

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

BLAST INFORMATION

Location: 987 Max. Charge Weight: 380 Date of Blast: 1-28-14
 Northing: 37° 59' 11" N Time of Blast: 11:30
 Easting: 171° 20' 23" W Blast Duration: 0.3 Blast Number: 108

SEISMOGRAPH INFORMATION

Seismograph Model	UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Serial number:	1000	1001	1002	1003	1004
Last Calibration Date	6-3-13	6-3-10	6-3-13	6-3-13	6-3-13

LOCATION INFORMATION

Location	Mag. (m/s)	W. (m/s)	Jan. (m/s)	MP (m/s)
Northing	37° 59' 11" N	171° 20' 23" W	37° 59' 11" N	30° 51' 30" W
Easting	171° 20' 23" W	171° 20' 23" W	171° 20' 30" W	171° 20' 23" W
Distance from Blast	83	200	148	108
Scaled Distance	83	200	148	108

VIBRATION INFORMATION

Longitudinal Peak Particle Velocity (ips)	.04				
Longitudinal Peak Frequency (Hz)	11.6				
Transverse Peak Particle Velocity (ips)	.06				
Transverse Peak Frequency (Hz)	15.6				
Vertical Peak Particle Velocity (ips)	.04				
Vertical Peak Frequency (Hz)	4.6				
Peak Vector Sum (ips)	.08				
Peak Air Overpressure (db)	112				

GENERAL COMMENTS

Seismograph Operator: Deion Lopez Signature: Deion Lopez

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: PRC Designed Bench Height (ft): 40 Date: 10/11/88
 Northing: 37° 59' 19" N Rock Density (tyd³): 2.53 Time: 11:34
 Easting: 122° 17' 22" W Relative Rock Hardness: 7 Blast Number: 1658

DESIGN DATA:

Number of Holes Shot: 24 Hole Dia. (in.): 5 7/8 Stemming (ft): 20 Loading Time Required (man hrs): 3 Deck Type: _____
 Ave. Hole Depth (ft): 42 Burden (ft): _____ Stem Type: 2 1/2" dia. bit Staggered Pattern: 1/1 Length (ft): _____
 Relative Confinement: _____ Spacing (ft): 2 Subdrill (ft): _____ Number of Lost Holes: 0 Tons Shot: 50,000

EXPLOSIVES DATA:

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units
TITANIUM	14,000	450 gms	60	305247	34		
				346247	34		
				4205247	6		
							Max. Hbl/Shot: <u>330</u>
							Glass Transition Temp: <u>1720K</u>

VIBRATION DATA:

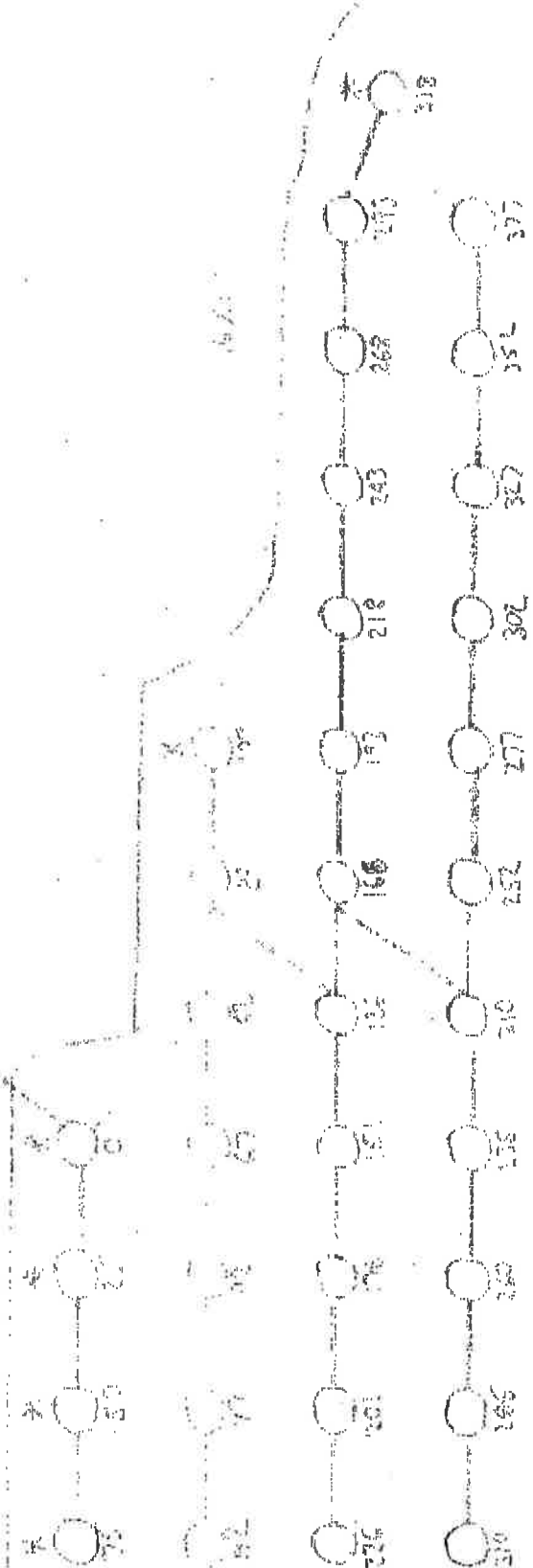
Nearest Structure: Mo. Cr. Co. Seismograph Loc.: 330 ft Temperature: 61° Max. Chg. (lb/ft³): 380
 Northing: 37° 59' 19" N Nothing: _____ Sky Condition: 025/025 RPPV: 107
 Easting: 122° 17' 22" W Easting: _____ Wind Direction: 165 Frequency: 4
 Distance Away: 163 Distance Away: _____ Wind Speed: 0-3 mph Airblast: _____

