Exhibit D

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LIB190028

SOIL SURVEYS GROUP INC.

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

January 3, 2019
Job #7246

Mr. Pat Corrigan
c/o G. David Case Architecture
P.O. Box 3074
Monterey, CA 93942

Dear Mr. Corrigan:

Submitted herewith is the report of our Geotechnical Investigation for the proposed single family residence with detached garage to be constructed at 3306 Martin Road, APN 009-321-007, in Carmel, California. Two borings were drilled on November 8, 2018, for geotechnical investigation purposes. Laboratory tests were subsequently made on driven soil core samples taken from the borings to determine the near surface and subsurface soil conditions and suitability for the construction of the proposed residence and garage. We find that the project site is suitable for the proposed use with the recommendations made herein.

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

Very truly yours,

SOIL SURVEYS GROUP, INC.

REGISTERED PROFESSIONAL ENGINEER
BELINDA A. TALUBAN
No. 44217
Exp 6/30/19
CIVIL
STATE OF CALIFORNIA

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

Michelle M. Garcia, C.E.G.
Engineering Geologist 2668

CERTIFIED ENGINEERING GEOLOGIST
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STATE OF CALIFORNIA

BAT/MMG/jg

cc. Monterey County Resource Management Agency Divisions of Planning and Building Inspection

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SOIL SURVEYS GROUP INC.

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

GEOTECHNICAL INVESTIGATION

FOR THE PROPOSED SINGLE FAMILY RESIDENCE

TO BE LOCATED AT 3306 MARTIN ROAD

APN 009-321-007

CARMEL, CALIFORNIA

MR. PAT CORRIGAN

JANUARY 3, 2019; JOB #7246

I. INTRODUCTION:

This Geotechnical Investigation was made to determine the suitability of the soils at the project site for the proposed single family residence with detached garage to be located at 3306 Martin Road, APN 009-321-007, in Carmel, California. Two borings were drilled on November 8, 2018, for geotechnical investigative purposes. Core samples were taken from the boringS for laboratory testing. The boring logs, our field observations, and field and laboratory test data were analyzed to determine the following:

1. **Suitability of the soils at the project site for the proposed new residence with detached garage.**
2. **Unsuitable or unstable soil conditions, if any.**
3. **Foundation design criteria for the proposed buildings.**
4. **Subsurface groundwater and soil moisture considerations.**
5. **Surface drainage considerations.**
6. **Analysis of seismic hazards and seismic design factors per the 2016 California Building Code.**

Site Setting: The project consists of a new single family residence with a detached garage within the northern half of the subject parcel. The 0.46 acre parcel is located on the south side of Martin Road, approximately 0.32 kilometers west of the intersection of Martin Road and Hatton Road, in Carmel, California. The site slopes gently at an approximate gradient of 10 percent from the northwest to southeast within the northerly half of the parcel, and increasing to over forty percent at the southern end of the property. Vegetation has been recently removed within the building. A driveway will be constructed north of the residence location. There is no evidence of major erosion, mass movement, or sliding on the at the subject site.

II. LABORATORY TEST DATA[1]:

Fifteen moisture density tests were made from the driven core samples. Standard Penetration Tests (SPT) were performed with a Terzaghi Split Spoon sampler. Core samples were also taken with a 2 ½-inch interior diameter (i.d.) Modified California Sampler. All samplers were driven into the soil by a 140 lb. hammer. The samplers were dropped a vertical distance of 30 inches at the sample location. Results of these tests are shown as follows:

MOISTURE DENSITY TESTS

Boring No.	Depth/ Ft.	Water Content %	Dry Density p.c.f.	Standard penetration Tests, Blows /foot	Pocket Penetrometer Tons S.F.
B-1	1.5-2	14.3	94.8	17(10)*	>4.5
B-1	2-2.5	15.3	105.2	27(16)*	>4.5
B-1	3.5-4	14.0	87.8	24	>4.5
B-1	5-5.5	13.0	93.7	30	>4.5
B-1	9-9.5	11.5	109.5	71	>4.5
B-1	13-13.5	12.7	109.4	43	>4.5
B-1	17-17.5	9.4	95.3	39	1.5
B-1	21-21.5	14.1	96.5	37	1.25
B-2	2-2.5	19.3	86.1	12	3.25
B-2	4-4.5	12.2	117.6	25	4.5
B-2	5.5-6	11.2	84.9	67	>4.5
B-2	9-9.5	10.9	96.0	56	>4.5
B-2	13-13.5	9.5	109.7	32	>4.5
B-2	17-17.5	7.1	88.9	47	4.25
B-2	21-21.5	8.1	104.0	70	0.5

