Appendix D
Preliminary Geotechnical Report
PRELIMINARY GEOTECHNICAL REPORT

NEW HOPE PROPERTY
GREENFIELD DRIVE
GILROY, CALIFORNIA

AUGUST 5, 2013
JOB NO. 197.100

PREPARED FOR

UCP, LLC

PREPARED BY

LAI & ASSOCIATES

415 BOULDER COURT, SUITE 400
PLEASANTON, CALIFORNIA 94566
Via Email and Mail

August 5, 2013
Job No. 197.100

Mr. Michael Cady
UCP, LLC
99 Almaden Boulevard, Suite 400
San Jose, California 95113

Subject: Preliminary Geotechnical Investigation
   New Hope Property
   Greenfield Drive
   Gilroy, California

Dear Mr. Cady:

INTRODUCTION

This report presents the results of our preliminary geotechnical investigation at the New Hope Property in Gilroy, California. The site identified with APN 808-20-008 is located on the northern end of Greenfield Drive and on the southwest side of Uvas Creek, as shown on the Vicinity Map, Plate 1.

As shown on the tentative maps, a residential development of about 33 to 36 single family homes with in-tract roads is being proposed in the middle and relatively flat portion of the site. Details of development layout, and building construction and loads are not available at this time. Site grading is expected to be moderate and is typical and similar to those of the nearby residential developments.

PURPOSE AND SCOPE OF SERVICES

The purpose of this preliminary investigation was to evaluate the proposed residential development with respect to the site soil, bedrock and groundwater conditions, and to provide preliminary geotechnical recommendations for the planning and preliminary design of the development. The scope of our services included review of reports and maps in the area, field exploration, and preliminary engineering analyses based on the field data, and preparation of this report.

FIELD EXPLORATION AND LABORATORY TESTING

Our field exploration was performed on July 22, 2013, and consisted of drilling and logging 3 borings at the approximate locations shown on the Site Plan, Plate 2. The borings were drilled to depth of about 11½ to 20 feet below the existing ground surface using a truck-mounted drill rig. Materials encountered in each boring were visually classified in the field and a log was recorded.

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John 3:16
The boring logs showing soil and bedrock classification and blow counts are presented on Plates 3, 4 and 5. A Key to Boring Log Symbols and Rock Description are included on Plates 6 and 7, respectively.

**SEISMICITY AND FAULTING**

The site is situated in the Coast Range geomorphic province of California which is seismically dominated by the presence of the active San Andreas Fault system. The San Andreas Fault system is the general boundary between the northward moving Pacific Plate and the southward moving North American Plate. In the San Francisco Bay Area, relative plate movement is distributed across a complex system of generally strike-slip, right-lateral, parallel, and sub-parallel faults.

The site is not located within a State California Earthquake Fault Zone for active faults. The nearest active fault is the Sargent fault, located about 2 miles to the southwest. Other active faults in the vicinity of the site include the Calaveras fault, located about 5 miles to the northeast; the San Andreas fault, situated about 6 miles to the southwest; the Zayante fault, located about 10 miles to the southwest; the Quien Sabe fault, located about 12 miles to the southeast; the Ortigalita fault, located about 24 miles to the northeast; the Monte Vista – Shannon fault, located about 25 miles to the northwest; the Monterey Bay fault, located about 26½ miles to the southwest; the San Gregorio fault, located about 33 miles to the southwest; the Hayward fault southeast extension, located about 21½ miles to the northwest; Hayward fault, located about 37½ miles to the northwest; and the Greenville fault, located about 30 miles to the northeast.

**SITE CONDITIONS**

**SURFACE CONDITIONS**

The irregular-shaped site encompasses about 8 acres of land that is currently vacant. A small hill is located at the southern portion of the site. A section of Uvas Creek and associated drainage swales occupy the northern portion of the site. The banks of Uvas Creek and associated drainage swales were at gradients of as steep as about 3 horizontal to 1 vertical (3H:1V). No signs of significant slope instability were observed on the banks of Uvas Creek and associated drainage swales. The existing ground surface of the middle portion of the site is relatively flat and slopes gently downward in a northeasterly direction.

**SUBSURFACE CONDITIONS**

As encountered in the borings, the relatively flat and middle portion of the site is covered by about 2 feet of light brown to brown, medium dense silty sand/sandy silt with some clay. Due to recent disking for weed abatement, the upper about 12 inches of the silty sand/sandy silt were loose. The silty sand/sandy silt was generally underlain by highly weathered, friable to weak, gravelly sandstone, silty sandstone and sandy siltstone to the maximum depth explored, about 20 feet below the existing ground surface. An about 3-foot thick claystone was noted in Boring B-2 at a depth of about 14 feet.

As shown on the Site Plan, undocumented fill was observed around the small hill located in the southern portion of the site. Outcrops of sandstone and shale of Monterey Formation were noted.
along the southern limit of the site. The sandstone and shale were highly fractured, weathered and weak to moderately strong. The observed bedrock structure was striking N22W and dipping 32 degrees south.

No free water was encountered in the borings. It should be anticipated that the actual groundwater level may fluctuate depending on factors such as seasonal rainfall, time of the year, the water level in Uvas Creek, local irrigation and well pumping.

The above is a general description of soil, bedrock and groundwater conditions encountered at the site. For a more detailed description of the soil, bedrock and groundwater conditions encountered, please see the boring logs shown on Plates 3, 4 and 5.

**PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS**

**GENERAL**

We conclude that, from a geotechnical engineering standpoint, the site is suitable for the proposed residential development, provided that the preliminary conclusions and recommendations contained in this report are incorporated into the planning and preliminary design of the project. However, these preliminary conclusions and recommendations are not adequate for the final design and construction of the project. A design-level geotechnical investigation should be performed to provide geotechnical recommendations for the final design and construction of the project.

**ARTIFICIAL FILL**

If improvements are planned in and next to the observed undocumented fill area located in the southern portion of the site, the undocumented fill should be removed and replaced with engineered fill.