PERFORMANCE DATA:

Powder Factor (lb/ton): 42 Displacement: good Crushability: _____
 Lb/tyd³: 9 Vibration: Good Fines: _____
 Fragmentation: good Dig ability: _____
 Comments: _____ Blaster in Charge: Tom Jago

1.28.8
 FB.7
 #1609

Face 40
 P.O.I



34 Holes
 34 = 80' E2
 34 = 50' E2
 6 = 40' E2
 68 = 450' E2

12,100 lbs

Depth 415'

20' stemming

300 lbs per max

Main 1636
 Vicin 3907
 Som M 2909
 P.M.P 2112

37° 59' NW
 122° 27' OSW

* O = Thin on the face
 LT. load 160 lbs - 200

San Rafael Quarry

SEIS#	RESIDENCE	COORDINATES	DISTANCE IN METERS	DISTANCE IN FEET
9591	16 Marin Bay	N 37 59 31.92 W 122 27 18.6	725.3764283	2379
9808	Quarry Property	N 37 59 29.28 W 122 27 11.64	586.4415896	1924
			Multiply by 3.28	
	Blast Coordinates	37°	59'	11.000"
		-122°	27'	7.000"
		Revised April 13, 2004		



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.

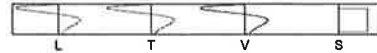
Begin Date: 01/28/2014 07:01:41 (UTC-8)
End Date: 01/28/2014 20:00:00 (UTC-8)
Events over Trigger: 0 (6-5)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.7

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 January 28, 2014 at approximately 11:33 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.

Seismic Analysis Velocity Waveform Analysis

Serial Number: 9808
Firmware Version: 08-03.23
Event Date: 01/28/2014 11:33:19 (UTC -08:00)
Event number: 25
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):	0.045	0.0225	0.045
FREQ (HZ):	17.9	38.5	29.4
PD (.001"):	0.3675	0.21	0.27
PPA (g):	0.03255	0.01953	0.03255

