Exhibit B

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SOIL SURVEYS GROUP INC.

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

March 1, 2022
Job #8018

Marisa and Harry Jang
3620 Eastfield Road
Carmel, CA 93923

Dear Mrs. and Mr. Jang:

Submitted herewith is the report of our Geotechnical Investigation for the proposed single family residence to be located at 24813 Eastfield Place, APN 015-562-031, near Carmel, California. Three borings were drilled on December 14, 2021 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. 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.

Belinda Taluban

REGISTERED PROFESSIONAL ENGINEER
BELINDA A. TALUBAN
No. 44217
Exp. 6/30/23
CIVIL
STATE OF CALIFORNIA

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

BAT/sj/tr

cc. Monterey County, Housing and Community Development

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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 24813 EASTFIELD PLACE

APN 015-562-031

NEAR CARMEL, CALIFORNIA

MARISA AND HARRY JANG

MARCH 1, 2022; JOB #8018

I. INTRODUCTION:

This Geotechnical Investigation was made to determine the suitability of the soils at the project site for the proposed single family residence to be located at 24813 Eastfield Place, APN 015-562-031, near Carmel, California. Three borings were drilled on December 14, 2021 to depths of 21.5 feet, 21.5 feet, and 13.5 feet, respectively. 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 residence.**
2. **Unsuitable or unstable soil conditions, if any.**
3. **Foundation and retaining wall design criteria for the proposed residence.**
4. **Subsurface groundwater and soil moisture considerations.**
5. **Surface drainage considerations.**
6. **Analysis of seismic hazards and seismic design factors per the 2019 California Building Code.**

II. LABORATORY TEST DATA[1]:

Twenty-two moisture density tests and one shear test 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. The samplers were driven into the soil by a 140 lb. hammer and dropped a vertical distance of 30 inches at each of the sample locations. Results of these tests are shown as follows:

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[1] Boring Log is located in Appendix A

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	2-2.5	33.1	70.7	54	>4.5
B-1	3.5-4	33.5	64.9	64(38)*	>4.5
B-1	5-5.5	43.5	54.2	55	>4.5
B-1	9-9.5	45.6	43.4	36	---
B-1	13-13.5	47.1	50.8	18	3.25
B-1	17-17.5	53.6	47.1	26	3.25
B-1	20.5-21	48.7	54.1	20	1.0
B-1	21-21.5	43.5	53.5	34	---
B-2	1.5-2	42.0	66.7	16(10)*	2.75
B-2	2-2.5	43.0+	68.7+	38(23)*	>4.5
B-2	3.5-4	32.8	72.7	74	---
B-2	4.42-4.92	37.3	67.0	35(21)*	>4.5
B-2	4.92-5.42	41.5	64.7	77(46)*	>4.5
B-2	9-9.5	38.7	58.8	22	---
B-2	13-13.5	33.4	54.0	45	---
B-2	17-17.5	32.9	50.7	50	---
B-2	21-21.5	32.3	67.0	33	---
B-3	2-2.5	41.7	51.1	13	---
B-3	3.5-4	39.0	64.1	23(14)*	>4.5
B-3	4-4.5	40.0	63.7	37(22)*	>4.5
B-3	5.5-6	13.4	62.8	15	---
B-3	9-9.5	39.3	55.3	48	>4.5
B-3	13-13.5	43.2	57.5	35	>4.5

* = 2.5-inch Modified California Sampler ( ) = Adjusted to approximate SPT values
+ = Dry density and moisture content data taken from Shear Test.

Two 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-2	1.5-2	53	46	40	37	34	27	24
B-3	3.5-4	90	80	65	59	52	36	29

Two Plasticity Index (Atterberg Limit) 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-2	1.5-2	34	24	90	31	59
B-3	3.5-4	52	29	60	38	22

The test results for samples taken from the borings indicate that the fine fraction of the near surface silty, clayey shale soils encountered in Boring B-2 at 1.5 to 2.0 feet in depth are highly expansive and moderately plastic. The test results of the silty, clayey shale soils encountered in Boring B-3 at 3.5 to 4.0 feet are moderately expansive and moderately plastic.

