## SAN RAFAEL ROCK QUARRY VIBRATION REPORT

### BEAST INFORMATION
- **Location:** 73-7
- **Max. Charge Weight:** 300
- **Date of Blast:** 3.24.14
- **Nothing:** 37°59'09" N
- **Easting:** 122°27'08" W
- **Blast Duration:** 554 ms
- **Time of Blast:** 12:02
- **Blast Number:** 1606

### SEISMOGRAPH INFORMATION

<table>
<thead>
<tr>
<th>UNIT #1</th>
<th>UNIT #2</th>
<th>UNIT #3</th>
<th>UNIT #4</th>
<th>UNIT #5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seismograph Model</td>
<td>2800</td>
<td>3090</td>
<td>3740</td>
<td>3940</td>
</tr>
<tr>
<td>Serial Number</td>
<td>2491</td>
<td>4350</td>
<td>4847</td>
<td>4570</td>
</tr>
<tr>
<td>Last Calibration Date</td>
<td>5-3-13</td>
<td>5-3-13</td>
<td>5-3-13</td>
<td>5-3-13</td>
</tr>
</tbody>
</table>

### LOCATION INFORMATION

- **Location:** Marin Ave
- **Nothing:** 37°59'15" N 122°27'53" W
- **Easting:** 122°27'53" W 122°27'50" W 122°27'56" W
- **Distance from Blast:** 425 3643 2798 2012
- **Scaled Distance:** 92 210 161 121

### VIBRATION INFORMATION

| Longitudinal Peak Particle Velocity (ips) | 0.4 | 0.7 |
| Longitudinal Peak Frequency (Hz) | 14.2 | 14.4 |
| Transverse Peak Particle Velocity (ips) | 0.5 | 0.4 |
| Transverse Peak Frequency (Hz) | 10.7 | 10.8 |
| Vertical Peak Particle Velocity (ips) | - | - |
| Vertical Peak Frequency (Hz) | - | - |
| Peak Vector Sum (ips) | 0.7 | 0.5 |
| Peak Air Overpressure (dB) | 105 | 109 |

### GENERAL COMMENTS:

Seismograph Operator: [Signature]

Signature: [Signature]
SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA:
Location: 9B-7
Northing: 37°58'06.0
Easting: 123°37'08.3

Designed Bench Height (ft): 32
Rock Density (t/yd³): 2.23
Relative Rock Hardness: 7
Date: 3/24/14
Time: 17:02
Blast Number: KO 6

DESIGN DATA:
Number of Holes Shot: 35
Hole Dia. (in.): 1.5
Stemming (ft): 18
Loading Time Required (man hrs): 7
Ave. Hole Depth (ft): 20.7
Burden (ft): 15
Stem Type: 5/8
Staggered Pattern (y or n): Y
Relative Confinement: 15
Spacing (ft): 15
Subdrill (ft): 0
Number of Lost Holes: Tons Shot: 25.072

EXPLOSIVES DATA:
Bulk Explosive Weight Boosters Units Delays Units Misc. Units
TNT 1000 8160 450 72 80 36 Max (lb/hole): 300

VIBRATION DATA:
Nearest Structure: Seismograph Loc.: Sky Condition: Clear
Northing: 37°58'06.0
Easting: 123°37'08.3
Wind Direction: S.E.
Distance Away: 170

PERFORMANCE DATA:
Powder Factor (lb/ton): Displacement: Crushability:
1/1.65
Vibration: 1/1.25
Fragmentation: Quality: Digability:
Comments: Blaster in Charge:
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.
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.