Appendix B
Boring Logs and Trench Logs
### Geotechnical Boring Log LGC-1

**Date:** 1/25/2011  
**Drilling Company:** Al-Roy Drilling  
**Project Name:** South Shores Church  
**Project Number:** 10132-01  
**Type of Rig:** EZ Bore Bucket Auger  
**Drop:** 12"  
**Hole Diameter:** 28"  
**Elevation of Top of Hole:** ~ 253 MSL  
**Hole Location:** See Geotechnical Map  
**Drive Weight:** Kelly Bar, varies with depth

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Depth (ft)</th>
<th>Graphic Log</th>
<th>Attitudes</th>
<th>Sample Number</th>
<th>Blow Count</th>
<th>Dry Density (pcf)</th>
<th>Moisture (%)</th>
<th>USCS Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>@0' to 3'</td>
<td>Artificial Fill (Af) - Brown Clay &amp; Sand &amp; Pebbles, v. moist, v. stiff</td>
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<tr>
<td>@3' to 35'</td>
<td>Quaternary Landslide (QLs) - Cobble Breccia w/ lt. brown Clayey Sandstone matrix &amp; few boulders, damp to moist, sl. dense to v. dense, variable. Zones of clast supported, clasts typically angular to subangular, blueish, meta-origin.</td>
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<tr>
<td>@3'</td>
<td>Rock to 5' dia., rock clasts &gt;60%, highly weathered</td>
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<tr>
<td>@5'</td>
<td>Sample R-1 - as above</td>
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<tr>
<td>@7'</td>
<td>Boulder to 10' dia., Material grades to mod. weathered, zones of friable, iron oxide staining</td>
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<tr>
<td>@9 to 11'</td>
<td>Bulk Bag Sample - as above</td>
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**©22' GB:N76E 12S**

@22' Vague general bedding attitude on 2' thick coarse sandstone within lt. brown Cobbly Sandstone, sl. moist, v. dense.

@25' Boulder 12' dia., abundant iron oxide staining. Zones of clast supported below.

@29' Decrease in rock. General bedding attitude on 2' thick coarse sand lens.

@29' Sample R-3 lt. orange brown Clayey Sandstone.

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**Sample Types:**  
- B: Bulk Sample  
- R: Ring Sample  
- G: Grab Sample

**Test Types:**  
- DS: Direct Shear  
- MD: Maximum Density  
- SA: Sieve Analysis  
- SH: Sieve and Hydrometer  
- EI: Expansion Index  
- CN: Consistency  
- CR: Corrosion  
- AL: Atterberg Limits  
- CO: Collapse/Swell  
- RV: R-Value

**THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.**
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<thead>
<tr>
<th>Elevation (ft)</th>
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<th>Blow Count</th>
<th>Dry Density (pcf)</th>
<th>Moisture (%)</th>
<th>USCS Symbol</th>
<th>Type of Test</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
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<td></td>
<td>@31' Broken zones of cementation, up to 1' dia. angular, cemented material w/ clayey infill.</td>
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<td>220</td>
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<td>@35' Rupture Surface attitude, well-defined, oxidized, barely clay-lined, faint striations trend E-W. Surface enters at 34' 6&quot;, exits hole at 36' 9&quot;. Zone splits to 3&quot; wide at exit.</td>
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<tr>
<td>@35'</td>
<td></td>
<td>RS:N25W</td>
<td>42E</td>
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<td>@35' to 68' Tertiary San Onofre Breccia (Tso)2 (Possible Landslide) - Cobble Breccia &amp; fine to coarse Sandstone w/ Clay, lt. orange brown, dense to v. dense, sl. moist. Cobbles are angular, bluestone common, quartz, meta-origin.</td>
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<td>@40'</td>
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<td>GB:N80E,13S</td>
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<td>@39' Cobble supported zone, 1 ft. thick.</td>
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<td>@40'</td>
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<td>@40' Generalized Bedding attitude on 2&quot; thick Clayey Sand bed, varies in portion of borewall by up to 1&quot;. Below is coarse Sandstone w/ Gravel, dense, moist.</td>
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<tr>
<td>@50'</td>
<td></td>
<td>J:N25E,85W</td>
<td>R-4</td>
<td>10</td>
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<td>@46' Mod. cemented zone, well cemented lens, rock is 2&quot; to 6&quot; dia. in zone</td>
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<td>@50'</td>
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<td>@49' Base of cemented zone, becomes Silty Sandstone w/ Gravels, sl. moist, v. dense.</td>
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<td>@50'</td>
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<td>@50' Joint attitude, iron oxide lined.</td>
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<td>@50' Sample R-4 - Lt. olive green &amp; gray mottled Silty Coarse Sandstone, moist, v. dense, some oxidation.</td>
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<td>@52'</td>
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<td>@52' Becomes mod. cemented to 59'</td>
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<td>@59'</td>
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<td>@59' Top of rock-supported zone, rock to 18&quot; dia., subangular, remains sl. moist.</td>
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</tbody>
</table>

**Sample Types:**
- B: BULK SAMPLE
- R: RING SAMPLE
- G: GRAB SAMPLE

**Test Types:**
- D: DIRECT SHEAR
- MD: MAXIMUM DENSITY
- S: SIEVE ANALYSIS
- E: EXPANSION INDEX
- CN: CONSOLIDATION
- CR: COMPRESSION
- AL: ATTERBERG LIMITS
- CO: COLLAPSE/SWELL
- RV: R-VALUE

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**Geotechnical Boring Log LGC-1**

**Date:** 1/25/2011  
**Drilling Company:** Al-Roy Drilling  
**Project Name:** South Shores Church  
**Type of Rig:** EZ Bore Bucket Auger  
**Project Number:** 10132-01  
**Drop:** 12"  
**Hole Diameter:** 28"  
**Elevation of Top of Hole:** ~ 253' MSL  
**Drive Weight:** Kelly Bar, varies with depth  
**Logged by KTM/TJL**  
**Sampled by KTM**  
**Hole Location:** See Geotechnical Map

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<th>Moisture (%)</th>
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<th>Type of Test</th>
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</thead>
<tbody>
<tr>
<td>60</td>
<td>60</td>
<td></td>
<td>@66'</td>
<td>C:N5E,13E</td>
<td>R-5</td>
<td>20/8&quot;</td>
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<td>DESCRIPTION</td>
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<tr>
<td>190</td>
<td>65</td>
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<tr>
<td>185</td>
<td>70</td>
<td>@68'</td>
<td>CS:N25E,16SE</td>
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<tr>
<td>@68' Contact attitude, sub-planar, below is lt. brown Clayey Sandstone, v. dense, wet (no free water visible), sand to 1/8&quot; dia. @66' Sample R-5 - Lt. olive brown Clayey Siltstone, grades to Silty Sandstone, v. dense, v. moist to wet, @68' Base of sandstone, oxidation stained. @66' Clay Seam attitude, possible Rupture Surface. Olive green Clayey Siltstone bed is soft to stiff, v. moist to wet. V. thin (1/16&quot;) polished, striated, el. undulatory clay seam near top of 4&quot; thick bed. Bentonitic clay, small grab sample taken. @68' to TD - Tertiary San Onofre Breccia (Tso) - Cobble Breccia &amp; Sandstone, lt. blue gray, v. dense, moist to wet. Variable, lenses of Siltstone w/ coarse sand. Grades to rock-supported zone, slight belling of borewalls.</td>
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<td>@75' Decrease belling, becomes predominantly lt. blue gray Gravelly Sandstone, v. dense, v. moist, unoxidized/fresh, gradual increase cementation, increase moisture w/ depth.</td>
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<td>170</td>
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<td>@84' Lens of Siltstone, 2&quot; thick, poorly defined. Increase cementation below.</td>
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<td>@86' Zone of highly cemented material, 10&quot; thick.</td>
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<tr>
<td>@87' Decrease cementation, becomes Siltstone.</td>
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**SAMPLE TYPES:**
- D - BLAST SAMPLE
- R - RING SAMPLE
- G - GRAB SAMPLE

**TEST TYPES:**
- D - DIRECT SHEAR
- M - MAXIMUM DENSITY
- S - SILENE ANALYSIS
- E - ENFI SIEMENS ANALYSIS
- E - EXPANSION INDEX
- C - CONSOLIDATION
- C - CORROSION
- A - ATTERBERG LIMITS
- C - COLLAPSE/SWELL
- R - R-value
### Geotechnical Boring Log LGC-1

**Date:** 1/25/2011  
**Drilling Company:** Al-Roy Drilling  
**Project Name:** South Shores Church  
**Type of Rig:** EZ Bore Bucket Auger  
**Project Number:** 10132-01  
**Drop:** 12"  
**Hole Diameter:** 28"  
**Elevation of Top of Hole:** ~ 253' MSL  
**Drive Weight:** Kelly Bar, varies with depth  

**Logged by KTM/TJL**  
**Sampled by KTM**

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**DESCRIPTION**

- **@90'** Groundwater level. Water seeping from walls. Grades to rock-supported zone below.

- **@97'** Base of rock supported zone. Decrease rock size and amount, increase sandstone matrix. Wet v. dense.

