Exhibit D

This page intentionally left blank.

SOIL SURVEYS GROUP INC.

103 CHURCH ST • SALINAS, CALIFORNIA 93901 • TELEPHONE (831) 757-2172

November 14, 2014
Job #6361

Todd and Kim Brammer
39 Harper Canyon Road
Salinas, CA 93908

Dear Mr. and Mrs. Brammer:

Submitted herewith is the report of our Geotechnical Investigation for the new single family residence to be constructed at 28771 Underwood Road, APN 416-451-048, near Salinas, California. Two test holes were bored on September 14, 2014 for Geotechnical investigation purposes. Laboratory tests were subsequently made from the driven soil samples taken from the test holes to determine the near surface soil conditions and suitability for construction of the new residence. From our investigation, we have determined that, in our opinion, the site is suitable for the proposed use provided the recommendations made herein are followed.

It is a pleasure working with you on this project. If you have any questions regarding our investigation or this report, please contact us.

Very truly yours,

SOIL SURVEYS GROUP, INC.

Richard E. Dante, P.E.
R.G.E. 0259
R.C.E. 20251

Belinda A.Taluban, P.E.
R.C.E. 44217

RED/BAT/mmg

cc. Monterey County Resource Management Agency - Building Services Division

TABLE OF CONTENTS

SOIL SURVEYS GROUP INC.

103 CHURCH ST • SALINAS, CALIFORNIA 93901 • TELEPHONE (831) 757-2172

GEOTECHNICAL INVESTIGATION

FOR

NEW SINGLE FAMILY RESIDENCE

AT 28771 UNDERWOOD ROAD, APN 416-451-048

NEAR SALINAS, CALIFORNIA

FOR MR. AND MRS. BRAMMER

NOVEMBER 14, 2014; JOB #6361

I. INTRODUCTION:

This Geotechnical Investigation was made to determine the suitability of the project site for the proposed new single family residence to be constructed at 28771 Underwood Road, near Salinas. Two test holes were bored on September 14, 2014, to depths of 26.5 feet and 21.5 feet for Geotechnical investigation purposes. Core samples were taken from the test holes for laboratory testing. The test hole logs, our field observations, and field and laboratory test data were analyzed to determine the following:

1. **Suitability of the project site for the proposed use.**
2. **Expansive, unsuitable or unstable soil conditions, if any.**
3. **Foundation and retaining wall design criteria for the proposed single family dwelling and site retaining walls.**
4. **Subsurface groundwater and soil moisture considerations.**
5. **Surface drainage considerations.**
6. **Analysis of seismic hazards and seismic factors per the 2013 California Building Code.**

II. LABORATORY TEST DATA[1]:

Fourteen moisture density tests were made from the driven core samples. Standard Penetration Tests (SPT) were performed with a Terzaghi Split Spoon sampler and penetration tests were made using a 2½-inch inside

[1]Test Hole logs are located in Appendix A.

diameter (i.d.) California Sampler. All samplers were driven into the soil by a 140 lb. hammer dropped a vertical distance of 30 inches at each of the sample locations. Results of these tests are shown as follows:

MOISTURE DENSITY TESTS

Test Hole No.	Depth/ Ft.	Water Content %	Dry Density p.c.f.	Standard penetration Tests, Blows /foot	Pocket Penetrometer Tons S.F.
1	2-2.5	5.1	64.3	10	---
1	4-4.5	10.6	90.6	52	>4.5
1	6-6.5	9.8	83.5	65	---
1	11-11.5	9.3	86.8	80	2.0
1	16-16.5	7.8	83.1	49	---
1	21-21.5	10.0	86.7	49	1.0
1	26-26.41	12.4	81.5	50/5"	2.0
2	2-2.5	18.7	99.4	17	3.5
2	3.5-4	23.7	92.7	23*	2.5
2	4-4.5	21.7+	99.4+	38*	2.25
2	6-6.5	19.5	87.6	19	1.75
2	11-11.5	16.9	71.6	3	---
2	16-16.5	18.3	90.3	20	0.5
2	21-21.5	18.0	87.0	30	1.5

* = 2 ½" Cal, not SPT
+ = Direct Shear test-average water content and dry density were used

Three Sieve Analysis tests were made on driven core samples. Results of these tests are shown as follows:

A.S.T.M. D 422 SIEVE ANALYSIS TEST-Percent Passing

Test Hole No.	Depth/ Ft.	Sieve No. 4	Sieve No. 10	Sieve No. 20	Sieve No. 30	Sieve No. 40	Sieve No. 100	Sieve No. 200
1	2-2.5	100	100	100	100	100	91	41
1	4-4.5	100	100	100	99	99	69	35
2	3.5-4	100	100	99	99	99	83	45

Todd and Kim Brammer
November 14, 2014
Job #6361

Three plasticity index tests were performed on driven core samples. Results of these tests are as follows:

PLASTICITY INDEX TEST

Test Hole No.	Depth/ Feet	% Passing Sieve No. 40	% Passing Sieve No. 200	Liquid Limit	Plastic Limit	Plasticity Index
1	2-2.5	100	41	28	22	6
1	4-4.5	99	35	38	25	13
2	3.5-4	99	45	36	21	15

The test results for samples from the test holes indicate that the fine fraction of the near surface (2.0 feet to 2.5 feet in depth) sandy silty soil at the Test Hole 1 location is slightly plastic and slightly expansive. The test results from Test Hole 1 at 4.0 feet to 4.5 feet in depth indicates that the fine fraction of the slightly clayey, slightly sand silty soil is plastic and slightly to moderately expansive. Test results from the Test Hole 2 at 3.5 feet to 4.0 feet, indicate that the fine fraction of the slightly sandy, clayey silt is plastic and slightly to moderately expansive.

