SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: South Hill
Northing: 37°59.03'N
Easting: 122°27.26'W
Max. Charge Weight: 220 lb
Blast Duration: 399 ms
Date of Blast: 3/20/17
Time of Blast: 11:30
Blast Number: 158

<table>
<thead>
<tr>
<th>Seismograph Model</th>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
<th>Unit 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>Serial Number</td>
<td>481</td>
<td>4550</td>
<td>4567</td>
<td>4963</td>
</tr>
<tr>
<td>Last Calibration Date</td>
<td>5/17/12</td>
<td>5/17/12</td>
<td>5/17/12</td>
<td>5/17/12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
</tr>
<tr>
<td>Northing</td>
</tr>
<tr>
<td>Easting</td>
</tr>
<tr>
<td>Distance from Blast</td>
</tr>
<tr>
<td>Scaled Distance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vibration Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitudinal Peak Particle Velocity (ips)</td>
</tr>
<tr>
<td>Longitudinal Peak Frequency (Hz)</td>
</tr>
<tr>
<td>Transverse Peak Particle Velocity (ips)</td>
</tr>
<tr>
<td>Transverse Peak Frequency (Hz)</td>
</tr>
<tr>
<td>Vertical Peak Particle Velocity (ips)</td>
</tr>
<tr>
<td>Vertical Peak Frequency (Hz)</td>
</tr>
<tr>
<td>Peak Vector Sum (ips)</td>
</tr>
<tr>
<td>Peak Air Overpressure (db)</td>
</tr>
</tbody>
</table>

GENERAL COMMENTS:

No Triggers

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

#### BASE DATA:
- **Location:** South Hill
- **Northing:** 3723903
- **Easting:** 1282782
- **Designed Bench Height (ft):** 25
- **Rock Density (yd^3):** 2.23
- **Relative Rock Hardness:** 0
- **Date:** 8/27/17
- **Time:** 11:50
- **Blast Number:** 1585

#### DESIGN DATA:
- **Number of Holes Shot:** 82
- **Hole Dia. (in.):** 6
- **Steaming (ft):** 15
- **Loading Time Required (man hrs):** 5
- **Ave. Hole Depth (ft):** 15
- **Burden (ft):** 12
- **Row Type:** Spacing (ft):
- **Staggered Pattern (y or n):** y
- **Deck Type:**
- **Length (ft):**
- **Relative Confinement:**
- **Spacing (ft):**
- **Number of Last Holes:**
- **Tons Shot:** 312

#### EXPLOSIVES DATA:
<table>
<thead>
<tr>
<th>Bulk 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></td>
<td>93.40</td>
<td>450</td>
<td>2.28</td>
<td>22</td>
<td>2</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max (lb/hole): 22.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Blast Duration (sec): 541.6</td>
</tr>
</tbody>
</table>

#### VIBRATION DATA:
- **Nearest Structure:** N/A
- **Seismograph Loc.:** N/A
- **Temperature:** 67
- **Max. Chrg. (lb/8ms):** 270
- **Northing:** 322619
- **Sky Condition:** Clear
- **RPPV:**
- **Easting:** 1223271
- **Wind Direction:** N
- **Frequency:** 58
- **Airblast:**

#### PERFORMANCE DATA:
- **Powder Factor (lb/ton):**
- **Displacement:**
- **Crushability:**
- **Fines:**
- **Vibration:**
- **Digability:**
- **Comments:**
- **Blaster in Charge:**

Total Charge Wt.: 4362
8-27-12
South Hill
#1585

Depth: 28'

3 holes 1845, loaded 150.

22 holes
22 x 80 E2
5 = 42 ms
3 x 17 ms
2x 483 gpm

15' stemming
900 booster

From 1680
Violi 2904
South 2956
Wen 2998

37° 51' 03" N
12° 27' 22" W
The seismograph at 114 San Marino Drive (S/N 8021) did not trigger during the shot on August 27, 2012 at approximately 11:30 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: 8030 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance: 
Operator: VIBRA-TECH GSM

Begin Date: 08/27/2012 06:00:50 (UTC-7)
End Date: 08/27/2012 29:00:00 (UTC-7)
Events over Trigger: 0 (7-6)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 9

Shaketable Calibrated: 05/14/2012
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 8030) did not trigger during the shot on August 27, 2012 at approximately 11:30 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 8056) did not trigger during the blast on August 27, 2012 at approximately 11:30 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.