**SITE PREPARATION AND GRADING**

Our general site preparation and grading recommendations are as follows:

1. The areas to be graded should be cleared of debris and any significant surface vegetation.
2. If encountered during site grading, septic tanks and associated leach fielded should be removed.
3. The root system of the removed trees should be removed. The removal of the tree roots could disturb up to about 18 to 30 inches of the soils. If these disturbed soils are not being removed by design cuts, the disturbed soils should be reworked by over-excavating up to about 18 inches of the disturbed soils, preparing the exposed subgrade as discussed below, and placement of engineered fill.
4. If zones of soft or saturated soils are encountered during excavation and compaction, deeper excavations may be required to expose firm soils. This should be determined in the field by the soil engineer.
5. In the areas where engineered fill is planned, the subgrade should be scarified to a depth of about 12 inches; moisture conditioned to at least 3 percent above optimum moisture content; and re-compactcd to at least 90 percent relative compaction per ASTM D-1557.

6. In the areas where engineered fill is not planned, the building and improvement areas should be scarified to a depth of at least 12 inches; moisture conditioned to at least 3 percent above optimum moisture content; and re-compactcd to at least 90 percent relative compaction.

7. The on-site soils are generally suitable for engineered fill provided they are clean of debris, vegetation, rock greater than 4 inches in largest dimension and other deleterious matter. All fill materials should be subject to the evaluation by this office prior to their use.

8. All fill and backfill should be placed in thin lifts (normally 6 to 8 inches depending on the compaction equipment), properly moisture conditioned to at least 3 percent above optimum moisture content and compacted to at least 90 percent relative compaction.

9. Observations and soil density tests should be carried out during grading to assist the contractor in obtaining the required degree of compaction and proper moisture content. Where the compaction is outside the range required, additional compactive effort should be made and adjustment of moisture content until the specified compaction and moisture conditioning is achieved.

10. The soil engineer should be notified at least 48 hours prior to any grading operations. The procedure and methods of grading may then be discussed between the contractor and the soil engineer.

CUT AND FILL SLOPES

Cut and fill slopes should be constructed at gradients of not steeper than 2/3H:1V. The fill slopes should be founded on keyways extending at least 2 feet into firm soils or bedrock. The keyway should be at least 12 feet wide and sloped back at about 5 percent. A subdrain should be installed at the back of the keyway. Plate 8 shows our general keyway recommendations.

EROSION PROTECTION

All cut and fill slopes should be planted with deep-rooted, fast growing grasses before the first winter to reduce erosion. On a preliminary basis, some irrigation of slopes could be performed; however, specific details regarding irrigation systems, locations and discharge should be reviewed by our office.

BUILDING FOUNDATION CONSIDERATIONS

From a geotechnical engineering standpoint, the proposed buildings can be supported on post-tension slab foundations. The slab foundation should be designed by a structural engineer to accommodate ¾ inch total soil movement and ½ inch in 25 horizontal feet differential soil movement without structural distress to the slab and excessive deflections in the building framing and wall finishes. We recommend that the following criteria be incorporated in the design of the slab foundation:

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John 3:16
Allowable Bearing Capacity (may be increased by 1/3 for seismic and wind load) | 1,500 psf
---|---
Passive Equivalent Fluid Pressure (neglect the upper 1 foot if the ground surface is not confined by slabs or pavement) | 300 pcf
Base Friction Coefficient | 0.3
Minimum Interior Span | 10 feet
Minimum Perimeter Cantilever | 3 feet
Minimum Slab Thickness | 8 inches

During utility trench excavation and backfilling, previously compacted subgrade soils may be disturbed. These soils should be uniformly moisture conditioned to at least 3 percent above optimum moisture content and recompacted to at least 90 percent relative compaction.

Where moisture vapor through the slab would be objectionable, the use of a vapor barrier and capillary moisture break should be considered by the designer of the slab and floor covering. The slab designer should determine the thicknesses of the slab, vapor barrier, rock cushion and sand cushion.

The upper 12 inches of the subgrade soils should be pre-saturated to at least 3 percent above optimum moisture content. The pre-saturated pad should not be allowed to dry-out to less than the recommended moisture content. Moisture content of the subgrade should be checked immediately prior to the placement of capillary moisture break or concrete.

**SITE RETAINING WALLS**

Site retaining walls may be required for the site grading and can be of cast-in-place concrete, masonry or mechanically stabilized earth (MSE) construction.

**CAST-IN-PLACE CONCRETE OR MASONRY WALLS**

The cast-in-place concrete or masonry retaining wall can be supported on a footing foundation. We recommend that the following geotechnical criteria be incorporated in the cast-in-place concrete or masonry retaining wall design:

| Active Equivalent Fluid Pressure | 45 pcf
| 3H:1V backfill | 60 pcf
| 2H:1V backfill | 70 pcf
| Uniform Traffic Load | 100 psf for the upper 10 feet
| Allowable Bearing Capacity (may be increased by one-third for seismic and wind loads) | 3,000 psf
| Passive Equivalent Fluid Pressure (neglect the upper 1 foot if the ground surface is not confined by slabs or pavement) | 300 pcf
| Base Friction Coefficient | 0.3
| Minimum Footing Width | 18 inches
| Minimum Footing Depth Below the Low Adjacent Grade | 18 inches

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John 3:16
The above recommended lateral pressures are based on drained condition and backfill, and do not include any surcharges other than the traffic load. Therefore, the designer should include the appropriate surcharge loads to the retaining wall design.

To reduce hydrostatic pressure build-up, the retaining wall should be provided with a permanent backdrain. The backdrain should consist of a blanket of Class 2 permeable material and a 4-inch diameter perforated PVC pipe (SDR 35). The permeable material blanket should be at least 12 inches thick and should be placed from the bottom of the wall to about 1 foot below the finished grade behind the wall. Alternatively, a geo-composite drain, such as Miradrain 6200 or an approved equivalent, may be used in lieu of the Class 2 permeable material blanket. The perforated pipe should be placed near the bottom of the wall to carry collected water to a suitable gravity discharge.

MECHANICALLY STABILIZED EARTH (MSE) WALLS

We recommend that the following geotechnical criteria be incorporated in the MSE wall design:

| Active Equivalent Fluid Pressure | 45 pcf | 60 pcf | 70 pcf |
|----------------------------------)|--------|--------|--------|
| Level backfill                   |        |        |        |
| 3H:1V backfill                   |        |        |        |
| 2H:1V backfill                   |        |        |        |

<table>
<thead>
<tr>
<th>Traffic Load</th>
<th>Equivalent to 2 feet of fill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable Bearing Capacity (may be increased by one-third for seismic and wind loads)</td>
<td>3,000 psf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engineered Fill</th>
<th>125 pcf</th>
<th>30 degrees</th>
<th>0</th>
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<td>Unit weight</td>
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<tr>
<td>Friction angle</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cohesion</td>
<td></td>
<td></td>
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<table>
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<tr>
<th>Retained Soil</th>
<th>125 pcf</th>
<th>30 degrees</th>
<th>0</th>
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</thead>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friction angle</td>
<td></td>
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<td></td>
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<tr>
<td>Cohesion</td>
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<td></td>
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<table>
<thead>
<tr>
<th>Foundation Materials</th>
<th>125 pcf</th>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Friction angle</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cohesion</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimum Retaining Wall Embedment Below Lowest Adjacent Grade</th>
<th>6 inches</th>
<th>12 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sloped ground</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above recommended lateral pressures are based on drained condition and backfill, and do not include any surcharges other than traffic load. Therefore, the designer should include the appropriate surcharge loads to the MSE wall design.