One Direct Shear test was made from a soil sample taken from Test Hole 2 at 4.0-4.5 feet below surface. Results of this test are summarized as follows (see Appendix B for full report sheet):

Test Hole No.	Depth/ Ft.	Internal Frict. Angle, φ°	Cohesion, C p.s.f.	Soil Weight p.c.f.	Description of soil
2	4-4.5	31.2	80	121.1	Very dark grey silty very fine SAND (SM-ML)

Test Hole 1 was located near the northwest corner of the proposed residence. The near surface soil consists of very soft sandy silt to a depth of 1.0 feet; below this depth the soil consists of stiff, sandy silt to a depth of 3.5 feet; below this depth the soil consists of hard sandy silt to the bottom of the boring at 26.5 feet.

Test Hole 2 was located near the southeast corner of the proposed residence. The near surface soil consists of very soft slightly sandy silt to a depth of 1.0 foot and of very stiff slightly sandy, clayey silt to a depth of 10.0 feet; below this depth the soil consists of soft to stiff slightly sandy, clayey silt to a depth of 15.0 feet overlying very stiff, slightly clayey, sandy silt to the bottom of the boring at 21.5 feet.

No free groundwater was observed in the test holes on the date of drilling to a maximum depth of 26.5 feet prior to backfilling the test holes with soil cuttings. The actual depth to groundwater is unknown, but it should be noted that groundwater fluctuations can occur due to variations in rainfall, temperature, and other factors not evident during the time of our investigation.

III. SUITABILITY OF SITE FOR PROPOSED USE:

No unsuitable or unstable soil conditions were found at the proposed building location except for some very soft near surface soil to a depth of one foot in some areas and some slightly expansive sandy silty soils at several locations. In our opinion, the site is suitable for the proposed residence with the recommendations made herein, specifically the recommendations for recompaction of any soft near surface soil and mitigations for expansive soils.

IV. RECOMMENDED FOUNDATION DESIGN CRITERIA:

Spread footings may be used for the new building foundations, after the site is cleared and grubbed and the building pad is graded, compacted, and properly prepared prior to beginning of the foundation excavations. The soil shall be moisture conditioned and recompacted as needed and as required by the Geotechnical engineer. Spread footings shall be installed to a minimum depth of 12 inches for single story and to 18 inches for any two story portions of the new residence. The minimum footing depths shall be measured from the lowest adjacent grade, and mitigations for soft and expansive soil conditions must be followed.

Allowable foundation pressures are:

Continuous footings	**= 1800 p.s.f.**
Isolated rectangular footings	**= 2000 p.s.f.**

Continuous footings shall be reinforced with two #4 steel reinforcement bars placed near the bottom of footing and a #4 steel reinforcement bar installed horizontally every 18 inches on center within the stem wall. Spread footings shall also meet the minimum requirements of the 2013 California Building Code and the County of Monterey building ordinances for width, thickness, embedment, and reinforcement. The proposed residence and any future additions shall be designed in strict accordance with the requirements specified in the 2013 California Building Code, or latest approved edition, to resist seismic forces.

The new concrete floor and garage slabs-on-grade shall be a minimum of five inches thick and shall be reinforced with a minimum of #3 steel reinforcement bars at 16 inches on center, each way or #4 steel reinforcement bars placed 24 inches on center, each way and shall extend a minimum of 8 inches into the perimeter foundation. *The reinforcing steel must be firmly held in the vertical center of the slabs during placement and finishing of concrete with pre-cast concrete dobies.* All new concrete floor slab-on-grade shall be underlain by an approved 15 mil. vapor barrier installed over an open graded gravel capillary break as provided in Section VIII-C herein. ***New concrete slabs shall have weakened plane joints a maximum of fifteen feet on center, each way. The concrete shall be properly cured with an approved curing compound or wetted burlap for a minimum of 14 days.***

Soil Surveys Group, Inc. shall inspect and approve the foundation footing excavations for suitable soil bearing and proper penetration into competent soil. We also recommend that Soil Surveys Group, Inc. review and approve the grading, drainage and foundation plans prior to construction.

A. New Concrete Sidewalks and Outside Flatwork:

We recommend that all new concrete sidewalks and outside flatwork be at least five inches thick and be placed over at least four inches of Class 2 Aggregate Baserock compacted to a minimum of 90 percent relative compaction over subgrade soil also compacted to a minimum of 90 percent relative compaction. All concrete flatwork should be divided into as nearly square panels as possible. Frequent joints should be

installed to provide articulation to the concrete panels. Landscaping and planters adjacent to concrete flatwork should be designed in such a manner that positive drainage is achieved away from the project building addition and the existing building. It is assumed that the outside concrete flatwork will be subjected only to pedestrian traffic.

V. EXPANSIVE AND SOFT SOIL MITIGATIONS:

To mitigate the effects of the slightly expansive near surface sandy silty soil within the proposed residence, the following measures are recommended:

1. Any existing soft soil within the new building area shall be recompacted to 90 percent relative compaction at the direction of Soil Surveys Group, Inc. prior to placing additional building pad fill or finishing the subgrade for the building pad. Soil Surveys Group, Inc. shall be retained to inspect and test the recompaction of any soft soil within the building pad.