- Downhole logged to 104'

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**Total Depth = 107’**  
**Groundwater Encountered at 90’**  
**Backfilled with Cuttings and Tamped on 1/25/2011**

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**SAMPLE TYPES:**
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- B: Ring Sample
- G: Grab Sample

**TEST TYPES:**
- DS: Direct Shear
- MD: Maximum Density
- SA: Sieve Analysis
- SH: Sieve and Hydrometer
- SI: Expansion Index
- CN: Consolidation
- CR: Corrosion
- AL: Attenberg Limits
- CO: Collapse/Swell
- RV: R Value
Geotechnical Boring Log LGC-2

<table>
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<th>Elevation (ft)</th>
<th>Depth (ft)</th>
<th>Graphic Log</th>
<th>Attitudes</th>
<th>Sample Number</th>
<th>Blow Count</th>
<th>Dry Densitypcf)</th>
<th>Moisture (%)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>0</td>
<td></td>
<td></td>
<td>R-1</td>
<td>2</td>
<td>112.6</td>
<td>15.9</td>
<td>SC</td>
<td>Asphalt 4&quot; over Base</td>
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<td>@0.5 to 19' - Artificial Fill; Older (Af)</td>
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<td></td>
<td>R-2</td>
<td>3</td>
<td>127.4</td>
<td>9.8</td>
<td>CN</td>
<td>@2.5 R-1 Dark &amp; light gray with some bluish gray mottled, CLAYEY fine to coarse SAND with some GRAVELS, very moist, stiff, gravels to 3&quot; dia, angular, metamorphic origin, and rounded (5 rings only, disturbed sample)</td>
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<td>R-3</td>
<td>3</td>
<td>124.5</td>
<td>15.1</td>
<td>SC-SM</td>
<td>@5 R-2 Dark gray &amp; brown mottled, CLAYEY SAND with GRAVELS, very moist, stiff, slightly odorulous</td>
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<td>@4' to 7' - Bag Sample B-1, as above</td>
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<td>@7.5' R-3 Brown, gray &amp; greenish brown mottled, CLAY, SILT, &amp; fine to coarse SAND with some GRAVELS, very moist, stiff, gravels subrounded. Slight seepage.</td>
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<td>@10' R-4 As above, (5 rings, disturbed sample)</td>
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<td>@13' Fill changes to material at 15'</td>
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<td></td>
<td>@15' R-5 Light &amp; dark reddish brown mottled, fine to coarse SAND with CLAY &amp; GRAVELS, moist, very stiff. Gravels to 4&quot; typically angular, highly oxidized. @15' to 18' - Bag Sample B-2 Contact with bedrock along undulatory tight contact, lacks topsoil, etc.</td>
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<td>@18' to TD - Tertiary San Onofre Breccia (Tso) - Light yellowish &amp; reddish brown, SANDSTONE w/ CLAY &amp; GRAVELS &amp; COBBLES and some SILTSTONE, moist, very dense, highly weathered upper portion</td>
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<td></td>
<td>@20 R-6 Light yellowish &amp; reddish brown mottled, SILTY SANDSTONE with CLAY &amp; GRAVELS, slightly moist, very dense. Gravels to 1&quot; dia, metamorphic.</td>
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<td>@22' Bedding defined by 1&quot; to 2&quot; thick, non-continuous, subplanar cemented opaque white mineral. Fabric of sandstone similar orientation, highly oxidized, weakly cemented matrix.</td>
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<td>@26' Generalized Bedding, defined by elongate clasts, increase rocks, belling. @29' Cemented zone 1&quot; dia., tight</td>
</tr>
</tbody>
</table>

**Sample Types:**
- B: Blak Sample
- R: Ring Sample
- G: Grab Sample

**Test Types:**
- DS: Direct Shear
- MD: Maximum Density
- SA: Saturated Analysis
- S&H: Sieve and Hydrometer
- EI: Expansion Index
- CC: Compression
- CR: Corrosion
- AL: Atterberg Limits
- CD: Collapse
- RV: R-Value
### Geotechnical Boring Log LGC-2

**Date:** 5/14/2012  
**Project Name:** South Shores Church  
**Project Number:** 10132-01  
**Drop:** 30"  
**Type of Rig:** Bucket Auger

**Elevation of Top of Hole:** ~ 252' MSL  
**Hole Location:** See Geotechnical Map  
**Hole Diameter:** 26"  
**Drive Weight:** Between 0' and 30' = 2400 pounds  
Between 31' and 60' = 1550 pounds

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**Logged by KTM**  
**Sampled by KTM**

### DESCRIPTION

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<tr>
<td>220</td>
<td>30</td>
<td>GB, N40W, 255W</td>
<td></td>
<td>R-7</td>
<td>30</td>
<td>N/A</td>
<td>5.6</td>
<td>[SM]</td>
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</tr>
<tr>
<td>215</td>
<td>40</td>
<td></td>
<td>R-8</td>
<td>14/6&quot;</td>
<td>N/A</td>
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<td>7.9</td>
<td>[GM-GC]</td>
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</tr>
</tbody>
</table>

@30' R-7 Light yellowish brown, SANDY SILTSTONE/SILTY SANDSTONE with GRAVELS, slightly moist, very dense. Clasts oxidized, meta, angular.  
@31' Generalized Bedding, well defined by fabric of elongate/flat clasts. Gradual increase in rock content (gravel and cobbles) to about 50%.  
@35' Becomes clast-supported, up to 1' dia., both angular (elongate & flat) metamorphic & subrounded granitic. Clayey matrix becomes light gray with some white mineral, micaceous. Belling of borehole walls up to 1 foot.  
@40' R-8 (disturbed) Note drive weight decreased to 1550 pounds. Light brown, GRAVELS with CLAY and SAND, slightly moist, very dense.

**Total Depth = 40’**  
No Ground Water Encountered  
Backfilled with Tamped Cuttings and Capped with AC to 4 inches on 5/14/2012

---

**THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.**

**SAMPLE TYPES:**  
B BLK SAMPLE  
R RING SAMPLE  
G GRAB SAMPLE

**TEST TYPES:**  
DS DIRECT SHEAR  
MD MAXIMUM DENSITY  
SA SIEVE ANALYSIS  
S&H SIEVE AND HYDROMETER  
EI EXPANSION INDEX  
CN CONSOLIDATION  
CR CORROSION  
AL ATTERBERG LIMITS  
CG COLLAPSE/SWELL  
RV R-VALUE
This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BLOWNFT.</th>
<th>FIELD'S MOISTURE</th>
<th>DRY DENSITY</th>
<th>SHEAR RESISTANCE RIPS/20, FT</th>
<th>DEPTH FEET</th>
<th>SOURCE/STRAIN</th>
<th>SOURCE/TYPE</th>
<th>Descriptions and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>8.6</td>
<td>119.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 3 inches, A.C. / 6 inches A.B.</td>
</tr>
<tr>
<td>21</td>
<td>25.9</td>
<td>95.2</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>Silty CLAY: stiff, gray-brown, moist, trace of sand and gravel</td>
</tr>
<tr>
<td>65</td>
<td>11.2</td>
<td>103.0</td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td>FILL</td>
</tr>
<tr>
<td>41</td>
<td>17.8</td>
<td>108.3</td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>BRECCIA: hard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 4 feet, hard drilling</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 6 feet, softer with CLAY: stiff</td>
</tr>
</tbody>
</table>

Bottom of boring at 11 feet.

Note:
1) Hard drilling.
2) No water.
3) No caving.
4) Hole backfilled, tamped and A.C. patched.
5) All 3-inch O/D Ring Samples driven with energy: 140# hammer at 30-inch drop.

EARTH SCIENCE CONSULTANTS
Irvine, California

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

Project No.: 6375-04
Figure No.: B-2
# LOG OF BORING

**Drill Rig:** Al-Ray Hollow Stem Mobile 57  
**Boring Diameter:** 8 inches  
**Boring Elevation:** 270 feet  
**Date Drilled:** 2/17/2006 WGN  
**Boring No.:** B-2

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOW/SFT.</th>
<th>FIELD MOISTURE</th>
<th>DRY DENSITY lb/ft³</th>
<th>SHEAR RESISTANCE</th>
<th>KIPS/FT²</th>
<th>DEPTH FEET</th>
<th>ROCK TYPE</th>
<th>SOURCE/ROCK</th>
<th>SYMBOL</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>NO SAMPLES</td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

[@ 3 inches, A.C. / 4 inches A.B.]
[@ 19 inches, very hard rock drilling]

- **SAN ONOFRE BRECCIA**

Bottom of boring at 2 feet.

Note:
1. No water.
2. No caving.
3. Hole backfilled, lamed and A.C. patched.

---

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Irvine, California  

**South Shores Church**  
32712 Crown Valley Parkway  
Dana Point, California  

**Project No.:** 6375-04  
**Figure No.:** B-3


**LOG OF BORING**

<table>
<thead>
<tr>
<th>Drill Rig:</th>
<th>Boring Diameter:</th>
<th>Boring Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al-Roy Hollow Stem Mobile 57</td>
<td>8 inches</td>
<td>265 feet</td>
</tr>
</tbody>
</table>

**Date Drilled:** 2/1706  
**Rig:** WGN  
**No.:** B-3

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOW/SFT.</th>
<th>MOISTURE</th>
<th>DRY WEIGHT</th>
<th>DRY DENSITY</th>
<th>SHEAR RESISTANCE</th>
<th>MOSS, FT</th>
<th>DEPTH, FEET</th>
<th>SOIL/ROCK</th>
<th>SYMBOL</th>
<th>SOIL/ROCK TYPE</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td></td>
<td>60</td>
<td>8.8</td>
<td>121.4</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td>80</td>
<td>7.2</td>
<td>109.1</td>
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<td></td>
</tr>
</tbody>
</table>

**Descriptions and Remarks**

- Ø 3 inches, A.C. / 5 inches A.B.
- BRECCIA: very hard drilling
- SAN ONOFRE BRECCIA

Bottom of boring at 6 feet.

Note:
1) No water.
2) No caving.
3) Hole backfilled, tamped and A.C. patched.

---

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Irvine, California

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

Project No.: 6375-04  
Figure No.: B-4
### LOG OF BORING

<table>
<thead>
<tr>
<th>Sample</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOOSPT.</th>
<th>FIELD MOIST./DRY WT.</th>
<th>DRY DENSITY LBS/FCU.</th>
<th>S.E.A. RESISTANCE IPS/FCU.</th>
<th>DEPTH FEET</th>
<th>SED/ROCK</th>
<th>SOIL/ROCK</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>15.2</td>
<td>105.8</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>BEDROCK</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>11.4</td>
<td>104.4</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>BEDROCK</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>13.0</td>
<td>115.2</td>
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<td></td>
<td></td>
<td></td>
<td>SAN ONOFRE BRECCIA</td>
<td></td>
</tr>
</tbody>
</table>

**Bored to:** 9 3 inches. A.C. / 5 inches A.3

**BRECCIA:** very hard drilling

**SAN ONOFRE BRECCIA**

Bottom of boring at 9 feet.

**Note:**
1. No water.
2. No caving.
3. Hole backfilled, tamped and A.C. patched.

---

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Irvine, California

**South Shores Church**
32712 Crown Valley Parkway
Dana Point, California

**Project No.:** 6375-04
**Figure No.:** B-5
**LOG OF BORING**

**Drill Rig:** Al-Roy Hollow Stem Mobile 57  
**Boring Diameter:** 8 inches  
**Boring Elevation:** 263 feet  
**Boring No.:** B-5

**Date Drilled:** 2/17/2006 WGN

---

**BULK**

**TIDE**

**BLOW/ZFT.**

**FIELD MOISTURE %**

**DRY DENSITY LB/CU. FT.**

**SHEAR RESISTANCE REC. FT.**

**DEPTH FEET**

**SOIL/ROCK TYPE**

**SITES**

- 3 inches A.C., 7/4 inches A-3

**Descriptions and Remarks**

**BRECCIA:** hard

SAN ONOFRE BRECCIA

Bottom of boring at 2 feet.