To reduce hydrostatic pressure build-up, MSE walls of more than 3 feet high should be provided with a permanent backdrain. The backdrain should consist of a blanket of Class 2 permeable material and a 4-inch diameter perforated PVC pipe (SDR 35). The permeable material blanket should be at least 12 inches thick and should be placed behind the geo-grid, from the base of the wall to about 1 foot below the finished grade behind the wall. The perforated pipe should be placed near the bottom of the wall to carry collected water to a suitable gravity discharge.
UTILITY TRENCH EXCAVATION AND BACKFILL

All excavations should conform to applicable State and Federal industrial safety requirements. Where trench excavations are more than 5 feet deep, they should be sloped and/or shored. Temporary walls should be sloped no steeper than 1 horizontal to 1 vertical (1H:1V). Flatter trench slopes may be required if seepage is encountered during construction or if exposed subsurface conditions differ from those encountered by the borings.

Material quality, placement procedures, and compaction requirements for utility bedding and shading material should meet the City of Gilroy and/or other applicable agency requirements. Utility trench backfill above the shading materials may consist of on-site soils provided they are free of rubble, rock fragments over 4 inches in largest dimension, rubbish, vegetation, and deleterious material. Backfill materials should be placed in lifts not exceeding 8 inches in loose thickness, moisture conditioned and compacted to requirements outlined in the “Site Preparation and Grading” section.

PRELIMINARY PAVEMENT SECTIONS

Preliminary pavement analyses are based on an assumed resistance (R)-value of 15, which we expect to be representative of the final pavement subgrade materials, the Caltrans “Design Method for Flexible Pavement,” and traffic indices (T.I.s) which are indications of load frequency and intensity. We have assumed that the assigned T.I.s include provisions for heavy truck traffic related to construction activities. We recommend the following preliminary pavement sections.

<table>
<thead>
<tr>
<th>Traffic Index (T.I.)</th>
<th>Thickness (inches)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Asphalt Concrete Type A</td>
</tr>
<tr>
<td>4</td>
<td>2½</td>
</tr>
<tr>
<td>4½</td>
<td>2½</td>
</tr>
<tr>
<td>5</td>
<td>2½</td>
</tr>
<tr>
<td>5½</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>6½</td>
<td>3½</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

Since the on-site material properties may vary, we recommend that soil samples be obtained from the rough roadway subgrade after site grading and underground utility installation. R-value tests should be performed on these samples. Final pavement section recommendations should be made on the basis of these test results.

Prior to subgrade preparation, all utility trench backfill should be properly placed and compacted. The uppermost 9 inches of all pavement subgrade soils should be moisture conditioned to at least 3 percent over optimum moisture content and re-compacted to at least 95 percent relative compaction per ASTM D-1557 to provide a smooth, unyielding surface. The re-compacted subgrade soils should be maintained in a moist and compacted condition until covered with the complete pavement section.
Class 2 aggregate base should conform to the requirements in Section 26, Caltrans "Standard Specifications," (2006). The aggregate base should be placed in thin lifts in a manner to prevent segregation; uniformly moisture conditioned; and compacted to at least 95 percent relative compaction to provide a smooth, unyielding surface.

Where drop inlets or other surface drainage structures are to be installed, slots or weep holes should be provided to allow free drainage of the contiguous base course materials.

CORROSIVITY TESTING

During the design-level geotechnical investigation, soil samples should be obtained from the site for corrosivity testing. We suggest that a corrosion expert be consulted for advice with regard to corrosion sampling and testing, and selection of proper corrosion protection measures on underground pipes and foundations.

SEISMIC CONSIDERATIONS

SURFACE FAULT RUPTURE

The site is not located within a State of California designated Earthquake Fault Zone for active faults (Davis, 1982). We did not encounter any evidence of active fault crossing or trending toward the site. Therefore, the risk of surface fault rupture at the site is judged low.

GROUND SHAKING

Due to the proximity of the site to the Sargent and other active faults, it is likely that the site will experience strong ground shaking from at least one moderate to severe earthquake during the life span of the project. Using the USGS 2008 model, the peak horizontal ground acceleration (10% exceedence in 50 years) of 0.6g is estimated at the site. Ground shaking is a hazard that cannot be eliminated but can be partially mitigated through proper attention to seismic structural design and observance of good construction practices. According to the 2010 California Building Code (CBC), the following seismic parameters should be used in the structural design of the proposed buildings and structures:

<table>
<thead>
<tr>
<th>Site Latitude</th>
<th>36.9917 degrees</th>
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</thead>
<tbody>
<tr>
<td>Site Longitude</td>
<td>-121.5790 degrees</td>
</tr>
<tr>
<td>Site Class</td>
<td>C</td>
</tr>
<tr>
<td>Mapped Spectral Acceleration for Short Periods, $S_S$</td>
<td>1.5g</td>
</tr>
<tr>
<td>Mapped Spectral Acceleration for 1-Second Period, $S_I$</td>
<td>0.709g</td>
</tr>
</tbody>
</table>

It is our opinion that the structural integrity of the proposed buildings and structures is a primary factor in determining possible seismic damage and that the level of seismic damage would be only nominally influenced by the foundation system selected. We recommend that, at a minimum, the buildings and structures be designed in conformance with the current edition of the CBC.

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LIQUEFACTION

Liquefaction is the temporary transformation of saturated cohesionless soil into a viscous liquid during strong ground shaking from a major earthquake. Evidence of historic ground failure due to liquefaction at the site was not identified. No significant relatively loose sandy soils were encountered at the site. Therefore, the risk of liquefaction at the site is considered to be very low.

