# SAN RAFAEL ROCK QUARRY VIBRATION REPORT

**Location:** PB-7  
**Max. Charge Weight:** 22.0  
**Date of Blast:** 11-4-11  
**Northing:** 37°59'11" N  
**Blast Duration:** 335ms  
**Easting:** 122°27'19" W  
**Time of Blast:** 11:55  
**Blast Number:** 1562

<table>
<thead>
<tr>
<th>Seismograph Model</th>
<th>Micro</th>
<th>Micro</th>
<th>Micro</th>
<th>Micro</th>
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</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td>2484</td>
<td>4072</td>
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<tr>
<td>Last Calibration Date</td>
<td>5/24/11</td>
<td>5/24/11</td>
<td>5/24/11</td>
<td>5/24/11</td>
</tr>
</tbody>
</table>

**Location Information:**

- **Location:** Marin, CA  
- **Northing:** 37°59'11" N  
- **Easting:** 122°27'19" W  
- **Distance from Blast:** 920, 2272, 2325, 2006

**Vibration Information:**

- **Longitudinal Peak Particle Velocity (ips):** 1.6, 0.6
- **Longitudinal Peak Frequency (Hz):** 33.3, 9.0
- **Transverse Peak Particle Velocity (ips):** 0.1, 0.7
- **Transverse Peak Frequency (Hz):** 33.3, 20.0
- **Vertical Peak Particle Velocity (ips):** 17, 0.6
- **Vertical Peak Frequency (Hz):** 100, 10.8
- **Peak Vector Sum (ips):** 18
- **Peak Air Overpressure (db):** 112

**General Comments:**

Seismograph Operator: [Signature]

Seismograph Operator: [Signature]
**SAN RAFAEL ROCK QUARRY BLAST REPORT**

**BASE DATA:**

- **Location:** PB-7
- **Designed Bench Height (ft):** 40
- **Rock Density (lb/ft³):** 2.7
- **Relative Rock Hardness:** 7
- **Date:** 11/9/11
- **Time:** 11:25
- **Blast Number:** 1564

**DESIGN DATA:**

- **Number of Holes Shot:** 18
- **Hole Dia.(in.):** 3/4
- **Stemming (ft):** 1
- **Loading Time Required (min hrs):** 7
- **Deck Type:** 7/16
- **Ave. Hole Depth (ft):** 10
- **Burden (ft):** 1.5
- **Stem Type:** 3/4
- **Staggered Pattern (Y or N):** Y
- **Length (ft):** 5
- **Relative Confinement:**
- **Spacing (ft):** 10
- **Subdrill (ft):** 2
- **Number of Lost Holes:** 0
- **Tons Shot:** 43,714

**EXPLOSIVES DATA:**

<table>
<thead>
<tr>
<th>Explosives</th>
<th>Weight</th>
<th>Boosters</th>
<th>Units</th>
<th>Delays</th>
<th>Units</th>
<th>Misc.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk Exp.</td>
<td>558.00</td>
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<td>25</td>
<td>0.012</td>
<td>1</td>
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<td></td>
</tr>
</tbody>
</table>

- **Max (lb/hole):** 50
- **Blast Duration (sec):** 335
- **Total Charge Wt.:** 7,877

**VIBRATION DATA:**

- **Nearest Structure:** 1000 ft
- **Seismograph Loc.:** 100 ft
- **Temperature:** 57°
- **Max. Chrg. (lb/ft³):** 9.8
- **Northing:** 39°59'11"N
- **Northing:**
- **Sky Condition:** O
ev
- **RPPV:** 1.6
- **Easting:** 127°27'22"W
- **Easting:**
- **Wind Direction:** 265°
- **Frequency:** 10
- **Distance Away:**
- **Distance Away:**
- **Wind Speed:** 2
- **Airblast:** 11

**PERFORMANCE DATA:**

- **Powder Factor (lb/ton):** 5
- **Displacement:** 6.02 ft
- **Crushability:**
- **Fines:**
- **Lb/yard³:** 112
- **Vibration:** 0.1 ft/sec
- **Digability:**
- **Comments:** Double Primed Hole at 12 ft
- **Blaster in Charge:** [Signature]
The seismograph at 114 San Marino Drive (S/N 9669) did not trigger during the shot on November 9, 2011 at approximately 11:56 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph located across the street from 16 Marin Bay Park Court (S/N 7155) did not trigger during the blast on November 9, 2011 at approximately 11:56 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph on Quarry Property (S/N 9856) did not trigger during the shot on November 9, 2011 at approximately 11:56 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.