

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

BASE INFORMATION
 Location: 737 Max. Charge Weight: 300 Date of Blast: 3.24.14
 Northing: 37° 59' 09" N Blast Duration: 554ms Time of Blast: 12:02
 Easting: 122° 27' 08" W Blast Number: 1606

SEISMOGRAPH INFORMATION	UNIT #1	UNIT #2	UNIT #3	UNIT #4	UNIT #5
Seismograph Model	2000	M1010	M1010	M1010	M1010
Serial Number	2481	4550	4527	4570	4570
Last Calibration Date	5 3 13	5 3 13	5 3 13	5 3 13	5 3 13

LOCATION INFORMATION

Location	Mag. Mag.°	Sec. Mag.°	M. W. or S. or N.
Northing	37° 59' 19" N	37° 59' 31" N	37° 59' 30" N
Easting	122° 27' 22" W	122° 27' 33" W	122° 27' 16" W
Distance from Blast	925	3643	2748
Scaled Distance	92	210	161

VIBRATION INFORMATION

Longitudinal Peak Particle Velocity (ips)	.04		.57	
Longitudinal Peak Frequency (Hz)	14.2		10.4	
Transverse Peak Particle Velocity (ips)	.05		.06	
Transverse Peak Frequency (Hz)	12.2		8.1	
Vertical Peak Particle Velocity (ips)	.06		-	
Vertical Peak Frequency (Hz)	10.0		-	
Peak Vector Sum (ips)	.10		.10	
Peak Air Overpressure (db)	106		108	

GENERAL COMMENTS:

Seismograph Operator: TR/Jan Lopez Signature: [Signature]

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA

Location: RB-7 Designed Bench Height (ft): 32 Date: 3 24 14
 Northing: 37°59'09 N Rock Density (tyd³): 2.73 Time: 17:02
 Easting: 122°00'35 W Relative Rock Hardness: 7 Blast Number: 1506

DESIGN DATA

Number of Holes Shot: 36 Hole Dia. (in.): 5 1/8 Stemming (ft): 18 Loading Time Required (man hrs): 7 Deck Type: ---
 Ave. Hole Depth (ft): 32.7 Burden (ft): 15 Stem Type: 2 1/2" dia Staggered Pattern (y or n): --- Length (ft): ---
 Relative Confinement: --- Spacing (ft): 15 Subdrill (ft): 0 Number of Lost Holes: 20032 Tons Shot: 20032

EXPLOSIVES DATA

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole)	Blast Duration (sec)
<u>Titex 1000</u>	<u>8150</u>	<u>450 gms</u>	<u>72</u>	<u>80 ft</u>	<u>36</u>			<u>300</u>	<u>554</u>
				<u>50 ft</u>	<u>36</u>				
				<u>42 ft</u>	<u>12</u>				
				<u>PM</u>	<u>1</u>				

VIBRATION DATA

Nearest Structure: Mill Seismograph Loc: Site Temperature: 61 Max. Chrg. (lb/ft³): 300
 Northing: 37°59'09 N Easting: 122°00'35 W Sky Condition: Clear RSPV: 07
 Distance Away: 1400 Distance Away: --- Wind Direction: SE Wind Speed: 10 Airblast: ---

PERFORMANCE DATA

Powder Factor (lb/ton): 5 Displacement: --- Crushability: ---
 Libyrd³: --- Vibration: --- Pines: ---
 Fragmentation: Good Dig ability: ---
 Comments: 2" cut for one cut Blaster in Charge: [Signature]

