

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-7 Max. Charge Weight: 400 Date of Blast: 9.A.13
 Northing: 37° 59' 15" N Blast Duration: 268 ms Time of Blast: 11:31
 Easting: 122° 27' 06" W Blast Number: 1598

SEISMOMETER INFORMATION		UNIT		SERIAL NUMBER	
Seismograph Model	2000	Micro	Micro	Micro	Micro
Serial Number	2481	4550	4567	4570	
Last Calibration Date	5 3 13	5 3 13	5 3 13	5 3 13	

LOCATION INFORMATION		UNIT		SERIAL NUMBER	
Location	Marinas	Via Mont.	San Marino	McNear 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	1320	3748	2534	1684	
Scaled Distance	66	187	126	84	

VIBRATION INFORMATION		UNIT		SERIAL NUMBER	
Longitudinal Peak Particle Velocity (ips)	.07	.07	.11		
Longitudinal Peak Frequency (Hz)	19.7	11.6	26.3		
Transverse Peak Particle Velocity (ips)	.07	.07	.09		
Transverse Peak Frequency (Hz)	22.7	17.2	41.6		
Vertical Peak Particle Velocity (ips)	.05	.10	.16		
Vertical Peak Frequency (Hz)	27.7	17.2	45.4		
Peak Vector Sum (ips)	.09	.11	.16		
Peak Air Overpressure (db)	106	112	106		

Seismograph Operator: Deron Lopes Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB-7 Date: 9 4 13
 Northing: 37° 54' 15 N Time: 11:31
 Easting: 122° 27' 06 W Blast Number: 1598

DESIGN DATA:

Number of Holes Shot: 18 Hole Dia. (in.): 3 1/4 Loading Time Required (man hrs): 5
 Ave. Hole Depth (ft): 43 Burden (ft): 17 Stem Type: 3/8" Stone Staggered Pattern (y or n): N
 Relative Confinement: - Spacing (ft): 18 Subdrill (ft): 3 Number of Lost Holes: 0
 Deck Type: - Length (ft): - Tons Shot: 18,196

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Misc.	Units	Max (lb/hole):
Titan 1000	7,340	450g	36	80' E2		18	400
				50' E2		18	Blast Duration (sec): <u>268 ms</u>
				42 MS		4	Total Charge Wt.: <u>7376</u>

VIBRATION DATA:

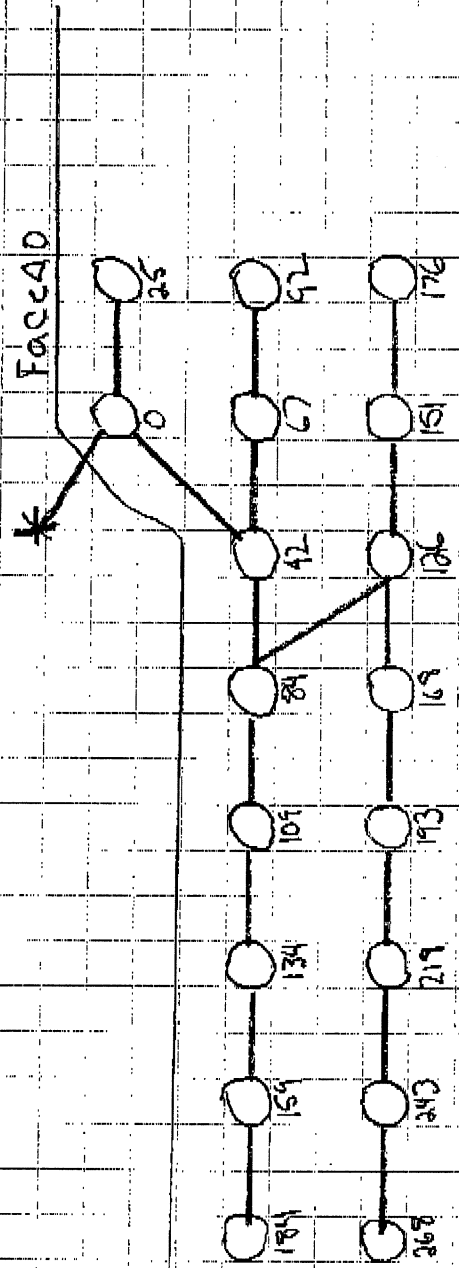
Nearest Structure: Marina Seismograph Loc.: Same Temperature: 81° Max. Chrg. (lb/8ms): 400
 Northing: 37° 54' 19 N Northing: - Sky Condition: Clear RPPV: .09
 Easting: 122° 27' 22 W Easting: - Wind Direction: East Frequency: 27.7
 Distance Away: 1320 Distance Away: - Wind Speed: 2-4 mph Airblast: 106