GROUND SUBSIDENCE

Ground subsidence is the result of densification or “shakedown” when dry cohesionless soils are subjected to high amplitude seismic waves. In general, significant deposits of loose sandy soils do not exist at the site. The seismic densification related ground subsidence is expected to be very minor.

LURCH CRACKING

Lurch cracking is the sudden swaying, spreading, or rolling of the ground during a strong earthquake. Lurching generally forms cracks on slopes underlain by weak soils. Given the relative dense soils across most of the site, the potential for lurch cracking at the site is very low.

ADDITIONAL SOIL ENGINEERING SERVICES

As discussed above, the preliminary conclusions and recommendations contained in this report are not adequate for the final design and construction of the project. A design-level geotechnical investigation should be performed to provide the geotechnical recommendations for the final design and construction of the project.

Prior to construction, our firm should be provided the opportunity to review the plans and specifications to determine if the recommendations of this report as well as the future design-level geotechnical investigation report have been implemented in those documents.

To a degree, the performance of the proposed improvements is dependent on the procedures and quality of the construction. Therefore, we should provide observations of the contractor's procedures and the exposed soil conditions, and field and laboratory testing during site preparation and grading, placement and compaction of fill, retaining wall construction, underground utility installation, and foundation and pavement construction. These observations will allow us to check the contractor's work for conformance with the intent of our recommendations and to observe any unanticipated soil conditions that could require modification of our recommendations.

LIMITATIONS

The preliminary conclusions and recommendations of this report are based upon the information provided to us regarding the proposed residential development, subsurface conditions encountered at the boring locations, and professional judgment. This study has been conducted
in accordance with current professional geotechnical engineering standards; no other warranty is expressed or implied.

The locations of the borings were determined by pacing from the existing streets, fences and trees should be considered approximate only. Site conditions described in the text are those exist at the time of our field exploration during July of 2013, and are not necessarily representative of such conditions at other locations and times.

In the event that changes in nature, design and location of the proposed development are planned, or if it is found during construction that subsurface conditions differ from those described on the boring logs, then the conclusions and recommendations in this report shall be considered invalid, unless the changes are reviewed, and the conclusions and recommendations are modified or approved in writing.

Respectfully submitted,

LAI & ASSOCIATES

[Signature]

Paul Sai-Wing Lau
Principal Engineer
GE 2326

PSL/NEW HOPE REPORT

Attachments: Plate 1 - Vicinity Map
Plate 2 - Site Plan
Plates 3, 4 and 5 - Boring Logs
Plate 6 - Key to Boring Log Symbols
Plate 7 - Rock Descriptions
Plate 8 - Typical Keyway Details

Copies: Addresssee (1)
VICINITY MAP
NEW HOPE PROPERTY
GREENFIELD DRIVE
GILROY, CALIFORNIA
FOR
UCP, LLC

BASE: PORTIONS OF U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLES, GILROY, CHITTENDEN, CALIFORNIA AT A SCALE OF 1:24,000.
**LOG OF BORING**

**Project No.:** 197.100  
**Client:** UCP, LLC  
**Date Drilled:** 7-22-13  
**Project Name:** New Hope Property  
**Drilling Method:** Hollow-stem Auger  
**Elevation:** 254 feet

<table>
<thead>
<tr>
<th>SAMPLER TYPE</th>
<th>DRIVE WEIGHT (LBS.)</th>
<th>HEIGHT OF FALL (IN.)</th>
</tr>
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<tr>
<td>Standard Penetration Test</td>
<td>140</td>
<td>30</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Sample Symbol</th>
<th>USCS Classification</th>
<th><strong>MATERIAL DESCRIPTION AND REMARKS</strong></th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>SM/ML</td>
<td>SILTY SAND/SANDY SILT, light brown to brown, dry to moist, medium dense, fine-grained sand, some clay, upper 12 inches loose</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td></td>
<td>SILTY SANDSTONE/SANDY SILTSTONE with CLAY, fine-grained, light brown to yellowish-brown, highly weathered, friable</td>
<td></td>
</tr>
<tr>
<td>50/5&quot;</td>
<td></td>
<td>at 10 feet, medium-grained sand, brown</td>
<td></td>
</tr>
</tbody>
</table>
| 54           |               | Boring terminated at 11-1/2 feet  
No groundwater encountered |

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**PLATE 3**
**Project No.: 197.100**

**Client:** UCP, LLC  
**Date Drilled:** 7-22-13

**Project Name:** New Hope Property  
**Drilling Method:** Hollow-stem Auger  
**Elevation:** 223 feet

<table>
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<td>Standard Penetration Test</td>
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<td>30</td>
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</tbody>
</table>

<table>
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<tr>
<th>Moisture Content (%)</th>
<th>Dry Unit Weight (PCF)</th>
<th>Penetration Resistance (b/cf/foot)</th>
<th>Depth (feet)</th>
<th>Sample Symbol</th>
<th>USCS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM/ML</td>
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<td>0</td>
<td>0</td>
<td></td>
<td>SILTY SAND/SANDY SILT, light brown to brown, dry to moist, medium dense, fine-grained sand, some clay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63</td>
<td>5</td>
<td></td>
<td>GRAVELLY SANDSTONE with CLAY, coarse-grained, brown, highly weathered, weak (soil-like)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>73</td>
<td>10</td>
<td></td>
<td>at 5 feet, friable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37</td>
<td>15</td>
<td></td>
<td>at 10 feet, weak</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td>at 13 feet, grading more clay and less sand</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLAYSTONE, gray, highly weathered, weak, 45° shear (soil-like)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>below 16 feet, grading less clay, more sand</td>
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<td></td>
<td></td>
<td></td>
<td>SILTY SANDSTONE/SANDY SILTSTONE with CLAY, fine-grained, light brown to yellowish-brown, highly weathered, friable</td>
</tr>
<tr>
<td></td>
<td>91/9&quot;</td>
<td></td>
<td></td>
<td></td>
<td>Boring terminated at 20 feet, No groundwater encountered</td>
</tr>
</tbody>
</table>

**MATERIAL DESCRIPTION AND REMARKS**

**SURFACE CONDITIONS:** Grass field (undisked)

**MATERIAL DESCRIPTION:**
- **SILTY SAND/SANDY SILT**
  - Light brown to brown, dry to moist, medium dense, fine-grained sand, some clay

- **GRAVELLY SANDSTONE with CLAY**
  - Coarse-grained, brown, highly weathered, weak (soil-like)
  - At 5 feet, friable
  - At 10 feet, weak
  - At 13 feet, grading more clay and less sand