2. If any part of the building will bear on both cut and fill, the area within the cut portion of the building pad shall be subexcavated and recompacted a minimum of two feet deep for a distance of five feet outside the building, so that the entire building overlies engineered fill prior to excavating for the new foundation footings.

3. Soil Surveys Group, Inc. shall be retained to inspect, test, and approve all foundation footing excavations for soil bearing conditions. Soil Surveys Group, Inc. shall also inspect and approve the subgrade below new concrete floor slabs prior to placement of reinforcement steel.

4. Spread footings for the new addition shall be constructed a minimum of 12 inches deep for one story and 18 inches deep for any two story portions of the building. The minimum depths shall be measured from the lowest adjacent grade. Continuous footings shall be reinforced with two #4 steel reinforcement bars.

5. The foundation excavations shall be flooded with three to four inches of water at least 24 hours prior to pouring concrete. The subgrade for concrete slabs and foundations should be brought to at least three percent over optimum moisture for a depth of at least eight inches prior to pouring concrete. However, no free water shall remain in the footing excavations during the concrete pour. To achieve the proper moisture conditioning in the subgrade beneath concrete slabs, water should be applied each evening for several days prior to placement of reinforcing steel and concrete.

6. All concrete floor slabs-on-grade shall be a minimum of five inches thick and shall be reinforced with a minimum of #3 steel reinforcement bars at 16 inches on center, each way or #4 steel reinforcement bars placed a minimum of 30 inches on center, each way.

7. Roof and site rain water should be directed away from the proposed building foundations as well as away from the existing building. Rainfall runoff must not be allowed to collect or flow in a downslope direction against any new or existing building foundation.

8. Soil Surveys Group, Inc. shall inspect and approve the installation of all new roof and yard drainage facilities.

VI. SURFACE AND SUBSURFACE DRAINAGE AND EROSION CONSIDERATIONS:

The near surface soil at the project site has the potential to erode, especially if protective vegetation is removed. Therefore, all new cut and fill slopes as well as disturbed soil areas must be seeded with grass or landscape plants for erosion control and to prevent sloughing soil from blocking drainage patterns at the project site. Such erosion control measures shall be taken at completion of grading and building construction operations.

Concentrated storm water runoff from the project site should not be allowed to discharge uncontrolled onto sloping ground. Suitable energy dissipation systems shall be designed where concentrated rainfall runoff is discharged or the concentrated flows should be piped to flat ground, to an adjacent natural drainage channel, or an approved drainage facility. Concrete splash blocks shall be installed at downspout discharge points. Rock energy dissipaters consisting of four inch to six inch rock or rubble rip rap should be installed at rain gutter collector pipe discharge points to reduce soil erosion.

The building site and ground adjacent to the new residence shall be graded so that rainfall runoff does not become trapped or flow against any of the project building foundations. No subsurface drainage is indicated however, the Geotechnical engineer may recommend a system of subsurface drains should wet subsurface soil conditions be encountered during site preparation or excavations for the new building foundations.

Following are specific surface drainage recommendations to be incorporated into the project Plans:

1. The new building shall have roof rain gutters and downspouts installed which shall discharge onto concrete splash blocks or into solid smooth wall collector pipes which shall then discharge onto landscaped areas down slope of the proposed residence. Rock rip rap shall be installed at the discharge points of collector pipes located off paved areas in order to spread the water and prevent soil erosion.

2. Drainage collection facilities and pipes shall be installed as necessary to ensure that rain water does not collect or become trapped against the project building at any location.

3. Surface drainage shall be collected in separate solid wall pipes and **shall not** discharge into any perforated pipe. Perforated subsurface drain pipes (if any) may **drop** into solid wall drain pipes outside the limits of the new residence.

4. Positive drainage must be established **away** from the new building foundation. The Geotechnical engineer should be retained to review the final building and site grading plans and may provide specific recommendations for surface and subsurface drainage. The Geotechnical engineer shall also inspect and test all grading operations and shall inspect and approve new foundation footing excavations as discussed in Sections IV and VIII of this report.

VII. RETAINING WALL DESIGN CRITERIA:

The following design criteria are recommended for the project retaining walls:

Friction Angle	φ	$= 31.2^\circ$
Cohesion	c	$= 80$ *p.s.f.*
Soil Weight,	w	$= 121.1$ *p.c.f.*
Equivalent fluid pressure, active		$= 38$ *pounds per square foot per foot of depth for* ***Level Grade***

Equivalent fluid pressure, active	*= 55 p.c.f. with **2:1 slope behind wall***
Equivalent fluid pressure, at rest,	*= 60 p.c.f., restrained condition*
Equivalent fluid pressure, passive	*= 381 p.c.f.*
Sliding friction f	*= 0.35*
Allowable Footing Toe Pressure	*= 2800 p.s.f. plus ⅓ additional for seismic force (if added)*

Retaining walls that are more than five feet high, or are part of or within ten feet of a building should include the seismic force of the soil against the retaining wall or basement wall. The estimated seismically generated ground accelerations to be used for this area are:

PAGA = 0.4 g
RHGA =0.26 g = k_h
w = 121.1 p.c.f.

