

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PR-2 Max. Charge Weight: 400 Date of Blast: 8.2.13
 Northing: 30° 54' 11" N Blast Duration: 31.6ms Time of Blast: 11:14
 Easting: 100 27 09 W Blast Number: 1072

SEISMOGRAPH INFORMATION	UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Seismograph Model	101119	101119	101119	101119	101119
Serial Number	1072	1072	1072	1072	1072
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	101119	101119	101119	101119	101119
Northing	30° 54' 11" N	30° 54' 11" N	30° 54' 11" N	30° 54' 11" N	30° 54' 11" N
Easting	100 27 09 W	100 27 09 W	100 27 09 W	100 27 09 W	100 27 09 W
Distance from Blast	1072	2492	2492	2492	2492
Scaled Distance	66	177	151	151	97

VIBRATION INFORMATION	UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Longitudinal Peak Particle Velocity (ips)	.07	/	/	/	.08
Longitudinal Peak Frequency (Hz)	13.5	/	/	/	19.2
Transverse Peak Particle Velocity (ips)	.06	/	/	/	.07
Transverse Peak Frequency (Hz)	30.3	/	/	/	17.5
Vertical Peak Particle Velocity (ips)	.06	/	/	/	.08
Vertical Peak Frequency (Hz)	15.6	/	/	/	33.3
Peak Vector Sum (ips)	.08	0	0	0	.11
Peak Air Overpressure (db)	116	-	-	-	117

GENERAL COMMENTS

Seismograph Operator: Decon Lopez Signature: Decon Lopez

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: DR-7 Designed Bench Height (ft): 40 Date: 2.15.86
 Northing: 37°59'11N Rock Density (g/cm³): 2.85 Time: 11:44
 Easting: 172°27'21W Relative Rock Hardness: 7 Blast Number: 538

DESIGN DATA:

Number of Holes Shot: 43 Hole Dia. (in.): 1 1/4 Loading Time Required (min ins): 2 Deck Type:
 Avg. Hole Depth (ft): 45 Burden (ft): 5 Staggered Pattern (y or n): Length (ft):
 Relative Confinement: Spacing (ft): Number of Lost Holes: Total Shot: 43

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units
ANFO	4500	450	15	40	15		

Max (lb/note): 420 Blast Duration (sec): 194

VIBRATION DATA:

Total Charge Wt.: 13,066

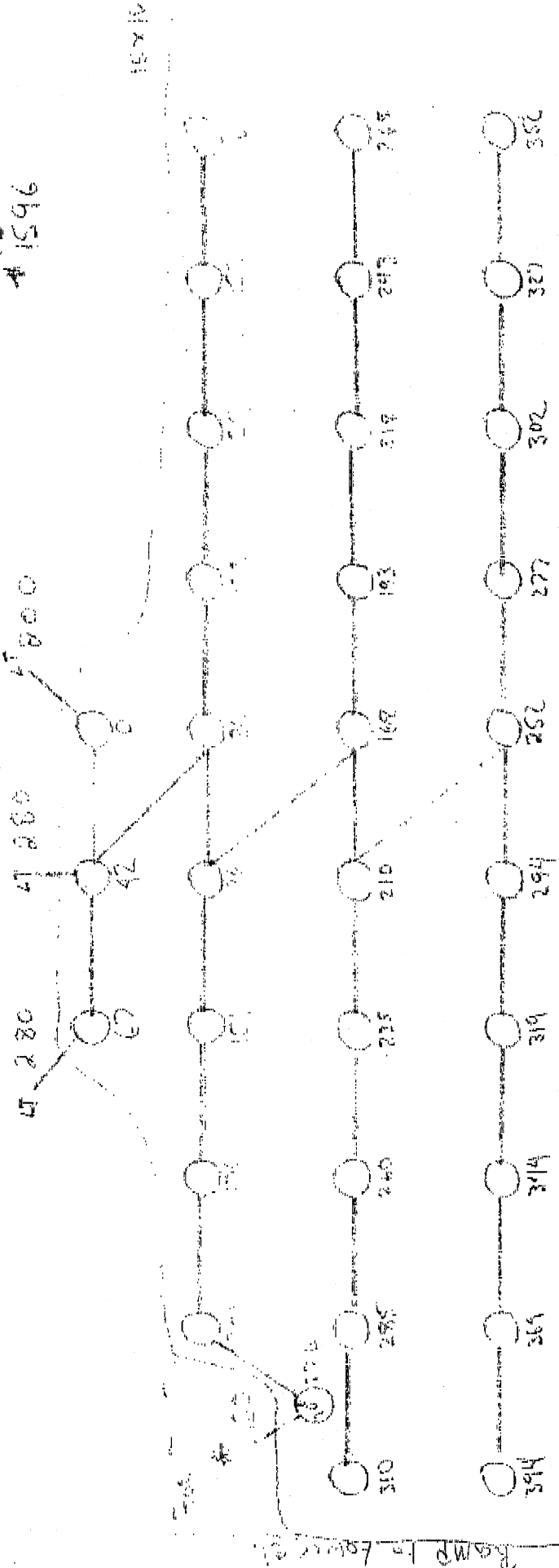
Seismograph (no.): Temperature: Max. Chg. (lb/ins): 550
 Northing: 37°59'11N Sky Condition: B, S, W RPPV: 108
 Easting: 172°27'21W Wind Direction: S, S, E Frequency: 23.8
 Distance Away: Wind Speed: Airblast:

PERFORMANCE DATA:

Powder Factor (lb/ton): Displacement: Good Crushability:
 Lb/yd³: 118 Vibration: Great Fines:
 Fragmentation: Great Dig ability:

Comments: Blaster in Charge: J. M. Lopez

8.2.13
PB-7
#1596



33 Holes
33: 80 62 dets
33: 50 62 dets
7: 40ms 67T
66: 450 gcm

13,000 lbs Titan

Depth: 43'

System
420 lbs per

4 holes LT Loaded

1720' AMSK holes

Moist: 137%
W.M.P: 364%
S.M.W: 24-42
P.W: 2006

37° 59' 11" N
122° 27' 08" W

Seismic Analysis Velocity Waveform Analysis

Serial Number: 9591
 Firmware Version: 08-03.23
 Event Date: 08/02/2013 11:42:34 (UTC -07:00)
 Event number: 2
 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):	0.0375	0.0225	0.03
FREQ (HZ):	22.7	17.2	18.5
PD (.001"):	0.3575	0.2525	0.295
PPA (g):	0.01953	0.01302	0.02604

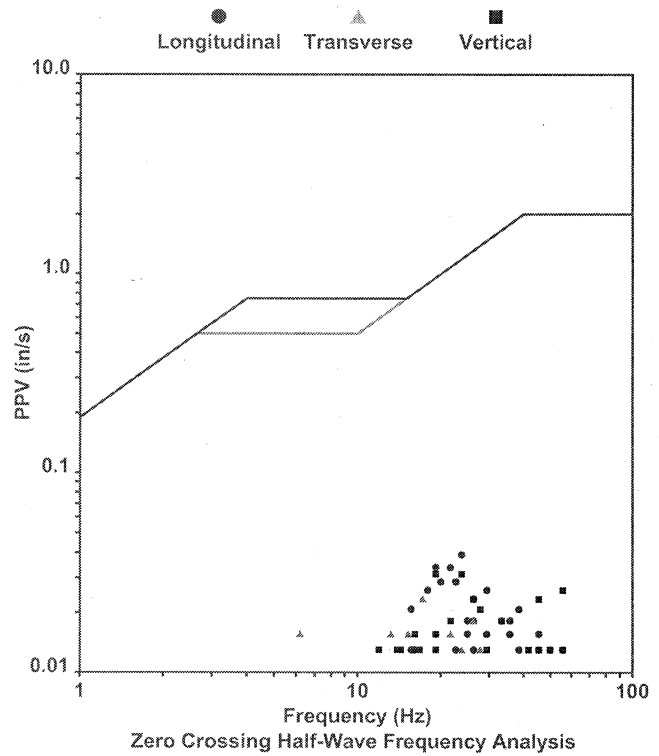
Peak Vector Sum: 0.045 in/s
 Peak Air Pressure: 111.7 DB
 0.001194 psi @ 1.9 HZ

