

SAN RAFAEL ROCK QUARRY VIBRATION REPORT

| | | | | | |
|-----------|----------------|---------------------|------|----------------|---------|
| Location: | PB-7 | Max. Charge Weight: | 400 | Date of Blast: | 3.12.14 |
| Northing: | 32° 31' 13" N | Blast Duration: | 23.4 | Time of Blast: | 12:09 |
| Easting: | 102° 31' 17" W | | | Blast Number: | 603 |

| SEISMOGRAPH INFORMATION | | UNIT #1 | UNIT #2 | UNIT #3 | UNIT #4 | UNIT #5 |
|-------------------------|--------|---------|---------|---------|---------|---------|
| Seismograph Model | 3602 | 4507 | 4507 | 4507 | 4507 | 4507 |
| Serial Number | 2161 | 4500 | 4507 | 4507 | 4570 | 4570 |
| Last Calibration Date | 5.3.13 | 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 | Station | VA | VA | VA | VA | VA |
| Northing | 37° 34' 19" N | 27° 59' 18" N | 27° 59' 31" N | 27° 59' 30" N | 27° 59' 30" N | 27° 59' 30" N |
| Easting | 122° 20' 22" W | 122° 20' 53" W | 122° 20' 30" W | 122° 20' 30" W | 122° 20' 16" W | 122° 20' 16" W |
| Distance from Blast | 531 | 3748 | 2748 | 2748 | 2112 | 2112 |
| Scaled Distance | 76 | 187 | 139 | 139 | 105 | 105 |

| VIBRATION INFORMATION | | UNIT #1 | UNIT #2 | UNIT #3 | UNIT #4 | UNIT #5 |
|---|---|---------|---------|---------|---------|---------|
| Longitudinal Peak Particle Velocity (ips) | | | | | | |
| Longitudinal Peak Frequency (Hz) | | | | | | |
| Transverse Peak Particle Velocity (ips) | | | | | | |
| Transverse Peak Frequency (Hz) | | | | | | |
| Vertical Peak Particle Velocity (ips) | | | | | | |
| Vertical Peak Frequency (Hz) | | | | | | |
| Peak Vector Sum (ips) | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak Air Overpressure (db) | - | - | - | - | - | - |

GENERAL COMMENTS: No Triggers

Seismograph Operator: *P. Lopez* Signature: *P. Lopez*

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:

Location: QB-7 Date: 3.13.19
 Northing: 37° 51' 19" N Rock Density (tyd³): 2.23
 Easting: 122° 37' 07" W Relative Rock Hardness: 7
 Designed Bench Height (ft): 40 Time: 12:04
 Blast Number: 1005

DESIGN DATA:

Number of Holes Shot: 10 Hole Dia. (in.): 1 3/4 Stemming (ft): 12.0 Loading Time Required (man hrs): 6 Deck Type: ---
 Ave. Hole Depth (ft): 15 Rounding (ft): 15 Stem Type: M Cragged Pattern: --- Blast Type: ---

EXPLOSIVES DATA:

| Bulk Explosive | Weight | Boosters | Units | Delays | Units | Misc | Units | Number of Lost Holes: | Tons Shot: |
|----------------|--------|----------|-------|--------|-------|------|-------|-----------------------|------------------------------------|
| titan 1000 | 9380 | 450 | 58 | 80 | 62 | --- | --- | --- | 21506 |
| | | | | 50 | 60 | --- | --- | | |
| | | | | 4 | --- | --- | --- | | |
| | | | | --- | --- | --- | --- | | |
| | | | | | | | | | Max (lb/holet): <u>400</u> |
| | | | | | | | | | Blast Duration (sec): <u>343 m</u> |

VIBRATION DATA:

Nearest Structure: Plant 305 Seismograph Loc.: 305 Temperature: 68 Max. Chrg. (lb/8ms): 400
 Northing: 37° 51' 19" N Easting: --- Sky Condition: Clear RPPV: ---
 Easting: 122° 37' 07" W Distance Away: --- Wind Direction: --- Frequency: ---
 Distance Away: --- Wind Speed: --- Airblast: ---