One Shear Test was made from a soil sample taken from Boring B-2 at 2.0 to 2.5 feet below surface. Results of this test are summarized as follows (see Appendix B for full report sheet):

Boring No.	Depth/ Ft.	Internal Frict. Angle, φ°	Cohesion, C p.s.f.	Soil Weight p.c.f.	Description of soil
B-2	2.0-2.5	26.2	1300	98.2	Yellow Mottled Dark Gray Clayey GRAVEL with Sand (Weathered Rock)

Boring B-1 was located near the norther portion of the eastern edge of the proposed residence, as shown in Figure II. The near surface soil consists of loose, silty, clayey, fine to coarse grained sand with organics to a depth of one foot underlain by hard, silty shale to a depth of 2.5 feet overlying hard, silty, clayey, fractured shale with veins of clay to a depth of four feet. Below this depth, the soil consists of hard shale with veins of silty clay to a depth of 9.5 feet underlain by very stiff shale to a depth of 17.5 feet overlying very stiff to hard, silty, clayey, fractured shale to the bottom of the boring at 21.5 feet in depth.

Boring B-2 was located near the center portion of the eastern (rear) edge of the proposed residence, as shown in Figure II. The near surface soil consists of soft, silty, clayey, fractured shale to a depth of one foot overlying stiff to hard, siliceous shale and fractured shale with veins of silty clay to a depth of 5.5 feet. Below this depth, the soil consists of very stiff, silty, clayey, weathered shale to a depth of 9.5 feet overlying

hard, fractured shale with veins of clay to a depth of 16.5 feet underlain by hard, silty, clayey, siliceous shale to the bottom of the boring at 21.5 feet in depth.

Boring B-3 was located near the southwestern corner of the proposed residence, as shown in Figure II. The near surface soil consists of loose, silty sand with fractured shale to a depth of one foot overlying stiff, fractured shale with veins of silty clay to a depth of 2.5 feet. Below this depth, the soil consists of stiff to very stiff, siliceous shale to a depth of 6.5 feet overlying hard, siliceous shale to the bottom of the boring at 13.5 feet in depth.

No groundwater was encountered in the borings to a maximum depth explored of 21.5 feet below ground surface, prior to backfilling the borings with soil cuttings. 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 soft/loose soil in the upper one to two feet and moderately to highly expansive soils at potential footing depths. In our opinion, the site is suitable for the proposed residence with the recommendations made herein, specifically, the recommendations for the recompaction of all soft/loose soils and mitigation of the expansive soils.

IV. RECOMMENDED FOUNDATION DESIGN CRITERIA:

Spread footings may be used for the proposed building foundations after the site is cleared, grubbed, and the proposed building pad is graded, compacted, and properly prepared. Spread footings shall be installed to a minimum depth of 18 inches for both one and two story foundations. The minimum depths shall be measured from the **inside building pad soil subgrade.** Mitigation for recompaction of soft/loose soil conditions must be followed.

Allowable foundation pressures after compaction of the building pad area are:

Continuous footings	**= 1700 p.s.f.**
Isolated rectangular footings	**= 2000 p.s.f.**
Lateral soil passive pressure	**= 150 p.s.f.**

Continuous footings shall be reinforced with four #4 steel reinforcement bars, two placed near the bottom of the footing and two near the top of footing. Spread footings shall also meet the minimum requirements of the 2019 California Building Code and the County of Monterey Building ordinances for width, thickness, embedment and reinforcement steel. The proposed residence and any future building additions shall be designed in strict accordance with the requirements specified in the 2019 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.

Soil Surveys Group, Inc. shall inspect and approve the foundation footing excavations and the subgrade beneath concrete floor slabs 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 building construction.

A. Concrete Sidewalks and Outside Flatwork:
We recommend that any new on-site concrete sidewalks and outside non-vehicle flatwork will be at least four inches thick and be placed over a compacted sandy 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 project building is achieved. It is assumed that outside concrete flatwork in pedestrian use areas will be subjected only to pedestrian traffic.