* = 2.5-inch mod. Cal not SPT, ( ) = value adjusted to approximate SPT values

[1] Boring Logs are located in Appendix A

Four 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

Boring No.	Depth/ Ft.	Sieve No. 4	Sieve No. 10	Sieve No. 20	Sieve No. 30	Sieve No. 40	Sieve No. 100	Sieve No. 200
B-1	1.5-2	97	95	90	87	83	68	58
B-1	9-9.5	99	98	95	91	84	62	53
B-2	2-2.5	99	98	93	90	86	71	64
B-2	4-4.5	98	96	91	87	79	55	43

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

PLASTICITY INDEX TEST

Boring No.	Depth/ Feet	% Passing Sieve No. 40	% Passing Sieve No. 200	Liquid Limit	Plastic Limit	Plasticity Index
B-1	1.5-2	83	58	52	15	37
B-1	9-9.5	84	53	36	14	22
B-2	2-2.5	86	64	56	21	35
B-2	4-4.5	79	43	33	13	20

The test results for samples taken from the borings indicate that the fine fraction of the near surface fine to coarse grained silty, sandy clays encountered in Boring 1 at 1.5 to 2.0 feet and in Boring 2 at 2.0 to 2.5 feet in depth feet are slightly to moderately plastic and moderately to highly expansive. The fine fraction of the deeper subsurface silty, clayey, fine grained sand encountered in Boring 1 at 9.0 to 9.5 feet and in Boring 2 at 4.0 to 4.5 feet are slightly plastic and moderately expansive.

Boring 1 was located towards the front of the parcel , approximately 35 feet south of Martin Road and 30 feet west of the easterly property boundary, near the westerly edge of the proposed detached garage, as shown on Figure II. The near surface soil consists of very loose silty sand with gravel fill to a depth of one foot and of medium dense, silty, clayey, fine to coarse grained sands to a depth of three feet, underlain by verystiff sandy, silty, clay to a depth of eight feet. Below eight feet n depth the soil consists of very dense, silty, clayey, fine to coarse grained sand to 11.5 feet, underlain by very stiff silty, sandy clay to a depth of thirteen feet. Belo thirteen feet in depth the soil consists of dense, silty, clayey, fine to coarse grained Boring 2 was located within the middle of the eastern edge of the proposed residence location, as showsands to a depth of sixteen feet, underlain by dense slightly silty, fine to coarse grained sands with gravels to a depth of twenty feet and of dense silty, clayey, fine to coarse grained decomposed granitic sand with thin veins of clay to the bottom of the boring at 21.5feet in depth.

Boring 2 was located approximately 60 feet south of Martin Road and 15 feet east of the west property boundary, within the middle of the westerly third of the proposed residence. The near surface soil consists of soft sandy, clayey, silt to a depth of one foot over stiff sandy, silty, clays to three feet in depth. Below three feet in depth the soil consists of medium dense to very dense silty, clayey sands to a depth of eight feet, where the soil consists of hard, silty, sandy clays to a depth of 12 feet underlain by dense silty, clayey, fine to coarse grained sands with gravels to a dept of 13.5 feet. Below 13.5 feet in depth the soil consists of dense to very dense silty fine to coarse grained sands with gravels to the bottom of the boring at 21.5 feet in depth.

No free groundwater was observed in the borings to a maximum explored depth of 21.5 feet. The actual depth to groundwater during rainy months 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 boring locations except for loose/soft soil up to 1.5 feet in depth and slightly to moderately expansive soils at footing depths. In our opinion, the site is suitable for the proposed new residence with the recommendations made herein, specifically the recommendations for the recompaction of loose soil and the mitigation of expansive soils.

IV. RECOMMENDED FOUNDATION DESIGN CRITERIA:

Spread footings may be used for the building foundations after the site is cleared, grubbed and the proposed building pads are subexcavated and recompacted (up to 1.5 feet is anticipated). Spread footings shall be installed to a minimum depth of 18 inches for both one and two story portions of the proposed residence. The minimum depths shall be measured from the **inside building pad soil subgrade.** Mitigation for recompaction of any loose/soft soil conditions must be followed.