The resultant seismic force is calculated by the formula: 3/8 w H^2 k_h per linear foot of retaining wall, or for this case **11.8 H^2**, ***where H is the height of the retaining wall. These forces, where needed, should be applied at a height of 0.6H above the base of the retaining wall and must be combined with the force produced by active soil pressure.***

These retaining wall design criteria are based on a fully drained condition. Therefore, we recommend that a four-inch diameter perforated NDS or PVC pipe be installed behind the stem wall along the top of the footing, holes placed down, behind all walls that retain earth. The pipe shall be covered with a 12-inch wide envelope of ¾-inch drain rock or Class 2 Permeable Material (per Caltrans Standard Specifications Section 68-1.025) which shall extend to minimum of one foot above the top of pipe and extend to within 12 inches of the top of wall. Filter fabric shall be installed over the top of the drain rock. No gravel shall be placed below the pipe. The remainder of the trench can be backfilled with clean native sand. As an alternative to installing drain rock or permeable material, a composite filter material, eg. Miradrain, can be installed with a perforated pipe at the bottom of the material. Clean-out risers must be installed on the perforated pipe at the up-stream ends, every 100-feet, and at 90° angle points. The capped end of the cleanout riser shall be located at the ground surface outside of or behind the retaining walls.

VIII. RECOMMENDED SPECIFICATIONS:

A. GRADING:

The area to support the new building shall be cleared of all vegetation and debris. The building area shall also be cleared and grubbed of all roots and organic topsoil before placing engineered fill or finishing subgrade for the new building pad. **On-site surface or subsurface grass, roots, or landscape plants (if any) within the new building area shall be removed.** Depressions created by the removal of any existing trees, shrubs or grass vegetation shall be backfilled to design subgrade with suitable fill placed in eight inch loose lifts and compacted to a minimum of 90 percent relative compaction. Any existing soft soil within the proposed building area shall be recompacted to 90 percent relative compaction for the depth recommended by Soil Surveys Group, Inc., in the field, prior to placing engineered fill or finishing subgrade of the new building pad. All new cut and fill slopes shall be 2:1 or flatter unless retained. Any fill to be placed on existing slopes steeper than 5:1 (horizontal:vertical) should be properly keyed and benched in as fill material is placed. A keyway should be excavated two feet into competent material, sloping into the slope a minimum of two percent and approximately ten feet wide or the width of the excavating equipment whichever is larger. Benches should be excavated into competent material approximately every six vertical feet during fill placement. A subdrain may be required in the rear of the keyway and shall be determined in the field by Soil Surveys Group, Inc. The native soil is suitable to be used as engineered fill provided any

organics or debris are first removed from the soil to be used as fill. Any native soil used for fill, or any imported fill soil for the new building pad shall be compacted to at least 90 percent relative compaction. All cut portions of a new building pad when the pad is comprised of both cut and fill subgrade, shall be subexcavated a minimum of two feet, backfilled in eight inch loose lifts and recompacted a minimum to a minimum of 90 percent relative compaction. ***Grading, filling, compaction operations and foundation excavations shall be inspected and tested by Soil Surveys Group, Inc.***

B. COMPACTION:

Laboratory soils compaction test method shall be *A.S.T.M. D 1557-09.* Subgrade *in any existing soft soil* within the new building shall be compacted to 90 percent relative compaction unless waived by the Geotechnical engineer. Subgrade soil below any new pavement shall also be compacted to 90 percent relative compaction, and aggregate base beneath any new pavement shall be compacted to 95 percent relative compaction.

Any imported soil fill placed for the new building pad shall be nonexpansive and shall be compacted to a minimum of 90 percent relative compaction except that if clean imported sand is to be used for fill beneath a new concrete floor slab-on-grade, that engineered fill shall be compacted to 95 percent relative compaction.

C. CONCRETE FLOOR SLAB-ON-GRADE:

Subgrade in recompacted soil under any concrete floor slab-on-grade shall be brought to at least 2% over optimum moisture prior to placing native or imported sandy soil fill, prior to placing the capillary break rock and moisture proof barrier or prior to pouring concrete. We recommend that a capillary break consisting of :

- a mat of clean, open graded rock, four inches thick, placed over finished soil subgrade
- a minimum 15 mil. water-proof membrane (such as Stego, Moistop or equal) placed over the open graded rock
- two inches of clean, moistened sand shall be placed between the water-proof membrane and the bottom of the floor slab. The moistened sand will help protect the membrane and will assist in equalizing the concrete curing rate to minimize shrinkage cracking.

Class 2 Aggregate Base or sand should not be used as the capillary break material. Capillary break material shall comply with and be installed according to the following:

1. MATERIAL:

The mineral aggregate for use under the floor slabs shall consist of broken stone, crushed or uncrushed gravel, quarry waste, or a combination of the above. The aggregate shall be free of adobe, vegetable matter, loam, volcanic tuff and other deleterious materials. It shall be of such quality that the absorption of water in a saturated, surface dry condition does not exceed 3% of the oven dry weight of the sample.

2. GRADING:

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 grading:

Sieve Size	Percentage Passing Sieve
3/8" to ½"	100
No. 4	0-10
No. 200	0-2

3. PLACING:
Subgrade, upon which Aggregate Base, gravel or crushed rock is to be placed, shall be prepared by removing grass and roots. Where loose topsoil is present, it shall be removed and cleaned of debris and recompacted to 90% of maximum density.