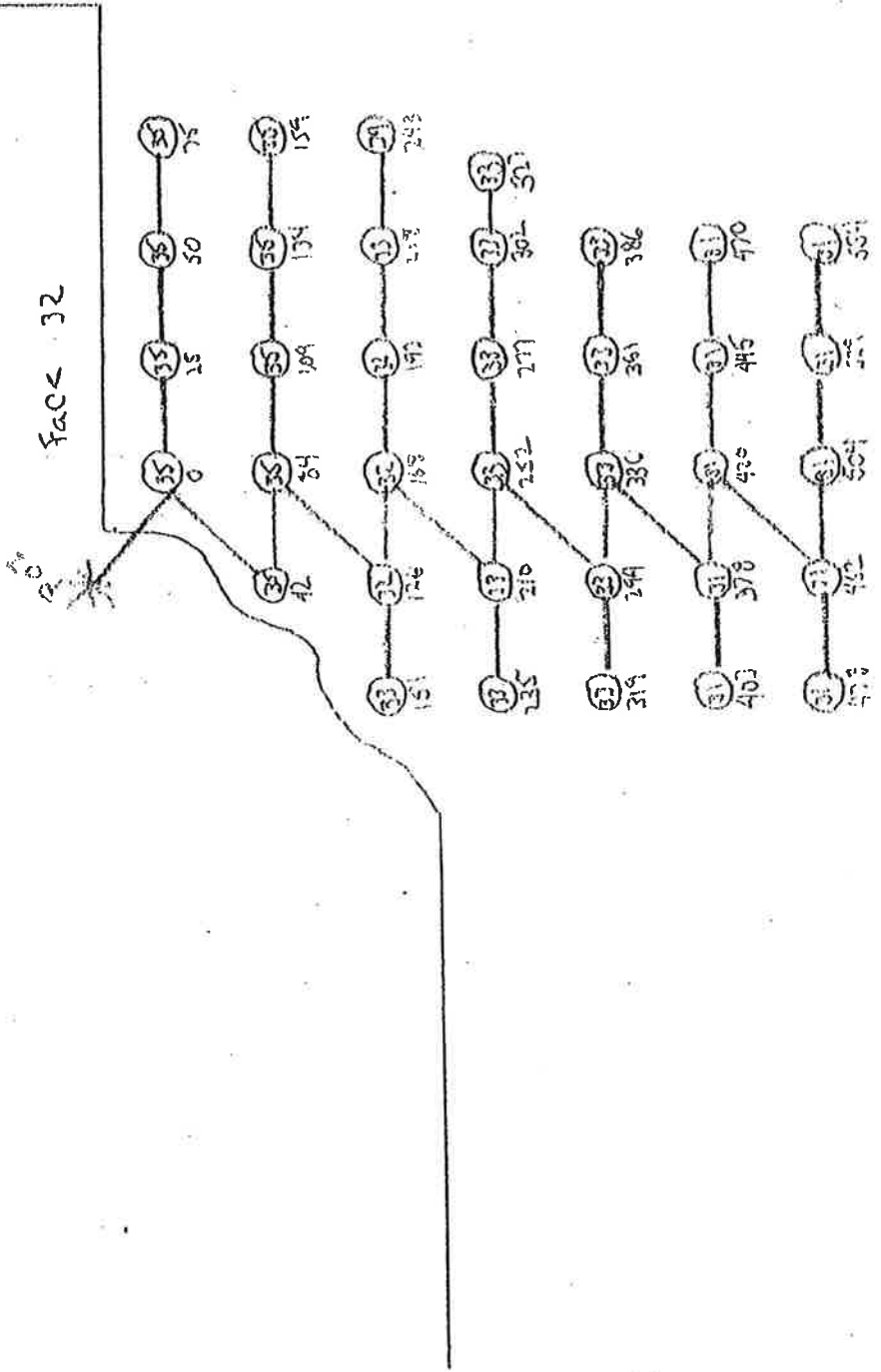
Total Charge Wt. 8232

E. 24.14
P.B. 7
- #1606

15x15
Ramp Cut

Highway

Face 32



main 1925
road 3643
1000 ft
1000 ft

37059094
1210000000

Depth 35-31 ft

31 = 10 ft

32 = 10 ft

33 = 10 ft

34 10100
35 8000
36 7000
37 4200
38 1000
39 4500

6100 lbs



Vibra-Tech Inc. Seismic Analysis

Stop Event Report

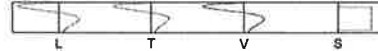
Serial No: 8154 v5.11
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 16 MARIN BAY PARK CT.
Distance:
Operator: VIBRA-TECH IP2
Comment: WILLIAM HOSKEN RES.

Begin Date: 03/24/2014 07:01:52 (UTC-7)
End Date: 03/24/2014 12:50:50 (UTC-7)
Events over Trigger: 0 (0--1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.3

Additional Info:
VIRTUAL CHECK
j-GEO-01252
N37 59.524, W122 27.373

Shaketable Calibrated: 01/23/2014
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 8154) did not trigger during the shot on March 24, 2014 at approximately 12:00 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.



Vibra-Tech Inc. Seismic Analysis

Stop Event Report

Serial No: 9668 v5.18
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance:
Operator: VIBRA-TECH IP2
Comment:

Begin Date: 03/24/2014 12:20:58 (UTC-7)
End Date: 03/24/2014 12:51:45 (UTC-7)
Events over Trigger: 0 (0--1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.3

Additional Info:
VIRTUAL CHECK
j-GEO-01253
N37 59.481, W122 27.256

Shaketable Calibrated: 01/29/2014
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 on Quarry Property (S/N 9668) did not trigger during the shot on March 24, 2014 at approximately 12:00 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.