**Note:**

1) No water.

2) No caving.

3) Very hard drilling to 2 feet and sample not possible.

4) Hole backfilled, tamped and A.C. patched.

---

South Shores Church  
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Dana Point, California

---

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Irvine, California

---

Project No.: 6375-04  
Figure No.: B-6
# LOG OF BORING

**Drill Rig:** Al-Roy Hollow Stem Mobile 57  
**Boring Diameter:** 8 inches  
**Boring Elevation:** 262 feet  
**Boring No.:** B-6  

**Date Drilled:** 2/17/2006 WGN  

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

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<thead>
<tr>
<th>SAMPLE</th>
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<th>17</th>
<th>20</th>
<th>35</th>
<th>52</th>
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<tbody>
<tr>
<td>BULK</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TUBE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BLOWS/FT.</td>
<td>9.5</td>
<td>17.0</td>
<td>9.7</td>
<td>15.8</td>
<td>9.1</td>
</tr>
<tr>
<td>MOISTURE &amp; DRY WEIGHT</td>
<td>107.9</td>
<td>108.2</td>
<td>111.1</td>
<td>115.2</td>
<td>129.8</td>
</tr>
<tr>
<td>DRY DENSITY &amp; MOISTURE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SOIL RESISTANCE &amp; MOISTURE</td>
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</tr>
<tr>
<td>DEPTH FEET</td>
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<tr>
<td>SOURCE</td>
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</tr>
<tr>
<td>SOIL TYPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Descriptions and Remarks**

- **3 inches, A.C., 7 inches A.P.**

- Silty CLAY with Gravel and Sand: compacted, dark brown-gray, stiff

- **FILL**

- Silty CLAY: very stiff, angular rock fragments

- **BEDROCK**

- **SAN ONOFRE BRECCIA**

Bottom of boring at 16 feet.

**Note:**

1) No water.
2) No caving.
3) Hole backfilled, tamped and AC patched.
4) BLOWS/ft. on 3' O/D ring sampler
5) Energy used: 140# hammer @ 30' drop

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Irvine, California

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32712 Crown Valley Parkway  
Dana Point, California

Project No.: 6375-04  
Figure No.: B-7
**LOG OF BORING**

Drill Rig: Al-Roy Hollow Stem Mobile 57

Boring Diameter: 8 inches

Boring Elevation: 256 feet

**Date Drilled:** 2/17/2006 WGN

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

**Boring No:** B-7

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOW/FT</th>
<th>MOISTURE'S</th>
<th>DRY DENSITY</th>
<th>RESISTANCE</th>
<th>READER'S</th>
<th>SOURCE ROCK</th>
<th>SOURCE ROCK TYPE</th>
<th>DEPTH FEET</th>
<th>SOIL TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>2.5</td>
<td></td>
<td>135.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BEDROCK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>7.1</td>
<td></td>
<td>113.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BEDROCK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Descriptions and Remarks**

- @ 3 inches, A.C. / 7 inches A.3
- *BEDROCK*
- BRECCIA: Hard drilling
- SAN ONOFRE BRECCIA

Bottom of boring at 6 feet.

1) Hole backfilled, tamped and A.C. patched.

---

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Irvine, California

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

Project No.: 6375-04
Figure No.: B-8
**LOG OF BORING**

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOWSOFT</th>
<th>FRICTION % DRY WEIGHT</th>
<th>DRY DENSITY LB/CF</th>
<th>SPIKE RESISTANCE IPS 20FT</th>
<th>DEPTH FEET</th>
<th>SOIL TYPE</th>
<th>SOIL EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>13.7</td>
<td>107.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>15.8</td>
<td>111.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>15</td>
<td>12.8</td>
<td>111.6</td>
<td></td>
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<td></td>
<td></td>
<td>10</td>
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<td></td>
</tr>
<tr>
<td>34</td>
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<td></td>
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<td>25</td>
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</tr>
</tbody>
</table>

**Descriptions and Remarks**

- **@ 3 inches, A.C. / 7 inches, A.B.:**
  - Silty CLAY with angular Gravel, compacted, gray-brown, soft, wet to medium stiff, very moist

- **FILL:**
  - Stiff dark gray Silty CLAY with Gravel and Asphalt

- **BEDROCK:**
  - Silty SANDSTONE with cobbles: hard

- **SAN ONOFRE BRECCIA:**

**Bottom of boring at 16 feet.**

1) No water.
2) No caving.
3) Hole backfilled, tamped and A.C. patched.

---

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

EARTH SCIENCE CONSULTANTS
Irvine, California

Project No.: 6375-04
Figure No.: B-9
LOG OF BORING

Drill Rig: Al-Roy Hollow Stem Mobile 57
Boring Diameter: 8 inches
Boring Elevation: 254 feet

Date Drilled: 2/17/2006 WGN

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

Boring No. B-9

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>SILT</th>
<th>tube</th>
<th>BLOWSPRT</th>
<th>field moisture %</th>
<th>DRY DENSITY, LBS/FT³</th>
<th>SHER CONE RESISTANCE, KS/IN²</th>
<th>DEPTH, FEET</th>
<th>SAND/ROCK, SOIL/ROCK TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td>13.6</td>
<td>106.3</td>
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<td></td>
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<td>43</td>
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<td>114.7</td>
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<td>FILL</td>
</tr>
<tr>
<td>52</td>
<td></td>
<td>14.8</td>
<td>113.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandy and Gravelly SILTSTONE: olive-green; hard drilling to 10 feet.</td>
</tr>
<tr>
<td>78</td>
<td></td>
<td>5.1</td>
<td>126.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

@ 3 inches, A.C. / 6 inches A:3

Gray-brown Silty CLAY with Gravel: very wet, soft to medium stiff

Bottom of boring at 11 feet.

Note:
1) No water.
2) No caving.
3) All borings backfilled, tamped, and A.C. capped.

SAN ONOFRE BRECCIA

EARTH SCIENCE CONSULTANTS
Irvine, California

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

Project No.: 6375-04
Figure No.: B-10
LOG OF BORING

Drill Rig: Al-Ray 0-24 2150
Boring Diameter: 24 inches
Boring Elevation: 

Date Drilled: 2/17/2006 TH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TIME</th>
<th>BLOW COUNT</th>
<th>MOISTURE %</th>
<th>DRY DENSITY LB/FT3</th>
<th>SHEAR RESISTANCE PSF</th>
<th>DEPTH FEET</th>
<th>SOIL ROCK</th>
<th>SOIL ROCK TYPE</th>
<th>DESCRIPTIONS AND REMARKS</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>15.9</td>
<td>112.6</td>
<td></td>
<td></td>
<td></td>
<td>CL</td>
<td></td>
<td>Silty CLAY with Gravel and Cobbles: mottled brown and gray, very moist, stiff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>13.7</td>
<td>116.5</td>
<td></td>
<td></td>
<td></td>
<td>SC</td>
<td></td>
<td>@ 5 feet, more sand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>11.2</td>
<td>117.5</td>
<td></td>
<td></td>
<td></td>
<td>SC</td>
<td></td>
<td>Clayey SAND with Gravel and Cobbles: yellow-brown, moist, loose</td>
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<tr>
<td></td>
<td></td>
<td>4</td>
<td>12.6</td>
<td>120.0</td>
<td></td>
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<td>SC</td>
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<td>Fill</td>
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<td></td>
<td>10</td>
<td>9.4</td>
<td>128.3</td>
<td></td>
<td></td>
<td></td>
<td>SC</td>
<td></td>
<td>Sandy CLAY: mottled gray and yellow-brown, moist, very stiff with gravel, cobbles, copper pipe fragments, AC chunks, wire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>7.6</td>
<td>133.7</td>
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<td>SC</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty SANDSTONE with some fine Gravel: moist, very dense, clean horizontal contact with fill above @ 15 to 17 feet, SANDSTONE then hard, cobble BRECCIA, massive</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>San Onofre BRECCIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bottom of boring at 21 feet. Note: 1) No water or caving. 2) Backfilled with cuttings and tamped.</td>
</tr>
</tbody>
</table>

EARTH SCIENCE CONSULTANTS
Irvine, California

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

Project No.: 6375-04
Figure No.: B-11
**LOG OF BORING**

**Drill Rig:** Al-Roy 0-24 2150#

**Boring Diameter:** 18 inches

**Boring Elevation:**

**Date Drilled:** 2/17/2006

**Boring No.:** BA-2

---

**SAMPLE**

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOWOFF</th>
<th>MOISTURE %</th>
<th>DRY DENSITY</th>
<th>DEPTH</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>14.3</td>
<td>116.1</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>CL</td>
</tr>
<tr>
<td>3</td>
<td>11.8</td>
<td>119.7</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>CL</td>
</tr>
<tr>
<td>2</td>
<td>15.2</td>
<td>108.9</td>
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<td></td>
<td></td>
<td>5</td>
<td>CL</td>
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<tr>
<td>11</td>
<td>11.8</td>
<td>119.0</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>Clayey SANDSTONE with Gravel and Cobbles: weathered and Clayey in SPC, yellow-brown, very tight</td>
</tr>
<tr>
<td>10</td>
<td>9.1</td>
<td>117.3</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>BEDROCK</td>
</tr>
</tbody>
</table>

**Note:**
1) No water or caving.
2) Boring backfilled and tamped.

---

**Descriptions and Remarks**

Silty CLAY with Gravel and Cobbles: mottled gray and brown, very moist, stiff.