PERFORMANCE DATA:

Powder Factor (lb/ton): .3 Displacement: Good Crushability: -
 Lb/yrd³: .8 Vibration: Good Fines: -
 Fragmentation: Good Dig ability: -

Comments: Rip-Rap shot Blaster in Charge: Tom Jones

9/4/13
 PB-7
 #1598



Main 1320
 VialM 37A8
 SamM 253A
 MCV 1184
 37° 59' 15 N
 122° 27' 06 W

depth = 43
 360 - 400 lbs per
 20 stem

18 Holes
 18° 80' E 2 det.
 18° 50' E 2 det.
 4° 40' E 2 TL
 36° 450 gram.
 2,340 lbs

Seismic Analysis

Velocity Waveform Analysis

Serial Number: 9591
 Firmware Version: 08-03.23
 Event Date: 09/04/2013 11:31:04 (UTC -07:00)
 Event number: 3
 Recording Time: 5 s
 Client: COUNTY OF MARIN
 Operation: SAN RAFAEL ROCK QRY
 Location: 16 MARIN BAY PARK CT.
 Distance:
 Operator: VIBRA-TECH GSM
 Comment: WILLIAM HOSKEN RES.
 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):	0.0525	0.0225	0.055
FREQ (HZ):	35.7	38.5	33.3
PD (.001"):	0.2625	0.375	0.335
PPA (g):	0.03255	0.01953	0.03906

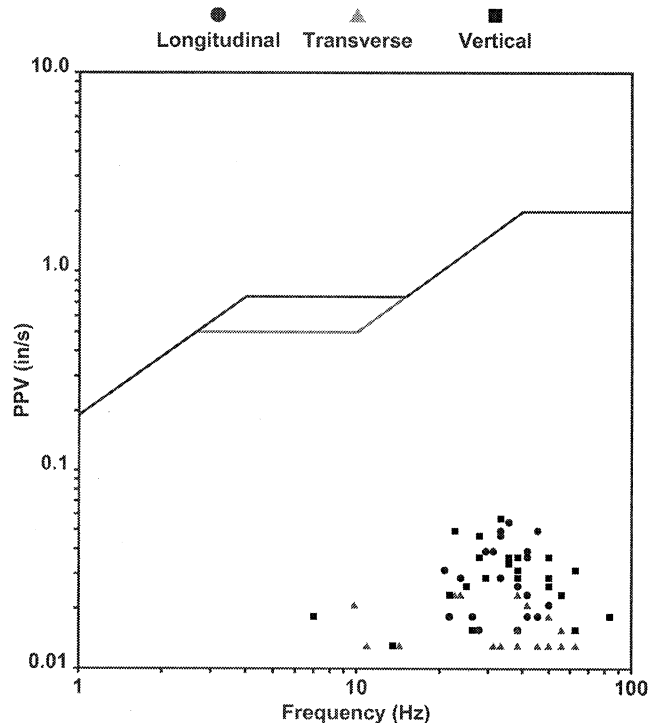
Peak Vector Sum: 0.0575 in/s
 Peak Air Pressure: 104.9 DB
 0.0005881 psi @ 2 HZ