V. SOFT/LOOSE AND EXPANSIVE SOIL MITIGATION:

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

1. All soft/loose soil within the proposed 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 perimeters after clearing, grubbing, and pad grading are completed, as up to one to two feet of loose materials were encountered in the borings. The bottom of the subexcavation should be scarified a minimum of 12 inches, moisture conditioned, and recompacted to 90 percent relative compaction. Subexcavation and recompaction should be extended under any proposed patios or other permanent flatwork. If no subexcavation is required, the building pad should be scarified a minimum of 12 inches, moisture conditioned, and recompacted to 90 percent relative compaction.

2. If the proposed residence will bear on both cut and fill, the cut portion of the building pad shall be subexcavated, backfilled and recompacted a minimum of two feet deep so that the entire structure overlies engineered fill prior to adding new fill or excavation of the foundation footings.

3. Spread footings shall be constructed a minimum of 18 inches for both one and two story portions of the proposed 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 of the footing and two at the top of the footing.

4. 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.

5. 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.

6. 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.

7. Soil Surveys Group, Inc. shall be retained to inspect and test the recompaction of all soft/loose 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 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 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 building shall be graded so that rainfall runoff does not become trapped or flow against any new or existing building foundations.

The boring log do not indicate the need for a shallow 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. RETAINING WALL DESIGN CRITERIA:

The following design criteria are recommended for the retaining wall:

Friction Angle	*$\varphi = 26.2°$*
Cohesion	*$c = 1300$ p.s.f.*
Soil Weight,	*$w = 98.2$ 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,	*= 55 p.c.f., restrained condition, level grade behind wall*
Equivalent fluid pressure, passive	*= 254 p.c.f.*
Sliding friction	*$f = 0.30$*
Allowable Footing Toe Pressure	*= 2700 p.s.f. plus ⅓ additional for seismic force (if added)*

Retaining walls that are more than six 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. The estimated seismically generated ground acceleration to be used for this site is:
PGA = 0.556g

Cantilever Retaining Walls:
RHGA = 0.227g = k_h
w =98.2 p.c.f.
The resultant seismic force is calculated by the formula: ½ w H^2 k_h per linear foot of retaining wall, or for this case **$11.2H^2$**, ***where H is the height of the retaining wall. These forces, where needed, should be applied at a height of 0.33H above the base of the retaining wall and must be combined with the force produced by active soil pressure.***

Basement Walls:
RHGA = 0.310g = k_h
w =98.2 p.c.f.
The resultant seismic force is calculated by the formula: ½ w H^2 k_h per linear foot of retaining wall, or for this case **$15.2H^2$**, ***where H is the height of the retaining wall. These forces, where needed, should be applied at a height of 0.40H above the base of the retaining wall and must be combined with the force produced by active soil pressure.***

Cantilever Walls with Sloped Backfill:
Dynamic Load Coefficient =0.382g = k_h
w =98.2 p.c.f.
The resultant seismic force is calculated by the formula: ½ w H^2 k_h per linear foot of retaining wall, or for this case **$18.8H^2$**, ***where H is the height of the retaining wall. These forces, where needed, should be applied at a height of 0.40H above the base of the retaining wall and must be combined with the force produced by active soil pressure.***

This retaining wall design criteria is based on a fully drained condition. Therefore, we recommend that a four-inch diameter perforated NDS or PVC pipe be installed behind the wall and along the top of the footing, holes placed down, for 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 within one foot of the level of retained soil (a minimum of one foot above the top of the pipe). 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. When installation of the drain rock is not physically possible, 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 building pad, 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 pad. On site surface or subsurface grass, roots, deleterious material, or brush (if any) within

the new building pad area shall be removed. Soil Surveys Group, Inc. should determine the exact depth of subexcavation necessary after clearing, grubbing, and pad grading are completed, as up to one to two feet of loose materials were encountered in the borings. The bottom of the subexcavation shall be scarified 12 inches, moisture conditioned and recompacted to 90 percent relative compaction. 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 pad. If no subexcavation required, the building pads should be scarified a minimum of 12 inches, moisture conditioned and recompacted to 90 percent relative compaction.