- **CLAYSTONE**
  - Gray, highly weathered, weak, 45° shear (soil-like)

- Below 16 feet, grading less clay, more sand

- **SILTY SANDSTONE/SANDY SILTSTONE with CLAY**
  - Fine-grained, light brown to yellowish-brown, highly weathered, friable

**REMARKS:**
- Boring terminated at 20 feet, No groundwater encountered
**LOG OF BORING**

**Project No.:** 197.100  
**Client:** UCP, LLC  
**Date Drilled:** 7-22-13

**Project Name:** New Hope Property  
**Drilling Method:** Hollow-stem Auger  
**Elevation:** 235 feet

<table>
<thead>
<tr>
<th>SAMPLER TYPE:</th>
<th>DRIVE WEIGHT (LBS.)</th>
<th>HEIGHT OF FALL (IN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Penetration Test</td>
<td>140</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moisture Content (%)</th>
<th>Dry Unit Weight (pcf)</th>
<th>Penetration Resistance (blows/foot)</th>
<th>Depth (feet)</th>
<th>Sample Symbol</th>
<th>USCS Classification</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>64</td>
<td>0</td>
<td>5</td>
<td></td>
<td>SM/ML</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td>SILTY SAND/SANDY SILT, light brown to brown, dry to moist, medium dense, fine-grained sand, some clay, upper 12 inches loose</td>
</tr>
<tr>
<td></td>
<td>63</td>
<td></td>
<td>10</td>
<td></td>
<td>GRAVELLY SANDSTONE with CLAY, coarse-grained, brown, highly weathered, friable to weak (soil-like)</td>
</tr>
<tr>
<td></td>
<td>92</td>
<td></td>
<td>15</td>
<td></td>
<td>at 10 feet, weak</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td></td>
<td>15</td>
<td></td>
<td>at 15 feet, more clay, friable</td>
</tr>
<tr>
<td></td>
<td>68</td>
<td></td>
<td>20</td>
<td></td>
<td>at 18-1/2 feet, friable to weak</td>
</tr>
</tbody>
</table>

**MATERIAL DESCRIPTION AND REMARKS**

**SURFACE CONDITIONS:** Disked field with medium grass

Boring terminated at 20 feet, No groundwater encountered
### Unified Soil Classification System

<table>
<thead>
<tr>
<th>Major Divisions</th>
<th>Classification Symbol</th>
<th>Typical Names</th>
</tr>
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<tbody>
<tr>
<td><strong>Coarse Grained Soils</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravels More Than Half Coarse Fraction is Larger Than No. 4 Sieve</td>
<td>GW</td>
<td>Well Graded Gravels, Gravel/Sand Mixtures</td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>Poorly Graded Gravels, Gravel/Sand Mixtures</td>
</tr>
<tr>
<td></td>
<td>GM</td>
<td>Silty Gravels, Poorly Graded Gravel/Sand/Silt Mixtures</td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>Clayey Gravels, Poorly Graded Gravel/Sand/Clay Mixtures</td>
</tr>
<tr>
<td>Sands More Than Half Coarse Fraction is Smaller Than No. 4 Sieve</td>
<td>SW</td>
<td>Well Graded Sands, Gravelly Sands</td>
</tr>
<tr>
<td></td>
<td>SP</td>
<td>Poorly Graded Sands, Gravelly Sands</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>Silty Sands, Poorly Graded Sand/Silt Mixtures</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>Clayey Sands, Poorly Graded Sand/Clay Mixtures</td>
</tr>
<tr>
<td><strong>Fine Grained Soils</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silts and Clays Liquid Limit Less Than 50</td>
<td>ML</td>
<td>Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands, or Clayey Silts with Slight Plasticity</td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays</td>
</tr>
<tr>
<td></td>
<td>OL</td>
<td>Organic Clays and Organic Silty Clays of Low Plasticity</td>
</tr>
<tr>
<td>Silts and Clays Liquid Limit Greater Than 50</td>
<td>MH</td>
<td>Inorganic Silts, Micaeous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts</td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Inorganic Clays of High Plasticity, Fat Clays</td>
</tr>
<tr>
<td></td>
<td>OH</td>
<td>Organic Clays of Medium to High Plasticity, Organic Silts</td>
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<tr>
<td><strong>Highly Organic Soils</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>PI</td>
<td>Peat and Other Highly Organic Silts</td>
</tr>
</tbody>
</table>

### Key to Boring Log Symbols

- **Depth in Feet**
- **Moisture Content (%)**
- **Dry Unit Weight (pcf)**
- **Blows per Foot**
- **Unified Soil Classification System**

**Note:** Soils described as dry, moist, and wet are estimated to be dry of optimum, near optimum, and more wet than optimum moisture content, respectively. Saturated soils are estimated to be within areas of free groundwater.

- **Bulk Sample**
- **2.5-inch I.D. Split Barrel Sample**
- **2.8-inch I.D. Shelby Tube Sample**
- **No Sample Recovered**
- **Standard Penetration Test Interval**
- **Well-defined stratum change**
- **Gradual stratum change**
- **Interpreted stratum change**
- **Apparent ground water level measured at date noted; seasonal weather conditions, site topography, etc., may cause fluctuations in water level indicated on boring logs**
- **Stabilized ground water level measured at date noted**

**Job Number:** 197.100

**Plate 6**
ROCK DESCRIPTIONS

ROCK TYPE

GRAIN SIZE (if Applicable)

COLOR

WEATHERING

Highly - Moderate to complete mineral decomposition, extensive disintegration, deep and thorough discoloration, fractures extensively coated or filled with oxides, carbonates and/or silt and clay.
Moderately - Slight change or partial decomposition of minerals, little disintegration, cementation little to unaffected, moderate to occasionally intense discoloration, moderately coated fractures.
Slightly - No megascopic decomposition of minerals, little to no effect on cementation, slight and intermittent or localized discoloration, few stains on fracture surfaces.
Unweathered - Unaffected by weathering agents, no discoloration or disintegration.