Allowable foundation pressures after any recompaction of the building pad areas are:
Continuous footings = 1500p.s.f.
Isolated rectangular footings = 1800 p.s.f.

Continuous footings shall be reinforced with four #4 steel reinforcement bars; two placed near the bottom of the footing and two placed near the top of the footing. Spread footings shall also meet the minimum requirements of the 2016 California Building Code and the County of Monterey Building ordinances for width, thickness, embedment and reinforcement steel. The new residence and any future building additions shall be designed in strict accordance with the requirements specified in the 2016 California Building Code, or latest approved edition, to resist seismic forces.

All 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 12 inches on center or #4 steel reinforcement bars placed 24 inches on center, each way and shall extend into perimeter foundation. *The reinforcement 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 slabs-on-grade shall be underlain by an approved 15 mil. vapor barrier installed over a minimum four inch thick open graded gravel capillary break with two inches of clean sand placed over the vapor barrier as recommended in Section VIII-C herein. ***Concrete slabs shall have***

weakened plane joints a maximum of fifteen feet on center, each way. All concrete shall be properly cured with an approved curing compound or wetted burlap for a minimum of 14 days.

A. Concrete Sidewalks and Outside Flatwork:
We recommend that any new on-site concrete sidewalks and outside flatwork be at least five inches thick and be placed over a compacted subgrade. 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 away from the new project buildings is achieved. It is assumed that the outside concrete flatwork will be subjected only to pedestrian traffic.

V. LOOSE/SOFT AND EXPANSIVE SOIL MITIGATIONS:

To mitigate the effects of the loose/soft and expansive near surface soil conditions, the following measures are recommended:

1. Existing loose soil within the proposed residence building pad and extending a minimum of five feet in all directions outside of the proposed building foundations shall be recompacted **as necessary** to 90 percent relative compaction at the direction of Soil Surveys Group, Inc. prior to placing additional building pad fill or finishing the building pad subgrade. Soil Surveys Group, Inc. shall determine the depth of recompaction within the building perimeter (up to 1.5 feet from existing grade is anticipated). Subexcavation and recompaction should be extended under any proposed patios or other permanent flatwork. If no subexcavation required, the building pad should be scarified a minimum of 12 inches, moisture conditioned and recompacted to 90 percent relative compaction.

2. Spread footings shall be constructed a minimum of 18 inches deep for both one and two story portions of the proposed new residence as measured from the lowest adjacent grade, and continuous non-retaining footings shall be reinforced with four #4 reinforcement bars, two placed near the bottom and two placed near the top of footing.

3. All new 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 12 inches on center or #4 steel reinforcement bars at 24 inches on center, each way and shall be bent to extend a minimum of eight inches into the perimeter footing.

4. The foundation excavations shall be flooded with three to four inches of water at least 24 hours prior to pouring concrete, and 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. 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.

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

6. Soil Surveys Group, Inc. shall be retained to inspect and test the recompaction of all loose/soft native soil and new engineered fill within the building pad perimeter and shall inspect and approve

foundation footing excavations for soil bearing conditions. Soil Surveys Group, Inc. shall also inspect and approve the subgrade below concrete floor and garage slabs prior to placement of reinforcing steel and shall inspect and approve the installation of all 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 during and at completion of grading and during 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 rainfall runoff is concentrated, or the drainage water should be collected and piped to flat ground or discharged onto a rocked energy dissipater down slope of the existing building foundations. Rock energy dissipaters consisting of four inch to six inch diameter rock or rubble rip rap should be installed at collection pipe discharge points to reduce soil erosion. Rain gutter downspouts shall discharge onto concrete splash blocks, or shall discharge into collector pipes. The building site, any new paved areas and ground adjacent to the residence shall be graded so that rainfall runoff does not become trapped or flow against any project building foundations.

The boring logs do not indicate the need for a subsurface drain system. However, the Geotechnical engineer may recommend a system of subsurface drains should wet subsurface soil conditions be encountered during site preparation or excavations for any new building foundations.

VII. RECOMMENDED SPECIFICATIONS:

A. GRADING:

The building pads, extending a minimum of five feet in each direction past new foundation footings shall be cleared and grubbed of all surface vegetation, demolition debris, and organic topsoil before recompacting the original ground, placing engineered fill or finishing the subgrade for the new building pads. On site surface or subsurface grass, roots, deleterious material, or brush (if any) within any new building pad areas shall be removed. Soil Surveys Group, Inc. should determine the exact depth of subexcavation necessary after clearing and grubbing and pad grading are completed, up to 1.5 feet of loose/soft materials were encountered in the borings. All subexcavated soil shall then be backfilled in eight inch loose lifts and recompacted to 90 percent relative compaction, prior to placing engineered fill or finishing subgrade of the new building pads.