**@ 5 to 10 feet, few A.C. fragments**

**@ 26 feet, refusal on hard BRECCIA**

---

**South Shores Church**
32712 Crown Valley Parkway
Dana Point, California

---

EARTH SCIENCE CONSULTANTS
Irvine, California

**Project No.:** 6375-04

**Figure No.:** B-12
**LOG OF BORING**

**Drill Rig:** Al-Roy 0-24 2150#  
**Boring Diameter:** 24 inches  
**Boring Elevation:**  
**Boring No.:** BA-3  
**Date Drilled:** 2/17/2006 TH

---

### Descriptions and Remarks

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BLASTF.</th>
<th>MOIST. %</th>
<th>DRY DENS.</th>
<th>SHAPE RES.</th>
<th>DEPTH FEET</th>
<th>SOIL ROCK SPACING</th>
<th>SOIL ROCK TYPE</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>18.4</td>
<td>104.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CL</td>
<td>Silty CLAY with Gravel and Cobbles: motiled gray and brown, very moist and firm</td>
</tr>
<tr>
<td>2</td>
<td>24.1</td>
<td>97.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FILL</td>
</tr>
<tr>
<td>10</td>
<td>15.8</td>
<td>117.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Silty SAND with Clay, Gravel &amp; Cobbles: weathered, than hard bedrock, moist, hard</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6 feet, Bedding: 42E,33SE</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>13 to 15 feet, Gravely zone, crude Bedding: N10E,15-20SE</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16 feet, Clay Shear: N40E,56NW</td>
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<td></td>
<td></td>
<td></td>
<td>continues yellow-brown Silty SANDSTONE with Gravel and Cobbles in beds and lenses</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>22.5 refusal</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>SAN ONOFRE BRECCIA</td>
</tr>
</tbody>
</table>

Bottom of boring at 22.5 feet.  
Note:  
1) Refusal on hard BRECCIA at 22.5 feet.  
2) No ground water encountered.  
3) No caving.  
4) Boring backfilled and tamped.

---

South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California  

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Irvine, California  

Project No.: 6375-04  
Figure No.: B-13
LOG OF BORING

Drill Rig: Bucket Auger EZ Bore
Boring Diameter: 28 inches
Boring Elevation: 253 feet
Boring No.: BA-4

Date Drilled: 2/20/2006 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BLLOW</th>
<th>DENSITY</th>
<th>RESISTANCE</th>
<th>DEPTH</th>
<th>SYMBOL</th>
<th>SOIL TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10.2</td>
<td>126.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10.7</td>
<td>116.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ML Sandy SILT: moist, rock fragments, stiff

@ 2 to 3 feet, Sandy CLAY: stiff
@ 4 feet, very irregular contact, roughly horizontal
FILL

BRECCIA: Gravel and cobble-size clasts of subangular to subrounded dark gray (GLEY-1-N4) to dark greenish-gray (GLEY-2-10G4/1) schist with some quartzite and white quartz fragments, some pockets and crude layers and lenses of cobbles and boulders in matrix of greenish-brown Sandy SILT and Silty SAND
@ 6 to 8 feet, slightly clayey
@ 8.5 feet, 16-inch boulder

@ 11 to 12 feet, crude layer of gravel and small cobbles, dips roughly 25° south
@ 14 feet, 18-inch boulder
@ 15 feet, 18-inch boulder

@ 18 feet, 12-inch boulder
@ 19 to 21 feet, cobble layer

@ 21 to 23 feet, fewer clasts
@ 23 to 26 feet, numerous cobbles and few boulders
@ 23 feet, crude contact: approx.: N60W,15-18SW

@ 25 feet, hard cobble layer
@ 25 to 30 feet, occasional coring required

@ 29 to 30 feet, crude layer of cobbles and small boulders, corinb

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

EARTH SCIENCE CONSULTANTS
Irvine, California

Project No.: 6375-04
Figure No.: B-14.1
**LOG OF BORING**

**Drill Rig:** Bucket Auger - EZ Bore  
**Boring Diameter:** 28 inches  
**Boring Elevation:** 253 feet  
**Boring No.:** BA-4  
**Date Drilled:** 2/20/2006 GDH

---

**Descriptions and Remarks**

- @ 31 feet, 8-inch layer of finely micaceous, Sandy Siltstone: greenish-brown and medium greenish-gray (GLEY-1-10YR/1)
- @ 31.7 to 32.4 feet, mostly gravel-size clasts in fine to coarse Silty Sand matrix
- @ 32.5 feet, Shear: N10W, 25°NE: with 1/2 to 1-inch Clayey Silt above, smooth surface, dull to moderately polished, possible striations plunge S85°E
- @ 33 to 40 feet, mostly medium greenish-gray, fine- to coarse-grained Silty Sandstone with fine to medium gravel-size clasts
- @ 40 feet, more gravel and coarser clasts
- @ 41 feet, clasts are mostly fine to medium gravel-size
- @ 41.5 feet, 8-inch irregular bed of fine to coarse Clayey Sandstone: N30E, 28°SE
- @ 44 feet, fine to coarse gravel-size clasts
- @ 45 to 46 feet, cement lens on SE side, small cobble on NW
- @ 48 feet, more silty matrix
- @ 50 feet, greenish-brown to greenish-gray, very Silty Clayey Sand matrix
- @ 52 feet, gravel- and cobble-size clasts become more numerous
- @ 54 feet, seepage from crude cobble lens, fine to coarse Silty Sand matrix, less silty
- @ 55 to 60 feet, mostly fine to coarse Silty Sandstone: with few gravel and cobble clasts and very moist, light greenish-gray (GLEY-1-10YR/1) (unoxidized)
LOG OF BORING

Drill Rig: Bucket Auger - EZ Bore

| Date Drilled: | 2/20/2006 GDH |

Boring Diameter: 28 inches
Boring Elevation: 253 feet

<table>
<thead>
<tr>
<th>Sample</th>
<th>Bulk TUB</th>
<th>BLOWS/Ft</th>
<th>MOISTURE %</th>
<th>DRY WEIGHT</th>
<th>DENSITY LB/FT</th>
<th>SHEAR RESISTANCE KPSF FT</th>
<th>DEPT FET</th>
<th>SOIL ROCK TYPE</th>
<th>BOREHOLD TYPE</th>
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</thead>
<tbody>
<tr>
<td>25</td>
<td>5.1</td>
<td>141.1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Descriptions and Remarks**

- 60 feet, greenish-gray (GLEY-1-5B5/1) to bluish-gray (GLEY-2-5B5/1), unoxidized, with more numerous gravel- to cobble-size clasts and very slight seepage on the east side
- 62 feet, more numerous clasts and greenish-gray (5Y-5/2)
- 63 to 70.5 feet, numerous gravel and cobble-size clasts with some boulders
- 66 feet, coring
- 66 to 69 feet, slight seepage from crude gravel and cobble lenses
- 70.5 feet, 12-inch greenish-gray Sandy Siltstone
- 71.5 feet, 12-inch cemented lens
- 72 to 73.5 feet, irregular bed of greenish-gray (GLEY-1-10GY5/1) very moist, very stiff Sandy Silt
- 73.5 feet, shear at base of Siltstone: N75W, 11-13NE and N10E, 15-17 SE with 1/2-inch to 1-inch greenish-brown, Clayey Silt group with some small rock fragments and few 1/4-inch gypsum crystals
- 73.5 to 78 feet, Fracture with red-brown oxide staining: N10E, 63-65SE; does not cut the shear above
- 73.5 to 85 feet, numerous gravels and cobble-size clasts and few boulders in dense matrix of Silty SAND
- 75 feet, seepage from fracture

**SAN ONOFRE BRECCIA**

Bottom of boring at 85 feet. Note:
1) Seepages at 60', 66-69' and 75'.
2) No caving.
3) Boring down-hole logged and backfilled and tamped.

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

EARTH SCIENCE CONSULTANTS
Irvine, California

Project No.: 6375-04
Figure No.: B-14.3
# LOG OF BORING

**Drill Rig:** EZ Bore Bucket Auger  
**Boring Diameter:** 30 inches  
**Boring Elevation:** 264.2 feet  
**Boring No.:** BN-1  
**Date Drilled:** 7/26/2006 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHEAR RESISTANCE</strong> (kPa)</td>
<td><strong>SOILROCK SYMBOL</strong></td>
</tr>
<tr>
<td><strong>SHEAR RESISTANCE</strong> (kPa)</td>
<td><strong>SOILROCK SYMBOL</strong></td>
</tr>
</tbody>
</table>

## Descriptions and Remarks

- **Sandy SILT with Clay, dark greenish-brown, very moist to saturated, soft**
- **Silty CLAY with Sand, reddish-brown (5YR-4/3), very moist, soft**
  - @ 7 feet, irregular contact: N2 SE, 15-20 SE  
    - RESIDUAL SOIL
- **BREECEIA: gravel- to cobble-size, sub-angular to sub-rounded, dark gray (GLEY-1-N4) to dark greenish-gray (GLEY-2-10G 4/1) and some light colored quartzite clasts in greenish-brown (2.5Y-5/3) Sandy SILT and Silty SAND Matrix: some crude cobby/bouldery layers**
  - @ 7 to 9 feet, mostly fine- to coarse Silty SANDSTONE with Gravel-size clasts
  - @ 9.5 feet, gravel to cobble-size clasts more numerous
  - @ 13 feet, crude contact with pebbly Silty SANDSTONE: N65E, 20-22SE
- **@ 15 feet, crude boulder/cobble layer with boulders to 16 inches**
- **@ 17 feet, 18-inch boulder**
  - @ 18.5 to 20.5 feet, cemented, pebbly, light yellowish-brown, Sandy SILTSTONE: N25W/20NE
  - @ 20.5 feet, becomes gravelly/cobbly again
- **@ 25 feet, crude contact with pebbly, orange-brown, slightly cemented Silty SANDSTONE with some scattered cobble-size clasts: N75 E, 25 SE**
  - @ 20.5 to 30 feet, 4 to 6 inch shear zone with some ribbon and pockets of dark greenish-gray CLAY in mostly Clayey SILT with Sand: N-S, 35W
  - @ 30 feet, base of shear zone dull surface: N10E, 45 NW

---

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Irvine, California

South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California

Project No.: 6375-04.1  
Figure No.: B-2.1
LOG OF BORING

Drill Rig: EZ Bore Bucket Auger
Boring Diameter: 30 inches
Boring Elevation: 264.2 feet
Boring No.