STRENGTH

Friable - Crumbles easily with fingers
Weak - Crumbles under light hammer blows
Moderately Strong - Specimen will withstand a few hammer blows before breaking
Strong - Specimen will withstand a few heavy ringing hammer blows before breaking into large fragments
Very Strong - Specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments

FRACTURING - Intensity, coating or filling, attitude(s)

Intensity
Occasionally Fractured
Moderately Fractured
Highly Fractured
Crushed

Size of Pieces
Greater than 12 inches
6 inches to 12 inches
½ inch to 6 inches
Less than ½ inch

BEDDING - Stratification, Attitude

Stratification
Very Thickly Bedded
Thickly Bedded
Thinly Bedded
Thinly Laminated

Thickness
Greater than 4 feet
2 to 4 feet
1 inch to 2 feet
Less than 1 inch

MISCELLANEOUS - Shearing of rock, veins, caliche, etc.

Source: Modified from Civil Engineers Reference Book (Blake, 1975)
NOTES:
2. PERFORATED PIPE PLACED PERFORATIONS DOWN, PVC PIPE (SDR 35) WITH A MINIMUM DIAMETER OF 4 INCHES.
3. SUBDRAIN SHOULD BE DISCHARGED VIA A SOLID PVC PIPE (SDR 35) TO STORM DRAIN OR SUITABLE NATURAL DRAINAGE.

TYPICAL KEYWAY DETAILS
GUIDELINES FOR REQUIRED SERVICES

The following list of services are the services required and must be provided by TMakdissy Consulting, inc. during the project development. These services are presented in check list format as a convenience to those entrusted with their implementation.

The items listed are included in the body of the report in detail. This list is intended only as an outline of the required services and does not replace specific recommendation and, therefore, must be used with referenced to the total report. The degree of observation and frequency of testing services would depend on the construction methods and schedule, and the item of work.

The importance of careful adherence to the report recommendations cannot be overemphasized. It should be noted, however, that report is issued with the understanding that each step of the project development will be performed under the direct observation of TMakdissy Consulting, inc.

The use of this report by others presumes that they have verified all information and assume full responsibility for total project.
<table>
<thead>
<tr>
<th>Item Description</th>
<th>Required</th>
<th>Not Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide foundation design parameters</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2. Review grading plans and specifications</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3. Review foundation plans and specifications</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4. Observe and provide recommendations regarding demolition.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. Observe and provide recommendations regarding site stripping</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. Observe and provide recommendations on moisture conditioning, removal, and/or recompaion of unsuitable existing soils</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7. Observe and provide recommendations on the installation of subdrain facilities</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8. Observe and provide testing services on fill areas and/or imported fill materials.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9. Review as-graded plans and provide additional foundation recommendations if necessary</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10. Observe and provide compaction tests on sanitary sewers, storm drain, water lines and PG&amp;E trenches</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11. Observe foundation excavations and provide supplemental recommendations, if necessary, prior to placing concrete</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>12. Observe and provide moisture conditioning recommendations for foundation areas prior to placing concrete</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>13. Provide design parameters for retaining walls</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>14. Provide geologic observations and recommendations for keyway excavations and cut slopes during grading</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>15. Excavate and recompact all geologic trenches and/or test pits</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>16. Observe installation of subdrain behind retaining walls (if any)</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. It should be noted that it is the responsibility of the owner or his representative to notify TMakdisy Consulting, inc., in writing, a minimum of two working days before any clearing, grading, or foundation excavations can commence at the site.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings and/or test pits and from a reconnaissance of the site. Should any variations or undesirable conditions be encountered during the development of the site, TMakdisy Consulting, inc. will provide supplemental recommendations as dictated by the field conditions.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are brought to the attention of the Architect and Engineer for the project and incorporated into the plans and the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.

4. At the present date, the findings of this report are valid for the property investigated. With the passage of time, significant changes in the conditions of a property can occur due to natural processes or works of man on this or adjacent properties. In addition, legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may render this report invalid, wholly or partially. Therefore, this report should not be considered valid after a period of two (2) years without our review, nor should it be used, or is it applicable, for any properties other than those investigated.

5. Not withstanding all the foregoing, applicable codes must be adhered to at all times.
APPENDIX A

Field Investigation

Site Plan

Logs of Test Borings
FIELD INVESTIGATION

The field investigation was performed on March 14, 2013 and included a reconnaissance of the site and the drilling of three (3) exploratory test borings at the approximate locations shown on Figure 1, "Site Plan".

The borings were drilled to a maximum depth of 30 feet below the existing ground surface. The drilling was performed using a power-driven 6 inch diameter, solid flight augers. Visual classifications were made from cuttings and the samples in the field. As the drilling proceeded, undisturbed core samples were obtained by means of 2.5 inches O.D. split-tube sampler. The sampler was driven into the in-situ soils under the impact of a 140-pound hammer having a free fall of 30 inches. The number of blows required to advance the sampler 12 inches into the soil were adjusted to the standard penetration resistance (N-Value).

The samples were sealed and returned to our laboratory for testing. Classifications made in the field were verified in the laboratory after further examination and testing.

The stratification of the soils, descriptions, location of undisturbed soil samples and standard penetration resistance are shown on the respective "Logs of Test Borings" contained within this appendix.
# BOREHOLE LOG

**LOCATION:** See Site Plan  
**DATE DRILLED:** 3/14/2013  
**DRILL RIG:** CME-55  
**HAMMER:** 140 lbs/30" drop  
**BORING BACKFILL METHOD:** Soil Cutting  
**ELEVATION:**  
Logged By: PM  
Drilling Method: Hollow Stem  
Drilling Contractor: Britton Exploration  
Total Depth of Boring: 30.0 feet

<table>
<thead>
<tr>
<th>DRILLING DETAILS</th>
<th>DEPTH</th>
<th>SAMPLER NO.</th>
<th>BLOW COUNT</th>
<th>GRAPHIC LOG</th>
<th>MATERIAL DESCRIPTION</th>
<th>LAB TESTS</th>
<th>OTHER NOTES</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Brown Sandy Silty Clay with Gravel, Damp, Stiff'</td>
<td>115.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-1</td>
<td>30</td>
<td></td>
<td>Dark Brown Clayey SAND with Gravel, Damp, Stiff'</td>
<td>113.8</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-2</td>
<td>35</td>
<td></td>
<td>Brown Yellowish Sandy Clay with Gravel (up to 2&quot;) Dry, Very Hard</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>1-3</td>
<td>50/5</td>
<td></td>
<td>Dark Brown Clayey SAND With Gravel, Very Hard</td>
<td>115.1</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-4</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>20</td>
<td>1-5</td>
<td>50/6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|                  | 30    |             |            |             | Bottom of Boring @ 30.0 Feet  
Groundwater @ 18.0 Feet |           |             |