Any new cut and fill slopes shall be 2:1 or flatter unless retained. 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 pads shall be compacted to at least 90 percent relative compaction, and any cut portions of the new building pad, if located within both cut and fill, shall be subexcavated a minimum of two feet, backfilled in eight inch loose lifts and recompacted to a minimum of 90 percent relative compaction. The bottom of the keyway should be moisture conditioned, compacted (if necessary) and approved by Soil Surveys Group, Inc. prior to backfilling in eight inch loose lifts and compacting the backfill to 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 1557-12.* Subgrade *in existing soil* beneath the new building pads 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 95 percent relative compaction, and aggregate base beneath new pavement shall be compacted to 95 percent relative compaction. Any imported sandy soil fill placed for the new building pads shall be compacted to a minimum of 95 percent relative compaction.

C. CONCRETE FLOOR SLABS-ON-GRADE:

Subgrade in recompacted soil under any new concrete floor slabs-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, shall be placed over the finished soil subgrade
- a minimum 15 mil. water-proof membrane (such as Stego, Moistop or equal) shall be 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 concrete 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
⅜" 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 percent of maximum density.

4. THICKNESS AND STRENGTH:

Concrete slabs 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., or as specified by the project engineer. If a helical anchor and grade beam foundation system are designed for the residence, the floor slab shall be a minimum of six inches thick and reinforced as a **structural slab.**

5. REINFORCEMENT:

Concrete slabs-on-grade shall be reinforced with a minimum of #3 steel reinforcement bars placed 12 inches on center, each way or #4 reinforcement bars placed 24 inches on center, each way and shall be bent to extend a minimum of eight inches into the perimeter footings.

D. UTILITY TRENCH BACKFILL:

All new on-site utility trenches shall be backfilled with a clean sand having a sand equivalent of 30 or higher. A two feet thick plug of compacted, **clayey soil backfill** or lean concrete shall be required around the pipe or conduit at places where utility trenches intersect the building perimeter. All trench backfill of imported clean sand or clean native sand shall be compacted to 95 percent relative compaction at all locations. Clean native sand shall be approved by Soil Surveys Group, Inc. prior to using for trench backfill.

E. PAVEMENT DESIGN CRITERIA:

A representative composite sample of the native subgrade and an R-value test was run. The R-Value was 48. Based on the Traffic Indices given in the table below, asphalt pavement should consist of the relevant thickness of Hot Mix Asphalt (HMA) over the relevant thickness of Class 2 Aggregate Base (AB), compacted to 95 percent relative compaction. The underlying soil subgrade shall be scarified 12 inches, moisture conditioned recompacted to 95 percent relative compaction. Soil Surveys Group, Inc. shall test and approve the finished soil subgrade and finished subgrade of Class 2 Aggregate Base.

Traffic Index(T.I.)	Thickness of H.M.A.	Thickness of A.B.
4	2.5"	6.0"
5	3.0"	7.5"
6	3.5"	8.5"

VIII. GEOLOGIC AND SEISMIC CONSIDERATIONS:

Monterey County is in a seismically active area of the state of California. The following table provides a list of nearby faults that could produce an earthquake that could impact the project site.

Fault Name	Approximate Distance to Site	Orientation from Site	Data Source
Cypress Point(concealed)	1.46 km	Southwest	Clark and others, 1997
Hatton Canyon (Concealed)	1.49 km	Northeast	Clark and others, 1997
Unnamed (Inferred)	1.77 km	Northwest	Clark and others, 1997
Monterey Bay-Tularcitos	5.5 km	Northeast	Uniform Building Code, 1997
San Gregorio (Sur Region)	8.75 km	West	Uniform Building Code, 1997
Rinconada	20.0 km	Northeast	Uniform Building Code, 1997
Zayante-Vergeles	40.0 km	Northeast	Uniform Building Code, 1997
San Andreas Creeping Section(Pajaro)	46.0 km	Northeast	Uniform Building Code, 1997

The new residence, garage and any future building additions must be designed in strict compliance with the 2016 California Building Code to help withstand such seismically generated ground accelerations for a reasonably expected duration without suffering major damage.