Date Drilled: 7/26/2006 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

Descriptions and Remarks

@ 30 feet, gravel, cobble and boulder-size clasts
@ 31.5 to 33 feet, matrix is very light brown and cemented and smaller clasts
@ 33 feet, becomes medium to dark greenish-brown
@ 35 feet, no sample, too hard (boulders)
@ 38 to 40 feet: coring
@ 38 feet, 18-inch boulder
@ 39 to 41 feet, cemented. Lens light greenish-brown (5y-5/4)
@ 41 feet, 2 to 4 inches shear zone with mostly greenish-gray Silty CLAY with Sand and some pebbles and small rock fragments: moderately irregular: N15 W, 35 NE, moderately polished on portions of the base with striations plunge N82E
@ 42 to 44 feet, crude, moderately cemented, light yellowish-brown Sandy SILTSTONE dips N-S, 25-30 degrees E
@ 44.5 feet, moderately irregular shear: N-S, 30-35E, some pockets of medium greenish-gray Silty CLAY
@ 45 feet, becomes darker greenish-brown (5y-4/3)
@ 46 feet, 20-inch x 10-inch rock fragment
@ 55 feet, cobbles and boulder-size clasts becoming more numerous, matrix becomes very moist
@ 57 feet, very slight seepage
@ 58 to 59 feet, crude cemented lens
@ 59 feet, slight increase in seepage

** No recovery

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

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Irvine, California

Project No.: 6375-04.1
Figure No.: B-2.2
**LOG OF BORING**

**Drill Rig:** EZ Bard Bucket Auger  
**Boring Diameter:** 30 inches  
**Boring Elevation:** 264.2 feet  
**Boring No.:** BN-1

---

### Descriptions and Remarks

- @ 60 feet, more numerous boulder size clasts
- @ 60.5 feet, matrix slightly cemented
- @ 60 to 65 feet, coring required
- @ 65 feet, coring rate too slow and drilling terminated

---

**Bottom of boring at 65 feet.**

Note:  
1) seepage at 57 to 59 feet  
2) Water level at 63 feet; overnight  
3) boring down-hole logged to 61 feet  
4) Boring backfilled and tamped and sod replaced

---

**South Shores Church**  
32712 Crown Valley Parkway  
Dana Point, California

---

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Irvine, California

---

**Project No.:** 6375-04.1  
**Figure No.:** B.2.3
### LOG OF BORING

**Drill Rig:** EZ Bore Bucket Auger  
**Boring Diameter:** 30 inches  
**Boring Elevation:** 232 ± feet  
**Boring No.:** BN-2

**Date Drilled:** 7/26/2006 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>BULK</th>
<th>TUBE</th>
<th>GLOSSITY</th>
<th>MOISTURE %</th>
<th>DRY DENSITY</th>
<th>MOIST. DRY</th>
<th>PIN HOLE</th>
<th>SHEAR RESISTANCE</th>
<th>NUCLEUS</th>
<th>SOURCE ROCK &amp; SYMBOL</th>
<th>SOIL ROCK TYPE</th>
<th>DESCRIPTIONS AND REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>SM</td>
<td>Silty SAND: fine- to Coarse-grained PAD FILL</td>
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<td></td>
<td></td>
<td>SM</td>
<td>Silty SAND with Clay: dark yellowish-brown, gravel-size rock fragments COLLUVIUM</td>
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<td></td>
<td></td>
<td>SM</td>
<td>BRECCIA: Sub-angular to rounded, mostly gravel-size clasts with isolated cobbles and small boulders in a greenish-brown, Silty Sand matrix. Bottom of boring at 15 feet.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>6.3</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>@ 6 feet: crude lens of cobbles</td>
<td>SM</td>
<td>BRECCIA: Sub-angular to rounded, mostly gravel-size clasts with isolated cobbles and small boulders in a greenish-brown, Silty Sand matrix. Bottom of boring at 15 feet.</td>
</tr>
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<td></td>
<td></td>
<td>@ 8 to 9 feet: cobbles and small boulders</td>
<td>SM</td>
<td>BRECCIA: Sub-angular to rounded, mostly gravel-size clasts with isolated cobbles and small boulders in a greenish-brown, Silty Sand matrix. Bottom of boring at 15 feet.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td>8.8</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>@ 10 feet: mostly gravel-size clasts in Silty SAND Matrix</td>
<td>SM</td>
<td>BRECCIA: Sub-angular to rounded, mostly gravel-size clasts with isolated cobbles and small boulders in a greenish-brown, Silty Sand matrix. Bottom of boring at 15 feet.</td>
</tr>
<tr>
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<td></td>
<td>@ 14 feet: began coring and cored to 15 feet but unable to extract the core</td>
<td>SM</td>
<td>BRECCIA: Sub-angular to rounded, mostly gravel-size clasts with isolated cobbles and small boulders in a greenish-brown, Silty Sand matrix. Bottom of boring at 15 feet.</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>@ 15 feet: refusal in cemented matrix with cobbles and boulders</td>
<td>SM</td>
<td>BRECCIA: Sub-angular to rounded, mostly gravel-size clasts with isolated cobbles and small boulders in a greenish-brown, Silty Sand matrix. Bottom of boring at 15 feet.</td>
</tr>
</tbody>
</table>

**Notes:**
1) No ground water encountered.
2) No caving.
3) Refusal at 15 feet.
4) Boring backfilled and tamped.

---

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**South Shores Church**  
32712 Crown Valley Parkway  
Dana Point, California

**Project No.:** 6375-04.1  
**Figure No.:** B-3
**LOG OF BORING**

**Drill Rig:** EZ Bore Bucket Auger  
**Boring Diameter:** 30 inches  
**Boring Elevation:** 232 ± feet  
**Boring No.:** BN-3

**Date Drilled:** 7/26/2006 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

**COLUMNS**

- **SAMPLE**
- **BLOWSPIT:**
- **FIELD % MOISTURE:**
- **DRIED DENSITY:**
- **DRY DENSITY:**
- **SHEAR RESISTANCE:**
- **RESIDUAL DENSITY:**
- **DEPTH FEET:**
- **SOIL TYPE:**
- **SOIL DESCRIPTION:**
- **SOURCES:**
- **Remarks:**

**Descriptions and Remarks**

**COLLUVIUM**

- Silty SAND: fine- to coarse, gravelly  
- Silty SAND with Clay: dark yellowish-brown, gravel-size clasts

- Displaced BRECCIA: mostly sub-angular to rounded, gravel-size clasts in a tight, greenish-brown Silty sand to Sandy Silt matrix with some isolated cobbles and boulders and crude cobble and boulder lenses and pockets

  - @ 6 feet: cobbles lens
  - @ 8 to 9 feet: cobbles and small boulders
  - @ 9 feet: mostly gravel-size in tight Silty Sand to Sandy Silt

  - @ 15 feet: more numerous clasts gravel to cobble size
  - @ 17 feet: 12-inch boulders
  - @ 19.5 feet: becomes Silty Sandstone with gravel-size clasts
  - @ 20.5 feet: irregular 6-inch bed of pebbly Silty Sandstone: N40E, 20SE
  - @ 21.5 feet: irregular 6-inch bed of pebbly Silty Sandstone: N40E, 20SE
  - @ 22 to 23 feet: 1/4-inch thick, dark greenish-brown, Silty Clay seam dips 25 - 35° east, with polished shear surface at base: N10E, 35SE; well-developed striations plunge 585E, gravelly Silty Sandstone below with reddish-brown oxidation

**LANDSLIDE**

- Displaced (?) BRECCIA: dense, greenish-gray

  - @ 24 to 26 feet: small boulder-and cobble-size clasts
  - @ 26.5 to 27.5 feet: greenish-gray and very Silty
  - @ 28 to 30 feet: cemented matrix with cobbles and small boulders; cured for 2 hours and could not extract the core

  - Refusal at 30 feet.

Bottom of boring is at 30 feet.

**Notes:**
1) No ground water encountered  
2) No caving  
3) Boring backfilled and tamped

---

GANICO Geotechnical, Inc.  
EARTH SCIENCE CONSULTANTS  
Irvine, California

South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California

**Project No.:** 6375-04.1  
**Figure No.:** B-4
LOG OF BORING

Drill Rig: Bucket Auger  
Boring Diameter: 24 inches  
Boring Elevation: 160± feet  

Date Drilled: 2/9/2007 GDH  

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

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<th>RESISTANCE</th>
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**Descriptions and Remarks**

Displaced, BRECCIA: greenish-brown, very weathered Silty Sand matrix with mostly gravel-size sub-angular to well-rounded gravel size clasts, some isolated cobbles

@ 7.5 to 8.5 feet: Shear Zone with 2-inch Clayey Silt with grit and some soft, white chalk-like inclusions, roots along the base: N15E, 26 SE

@ 8.5 feet: matrix is tighter and less weathered

@ 11 to 12 feet: irregular bed of pebbly SANDSTONE N30E, 20-25 SE; 6-inch cobble below

@ 14 feet: Rupture Surface with 1-inch greenish-brown, moderately plastic Silty Clay gouge: N17 E, 22-23 SE, well-developed striations S86E, some decayed roots along the base

Displaced BRECCIA: greenish-gray with mostly gravel-size clasts
@ 15 feet: tighter and slightly darker

@ 16 to 17 feet: crude pebbly Sandstone bed, dips about 20° E, more gravely clasts below with few small cobbles

@ 20 feet: 6-inch irregular dark bluish-gray Sandy Siltstone bed, dips about 20° E
@ 21 feet: 12-inch cemented lens, required coring

@ 22 feet: becomes bluish-gray matrix of Sandy Silt with mostly gravel-size, sub-angular to rounded clasts and few cobbles and small boulders

@ 25 feet: fracture: N35 SE, 85 NW
@ 26 feet: more numerous clasts
@ 27.5 feet: becoming Silty SAND matrix

South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California

EARTH SCIENCE CONSULTANTS  
Irvine, California

Project No.: 6375-04.1  
Figure No.: B-5.1
# LOG OF BORING

**Drill Rig:** Bucket Auger  
**Boring Diameter:** 24 inches  
**Boring Elevation:** 160 feet  
**Date Drilled:** 2/9/2007 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

## SAMPLE

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</table>

### Descriptions and Remarks

- @ 30 feet: wet along vertical fracture (NSW)
- @ 31 feet: 12-inch irregular, cemented lens on west side
- @ 36.5 feet: irregular shear with 1-inch Silty Clay with grit (N53E, 16-17 SE) no striations found, 12-inch cemented lens beneath the shear on west side.
- @ 32.5 feet: very slight seepage on south side and greenish-gray
- @ 35 feet: small boulder
- @ 42 feet: cemented, cored for 90 minutes
- @ 43 feet: refusal

**SAN ONOFRE**  
**BRECCIA**

**Bottom of boring at 43 feet.**

**Notes:**
1. Very slight seepage at 30 and 31.5 feet.
2. Boring down-hole logged.
3. Boring backfilled and tamped

---

**South Shores Church**  
32712 Crown Valley Parkway  
Dana Point, California

EARTH SCIENCE CONSULTANTS  
Irvine, California

**Project No.:** 6375-04.1  
**Figure No.:** B-5.2
LOG OF BORING

Drill Rig: Boyle 37 Truck-mounted
Core rig

Boring Diameter: 4 inches
Boring Elevation: 233± feet

Date Drilled: 2/13/07-2/14/07

GDOH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any
other location, there may be consequential changes in conditions.