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 pad 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. All fills placed on slope grades of 5:1 or greater shall be provided with a keyway excavated a minimum of two feet below grade, a minimum of 10 feet wide and at a 2% slope into the slope. 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 pad shall be compacted to 90 percent relative compaction. 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 pad 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.

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.

IX. 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
Hatton Canyon (Certain)	0.82 km	South	Clark and Others, 1997
Unnamed (Inferred)	0.50 km	Northwest	Clark and Others, 1997
Unnamed (Inferred)	1.21 km	Northeast	Clark and Others, 1997
Sylvan Thrust (Inferred)	1.37 km	Northeast	Clark and Others, 1997
Sylvan Thrust (Inferred)	1.75 km	North	Clark and Others, 1997
Sylvan Thrust (Inferred)	1.96 km	Northeast	Clark and Others, 1997
Unnamed (Inferred)	1.75 km	West	Clark and Others, 1997
Unnamed (Inferred)	1.92 km	Southwest	Clark and Others, 1997
Navy (Inferred)	3.80 km	Southwest	Clark and Others, 1997
Unnamed- Inferred	3.64 km	Northeast	Clark and Others, 1997
Monterey Bay-Tularicitos	4.0 km	Northeast	Uniform Building Code, 1997
San Gregorio (Sur Region)	9.5 km	Southwest	Uniform Building Code, 1997
Rinconada	18.0 km	Northeast	Uniform Building Code, 1997
Zayante-Vergeles	38.25 km	Northeast	Uniform Building Code, 1997
San Andreas (Pajaro Section)	44.5 km	Northeast	Uniform Building Code, 1997

The proposed residence and any future building additions must be designed in strict compliance with the 2019 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 2019 California Building Code (CBC):

Site Class	Latitude	Longitude	S_S	S_1	F_a	F_v
D	36.5650	-121.9040	1.272	0.477	1.0	1.823*

* The seismic response coefficient Cs shall be determined by Eq. (12.8-2) for values of $T \leq 1.5T_S$ and taken equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_S$ or Eq. (12.8-4) for $T > T_L$.

Frame and semi-rigid structures with proper strengthening connections and hold-down fasteners (where needed) are recommended for the proposed residence and any future building additions. With proper design parameters, seismic damage to the buildings 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 very stiff to hard, silty, clayey shale soils and no groundwater was encountered to a maximum depth explored of 21.5feet in depth. Considering the deeper very stiff to hard, silty, clayey shale soils and the absence of 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, provided that any near surface soil within the building pad area is recompacted as recommended herein.

X. UNFORESEEN OR UNUSUAL CONDITIONS:

If any unforseen or unsuitable soils conditions are found during grading or construction of the proposed 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 building site.
2. Soil with a high organic content at the finished subgrade of the building pad.
3. 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 residence provided all soft/loose near surface soil is recompacted prior to excavating for the new building foundations or finishing the subgrade of the building pad as recommended in Sections V and VIII herein.

2. Design criteria for a spread footing foundation system for the project residence is provided in Sections IV and V. Retaining wall design criteria is provided in Section VII. Design criteria for concrete slabs-on-grade are provided in Sections IV, V, and VIII herein.

3. Mitigation for soft/loose and expansive soil conditions at the project site are provided in Section V herein.

4. Surface drainage and erosion considerations are discussed in Section VI herein. Surface storm water runoff should be carefully controlled to provide **positive drainage away** from new and existing buildings.

5. The Geotechnical engineer should review the foundation and site grading plans for compliance with the recommendations herein and may provide additional specific recommendations for surface and subsurface drainage. The Geotechnical engineer shall inspect and approve all footing excavations and shall inspect, test, and approve recompaction of the building pad.

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

7. Seismic considerations are discussed and geoseismic design coefficients are provided in Section IX herein. The potential for damaging earthquake related liquefaction and lateral spreading is considered to be low at the project site.