Shaketable Calibrated

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

USBM Safe Blasting Levels

SSN: 9591 Event: 3



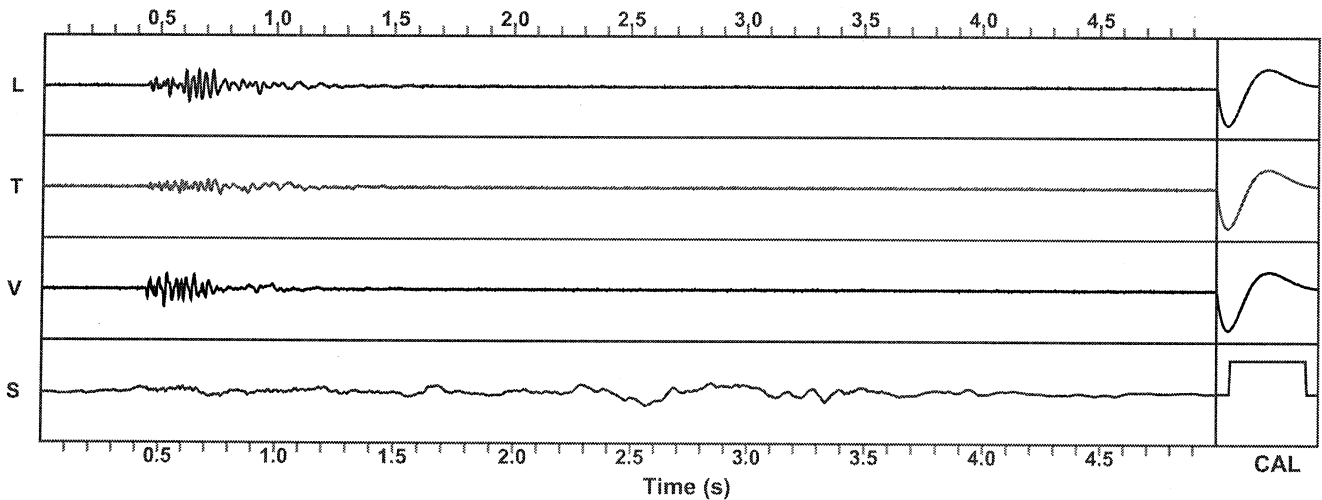
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

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

Velocity Waveform

SSN: 9591 Event: 3



Seismic Analysis

Velocity Waveform Analysis

Serial Number: 9808
Firmware Version: 08-03.23
Event Date: 09/04/2013 11:31:04 (UTC -07:00)
Event number: 21
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):	0.0825	0.06	0.125
FREQ (HZ):	50	50	45.5
PD (.001"):	0.5075	0.565	0.6625
PPA (g):	0.07161	0.05208	0.09115

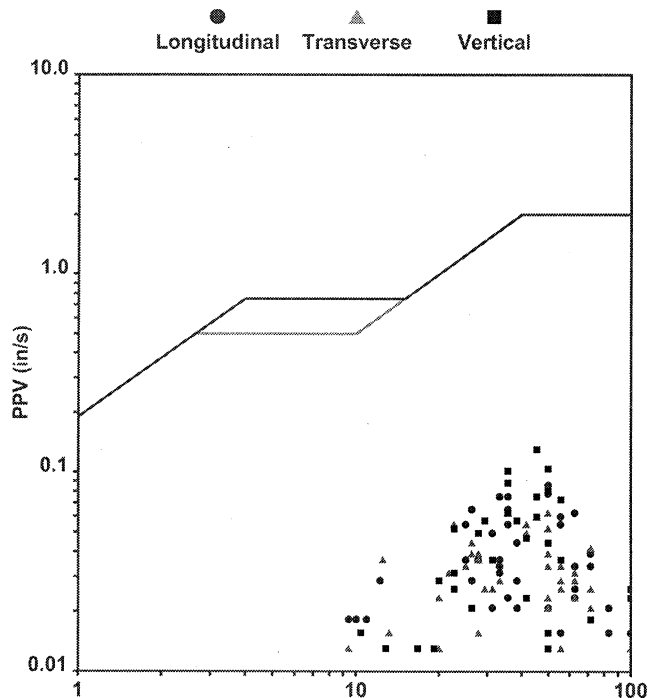
Peak Vector Sum: 0.15 in/s
Peak Air Pressure: 104 DB
 0.0005347 psi @ 2.1 HZ

Shaketable Calibrated

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

USBM Safe Blasting Levels

SSN: 9808 Event: 21



Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

Time Scale: 0.1 s
Seismic Scale: +/- 0.1875 in/s
Sound Scale: +/- 0.0023 psi

Velocity Waveform

SSN: 9808 Event: 21