4. THICKNESS AND STRENGTH:
The new concrete slab should be at least five inches thick; concrete shall be five sack minimum (5.5 sack if pumped) and shall achieve a 28 day compressive strength of at least 2500 p.s.i.

5. REINFORCEMENT:
The concrete slab-on-grade shall be reinforced with a minimum of #3 steel reinforcement bars placed 16 inches on center, each way, or #4 steel reinforcement bars placed 30 inches on center, each way and shall extend a minimum of 8 inches into the perimeter footings.

D. UTILITY TRENCH BACKFILL:
All new on-site utility trenches shall be backfilled with a clean, imported sand having a sand equivalent of 30 or higher except that the top eight inches of trench shall be capped with native clayey soil; a two feet thick plug of compacted, **clayey soil backfill** will be required around the pipe or conduit at places where utility trenches intersect the building perimeter. All trench backfill shall be compacted to 95% relative compaction at all locations.

IX. GEOLOGIC AND SEISMIC CONSIDERATIONS:

No known faults have been mapped or projected through the project site. However, severe ground vibration will result from a major earthquake centered on any of the nearby area faults. The new single family residence shall be designed to withstand severe shaking and lateral accelerations generated by a severe earthquake centered nearby on one of the area faults.

The project site is located approximately 6.9 kilometers (4.3 miles) northeasterly of the Monterey Bay Tularcitos Fault, 8.4 kilometers (5.2 miles) southwesterly of the Rinconada Fault and 24.9 kilometers (15.5 miles) northeasterly of the San Gregorio Fault (Sur Region) all considered B Faults on the **"Maps of Known Active Fault Near Source Zones in California and Adjacent Portions of Nevada, to be used with the 1997 Uniform Building Code."** The project site is located 1.0 kilometer (0.6 miles) northeasterly of the Chupines Fault, 4.3 kilometers (2.7 miles) southwesterly of the Harper Fault, and 1.3 kilometers (0.8 mile) southeasterly of the Corral de Tierra Fault as these faults are shown on the **Monterey County GIS Database, attributed to Clark et al, 2000.** These faults are considered "C" rated faults.

The proposed residence shall be designed in strict compliance with the 2013 California Building Code to help withstand such seismically generated ground accelerations for a reasonably expected duration without suffering major damage. The following are the site area coordinates and the seismic design

criteria/coefficients per the requirements of the 2013 California Building Code (CBC):

Site Class	Latitude	Longitude	S_S	S_1	F_a	F_v
D	36.5120°	-121.6806	1.379	0.497	1.00	1.50

Frame and semi-rigid structures with proper strengthening connections and hold-down fasteners (where needed) are recommended for the project building. With proper design parameters, seismic damage to the building should be reduced during major earthquakes centered near the project area.

Surface rupture, liquefaction, lurch cracking, lateral spreading, and differential settlement are seismic hazards that must be considered at the project site. Surface rupture usually occurs along fault lines, and no known faults have been mapped through the project site.

Liquefaction and lateral spreading tend to occur in loose, fine, saturated sands and in places where the liquefied soils can move toward a free face (e.g. a cliff or ravine). The deeper soil conditions underlying the project site are typically very stiff to hard sandy silts. Considering the dense subsurface soil conditions at the project site, the potential risk for occurrence of damaging liquefaction, lateral spreading or lurch cracking is considered to be low.

Differential compaction and settlement occur generally in loose, granular or unconsolidated semi-cohesive soils during severe ground vibration. In our opinion, the risk for differential compaction and settlement during a major seismic event is considered to be low provided that any soft near surface soil within the building pad is recompacted.

X. UNFORESEEN OR UNUSUAL CONDITIONS:

If any unforeseen or unsuitable soils conditions are found during grading or construction of the new residence, the Geotechnical engineer shall be notified immediately so that remedial action can be taken. Such unsuitable conditions could be:

1. **Wet or unsuitable pockets of soil uncovered during site preparation or foundation excavation.**
2. **Loose soil conditions or soil containing organic material.**
3. **Buried foundation footings, debris, tanks, and/or pipes within the building envelope.**
4. **Any other unforeseen conditions that would require remedial action by the Geotechnical engineer, project engineer, architect or contractor.**

XI. CONCLUSIONS AND RECOMMENDATIONS:

From our field observations, analysis of the test data and knowledge of the general area soils, the following are concluded:

1. The project soil conditions are suitable for the proposed new single family dwelling. Design criteria for spread footing foundation system are provided in Section IV. Design criteria for concrete slabs-on-grade are provided in Sections IV and V herein.

2. Surface storm water runoff should be carefully controlled around the proposed building to provide **positive drainage away** from the building foundation as discussed in Section VI herein.

3. Soil Surveys Group, Inc. should review the building and site grading plans for compliance with the recommendations herein and may provide additional specific recommendations for surface and subsurface drainage. Soil Surveys Group, Inc. shall inspect and approve all foundation footing excavations.

4. Geologic and seismic considerations are discussed in Section IX herein. The potential for damaging earthquake related liquefaction or lateral spreading is considered to be low at the project site.

5. Recommendations for grading, subexcavation and recompaction, soil fills, cut and fill slopes, and soil compaction are made in Section VII herein.

