

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

BASE INFORMATION

Location: P.B. 7 Max. Charge Weight: 420 Date of Blast: 3.21.13
 Northing: 37° 59' 11" N Time of Blast: 11:35
 Easting: 122° 22' 10" W Blast Duration: 3.20 Blast Number: 1592

SEISMOGRAPH INFORMATION

Seismograph Model	Serial Number	Last Calibration Date	UNIT #	UNIT #	UNIT #
Micro	4550	5.17.12	Micro	Micro	Micro
	4557	5.17.12	4570	4570	4570
	5.17.12	5.17.12	5.17.12	5.17.12	5.17.12

LOCATION INFORMATION

Location	UNIT #	UNIT #	UNIT #
Malibu Ag	San Marino	117	117
37° 59' 19" N	37° 59' 31" N	37° 59' 30" N	37° 59' 30" N
122° 22' 22" W	122° 22' 53" W	122° 22' 50" W	122° 22' 16" W
1267	7587	1954	1954
Distance from Blast	170	126	95
Scaled Distance			

VIBRATION INFORMATION

Longitudinal Peak Particle Velocity (ips)	.07	.08	.08
Longitudinal Peak Frequency (Hz)	30.0	26.3	26.3
Transverse Peak Particle Velocity (ips)	.10	.06	.08
Transverse Peak Frequency (Hz)	26.3	10.2	19.2
Vertical Peak Particle Velocity (ips)	.07	.07	.07
Vertical Peak Frequency (Hz)	30.0	17.8	26.3
Peak Vector Sum (ips)	.11	.10	.11
Peak Air Overpressure (db)	116	109	112

GENERAL COMMENTS

Ground wet at locations. From rain.

Seismograph Operator: Debra Lopez Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PB7 Date: 3.21.13
 Designed Bench Height (ft): 46
 Northing: 375414N Rock Density (tyd³): 3.25 Time: 11:35
 Easting: 123710W Relative Rock Hardness: 7 Blast Number: 1002

DESIGN DATA:

Number of Holes Shot: 36 Hole Dia. (in.): 6 3/4 Loading Time Required (man hrs): Deck Type:
 Ave. Hole Depth (ft): 43 Burden (ft): 16 Stem Type: 3/6 Staggered Pattern (y or n): Length (ft):
 Relative Confinement: Spacing (ft): Number of Lost Holes: Tons Short:

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosts	Units	Delays	Misc.	Units	Max (lb/hole)
Titanium	10,580	ASD	52	3000		16	430
				5000		26	
				4000		7	
				3000		1	
							Blast Duration (sec): <u>327ms</u>
							Total Charge Wt.: <u>10,632</u>

VIBRATION DATA:

Seismograph Loc.: SEV Temperature: 61° Max. Chrg. (lb/8ms): 533
 Northing: 375414N Nothing: Sky Condition: Clear RPPV:
 Easting: 122° 02' 22" W Easting: Wind Direction: SW Frequency: 36.10
 Distance Away: 130 Distance Away: Wind Speed: 0.0 Airblast:

PERFORMANCE DATA:

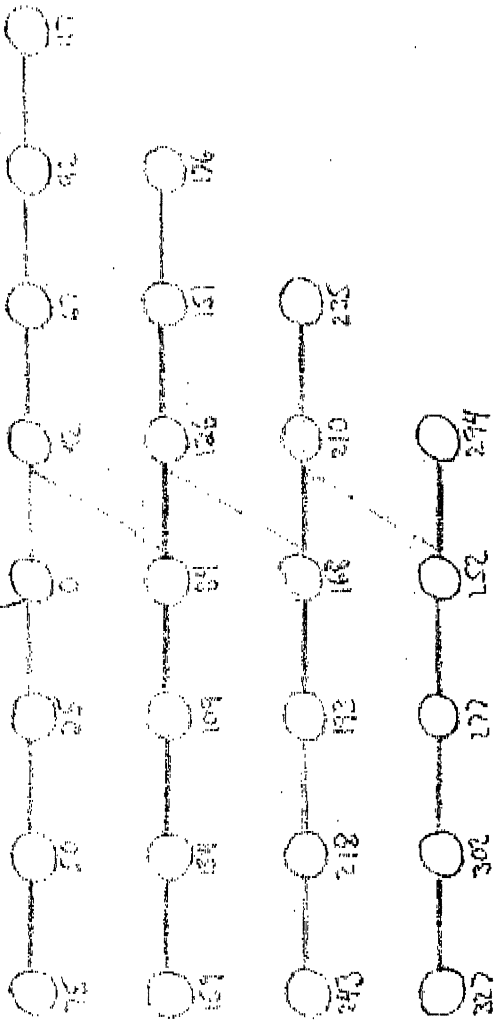
Powder Factor (lb/ton): 6 Displacement: Great Crushability:
 Lb/yd³: 1.35 Vibration: Great Fines:
 Fragmentation: Great Dig ability:
 Comments: Blaster in Charge: Phil Jones