Proposed Residential Development  
16801 Almaden Road (Pezzuto)  
San Jose, California

Date 4/1/13  
Drawn by: P.M  
Project No.: E 268-1
**BOREHOLE LOG**

**LOCATION:** See Site Plan  
**DATE DRILLED:** 3/14/2013  
**DRILL RIG:** CME-55  
**HAMMER:** 140 lbs/30" drop  
**BORING BACKFILL METHOD:** Soil Cutting

**ELEVATION:**  
**Logged By:** PM  
**Drilling Method:** Hollow Stem  
**Drilling Contractor:** Britton Exploration  
**BORING No.:** B-2  
**Total Depth of Boring:** 20.0 feet

### MATERIAL DESCRIPTION

<table>
<thead>
<tr>
<th>DEPTH</th>
<th>SAMPLER NO.</th>
<th>BLOW COUNT</th>
<th>GRAPHIC LOG</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1</td>
<td>27</td>
<td></td>
<td></td>
<td>Brown Sandy Silty Clay with Gravel</td>
</tr>
<tr>
<td>2-2</td>
<td>50/6</td>
<td></td>
<td></td>
<td>Dark Brown Silty, Clayey SAND with Gravel</td>
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<td>2-3</td>
<td>50/3</td>
<td></td>
<td></td>
<td>Red Grey</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hard Drilling, Gravel</td>
</tr>
</tbody>
</table>
| 20    |             |            |             | Bottom of Boring @ 20.0 Feet  
|       |             |            |             | No Groundwater Encountered |

### LAB TESTS

<table>
<thead>
<tr>
<th>DRY DENSITY</th>
<th>MOISTURE CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>125.2</td>
<td>12.0</td>
</tr>
<tr>
<td>LL = 22.6 %</td>
<td>PI = 6.0%</td>
</tr>
</tbody>
</table>

**T. MAKEMAY CONSULTING, INC.**  
Ginochello Consultants

**Proposed Residential Development**  
16801 Almaden Road (Pezzuto)  
San Jose, California

Date 4/1/13  
Drawn by: P.M  
Project No.: E 268-1  
Figure No. 4
# BOREHOLE LOG

**LOCATION:** See Site Plan  
**DATE DRILLED:** 3/14/2013  
**DRILL RIG:** CME-55  
**HAMMER:** 140 lbs/30" drop  
**BORING BACKFILL METHOD:** Soil Cutting

**ELEVATION:**  
Logged By: PM  
Drilling Method: Hollow Stem  
Drilling Contractor: Britton Exploration  
**BORING No.: B-3**  
Sheet 1 of 1  
Total Depth of Boring: 6.0 feet

<table>
<thead>
<tr>
<th>DRILLING DETAILS</th>
<th>DEPTH</th>
<th>SAMPLER NO.</th>
<th>BLOW COUNT</th>
<th>GRAPHIC LOG</th>
<th>MATERIAL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Brown Sandy Silty Gravel</td>
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<td></td>
<td></td>
<td></td>
<td>Increase in Gravel with Depth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dark Brown Clayey Sand with Gravel, Damp, Stiff</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>Bottom of Boring @ 6.0 Feet</td>
</tr>
<tr>
<td></td>
<td>10</td>
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</tbody>
</table>

**LAB TESTS**  
**DENSITY**  
**MOISTURE CONTENT**  
**NOTES**  
**REMARKS**

---

Proposed Residential Development  
16801 Almaden Road (Pezzuto)  
San Jose, California

**Date:** 4/1/13  
**Drawn by:** P.M  
**Project No.:** E 268-1  
**Figure No.:** 5
APPENDIX B

Laboratory Investigation

Summary of Laboratory Test Results
LABORATORY INVESTIGATION

The laboratory testing program was directed towards providing sufficient information for the determination of the engineering characteristics of the site soils so that the recommendations outlined in this report could be formulated.

Moisture content and dry unit weight tests were performed on undisturbed soil samples in order to determine the consistency of the soil and moisture variation throughout the explored soil profile and estimate the compressibility of the underlying soils.

The strength parameters of the foundation soils were determined from in situ penetration resistance of the soil and on unconfined compressive strength laboratory tests in accordance with ASTM D2166 and Direct Shear Test in accordance with ASTM D3080M

The expansion characteristics of the near-surface soils were evaluated by means of Atterberg Limits Tests performed in accordance with ASTM D4318.

A summary of all laboratory test results is presented on TABLE 1 of this appendix and on the respective "Logs of Test Borings", Appendix A.
### TABLE B-1

**SUMMARY OF LABORATORY TEST RESULTS**

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Depth (ft)</th>
<th>Dry Density (p.c.f.)</th>
<th>Moisture Content (% Dry Wt.)</th>
<th>Atterberg Limits</th>
<th>Unconfined Compressive Strength (p.s.f.)</th>
<th>Direct Shear Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Liquid Limit (%)</td>
<td>Plasticity Index (%)</td>
<td>Cohesion (p.s.f)</td>
</tr>
<tr>
<td>1-1</td>
<td>3.0</td>
<td>115.1</td>
<td>10.2</td>
<td></td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>1-2</td>
<td>5.0</td>
<td>113.8</td>
<td>6.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-4</td>
<td>15.0</td>
<td>115.1</td>
<td>9.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-1</td>
<td>2.0</td>
<td>125.2</td>
<td>12</td>
<td>22.6</td>
<td>6.0</td>
<td></td>
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</table>
APPENDIX C

The Grading Specifications

Guide Specifications for Rock Under Floor Slabs
1. **General Description**

1.1 These specifications have been prepared for the grading and site development of the subject residential development. *TMakdissy Consulting Inc.*, hereinafter described as the Soil Engineer, should be consulted prior to any site work connected with site development to ensure compliance with these specifications.

1.2 The Soil Engineer should be notified at least two working days prior to any site clearing or grading operations on the property in order to observe the stripping of organically contaminated material and to coordinate the work with the grading contractor in the field.

1.3 This item shall consist of all clearing or grubbing, preparation of land to be filled, filling of the land, spreading, compaction and control of fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades, and slopes as shown on the accepted plans. The Soil Engineer is not responsible for determining line, grade elevations, or slope gradients. The property owner, or his representative, shall designate the person or organizations who will be responsible for these items of work.

