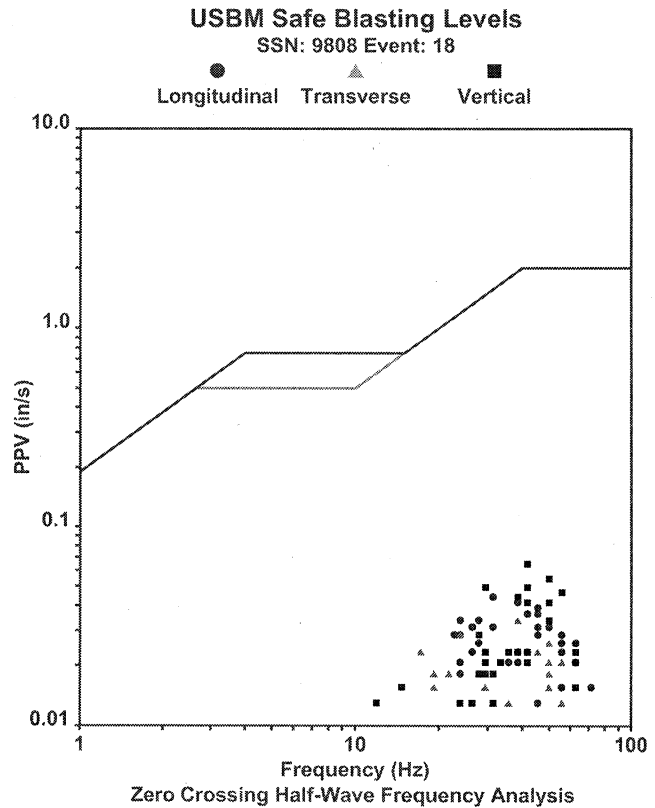
Summary Data

	L	T	V
PPV (in/s):	0.0425	0.0325	0.0625
FREQ (HZ):	31.3	38.5	41.7
PD (.001"):	0.3225	0.1975	0.2525
PPA (g):	0.03906	0.02604	0.04557

Peak Vector Sum: 0.07 in/s
Peak Air Pressure: 103.2 DB
 0.0004812 psi @ 4.3 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.

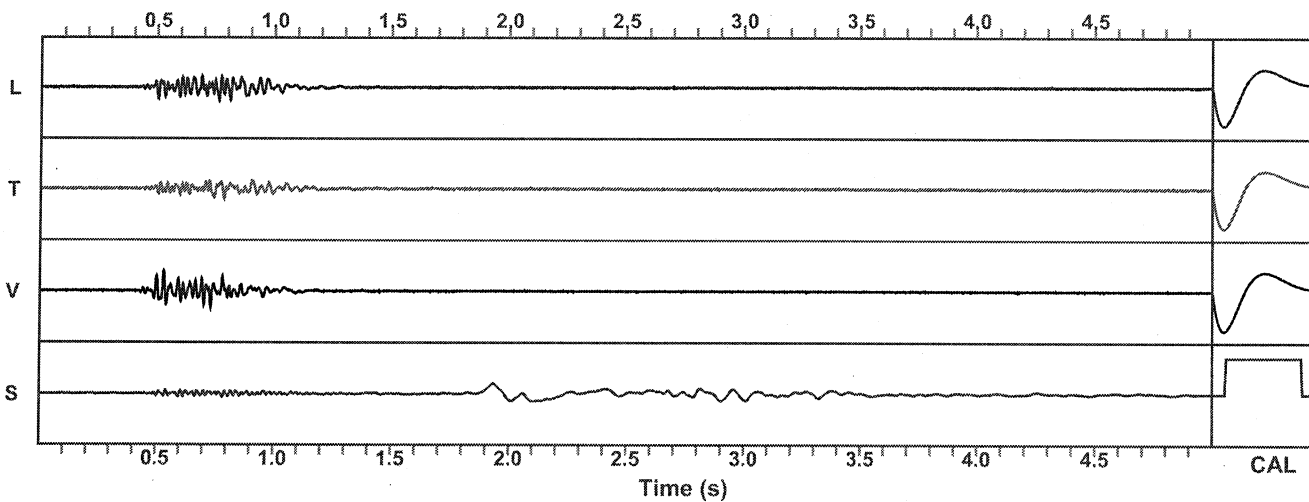


Waveform Graph Scale

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

Velocity Waveform

SSN: 9808 Event: 18





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.

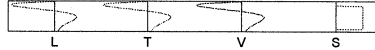
Begin Date: 06/27/2013 07:00:50 (UTC-7)
End Date: 06/27/2013 20:00:00 (UTC-7)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.9

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 June 27, 2013 at approximately 12:06 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.