Descriptions and Remarks

SM Silty SAND with Gravel

SM Silty SAND with Clay and gravel-size clasts

Displaced BRECCIA: mostly gravel-size, subangular to rounded
clasts in a greenish-brown, Silty Sand matrix, with pockets and
crude lenses of cobbles and boulders and irregular beds of Silty
Sand and Sandy Silt; soft and very weathered to 10 feet.

@ 7 feet: soft, sheared, 60° - 70° NW

@ 8 feet: cobbles and small boulders

@ 10 to 11 feet: fine, sub-angular gravel-size clasts in Silty Sand
matrix

@ 15 feet: oxidized fracture dips 45° NW

@ 15 feet: 12 inches hard, bluish-gray boulder

@ 16 to 19 feet: soft, very weathered, greenish-brown (5Y-5/3)
Sandy SILTSTONE with sub-angular gravel-size clasts

@ 20 feet: polished shear dips 30° east

@ 20.5 feet: becomes soft and sheared

@ 20.8 feet: shear with 1/8-inch Clay gouge: N40E, 7SE

LANDSLIDE

@ 21 feet, Displaced BRECCIA

Light greenish-gray (BY-6/2) fine- to medium-grained Silty
Sandstone with fine, angular rock fragments.

@ 24 to 25 feet: hard boulder

@ 25 to 27.5 feet: no recovery (probably Silty Sand matrix
washed out)

@ 27 to 29 feet: hard boulders

@ 29 to 31.2 feet: soft, very weathered, yellowish-brown, oxide
stained.

LANDSLIDE

EARTH SCIENCE CONSULTANTS
Irvine, California

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

Project No.: 6375-04.1
Figure No.: B-6.1
**LOG OF BORING**

**Drill Rig:** Boyle 37 Truck-Mounted Core rig  
**Boring Diameter:** 4 inches  
**Boring Elevation:** 233.5 feet  
**Date Drilled:** 2/13/2007 GDH  

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>Depth Feet</th>
<th>Descriptions and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2 feet</td>
<td>light greenish-brown, moderately cemented Silty SANDSTONE</td>
</tr>
<tr>
<td>31.5 feet</td>
<td>dull Sheer with 1/4-inch Sandy SILT with Clay: N 18 E, 29 NW</td>
</tr>
<tr>
<td>31.7 feet</td>
<td>4-inch cemented bed</td>
</tr>
<tr>
<td>32 to 33.5 feet</td>
<td>slightly cemented, with gravel in greenish-brown Silty SANDSTONE</td>
</tr>
<tr>
<td>33.5 to 35 feet</td>
<td>no recovery</td>
</tr>
<tr>
<td>35 to 36.8 feet</td>
<td>light green-gray, Silty Sandstone with gravel-size, sub-angular clasts</td>
</tr>
<tr>
<td>36.8 feet</td>
<td>small, hard cobble</td>
</tr>
<tr>
<td>37 to 38 feet</td>
<td>greenish-brown and more numerous gravel-size clasts</td>
</tr>
<tr>
<td>38 to 39 feet</td>
<td>cobbles</td>
</tr>
<tr>
<td>39 to 42.7 feet</td>
<td>moderately cemented, Silty SAND with gravel-size clasts, cobble at 42.7 feet some dark yellowish-brown oxidation and irregular fractures</td>
</tr>
<tr>
<td>43 to 47 feet</td>
<td>moderately cemented with more numerous gravel- to small cobble-size clasts</td>
</tr>
<tr>
<td>43.5 feet</td>
<td>irregular shear with thin Clayey SILT gouge and oxide stained, dips 35° approximately east</td>
</tr>
<tr>
<td><strong>LANDSLIDE?</strong></td>
<td></td>
</tr>
<tr>
<td>44.2 feet</td>
<td>6-inch well cemented bed</td>
</tr>
<tr>
<td>45 feet</td>
<td>more cobbly; weathered and soft to 47 feet</td>
</tr>
<tr>
<td>47 feet</td>
<td>thin 1/4-inch, low-angle, Clayey Silt bed</td>
</tr>
<tr>
<td>47 to 49 feet</td>
<td>small boulders and cobbles and random fractures</td>
</tr>
<tr>
<td>49 to 51 feet</td>
<td>closely fractured, moderate to high angle</td>
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<tr>
<td>51 to 53 feet</td>
<td>no recovery</td>
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<td>53 to 54.8 feet</td>
<td>closely fractured</td>
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<td>54.8 feet</td>
<td>3-inch white quartz cobble</td>
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<td>55 to 57 feet</td>
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<td>57 to 59 feet</td>
<td>closely fractured, weathered, gravel to cobble-sized clasts</td>
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<tr>
<td>58.5 feet</td>
<td>4 to 5 inches greenish-brown (SY-5/3) soft, weathered Clayey SILTSTONE</td>
</tr>
<tr>
<td>59 to 61.5 feet</td>
<td>no recovery</td>
</tr>
</tbody>
</table>

---

South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California

EARTH SCIENCE CONSULTANTS  
Irvine, California

Project No.: 6375-04.1  
Figure No.: B-6.2
**LOG OF BORING**

**Drill Rig:** Boyle 37 Truck-Mounted Core Rig  
**Boring Diameter:** 4 inches  
**Boring Elevation:** 233± feet

**Date Drilled:** 2/14/2007 GDH

---

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>59 to 61.5</td>
<td>@ 59 to 61.5 feet: no recovery (large piece of gravel stuck in sampler tip)</td>
</tr>
<tr>
<td>61.5 to 62</td>
<td>@ 61.5 to 62 feet: slightly cemented, greenish-brown Sandy Siltstone with clay</td>
</tr>
<tr>
<td>62 to 62.5</td>
<td>@ 62 to 62.5 feet: cemented at 62.5 and small cobble</td>
</tr>
<tr>
<td>62.5 to 63</td>
<td>@ 62.5 to 63 feet: greenish-brown, Sandy Silt with clay matrix</td>
</tr>
</tbody>
</table>
| 63 to 64.8 | @ 63 to 64.8 feet: mostly greenish-brown (5Y-5/3), soft, weathered, Silty Sand with Clay matrix and sub-angular, gravel-
| 64.8 to 66 | @ 64.8 to 66 feet: fine- to coarse-grained, greenish-brown Silty Sandstone, finer at 66 feet |
| 66 | @ 66 feet: fine- to medium, weathered, slightly cemented and greenish-gray (5Y-6/2) |
| 66.5 | @ 66.5 feet: Shear with clay coating, dips about 5° approximately east with possible striations S 45 E |
| 66.6 | @ 66.6 feet: becomes moderately cemented Silty Sand matrix with gravel-size clasts |
| 67.5 | @ 67.5 feet: becomes dark bluish-gray (GLEY-2, 5B-4/1) to dark greenish-gray (GLEY-2, 10BG-4/1), fine to coarse, Silty Sand matrix, slight to moderately cemented, with sub-angular, gravel-size clasts |
| 70 | @ 70 feet: 3-inch dark greenish-gray, very stiff Clayey Siltstone bed with random shea's, dips approximately east at about 5° |
| 71.5 | @ 71.5 feet: becomes fine-coarse, slightly cemented Silty Sandstone |
| 72.1 | @ 72.1 feet: 3-inch Clayey Siltstone, slightly clayey with 2 parallel polished shears, dip 12 degrees approximately east; shear at 72.3 has 1/2-inch very stiff Silty Clay |
| 72.5 | @ 72.5 feet: moderately cemented, some fine clasts in Sandy Silt with Clay matrix |
| 73 | @ 73 feet: fine- to coarse-grained Silty Sandstone |
| 73.3 | @ 73.3 feet: becomes very dark greenish-gray to bluish-gray, unoxidized (GLE-2, 5G-4/1 to 5B-3/1), moderate to well cemented Silty Sand matrix with numerous sub-angular to rounded gravel-size clasts |
| 77 | @ 77 feet: some larger clasts (coarse-gravel size) with few small cobbles |
| 78 | @ 78 feet: 6-inch pebbly Sandstone bed, irregular contacts |
| 81 | @ 81 feet: 3-inch cemented bed @ 81.6 feet: cement bed |
| 82.1 | @ 82.1 to 83.3 feet: fine- to coarse-grained, very dark greenish-gray, cemented Silty Sandstone with some pebbles |
| 82.3 | @ 82.3 to 84.5 feet: numerous clasts |
| 84.5 | @ 84.5 feet: 4-inch cemented bed |
| 85 to 90 | @ 85 to 90 feet: Silty Sandstone matrix, hard with gravel to small cobbles | |

**Bottom of boring at 90 feet**

**Notes:**
1) Ground water at 63 feet at 7:30 AM, 2/15/07
2) OPTV logged on 2/16/07
3) Boring backfilled with bentonite/cement slurry

---

**South Shores Church**  
32712 Crown Valley Parkway  
Dana Point, California

---

EARTH SCIENCE CONSULTANTS  
Irvine, California

---

Project No.: 6375-04.1  
Figure No.: B-6.3
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LOG OF BORING

Drill Rig: Boyle 37 Truck-Mounted Core Rig
Boring Diameter: 4 inches
Boring Elevation: 232± feet