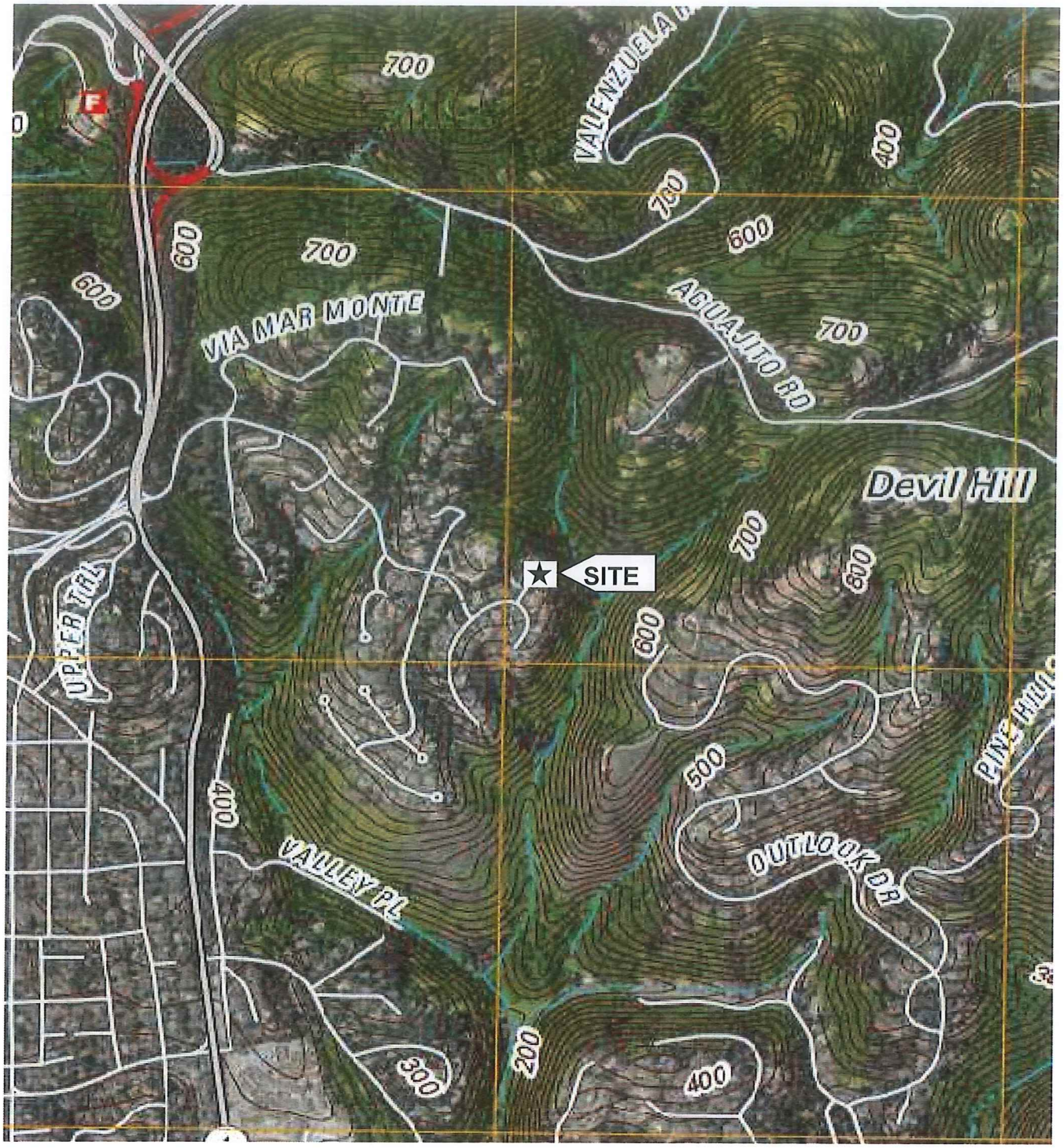
XII. LIMITATIONS:

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 three 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 X).