1.4 The contents of these specifications shall be integrated with the soil report of which they are a part, therefore, they shall not be used as a self-contained document.

2. **Tests**

The standard test used to define maximum densities of all compaction work shall be the ASTM D1557-91 Laboratory Test Procedure. All densities shall be expressed as a relative compaction in terms of the maximum dry density obtained in the laboratory by the foregoing standard procedure.
3. **Clearing, Grubbing, and Preparing Areas To Be Filled**

3.1 If encountered, all vegetable matter, trees, root systems, shrubs, debris, and organic topsoil shall be removed from all structural areas and areas to receive fill.

3.2 If encountered, any soil deemed soft or unsuitable by the Soil Engineer shall be removed. Any existing debris or excessively wet soils shall be excavated and removed as required by the Soil Engineer during grading.

3.3 All underground structures shall be removed from the site such as old foundations, abandoned pipe lines, septic tanks, and leach fields.

3.4 The final stripped excavation shall be approved by the Soil Engineer during construction and before further grading is started.

3.5 After the site has been cleared, stripped, excavated to the surface designated to receive fill, and scarified, it shall be disked or bladed until it is uniform and free from large clods. The native subgrade soils shall be moisture conditioned and compacted to the requirements as specified in the grading section of this report. Fill can then be placed to provide the desired finished grades. The contractor shall obtain the Soil Engineer's approval of subgrade compaction before any fill is placed.

4. **Materials**

4.1 All fill material shall be approved by the Soil Engineer. The material shall be a soil or soil-rock mixture which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or lumps over 6 inches in greatest dimension and not more than 15% larger than 2-1/2 inches. Materials from the site below the stripping depth are suitable for use in fills provided the above requirements are met.

4.2 Materials existing on the site are suitable for use as compacted engineered fill after the removal of all debris and organic material. All fill soils shall be approved by the Soil Engineer in the field.
4.3 Should import material be required, it must meet the specifications as delineated in the body of this report.

5. **Placing, Spreading, and Compacting Fill Material**

5.1 The fill materials shall be placed in uniform lifts of not more than 8 inches in uncompacted thickness. Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to obtain uniformity of material in each layer. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either (a) aerating the material if it is too wet, or (b) spraying the material with water if it is too dry.

5.2 After each layer has been placed, mixed, and spread evenly, either import material or native material shall be compacted to a relative compaction designated for engineered fill.

5.3 Compaction shall be by footed rollers or other types of acceptable compacting rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to ensure that the required density has been obtained. No ponding or jetting shall be permitted.

5.4 Field density tests shall be made in each compacted layer by the Soil Engineer in accordance with Laboratory Test Procedure ASTM D1556-64 or D2922-71. When footed rollers are used for compaction, the density tests shall be taken in the compacted material below the surface disturbed by the roller. When these tests indicate that the compaction requirements on any layer of fill, or portion thereof, has not been met, the particular layer, or portion thereof, shall be reworked until the compaction requirements have been met.

5.5 No soil shall be placed or compacted during periods of rain nor on ground which contains free water. Soil which has been soaked and wetted by rain or any other cause shall not be compacted until completely drained and until the moisture content is within the limits hereinbefore described or approved by the Soil Engineer. Approval by the Soil Engineer shall be obtained prior to continuing the grading operations.
6. **Pavement**

6.1 The proposed subgrade under pavement sections, native soil, and/or fill shall be compacted to a minimum relative compaction of 95% at 3% above optimum moisture content for a depth of 12 inches.

6.2 All aggregate base material placed subsequently should also be compacted to a minimum relative compaction of 95% based on the ASTM Test Procedure D1557-91. The construction of the pavement in the parking and traffic areas should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportation of the State of California and/or City of San Jose, Department of Public Works.

6.3 It is recommended that soils at the proposed subgrade level be tested for a pavement design after the preliminary grading is completed and the soils at the site design subgrade levels are known.

7. **Utility Trench Backfill**

7.1 The utility trenches extending under concrete slabs-on-grade shall be backfilled with native on-site soils or approved import materials and compacted to the requirements pertaining to the adjacent soil. No ponding or jetting will be permitted.

7.2 Utility trenches extending under all pavement areas shall be backfilled with native or approved import material and properly compacted to meet the requirements set forth by the City of San Jose, Department of Public Works.*

7.3 Where any opening is made under or through the perimeter foundations for such items as utility lines and trenches, the openings must be resealed so that they are watertight to prevent the possible entrance of outside irrigation or rain water into the underneath portion of the structures.
8. **Subsurface Line Removal**

8.1 The methods of removal will be designated by the Soil Engineer in the field depending on the depth and location of the line. One of the following methods will be used.

8.2 Remove the pipe and fill and compact the soil in the trench according to the applicable portions of sections pertaining to compaction and utility backfill.

8.3 The pipe shall be crushed in the trench. The trench shall then be filled and compacted according to the applicable portions of Section 5.

8.4 Cap the ends of the line with concrete to prevent entrance of water. The length of the cap shall not be less than 5 feet. The concrete mix shall have a minimum shrinkage.

9. **Unusual Conditions**

9.1 In the event that any unusual conditions not covered by the special provisions are encountered during the grading operations, the Soil Engineer shall be immediately notified for additional recommendations.

10. **General Requirements**

**Dust Control**

10.1 The contractor shall conduct all grading operations in such a manner as to preclude wind blown dirt and dust and related damage to neighboring properties. The means of dust control shall be left to the discretion of the contractor and he shall assume liability for claims related to wind blown material.
GUIDE SPECIFICATIONS FOR ROCK UNDER FLOOR SLABS

Definition

Graded gravel or crushed rock for use under slabs-on-grade shall consist of a minimum thickness of mineral aggregate placed in accordance with these specifications and in conformance with the dimensions shown on the plans. The minimum thickness is specified in the accompanying report.

Material

The mineral aggregate shall consist of broken stone, crushed or uncrushed gravel, quarry waste, or a combination thereof. The aggregate shall be free from deleterious substances. It shall be of such quality that the absorption of water in a saturated dry condition does not exceed 3% of the oven dry weight of the sample.

Gradation

The mineral aggregate shall be of such size that the percentage composition by dry weight, as determined by laboratory sieves (U.S. Sieves) will conform to the following gradation:

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<thead>
<tr>
<th>Sieve Size</th>
<th>Percentage Passing</th>
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<tbody>
<tr>
<td>3/4&quot;</td>
<td>90-100</td>
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