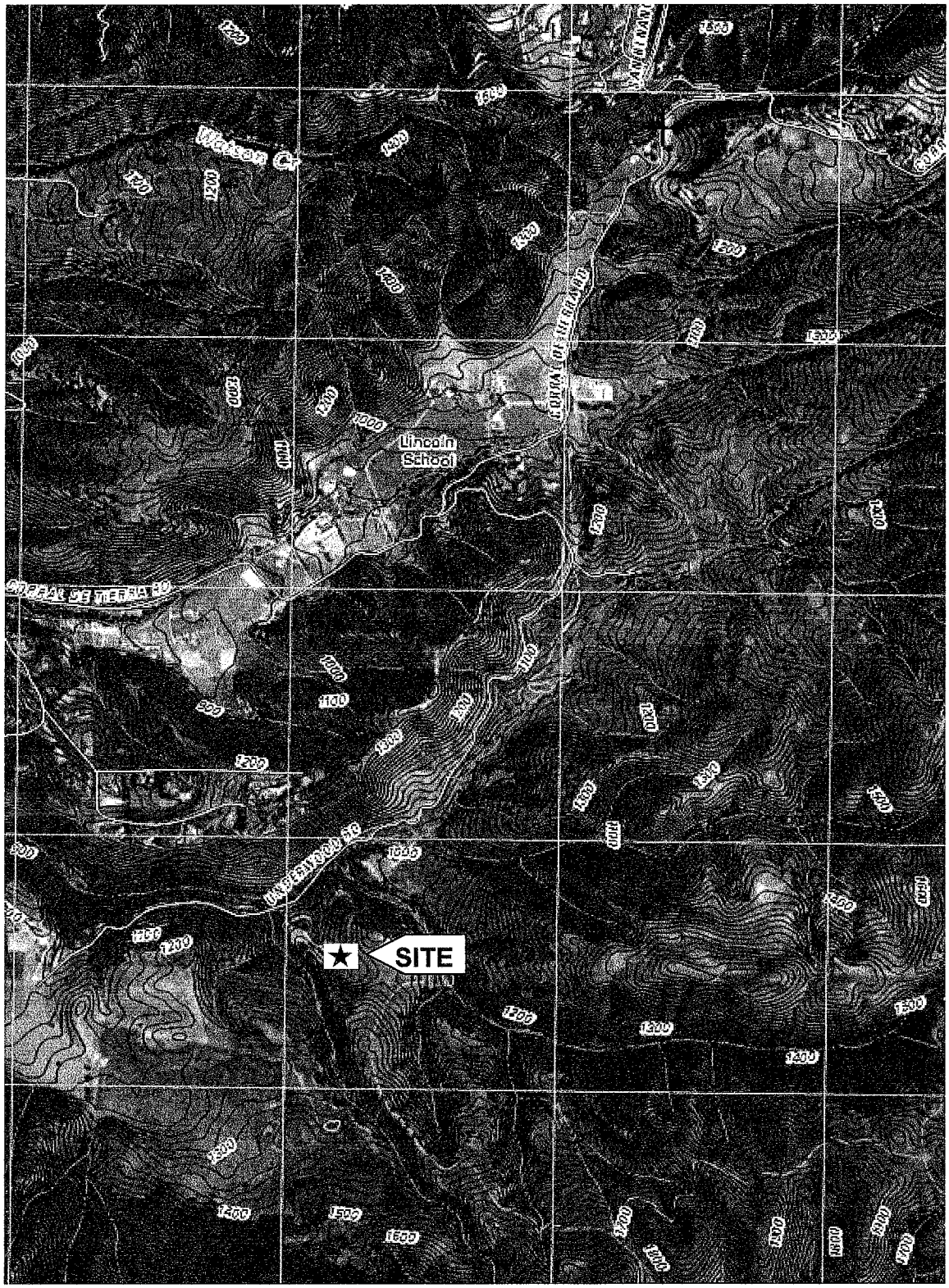
XII. LIMITATIONS:

This report necessarily assumes that the subsurface conditions are as found in the test holes and our knowledge of the general area soils. It should be recognized that the soil conditions described in this report are based on two test holes. It should be understood that subsurface soil conditions can vary between test holes and from site to site. If any unusual soil conditions are found during grading, installation of underground utilities or building addition construction, the Geotechnical engineer should be notified immediately so that remedial action can be taken (see Section X).

This report is issued with the understanding that it is the responsibility of the Owners or their representative to ensure that the applicable provisions of the recommendations contained herein are incorporated into the plans and specifications and that the necessary steps are taken to see that contractors and subcontractors carry out such provisions in the field. The use of this report, its contents or any part thereof, by a party or its agents, other than Todd and Kim Brammer, their engineer, architect, contractor or designated agents, is hereby disallowed unless specific permission is given to do so by Soil Surveys Group, Inc. This investigation and report were prepared with the understanding that a new residence will be constructed as shown on the Figure II map enclosed herein. The use of this report, test hole logs and laboratory test data shall be restricted to the original use for which they were prepared, and publication by any method, in whole or in part, is prohibited without the written consent of the Soil Surveys Group, Inc. Title to this report, logs and laboratory test data remain with Soil Surveys Group, Inc. without prejudice. Visual contact with this report and data herein constitutes prima facie evidence of the acceptance of these restrictions.

Soil Surveys Group, Inc. will not take responsibility for or assume any liability for the recommendations made in this report unless Soil Surveys Group, Inc. performs the field inspections and testing mentioned herein.