3.21.13
P.D. 7
#1592

*FOI

Face AOT

1975



Main = 1267
Vibr. Flood = 3485
Sump M = 2587
M^o W = 1954

37° 59' 11" N
102° 27' 10" W

depth 43^m

18 stems @ 45
420 lbs per

26 Holes
26-80' EZ
26-50' EZ
7-42 ms
1-17 ms

52-450 gram booster

10,580[#] Titan 1000

Seismic Analysis Velocity Waveform Analysis

Serial Number: 9808
Firmware Version: 08-03.23
Event Date: 03/21/2013 11:34:53 (UTC -07:00)
Event number: 16
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

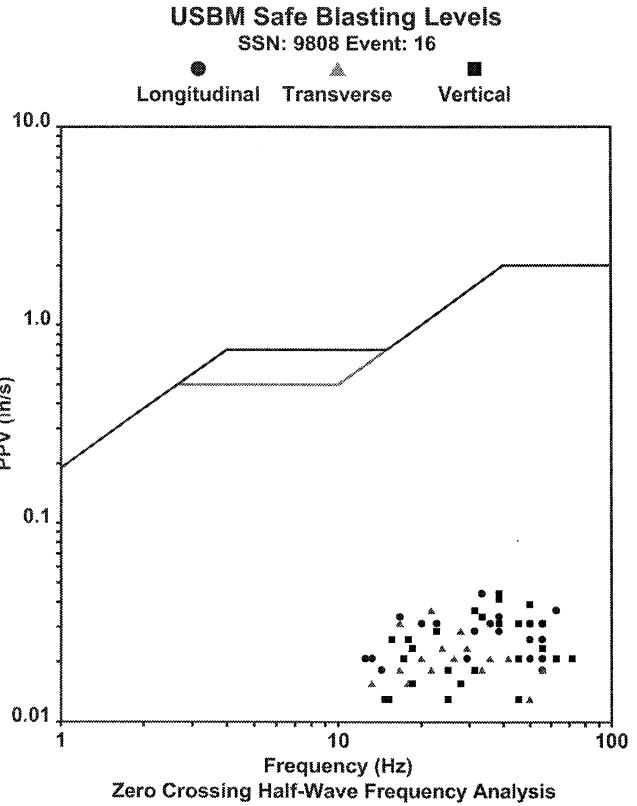
Summary Data

	L	T	V
PPV (in/s):	0.0425	0.035	0.0425
FREQ (HZ):	29.4	20.8	38.5
PD (.001"):	0.3525	0.39	0.3175
PPA (g):	0.03906	0.02604	0.04557

Peak Vector Sum: 0.055 in/s
Peak Air Pressure: 108.1 DB
 0.0007842 psi @ 3.5 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.