The following are the project site coordinates and the seismic design criteria/coefficients per the requirements of the 2016 California Building Code (CBC):

Site Class	Latitude	Longitude	S_S	S_1	F_a	F_v
D	36.5468°	-121.9150°	1.448	0.531	1.00	1.50

Frame and semi-rigid structures with proper strengthening connections and hold-down fasteners (where needed) are recommended for the new residence and any future building additions. With proper design parameters, seismic damage to the building can be mitigated for 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. Therefore, the potential for surface rupture or lurch cracking is considered to be low.

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 soils underlying the project site are typically dense to very dense, slightly silty, sandy soils and no ground water was encountered in the boring to a maximum explored depth of 21.5 feet. Considering the deeper sandy soils the absence of shallow

groundwater, the potential risk for occurrence of damaging liquefaction or lateral spreading is considered to be low during a strong seismic event.

Differential compaction and settlement occur generally in loose, granular or unconsolidated semi-cohesive soils during severe ground vibration. In our opinion, the risk for soil consolidation caused differential compaction and settlement during a major seismic event is considered to be low.

IX. UNFORESEEN OR UNUSUAL CONDITIONS:

If any unforseen 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, soft or unsuitable pockets of sandy soil within the proposed residence location.
2. Soil with a high organic content at the finished subgrade of the building pads.
3. Any other unforeseen conditions that would require remedial action by the Geotechnical engineer, project engineer, architect or contractor.

X. 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 residence provided all loose/soft near surface soil is recompacted prior to excavating for the new building foundations or finishing the subgrade of the building pads as recommended in Sections V and VII herein.

2. Design criteria for a spread footing foundation system for the project buildings are provided in Sections IV and V. Design criteria for concrete slabs-on-grade are provided in Sections IV, V and VII herein.

3. Surface storm water runoff should be carefully controlled around the proposed residence to provide positive drainage away from the new building foundations as discussed in Section VI herein.

4. The Geotechnical engineer should review the building and site grading plans for compliance with the recommendations herein and may provide additional specific recommendations for surface or subsurface drainage. The Geotechnical engineer shall inspect and approve all new foundation footing excavations.

5. Grading and compaction specifications and specifications for new concrete floor slabs-on-grade are provided in Section VII herein.

6. Seismic considerations are discussed, and geoseismic design coefficients are provided in Section VIII herein per the 2016 CBC. The potential for damaging earthquake related liquefaction is considered to be low at the project site.

XI. LIMITATIONS:

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

This report is issued with the understanding that it is the responsibility of the Owners or his 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 Mr. Pat Corrigan, his 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 and detached garage will be constructed at the project site. The use of this report, boring 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 Soil Surveys Group, Inc. Title to the designs remains with Soil Surveys Group, Inc. without prejudice. Visual contact with this report and drawings 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 Monterey 7.5' Quadrangle

Carmel, CA

FIGURE I: VICINITY MAP

SCALE
1" = 2000'

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

Job #7246

FIGURE II

Boring Locations (approx.)

NO SCALE

N

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Salinas, CA 93901
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BASE: **3306 Martin Road, in Carmel, California**
APN: 009-321-007
Site Image From Google Earth, December 2018 - Job # 7246

APPENDIX A

BORING 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

BORING NO. B-1

PROJECT 3306 Martin Road, Carmel - Corrigan Residence - Job #7246 DATE 11.8.18 LOGGED BY JG

DRILL RIG Central Coast Tractor HOLE DIA. 5" SAMPLER 2.5" Cal & 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 tan silty SAND with light blue-grey fine	SM								
gravelly sand(fill); dry, very loose		1							
			2.5"Cal						
Greyish-brown silty, clayey, fine to coarse grained	SC/CL	2	XXX	17(10)	94.8	14.3	52	15	>4.5
SAND/sandy CLAY; moist, medium dense/very stiff			XXX	27(16)	105.2	15.3			>4.5
		3	SPT						
Grades to: Light grey fine sandy, silty, CLAY;	CL								
slightly moist, very stiff		4	XXX	24	87.8	14.0			>4.5
			SPT						
Light reddish-grey, tan, fine to coarse grained sandy,	CL	5							
silty CLAY; moist, very stiff			XXX	30	93.7	13.0			>4.5
		6							
		7							
		8							
Light grey, tan, reddish-yellow tan silty, clayey, fine	SC/CL		SPT						
to coarse grained SAND/sandy CLAY; moist, very		9							
dense/hard			XXX	71	109.5	11.5	36	14	>4.5
		10							
		11							
Light reddish-olive tan, silty, fine to coarse grained,	CL	12							
sandy CLAY; moist, very stiff			SPT						
		13							
Light olive-tan, silty, clayey, fine to coarse grained	SC		XXX	43	109.4	12.7			>4.5
SAND; moist, dense		14							
		15							
		16							
Light reddish-yellow tan, dark brown, slightly silty,	SM		SPT						
fine to coarse grained, decomposed granitic SAND		17							
with trace shale gravels and black and white			XXX	39	95.3	9.4			1.5
weathered granitic gravels; moist, dense		18							
		19							
		20							