The findings and recommendations of this report are considered valid at the present date. However, changes in the property conditions can occur with the passage of time on this or adjacent properties, whether due to natural processes or the works of man; therefore the findings of this report shall be considered valid for a period of not more than three years without being reviewed and updated by Soil Surveys Group, Inc.



BASE: U.S. Geological Survey, Spreckels 7.5' Quadrangle, Salinas, California

FIGURE I: VICINITY MAP

SCALE
1" = 2000'

Job #6361

By: Soil Surveys Group, Inc.
103 Church Street
Salinas, CA 93901
831-757-2172

FIGURE II

Test Hole Locations (approx.)

By: **Soil Surveys Group, Inc.**
103 Church Street
Salinas, CA 93901
ph. 831-757-2172
fax 831-751-7330
email: info@soilsurveys.net

Google earth feet meters 500

APPENDIX A

TEST HOLE LOGS

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS (MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVELS (MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE)	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS (MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE)	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS (MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAIN SIZES

U.S STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

200	40	10	4	3/4"	3"	12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FT*
VERY LOOSE	0 - 4
LOOSE	4-10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH**	BLOWS/FT*
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch I.D) split spoon (ASTM D-1586)

** Unconfined compressive strength in tons/ft^2 as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

FIGURE NO. KEY TO LOGS

EXPLORATION DRILL LOG

HOLE NO. 1

PROJECT 28771 Underwood Road, Brammer Residence - Job #6361 | DATE 9.14.14 | LOGGED BY JG

DRILL RIG Cenozoic 2400 SK-1 | HOLE DIA. 6" | SAMPLER Terzaghi Split Spoon (SPT)

GROUNDWATER DEPTH: | INITIAL --- | FINAL --- | HOLE ELEV. ---

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Light greyish-brown sandy SILT; dry, very soft	ML								
		1							
Light grey-brown sandy SILT; slightly moist, stiff	ML		SPT						
		2							
			XXX	10	64.3	5.1	28	22	---
		3							
			SPT						
Yellowish-brown slightly sandy SILT with lenses of	ML	4							
dark brown clay with fine micaceous sand; dry,			XXX	52	90.6	10.6	38	25	>4.5
hard		5							
Light yellowish-brown slightly sandy SILT with thin	ML		SPT						
lenses of dark brown clay; slightly moist, hard		6							
			XXX	65	83.5	9.8			---
		7							
		8							
		9							
increased sand content @ 9.0'									
		10							
Light yellowish-brown micaceous, fine sandy SILT	ML		SPT						
with iron staining; slightly moist, hard		11							
			XXX	80	86.8	9.3			2.0
		12							
		13							
		14							
		15							
Light yellowish-brown and grey micaceous, fine	ML		SPT						
sandy SILT; slightly moist, hard		16							
			XXX	49	83.1	7.8			---
		17							
		18							
		19							
Same	ML								
		20							

DEPTH 26.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE NO. 1 CONTINUED

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Light yellowish-brown micaceous fine sandy SILT;	ML		SPT						
slightly moist, hard		21							
			XXX	49	86.7	10.0			1.0
		22							
		23							
increased moisture, slightly darker color @ 23.5'		24							
		25							
Light whitish yellowish-brown fine micaceous	ML		SPT						
sandy SILT with iron staining; slightly moist, hard		26							
Bottom of hole @ 26.5'	ML		XXX	85/11"	81.5	12.4			2.0
		27							
		28							
		29							
		30							
		31							
		32							
		33							
		34							
		35							
		36							
		37							
		38							
		39							
		40							
		41							
		42							

DEPTH 26.5' Job #6361

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE NO. 2

PROJECT 28771 Underwood Road, Brammer Residence - Job #6361 DATE 9.14.14 LOGGED BY JG

DRILL RIG Cenozoic 2400 SK-1 HOLE DIA. 6" SAMPLER Terzaghi Split Spoon (SPT) & 2½" Cal.

GROUNDWATER DEPTH: INITIAL --- FINAL --- HOLE ELEV. ---

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Light grey slightly sandy SILT; dry, very soft	ML								
		1							
Light grey micaceous, slightly fine sandy clayey	ML/MH		SPT						
SILT; slightly moist, very stiff		2							
			XXX	17	99.4	18.7			3.5
		3							
Dark grey brown micaceous, slightly fine sandy	ML/MH		2½"Cal.						
clayey SILT with occasional iron staining; moist,		4	XXX	23	92.7	23.7	36	21	2.5
very stiff			XXX	38	99.4	21.7	Shear	Test	2.25
		5							
			SPT						
		6							
Same	ML/MH		XXX	19	87.6	19.5			1.75
		7							
		8							
		9							
		10							
Dark grey-brown micaceous, slightly fine sandy	ML/MH		SPT						
clayey SILT; moist, soft		11							
			XXX	3	71.6	16.9			---
Light yellowish-brown slightly sandy clayey SILT;	ML	12							
moist, stiff									
		13							
		14							
		15							
Light yellow, white and light brown micaceous	ML		SPT						
slightly clayey fine sandy SILT with thin lenses of		16							
dark brown clay; moist, very stiff			XXX	20	90.3	18.3			0.5
		17							
		18							
		19							
Same	ML	20							