Date Drilled: 2/15/2007 GDH

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

Boring No. BN-6

<table>
<thead>
<tr>
<th>Descriptions and Remarks</th>
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<tbody>
<tr>
<td>Silty SAND with Clay: dark brown, moist</td>
</tr>
<tr>
<td>@ 1 foot: reddish-brown Silty CLAY with Sand and rock fragments</td>
</tr>
<tr>
<td>@ 3 feet: grading to breccia</td>
</tr>
<tr>
<td>COLLUVIUM</td>
</tr>
<tr>
<td>Displaced BRECCIA: brown to greenish-brown Silty SAND to Sancy SILT matrix with gravel-cobble-size, sub-angular to sub-rounded clasts</td>
</tr>
<tr>
<td>@ 6 to 8 feet: soft, weathered, greenish-brown (5Y-5/3) Sandy to Clayey SILTSTONE with isolated and crude thin lenses of sub-angular, gravel-size clasts and some random shears</td>
</tr>
<tr>
<td>@ 7 feet: irregular Shear dips 43° approximately east</td>
</tr>
<tr>
<td>Displaced BRECCIA</td>
</tr>
<tr>
<td>@ 8 to 9.5 feet: fine- to coarse-grained Silty SANDSTONE, tight</td>
</tr>
<tr>
<td>@ 9 feet: tight, 75° oxido-stained fracture</td>
</tr>
<tr>
<td>@ 9.5 to 13.5 feet: numerous sub-angular to rounded gravel-size clasts in Silty SAND matrix, slightly cemented, some oxide-satined random fractures</td>
</tr>
<tr>
<td>@ 13.5 feet: 5 inch Sandy SILTSTONE bed</td>
</tr>
<tr>
<td>@ 14 to 14.5 feet: Silty SANDSTONE bed</td>
</tr>
<tr>
<td>@ 14.5 feet: gravelly layer</td>
</tr>
<tr>
<td>@ 15 feet: becomes fine-grained and greenish-brown</td>
</tr>
<tr>
<td>@ 15 feet: bedding: N 70 W, 21 SW (from OPTV log and core)</td>
</tr>
<tr>
<td>@ 16 feet: becomes fine- to coarse-grained, with no clasts to 17.2 feet and greenish-brown (5Y-5/3)</td>
</tr>
<tr>
<td>@ 17.2 to 19 feet: some gravel-size clasts, soft and very weathered</td>
</tr>
<tr>
<td>@ 19 to 20 feet: hard, dark bluish-gray, quartzite boulder</td>
</tr>
<tr>
<td>@ 20 feet: cobble</td>
</tr>
<tr>
<td>@ 21 feet: bedding: N 75W, 12 NE</td>
</tr>
<tr>
<td>@ 20 to 26 feet: numerous gravel-size clasts in light greenish-brown (5Y-5/3 to 6/3) Silty SAND matrix, slightly to moderately cemented, some oxide staining</td>
</tr>
<tr>
<td>@ 26 to 27.6 feet: partial recovery (loose clasts only), soft and very weathered</td>
</tr>
<tr>
<td>@ 27.8 to 28.3 feet: 30° to 60° random fractures</td>
</tr>
<tr>
<td>@ 28.3 to 29 feet: moderately well cemented gravelly SANDSTONE</td>
</tr>
<tr>
<td>@ 29 to 29.4 feet: intense oxide staining and not cemented</td>
</tr>
<tr>
<td>@ 29.8 feet: becomes greenish-brown Sandy SILT matrix</td>
</tr>
</tbody>
</table>

South Shores Church
32712 Crown Valley Parkway
Dana Point, California

EARTH SCIENCE CONSULTANTS
Irvine, California

Project No: 6375-04.1
Figure No: B-7.1
### Descriptions and Remarks

- **30 to 30.3 feet**: gravel-size clasts in Sandy SILT matrix, cemented at 30.3 to 30.8 feet
- **30.8 feet**: becomes clayey SILTSTONE, light greenish-brown to greenish-gray (5Y 6/3 to 6/2) soft and sheared, few random clasts
- **31 to 31.7 feet**: several polished shears dip 15 to 20° approximately east

#### BRECCIA:
- **31.9 feet**: numerous gravel- to small boulder-size clasts in greenish-brown Sandy SILT with Clay matrix with random, oxide-stained fractures
- **35 feet**: Bedding from OPTV log: N 65 E, 15 SE
- **36 feet**: small white quartz cobble
- **37 to 41 feet**: no recovery; cuttings are fine- to coarse-grained Sand (rock fragment plug in the bit)
- **41 to 43 feet**: cobbles and small boulders, fractured with oxides staining
- **42 feet**: approximately 30° polished shear with 1/4-inch Sandy SILT with Clay gouge
- **43 to 43.8 feet**: Nc recovery
- **43.8 to 46 feet**: closely-fractured cobbles and small boulders, 45 to 60° dips with greenish-brown Clayey SILT coating along fractures
- **45.7 feet**: 3-inch Shear with Clayey SILT and small rock fragments and black (tornblend) fragment: N 45 E, 19 SE
- **46.5 feet**: matrix casts, slightly cemented
- **47.5 to 50 feet**: not cemented, greenish-brown, mostly weathered, Silty Sand matrix with small gravel-size clasts, with few scattered, larger clasts
- **47.8 feet**: 25° polished Shear and soft to 48.3 feet
- **48 feet**: Bedding: 'N 15 E, 10 NW (from OPTV log)
- **49.5 feet**: larger casts
- **49.8 feet**: stiff Sandy SILTSTONE bed
- **50 to 53 feet**: no recovery, rock plug in cutting head (probably mostly Sandstone)

- **53 to 54.8 feet**: mostly light greenish-brown Silty SANDSTONE, slightly cemented with mostly fine- to medium-gravel-size clasts and some thin, irregular Sandy Siltstone beds
- **54.6 to 55 feet**: light greenish-brown Clayey SILT
- **54.6 feet**: polished Shear, dips 45° approximately east
- **55.6 feet**: 5 inches Sandy SILT bed, medium to dark greenish-gray (GLEY, B6-5/1-4/1)
- **56.5 feet**: becoming greenish- to bluish-gray (unoxidized) and harder, moderately cemented Silty SAND matrix with gravel-size clasts

---

**South Shores Church**
32712 Crown Valley Parkway
Dana Point, California

**G. A. Nicoll & Associates, Inc.**
EARTH SCIENCE CONSULTANTS
Irvine, California

**Project No.**: 6375-04.1
**Figure No.**: B-7.2
**LOG OF BORING**

Drill Rig: Boyle 37 Truck-Mounted Core Rig  
Boring Diameter: 4 inches  
Boring Elevation: 232± feet  

**Date Drilled:** 2/15/2007 GDH  

This log is a representation of subsurface conditions at the time and place of drilling. With the passage of time or at any other location, there may be consequential changes in conditions.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>12&quot; DROP</th>
<th>BULK</th>
<th>TUBE</th>
<th>BLOWN FT.</th>
<th>FIELD MOISTURE %</th>
<th>DRY WEIGHT</th>
<th>DRY DENSITY LB/CL FT</th>
<th>SHEAR RESISTANCE KIPS/SD FT</th>
<th>DEPTH FEET</th>
<th>SOUR CROP</th>
<th>SOURCE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Descriptions and Remarks**

- @ 60 feet: becomes harder, slower drilling
- @ 60 to 61 feet: greenish-gray with light brown, irregular Sandy Silt inclusions and motting
- @ 60.5 feet: bedding: N 10 W, 10 NE
- @ 60 to 64 feet: mostly fine, gravel-size, sub-angular to rounded clasts in dark greenish-gray, unoxidized, Silty SAND matrix
- @ 61 to 61.5 feet: several thin, hard, dark greenish-gray Silty CLAY beds with polished shears along bedding and waxy texture; few isolated, rounded pebbles in the CLAY beds; beds dip 7 to 10 degrees approximately east
- @ 63.8 feet: small cobble

SAN ONOFRE BRECCIA

Bottom of boring at 64 feet.

**Notes:**
1) No ground water encountered
2) OPTV logged on 2/16/07
3) Boring backfilled with bentonite and cement slurry

---

South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California

EARTH SCIENCE CONSULTANTS  
Irvine, California

Project No.: 6375-04.1  
Figure No.: B-7.3
<table>
<thead>
<tr>
<th>Depth m</th>
<th>Depth ft</th>
<th>Azimuth deg</th>
<th>Dip deg</th>
<th>Depth m</th>
<th>Depth ft</th>
<th>Azimuth deg</th>
<th>Dip deg</th>
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</thead>
<tbody>
<tr>
<td>0.28</td>
<td>0.9</td>
<td>237</td>
<td>46</td>
<td>14.62</td>
<td>48.0</td>
<td>269</td>
<td>10</td>
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<tr>
<td>0.53</td>
<td>1.8</td>
<td>247</td>
<td>18</td>
<td>14.79</td>
<td>48.5</td>
<td>276</td>
<td>19</td>
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<tr>
<td>0.56</td>
<td>1.8</td>
<td>232</td>
<td>51</td>
<td>15.65</td>
<td>51.3</td>
<td>260</td>
<td>27</td>
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<tr>
<td>0.72</td>
<td>2.4</td>
<td>164</td>
<td>43</td>
<td>15.98</td>
<td>52.4</td>
<td>239</td>
<td>30</td>
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<tr>
<td>0.98</td>
<td>3.2</td>
<td>235</td>
<td>9</td>
<td>17.21</td>
<td>56.5</td>
<td>265</td>
<td>44</td>
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<td>1.27</td>
<td>4.2</td>
<td>274</td>
<td>32</td>
<td>17.56</td>
<td>57.6</td>
<td>322</td>
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<tr>
<td>1.36</td>
<td>4.5</td>
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<td>17.69</td>
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<tr>
<td>1.87</td>
<td>6.1</td>
<td>256</td>
<td>36</td>
<td>18.45</td>
<td>60.5</td>
<td>64</td>
<td>18</td>
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<tr>
<td>2.02</td>
<td>6.6</td>
<td>200</td>
<td>50</td>
<td>18.92</td>
<td>62.1</td>
<td>278</td>
<td>27</td>
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<tr>
<td>2.30</td>
<td>7.5</td>
<td>64</td>
<td>50</td>
<td>19.45</td>
<td>63.8</td>
<td>146</td>
<td>42</td>
</tr>
</tbody>
</table>
LOG OF TEST PIT

| Surface Elevation: | 249' | Logged By: | T. Hill |
| Pit Orientation: | N70E | Date: | 16-Feb-06 |
| Pit Dimensions: | See Below | Equipment: | Backhoe - Al-Roy |
| Ground Water Depth: | | Test Pit Number | TP-1 |

<table>
<thead>
<tr>
<th>GEOLOGICAL Classification and Description</th>
<th>Depth (ft)</th>
<th>Graphic Symbol</th>
<th>Soil Type</th>
<th>USCS</th>
<th>In-Situ</th>
<th>Bulk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual Soil (CL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedrock:</td>
<td>-2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conglomerate and SANDSTONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAN ONOFRE BRECCIA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ENGINEERING Classification and Description</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 2 feet, RESIDUAL SOIL, Sandy Clay (CL) with gravel and cobbles. Brown to 12 inches then orange-brown. Dry to 12 inches then humid to moist. Cracked and dry. Many roots to 12 inches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 to 5.5 feet, Bedrock: San Onofre Breccia Interbedded Cobble Conglomerate and Conglomeratic SANDSTONE. Massive, hard, no bedding observed.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Test pit backfilled and tamped.