This report is issued with the understanding that it is the responsibility of Marisa and Harry Jang 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 Marisa and Harry Jang, 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 at the project site, as shown on the Figure II map enclosed herein. 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

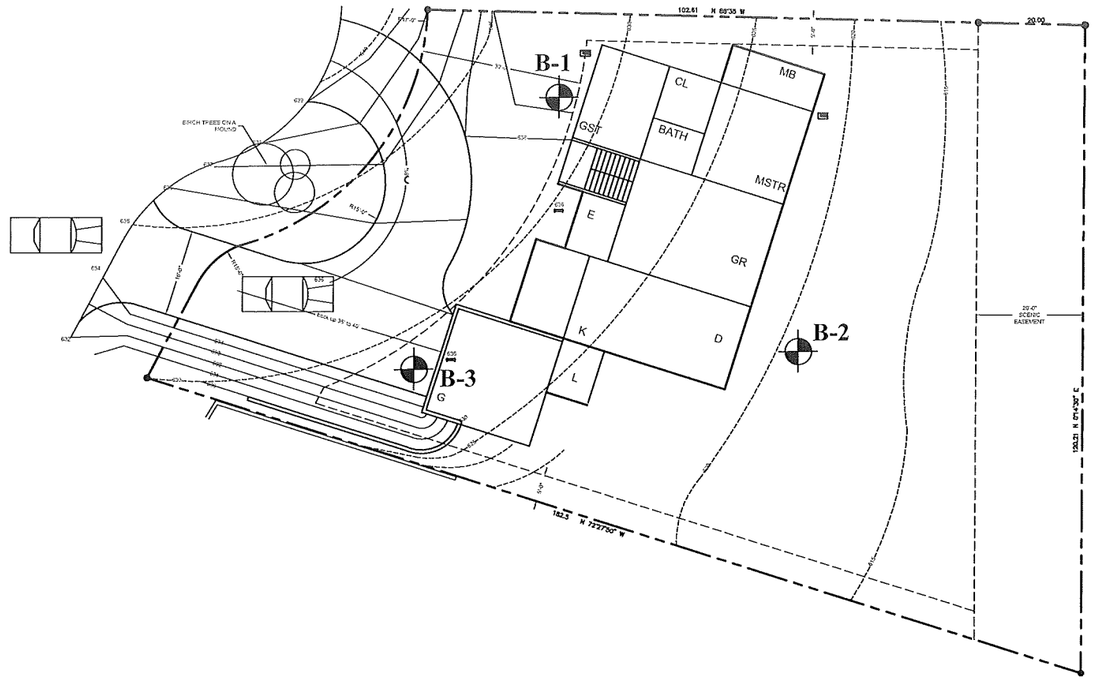
Carmel, CA

FIGURE I: VICINITY MAP

NO SCALE

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

Job #8018



North

No Scale

Base: 24813 Eastfield Place, in Carmel, California
APN:015-562-031
Site Plan by G David CASE Architecture - November 2021 - Job #8018

Figure II

Boring Locations (Approx.)

Soil Surveys Group, Inc.
103 Church Street
Salinas, CA 93901
(831)757-2172
info@soilsurveys.net

APPENDIX A

BORING LOG

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 24813 Eastfield Place, Carmel | Job #8018 | DATE 12.14.21 | LOGGED BY JG/WA

DRILL RIG Central Coast Drilling Tractor | HOLE DIA. 6" | SAMPLER Terzaghi Split Spoon (SPT) & 2.5" 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 reddish-brown, silty, clayey, fine to coarse	SM/SC								
grained SAND with organics; moist, loose		1							
Olive, yellowish-tan, silty, siliceous SHALE; moist,	TM/ML		SPT	14,19,35					
hard		2							
			1-1-1	54	70.7	33.1			>4.5
		3							
Olive, yellowish-tan, silty, clayey, fractured SHALE	TM/ML		2.5"Cal	14,50/6"					
with thin veins of dark brown clay; moist, hard		4	1-2-2	64(38)	64.9	33.5			>4.5
Olive, yellowish-tan, fractured SHALE with thin	TM/ML		SPT	15,19,36					
veins of silty clay; moist, hard		5							
			1-3-3	55	54.2	43.5			>4.5
		6							
		7							
		8							
Light tan, fractured, diatomaceous SHALE with thin	TM/ML		SPT	6,15,21					
veins of silty clay; moist, hard		9							
			1-4-4	36	43.4	45.6			---
		10							
		11							
		12							
Light yellowish-tan, olive-gray, with reddish iron	TM/ML		SPT	2,2,16					
staining, siliceous SHALE; moist, very stiff		13							
			1-5-5	18	50.8	47.1			3.25
		14							
		15							
		16							
Light yellowish-tan, with brownish-red iron	TM/ML		SPT	10,10,16					
staining, SHALE with veins of silty clay; moist,		17							
very stiff			1-6-6	26	47.1	53.6			3.25
		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)
Olive-gray, light yellowish-tan, silty, clayey,	TM/ML		SPT	6,14,20					
fractured SHALE with iron staining; moist, very		21	1-7-7	20	54.1	48.7			1.0
stiff to hard. Bottom of boring at 21.5'.	TM/ML		1-8-8	34	53.5	43.5			---
		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#8018 SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-2