DEPTH 21.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE NO. 2 CONTINUED

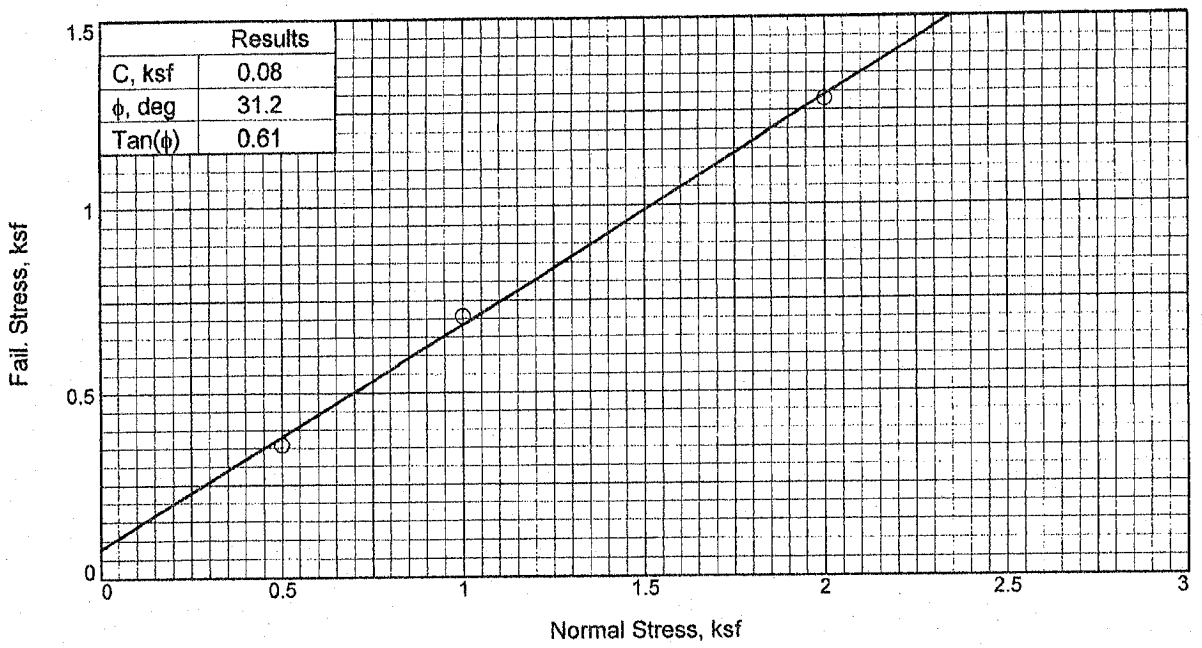
DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Light yellowish-brown micaceous slightly clayey	ML		SPT						
sandy SILT; moist, very stiff		21							
Bottom of hole @ 21.5'			XXX	30	87.0	18.0			1.5
		22							
		23							
		24							
		25							
		26							
		27							
		28							
		29							
		30							
		31							
		32							
		33							
		34							
		35							
		36							
		37							
		38							
		39							
		40							
		41							
		42							

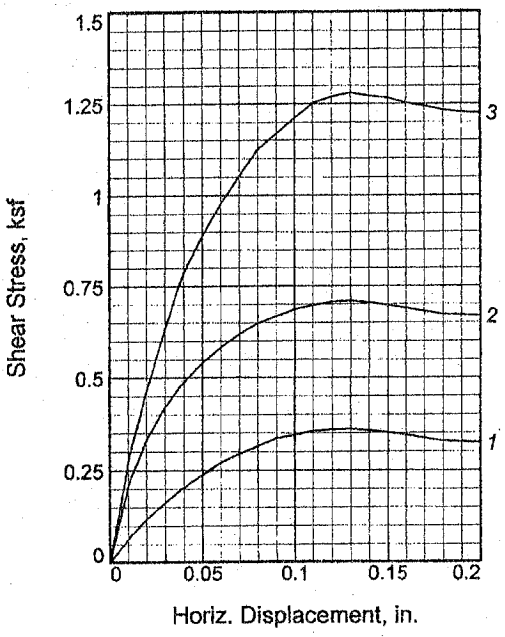
DEPTH 21.5' Job #6361

SOIL SURVEYS GROUP, INC.

APPENDIX B

DIRECT SHEAR TEST





Sample No.		1	2	3
Initial	Water Content, %	21.5	21.7	21.7
	Dry Density, pcf	99.5	99.7	99.1
	Saturation, %	83.6	84.8	83.7
	Void Ratio	0.6936	0.6909	0.7002
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	24.7	24.5	24.3
	Dry Density, pcf	99.6	99.8	99.3
	Saturation, %	96.4	95.9	94.0
	Void Ratio	0.6919	0.6891	0.6982
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
Normal Stress, ksf		0.50	1.00	2.00
Fail. Stress, ksf		0.36	0.71	1.28
Displacement, in.		0.12	0.12	0.13
Ult. Stress, ksf				
Displacement, in.				
Strain rate, in./min.		0.02	0.02	0.02

Sample Type: Mod.Cal.
Description: Very dark gray silty very fine SAND(SM-ML)

Specific Gravity= 2.70
Remarks:

Plate _____

Client: Soil Surveys,Inc.

Project:

Sample Number: 2 **Depth:** 4-4.5'

Proj. No.: 6361 **Date Sampled:**

DIRECT SHEAR TEST REPORT
Soil Mechanics Lab
Oakland, California

Tested By: MA

This page intentionally left blank