---

Surface Gradient: Slope Gradient -20°

Scale: 1" = 2.5'

GANICO Geotechnical, Inc.
EARTH SCIENCE CONSULTANTS

South Shores Church
32712 Crown Valley Parkway
Dana Point, California
Date: Mar-06
Project No. 6375-04 Figure No. B-15
## LOG OF TEST PIT

**Surface Elevation:** 248 ft.  
**Pit Orientation:** NS  
**Pit Dimensions:** 8x5.5 ft.  
**Ground Water Depth:** See page 2.5-5.5'  

**Logged By:** T. Hill  
**Date:** 16-Feb-06  
**Equipment:** Backhoe - Al-Roy  
**Test Pit Number:** TP-2

### GEOLOGICAL Classification and Description

- **Residual Soil (CL)**
- **Bedrock:**
  - 2.5 ft
- **SAN ONOFRE BRECCIA**

### ENGINEERING Classification and Description

- 0 to 2 feet, RESIDUAL SOIL... Sandy Clay (CL) with gravel and cobbles. Dark brown to 2 feet then reddish-brown. Very moist (watered area) soft at surface then stiff.
- 2.5 to 5.5 ft, Bedrock: San Onofre Breccia. Cobble Conglomerate with SAND and CLAY. Matrix massive. Hard below 4'. Minor seepage at Soil/Bedrock Contact from irrigation water.

*Note: Test pit backfilled and tamped.*

---

**Surface Gradient:** 10° in trench direction - 16° down slope  
**Scale:** 1:2.5

---

**GANICO Geotechnical, Inc.**  
**EARTH SCIENCE CONSULTANTS**

**South Shores Church**  
32712 Crown Valley Parkway  
Dana Point, California  
**Date:** Mar-06  
**Project No.: 6375-04**  
**Figure No.: B-16**
**LOG OF TEST PITS**

**Test Pit Number T-1**

<table>
<thead>
<tr>
<th>Surface Elevation:</th>
<th>269± feet</th>
<th>Logged By:</th>
<th>T. Hill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit Orientation:</td>
<td>N/A</td>
<td>Date:</td>
<td>3/9/2006</td>
</tr>
<tr>
<td>Pit Dimensions:</td>
<td>2'x3'x5.5'</td>
<td>Equipment:</td>
<td>Hand Auger</td>
</tr>
<tr>
<td>Ground Water Depth:</td>
<td>None Encountered</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Samples**

<table>
<thead>
<tr>
<th>Bulk</th>
<th>Tube</th>
<th>Depth (ft)</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.t.)</th>
<th>Graphic Symbol</th>
<th>Soil Type (USCS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>18.6</td>
<td>105.1</td>
<td></td>
<td>CL</td>
<td>CL</td>
</tr>
</tbody>
</table>

Sandy CLAY: dark brown, very moist, soft, many roots, 14” thick TOPSOIL

|      |      | 16.7       | 105.6        |                      | CL             | CL               |

Sandy CLAY: reddish-brown, moist, very stiff, fine roots, few cobbles (14 to 28”)

**REFERENCE STRATIGRAPHY**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.t.)</th>
<th>Graphic Symbol</th>
<th>Soil Type (USCS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.7</td>
<td>114.2</td>
<td></td>
<td>RE</td>
<td>BRECCIA: Gravel to boulder-size clasts in a sandstone matrix, no bedding found, very difficult to excavate (29 to 66”)</td>
</tr>
</tbody>
</table>

Bottom of pit at 5.5 feet.

*Note:*
1) No caving.
2) Pit backfilled and tamped.

---

**Test Pit Number T-2**

<table>
<thead>
<tr>
<th>Surface Elevation:</th>
<th>263± FEET</th>
<th>Logged By:</th>
<th>T. Hill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit Orientation:</td>
<td>N/A</td>
<td>Date:</td>
<td>3/9/2006</td>
</tr>
<tr>
<td>Pit Dimensions:</td>
<td>1.5x1.5x2.5'</td>
<td>Equipment:</td>
<td>Hand Equipment</td>
</tr>
<tr>
<td>Ground Water Depth:</td>
<td>None Encountered</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Samples**

<table>
<thead>
<tr>
<th>Bulk</th>
<th>Tube</th>
<th>Depth (ft)</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.t.)</th>
<th>Graphic Symbol</th>
<th>Soil Type (USCS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>18.6</td>
<td>105.1</td>
<td></td>
<td>CL</td>
<td>CL</td>
</tr>
</tbody>
</table>

Sandy CLAY: dark brown, very moist, soft, bedrock fragments FILL

|      |      | 16.7      | 105.6        |                      | CL             | CL               |

CLAY: dark yellowish-brown, moist, stiff, with sand and rock fragments, grades to bedrock RESIDUAL SOIL

Gravelly SANDSTONE: massive, hard SAN ONOFRE BRECCIA

**REFERENCE STRATIGRAPHY**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.t.)</th>
<th>Graphic Symbol</th>
<th>Soil Type (USCS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>55.5</td>
<td></td>
<td>RE</td>
<td>Bottom of pit at 2.5 feet.</td>
</tr>
</tbody>
</table>

**Note:***
1) No caving.
2) Pit backfilled and tamped.
## LOG OF TEST PITS

**Surface Elevation:** 265± feet  
**Logged By:** T. Hill  
**Date:** 3/9/2006  
**Pit Orientation:** N/A  
**Pit Dimensions:** 2x3x5'  
**Ground Water Depth:** None Encountered  
**Equipment:** Hand Equipment

### Test Pit Number T-3

<table>
<thead>
<tr>
<th>Bulk Tube</th>
<th>Depth (ft.)</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.f.)</th>
<th>Graphic Symbol</th>
<th>Soil Type (USCS)</th>
<th>Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC/CL</td>
<td>7.6</td>
<td>115.5</td>
<td></td>
<td></td>
<td>SC/CL</td>
<td>Sandy CLAY: dark brown, very moist, soft, roots LANDSCAPE SOIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Clayey SAND and Sandy CLAY: layered, brown and reddish-brown, very moist, stiff/dense, some cobbles, few brick and branch fragments FILL</td>
</tr>
<tr>
<td></td>
<td>13.2</td>
<td>110.5</td>
<td></td>
<td></td>
<td>Cl</td>
<td>Sandy CLAY: reddish-brown RESIDUAL SOIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>BRECCIA: Boulders, hard SAN ONOFRE BRECCIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Bottom of pit at 5 feet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Note:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>1) No caving.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>2) Pit backfilled and tamped.</td>
</tr>
</tbody>
</table>

### Test Pit Number T-4

**Surface Elevation:** 351± feet  
**Logged By:** T. Hill  
**Date:** 3/8/2006  
**Pit Orientation:** N/A  
**Pit Dimensions:** 1.5x1.5x2.6'  
**Ground Water Depth:** None Encountered  
**Equipment:** Hand Equipment

<table>
<thead>
<tr>
<th>Bulk Tube</th>
<th>Depth (ft.)</th>
<th>Moisture (%)</th>
<th>Dry Density (p.c.f.)</th>
<th>Graphic Symbol</th>
<th>Soil Type (USCS)</th>
<th>Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Sandy CLAY: dark brown, moist, stiff COLLUVIUM</td>
</tr>
<tr>
<td>Cl</td>
<td>10</td>
<td></td>
<td></td>
<td>Cl</td>
<td>Cl</td>
<td>CLAY: dark yellowish-brown, moist, stiff, rock fragments RESIDUAL SOIL</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
<td></td>
<td>Cl</td>
<td>Cl</td>
<td>SANDSTONE with Gravel and Cobbles: yellowish-brown, massive, hard SAN ONOFRE BRECCIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Cl</td>
<td>Bottom of pit at 2.6 feet.</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Cl</td>
<td>Cl</td>
<td>Note:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Cl</td>
<td>1) No caving.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl</td>
<td>Cl</td>
<td>2) Pit backfilled and tamped.</td>
</tr>
</tbody>
</table>

---

G. A. NICOLL & ASSOCIATES, INC.  
EARTH SCIENCE CONSULTANTS  
South Shores Church  
32712 Crown Valley Parkway  
Dana Point, California  
Date: April-05  
Project No: 6375-04  
Figure No: B-18
LOG OF TEST PITS

Test Pit Number
T-5

Surface Elevation: 237± feet
Pit Orientation: E-W
Pit Dimensions: 2x5x3.5'
Ground Water Depth: None Encountered

Logged By: T. Hill
Date: 3/8/2006
Equipment: Hand Equipment

Samples

<table>
<thead>
<tr>
<th>Bulk</th>
<th>Tube</th>
<th>Depth (ft.)</th>
<th>Moisture (%)</th>
<th>Dry Density (b.c.f.)</th>
<th>Graphic</th>
<th>Soil Type (USCS)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>CI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.2</td>
<td>119.3</td>
<td></td>
<td></td>
<td>Sandy CLAY with rock fragments; dark yellowish-brown, moist, stiff, fragments to 12' diameter</td>
</tr>
<tr>
<td></td>
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<td>CL</td>
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<td></td>
<td></td>
<td>Sandy CLAY: medium brown, moist, stiff, rock fragments</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>RESIDUAL SOIL</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Clayey SANDSTONE with Gravel and Cobbles: yellowish-brown, massive, hard</td>
</tr>
<tr>
<td></td>
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<td>SAN ONOFRE BRECCIA</td>
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DESCRIPTION AND REMARKS

Bottom of pit at 3.5 feet.

Note:
1) No caving.
2) Pit backfilled and tamped.
PROJECT NAME: South Shores Church
JOB NO.: 6375-04
EQUIPMENT: Hand Dug
LOGGED BY: Tom Hill

TRENCH NO.: ?
DATE: 03-09-06
ELEVATION: 234-240 feet (approx.)
LOCATION: Hillside

DESCRIPTION

0-9" Dark yellowish-brown, Sandy CLAY to Clayey SAND: moist, loose, with organics, roots, prismatic fracturing.


2.5-3.5' Bedrock: San Onofre Breccia. Yellow-brown gravel cobble breccia with sandstone matrix. Massive, hard, slightly to moderately fractured.

SCALE: 1" = 5' TOPOGRAPHY: Hillside

TRENCH ORIENTATION:

EARTH SCIENCE CONSULTANTS
South Shores Church
32712 Crown Valley Parkway
Dana Point, California
Proj. 6375-04 Apr 2006 Fig. 20
Fill: Silt, sand w/ clay; loose, w/ gravel and cobbles

Colluvium: Silt, sand w/ clay:
- fine-to coarse-grained
- dk brown to dk yellowish-brown
- numerous gravel-and cobble-size clasts; grades to v. weathered breccia

Tso: Breccia: Sub-angular to sub-rounded
- gravel-to large boulder-size clasts
- in a greenish-brown silt, sand w/ clay matrix; bedding is v. crude to indistinct