SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: South Hill El. 75'  
Northing: 37°59' 04 N  
Easting: 12°27' 22 W

Max. Charge Weight: 175  
Blast Duration: 400 MS

Date of Blast: 1-14-11  
Time of Blast: 12:19  
Blast Number: 1542

Seismograph Information

<table>
<thead>
<tr>
<th>Seismograph Model</th>
<th>Micro</th>
<th>Micro</th>
<th>Micro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td>2481</td>
<td>4550</td>
<td>4567</td>
</tr>
<tr>
<td>Last Calibration Date</td>
<td>5/10 10</td>
<td>5/17 10</td>
<td>5/17 10</td>
</tr>
</tbody>
</table>

Location Information

<table>
<thead>
<tr>
<th>Location</th>
<th>Marin ag</th>
<th>Vicmont</th>
<th>San Marin</th>
<th>McNear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northing</td>
<td>37°59' 9 N</td>
<td>37°59' 18 N</td>
<td>37°59' 31 N</td>
<td>37°59' 30 N</td>
</tr>
<tr>
<td>Easting</td>
<td>12°27' 22 W</td>
<td>12°27' 53 W</td>
<td>12°27' 30 W</td>
<td>12°27' 16 W</td>
</tr>
<tr>
<td>Distance from Blast</td>
<td>1584</td>
<td>2851</td>
<td>2904</td>
<td>2673</td>
</tr>
<tr>
<td>Scaled Distance</td>
<td>119.</td>
<td>215.</td>
<td>219.</td>
<td>203.</td>
</tr>
</tbody>
</table>

Vibration Information

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) | Peak Air Overpressure (db)

Nothing triggered

Seismograph Operator: Deran Lopez
Signature: [Signature]
# SAN RAFAEL ROCK QUARRY BLAST REPORT

**BASE DATA:**
- **Location:** South Hill E.175
- **Northing:** 37°55'04"N
- **Easting:** 122°21'22"W
- **Designed Bench Height (ft):** 55
- **Rock Density (lb/ft^3):** 2.7
- **Relative Rock Hardness:** 7
- **Date:** 1-14-11
- **Time:** 12:19
- **Blast Number:** 1542

**DESIGN DATA:**
- **Number of Holes Shot:** 23
- **Hole Dia.(in.):** 3.4
- **Stemming (ft):** 6.16
- **Loading Time Required (min):** 7
- **Ave. Hole Depth (ft):** 62
- **Burden(ft):** 8
- **Stem Type:** 3/8" steel
- **Staggered Pattern (y or n):** Y
- **Deck Type:** Stow-c
- **Length (ft):** 12.12
- **Relative Confinement:** Spacing (ft): 8
- **Subdrill (ft):** 3
- **Number of Lost Holes:** 0
- **Tons Shot:** 80.46

**EXPLOSIVES DATA:**

<table>
<thead>
<tr>
<th>Explosive</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>Alphaflite</td>
<td>2600</td>
<td>350 gr</td>
<td>40</td>
<td>65 min</td>
<td>2.3</td>
<td></td>
<td></td>
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<tr>
<td>Blastex</td>
<td>280</td>
<td></td>
<td>35</td>
<td>30 min</td>
<td>2.3</td>
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</tbody>
</table>

- **Max (lb/hole):** 2.00
- **Blast Duration (sec):** 400

**VIBRATION DATA:**
- **Nearest Structure:** Marina Pk
- **Seismograph Loc.:** Same
- **Temperature:** ≤6°
- **Max. Chrg. (lb/8ms):** 1.25
- **Northing:** 27°55'19"N
- **Easting:** 122°21'22"W
- **Skys Condition:** Clear
- **RPPV:**
- **Easting:**
- **Wind Direction:** N
- **Frequency:**
- **Distance Away:** 1584
- **Distance Away:**
- **Wind Speed:** 0-3
- **Airblast:**

**PERFORMANCE DATA:**
- **Powder Factor (lb/ton):** 4
- **Displacement:** Good
- **Crushability:**
- **Fines:**
- **Lb/yard^3:** 1.3
- **Vibration:** Great
- **Digability:**
- **Blaster in Charge:** Julia A. Jeppes
23 Holes
23: 65 units
23: 80 units
4% 350 gsm

Alphamix 52 bags - 2604'
Blastex 3/2 x 16' - 280 lbs

Depth: 62'
3/2 in.
2.0' Angle
175' max
16' stem
as little as 3 sticks per

Main 1584
Viameter 2851
SM: 2904
m²N: 2693
37434.04N
122° 27' 22" W
### Bill of Lading

**Intermodal Number:** 40052  
**Date:** 01/13/2011  
**Expiration:** 9/1/10

#### Detonators, Electric, for Blasting

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Lot/SN</th>
<th>Lot/SN</th>
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</thead>
<tbody>
<tr>
<td>1.1B UN0030 II</td>
<td>23.00</td>
<td>DPU500.29QCA</td>
<td>Uni Tronic Detonator 500 85°</td>
<td>3.00</td>
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<tr>
<td>1.1D UN0542 III</td>
<td>98.00</td>
<td>SP3300</td>
<td>Trojan Spartan 3500</td>
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</table>

#### Boosters, Without Detonators

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<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Lot/SN</th>
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</thead>
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<tr>
<td>1.5D NA0331 II</td>
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<td></td>
<td>Alpha Mix 50# Bag</td>
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<td>500.00</td>
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</tbody>
</table>

#### Explosive Blasting Index

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Lot/SN</th>
<th>Lot/SN</th>
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<tbody>
<tr>
<td>QD51428016</td>
<td>1.00</td>
<td></td>
<td>Blasted 2-1/2 x 16</td>
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</table>

#### Miscellaneous Supplies

<table>
<thead>
<tr>
<th>Description</th>
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<th>Description</th>
<th>Code</th>
<th>Lot/SN</th>
<th>Lot/SN</th>
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</thead>
<tbody>
<tr>
<td>1.00 Licensed Blaster</td>
<td>1.00</td>
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<tr>
<td>1.00 Delc</td>
<td>1.00</td>
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</tr>
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</table>

#### Additional Information

- **100 Roll of Harness wire 400 m**

**Emergency Contact:** 1-800-535-5053

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**Federal License No.** 9CA02220J01202  
**Federal License No.** 9CA061203006153  
**U.S. DOT No.** 118279  
**HAZ. Mat. Lic. No.** HMX 35161

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**Received by:**  
**Date:** 1/14/11

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**This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.**

**For Alpha Dyno Nobel By:**

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**This is to certify that the above materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.**

**Received by:**

**Date:** 1/14/11
The seismograph at 114 San Marino Drive (S/N 9774) did not trigger during the shot on January 14, 2011 at approximately 12:19 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 9468) did not trigger during the blast on January 14, 2011 at approximately 12:19 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
GeoSonics Inc. Seismic Analysis
Stop Event Report

Serial No: 9442 v3.23
Client: COUNTY MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance: 
Operator: VIBRA-TECH GSM
Comment: 

Begin Date: 01/14/2011 06:00:50 (UTC-8)
End Date: 01/14/2011 13:16:04 (UTC-8)
Events over Trigger: 0 (4-3)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.7

Shaketable Calibrated: 02/17/2010
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:

| L | T | V | G |

Cal Test Results:
Longitudinal: Pass
Transverse: Pass
Vertical: Pass
Sound: Pass

The seismograph on Quarry Property (S/N 9442) did not trigger during the shot on January 14, 2011 at approximately 12:19 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.