DEPTH 21.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-1 CONTINUED

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Light tan, light grey, dark brown, silty, clayey, fine	SM/SC		SPT						
to coarse grained SAND with thin veins of dark grey		21							
silty clay and shale, sandstone, and decomposed	SM/SC		XXX	37	96.5	14.1			1.25
granitic gravels; moist, dense		22							
Bottom of boring at 21.5'									
		23							
		24							
		25							
		26							
		27							
		28							
		29							
		30							
		31							
		32							
		33							
		34							
		35							
		36							
		37							
		38							
		39							
		40							
		41							
		42							

DEPTH 21.5' Job #7246 SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-2

PROJECT 3306 Martin Road, Carmel - Corrigan Residence - Job #7246 DATE 11.8.18 LOGGED BY JG

DRILL RIG Central Coast Tractor HOLE DIA. 5" SAMPLER 2.5" Cal & 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 reddish-tan, sandy, clayey SILT; slightly	ML								
moist		1							
Light reddish-grey brown sandy, silty CLAY; moist	CL		SPT						
stiff		2							
			XXX	12	86.1	19.3	56	21	3.25
		3							
Light grey tan and reddish-yellow brown, silty,	SC/CL		SPT						
clayey, SAND/sandy CLAY; moist, medium dense/		4							
very stiff			XXX	25	117.6	12.2	33	13	4.5
		5							
Light olive-tan, silty, clayey, fine to coarse grained	SC/SM		SPT						
SAND with scattered fine subangular decomposed		6	XXX	67	84.9	11.2			>4.5
granitic gravels; moist, very dense									
		7							
		8							
Olive-tan silty, fine to coarse grained, sandy CLAY;	CL		SPT						
moist, hard		9							
			XXX	56	96.0	10.9			>4.5
		10							
		11							
		12							
Reddish-yellow tan silty, clayey, fine to coarse	SC		SPT						
grained SAND with scattered subrounded gravels;		13							
moist, dense			XXX	32	109.7	9.5			>4.5
		14							
(Rounded gravels present in cuttings from 13.5' to									
15.5')		15							
		16							
White with reddish iron staining, light tan, light grey	SM		SPT						
slightly clayey, silty, fine to coarse grained SAND		17							
with decomposed granitic gravels; slightly moist,			XXX	47	88.9	7.1			4.25
dense		18							
(Hard drilling, rounded gravels present in cuttings)	SM	19							
Dark reddish-brown, silty, fine to coarse grained									
SAND with rounded gravels	SM	20							

DEPTH 21.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-2 CONTINUED

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Dark reddish-brown, reddish-yellow tan, silty, fine	SM		SPT						
to coarse grained decomposed granitic SAND with		21							
decomposed granitic gravels; moist, very dense.	SM		XXX	70	104.0	8.1			0.5
Bottom of boring @ 21.5'		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 #7246 SOIL SURVEYS GROUP, INC.