PROJECT 24813 Eastfield Place, Carmel | Job #8018 | DATE 12.14.21 | LOGGED BY JG/WA

DRILL RIG Central Coast Drilling Tractor | HOLE DIA. 6" | SAMPLER Terzaghi Split Spoon (SPT) & 2.5" 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)
Dark brown, silty, clayey, fractured SHALE with	TM/CL								
organics; wet, soft		1							
Light tan, siliceous SHALE with iron staining	TM/CH		2.5"Cal	6,10,28					
and thin veins of dark brown, silty clay; moist,		2	2-1-9	16(10)	66.7	42.0	90	31	2.75
stiff to very stiff			2-2-10	38(23)	68.7	43.0	shear	test	>4.5
Light yellowish-tan, gray, silty, fractured SHALE	TM/ML	3	SPT	12,24,50/6"					
with thin veins of silty clay; moist, hard									
		4	2-3-11	74	72.7	32.8			---
Light tan, olive-gray, fractured SHALE with iron	TM/ML		2.5"Cal	8,27,50/6"					
staining and thin veins of silty clay; moist, very stiff		5	2-4-12	35(21)	67.0	37.3			>4.5
to hard			2-5-13	77(46)	64.7	41.5			>4.5
		6							
		7							
		8							
Light yellowish-tan, gray, olive, silty, clayey,	ML		SPT	10,10,12					
weathered SHALE; moist, very stiff		9							
			2-6-14	22	58.8	38.7			---
		10							
		11							
		12							
Light yellowish-tan, silty, sandy, fractured SHALE	ML		SPT	12,25,20					
with iron staining and thin veins of clay; moist,		13							
hard			2-7-15	45	54.0	33.4			---
		14							
		15							
		16							
Light tan, olive-gray, fractured SHALE with iron	ML		SPT	50/6"	50.7	32.9			---
staining and thin veins of silty clay; moist, hard		17							
		18							
		19							
		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)
Light yellowish-tan, light gray, olive, silty, clayey,	TM/ML		SPT	10,15,18					
siliceous SHALE; moist, hard		21							
Bottom of boring at 21.5'	TM/ML		2-9-17	33	67.0	32.3			---
		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#8018 SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-3

PROJECT 24813 Eastfield Place, Carmel | Job #8018 | DATE 12.14.21 | LOGGED BY JG/WA

DRILL RIG Central Coast Drilling Tractor | HOLE DIA. 6" | SAMPLER Terzaghi Split Spoon (SPT) & 2.5" 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)
Dark brown, light tan, silty, SAND with fractured	SM								
shale and organics; wet, loose		1							
Light tan, fractured SHALE with iron staining and	ML		SPT	4,5,8					
veins of dark brown, silty clay; moist, stiff		2							
			3-1-18	13	51.1	41.7			---
		3							
Light tan, dark brown, silty, clayey, siliceous	ML/MH		2.5"Cal	6,17,20					
SHALE; moist, stiff to very stiff		4	3-2-19	23(14)	64.1	39.0	60	38	>4.5
			3-3-20	37(22)	63.7	40.0			>4.5
Olive-gray, siliceous SHALE with silty sand; moist,	ML/SM	5	SPT	8,7,8					
stiff									
		6	3-4-21	15	62.8	13.4			---
		7							
		8							
Light tan, with reddish-grey iron staining, silty	ML/CL		SPT	17,20,28					
clayey, siliceous SHALE; moist, hard		9							
			3-5-22	48	55.3	39.3			>4.5
		10							
		11							
		12							
Light yellowish-tan, gray, siliceous SHALE with	ML/CL		SPT	2,10,25					
iron staining and veins of silty, clayey sand; moist		13							
hard. Bottom of boring at 13.5'.	ML/CL		3-6-23	35	57.5	43.2			>4.5
		14							
		15							
		16							
		17							
		18							
		19							
		20							