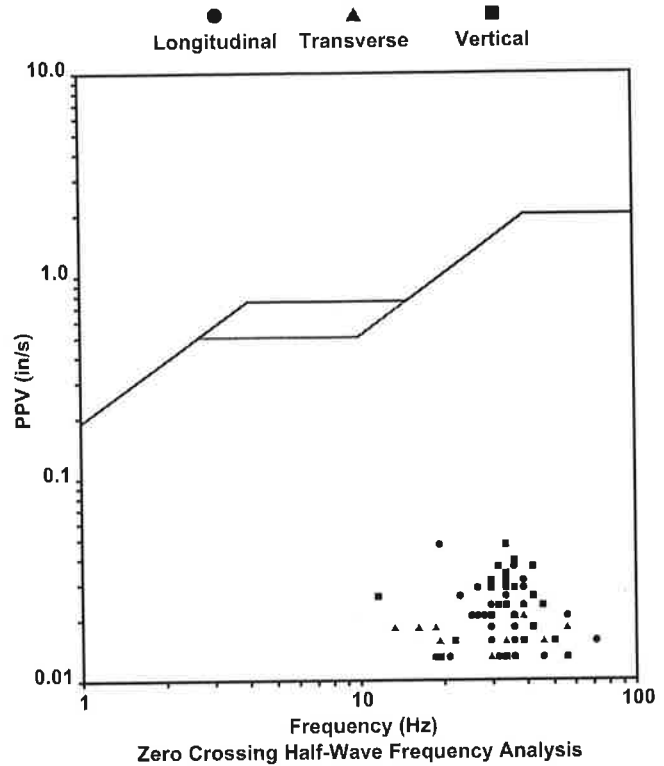
Peak Vector Sum: 0.0475 in/s
Peak Air Pressure: 110.7 DB
 0.001034 psi @ 5.1 HZ

Shaketable Calibrated

On: 02/20/2013 (UTC -08:00)
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 9808 Event: 25

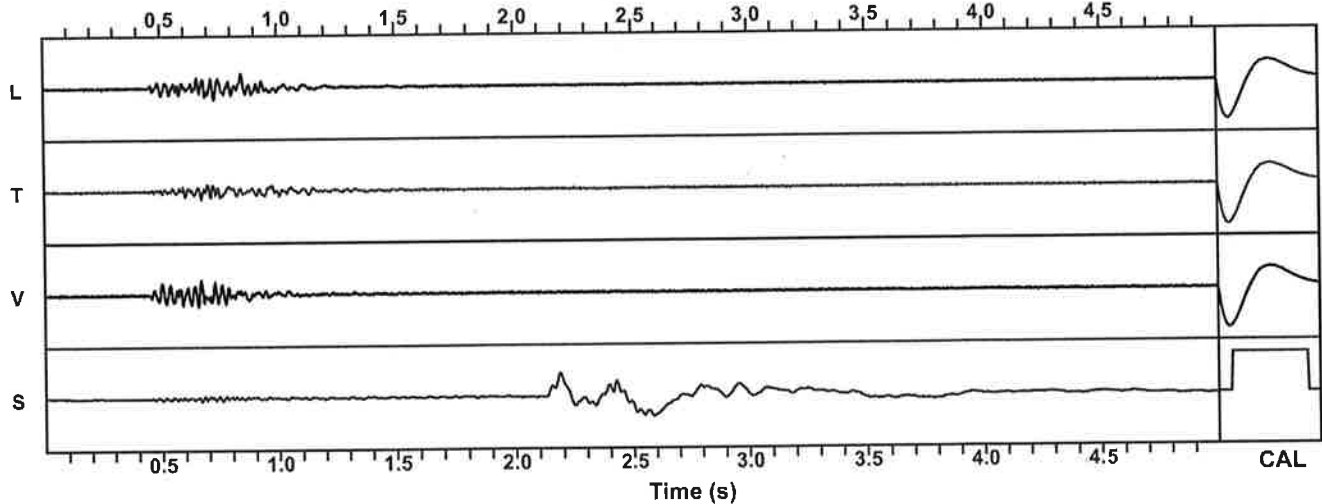


Waveform Graph Scale

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

Velocity Waveform

SSN: 9808 Event: 25



Maggie Heffelfinger

From: Maggie Heffelfinger <maggieh@vibratechinc.com>
Sent: Wednesday, January 29, 2014 9:51 AM
To: 'Davidson, Berenice'
Cc: 'jsemerad@co.marin.ca.us'; 'Simonitch, Richard'; Ethan Huff
Subject: San Rafael Quarry 01/28/2014 - partial

Importance: High

Attached please find the seismic analysis for the blast at the San Rafael Quarry. Unfortunately, the instrument at the William Hosken residence is not communicating and I am unable to retrieve the data from it. I apologize for any inconvenience. Should you have any questions please feel free to contact me.



1-28-14_On
Quarry Property....



01-28_San_Rafael_
Qua...

Thank you,

Maggie Heffelfinger
Administrative Assistant

570-455-5861 Office
570-455-6783 Fax



109 E. 1st Street
PO Box 577
Hazleton, PA 18201
www.vibratechinc.com

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