PERFORMANCE DATA:

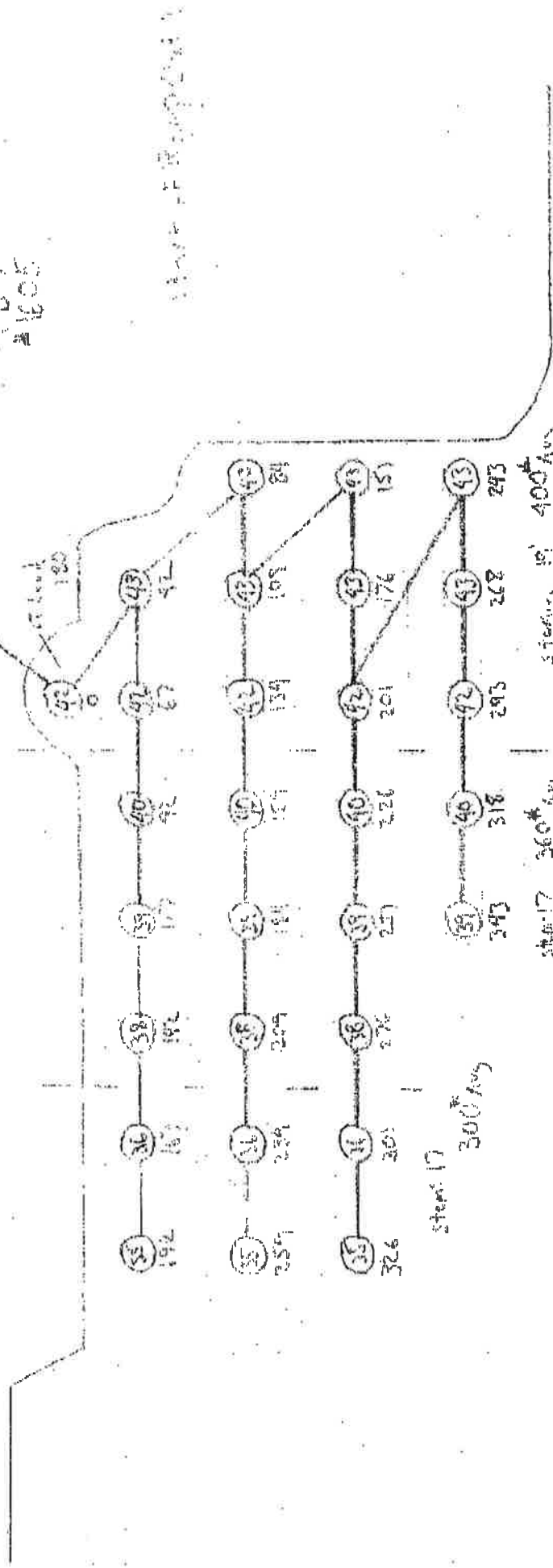
Powder Factor (lb/ton): 15 Displacement: Correct Crushability: ---
 Lb/yd³: 1.1 Vibration: Correct Fines: ---
 Fragmentation: Correct Dig ability: ---
 Comments: Ramp out Blaster in Charge: [Signature]

Total Charge Wt.: 9438

P.O.I

3.13.14
PR-7
#1605

Facc HT. 60



29=Holes

29=80' EZ det

29=50' EZ det

A=42 ms

58=950 gram

Depth=35.43'

Mag. 1531
Vib. 3748
Sat. 2798
MWP 2112

37° 59' 10" N
122° 27' 53" W

9380 lbs titan



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.

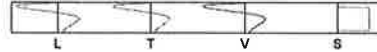
Begin Date: 03/13/2014 07:00:47 (UTC-7)
End Date: 03/13/2014 13:23:30 (UTC-7)
Events over Trigger: 0 (3-2)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.3

Additional Info:

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 13, 2014 at approximately 12:09 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: 03/13/2014 06:00:47 (UTC-7)
End Date: 03/13/2014 13:50:39 (UTC-7)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.3

Additional Info:

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 13, 2014 at approximately 12:09 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.