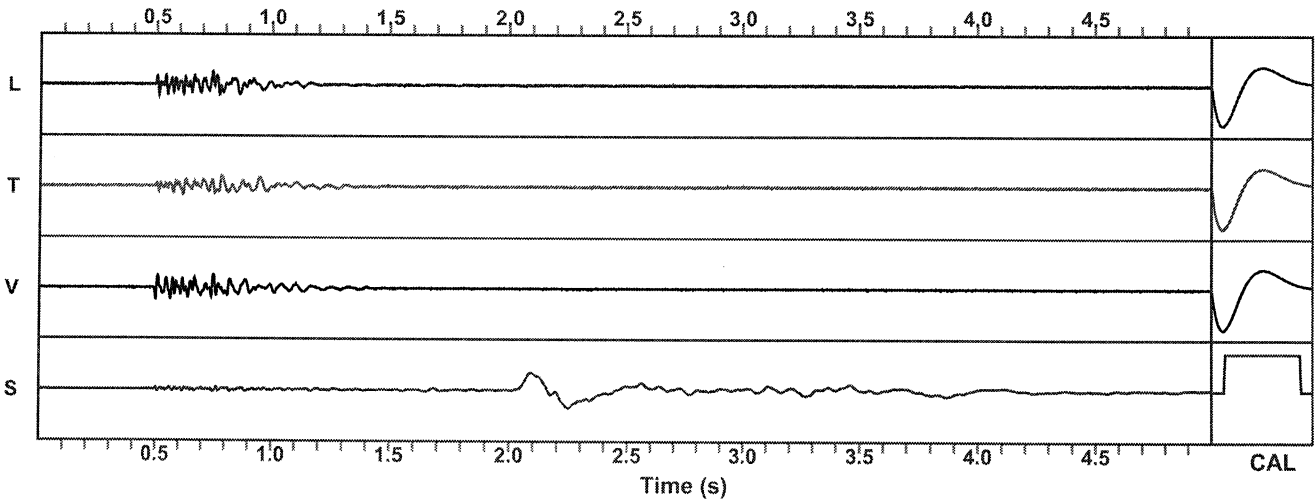


Waveform Graph Scale

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

Velocity Waveform

SSN: 9808 Event: 16



Seismic Analysis Velocity Waveform Analysis

Serial Number: 9591
 Firmware Version: 08-03.23
 Event Date: 03/21/2013 11:34:52 (UTC -07:00)
 Event number: 1
 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

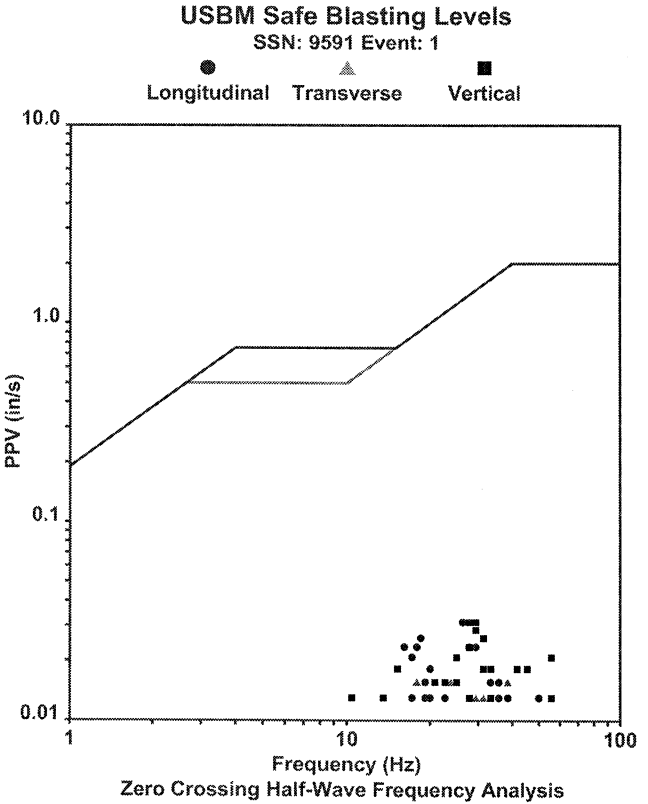
Summary Data

	L	T	V
PPV (in/s):	0.03	0.015	0.03
FREQ (HZ):	26.3	21.7	23.8
PD (.001"):	0.305	0.1825	0.195
PPA (g):	0.01953	0.01302	0.02604

Peak Vector Sum: 0.035 in/s
 Peak Air Pressure: 110.2 DB
 0.0009446 psi @ 2.8 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: 9591 Event: 1