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: 2

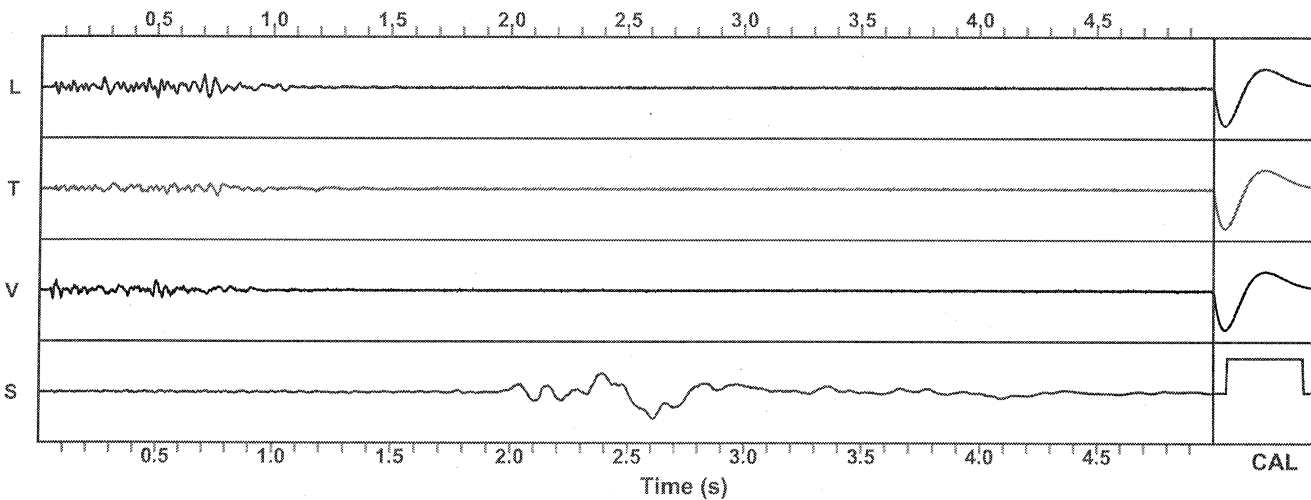


Waveform Graph Scale

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

Velocity Waveform

SSN: 9591 Event: 2



Seismic Analysis Velocity Waveform Analysis

Serial Number: 9808
 Firmware Version: 08-03.23
 Event Date: 08/02/2013 11:42:33 (UTC -07:00)
 Event number: 19
 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):	0.0625	0.05	0.0575
FREQ (HZ):	62.5	15.2	35.7
PD (.001"):	0.3875	0.435	0.5275
PPA (g):	0.05859	0.03255	0.07161

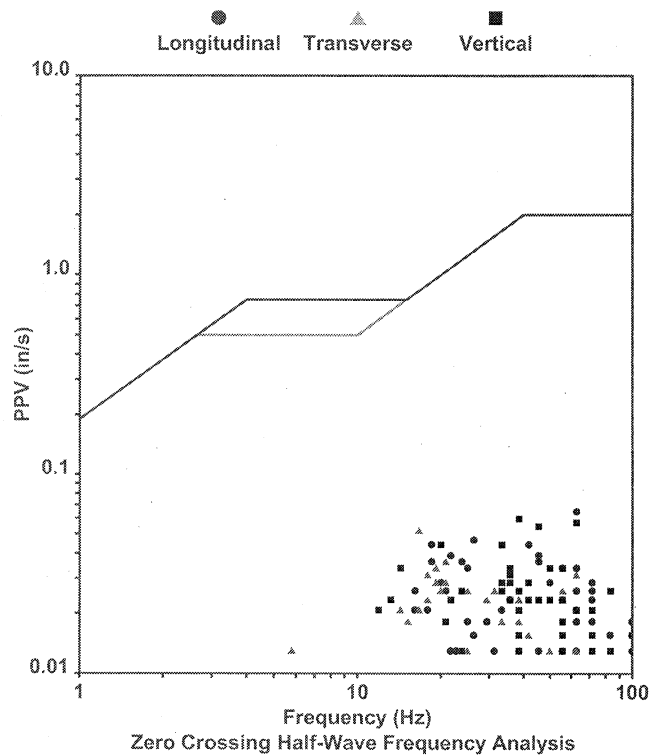
Peak Vector Sum: 0.08 in/s
 Peak Air Pressure: 110.6 DB
 0.001016 psi @ 3 HZ

Shaketable Calibrated

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

USBM Safe Blasting Levels

SSN: 9808 Event: 19



Waveform Graph Scale

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

Velocity Waveform

SSN: 9808 Event: 19