APPENDIX B

R-VALUE TEST

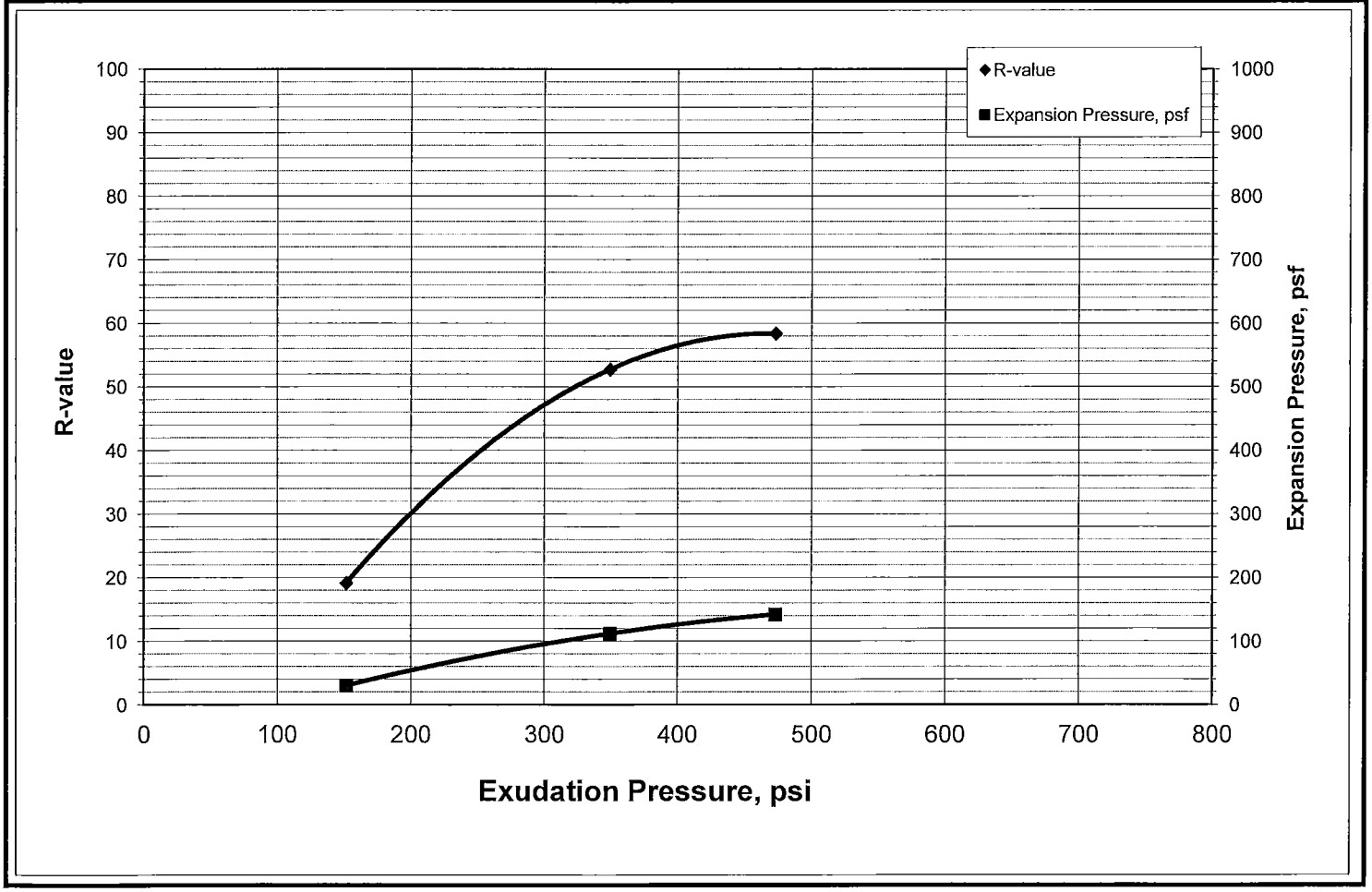
COOPER TESTING LABORATORY

R-value Test Report (Caltrans 301)

Job No.:	699-156	**Date:**	11/21/18	**Initial Moisture,**	8.7
Client:	Soil Surveys Inc	**Tested**	PJ	**R-value**	48
Project:	7246	**Reduced**	RU		
Sample	R-1 @ 1-1.5'	**Checked**	DC	**Expansion Pressure**	100 psf
Soil Type:	Grayish Brown Silty SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	152	349	473	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	65	40	34	
Weight of Soil & Mold, grams	3154	3145	3145	
Weight of Mold, grams	2099	2098	2097	
Height After Compaction, in.	2.54	2.42	2.44	
Moisture Content, %	14.6	12.4	11.8	
Dry Density, pcf	109.8	116.7	116.4	
Expansion Pressure, psf	30	112	142	
Stabilometer @ 1000				
Stabilometer @ 2000	112	56	50	
Turns Displacement	4.52	3.82	3.68	
R-value	19	53	58	

Remarks:



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