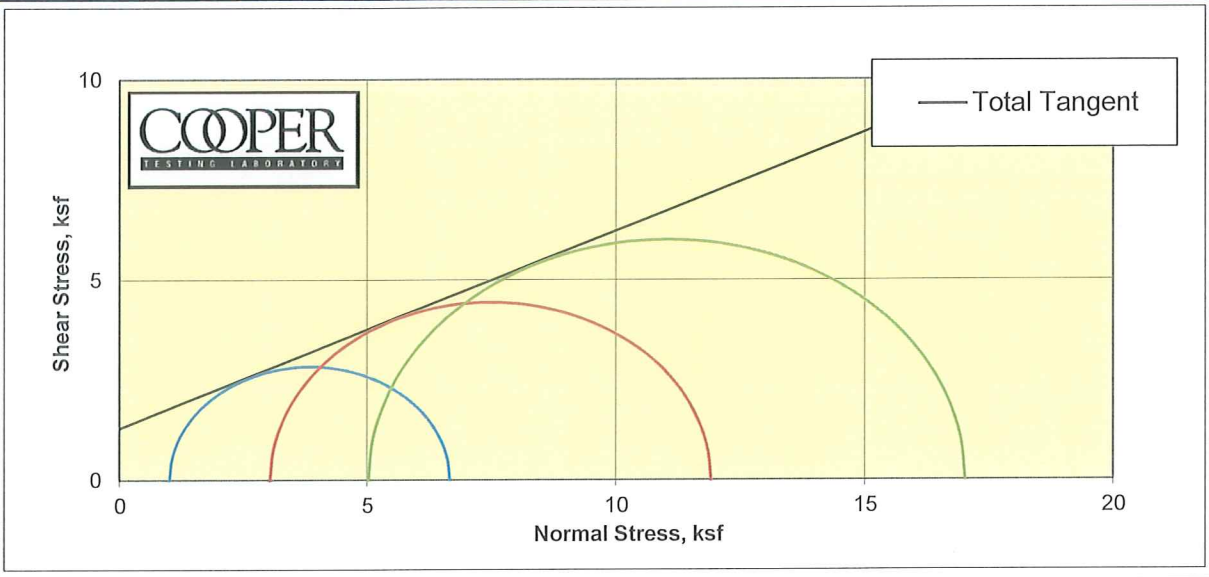
DEPTH 13.5'

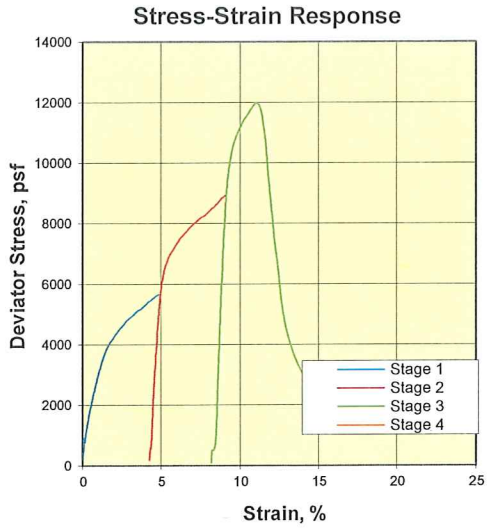
SOIL SURVEYS GROUP, INC.

APPENDIX B

DIRECT SHEAR TESTS

Staged Consolidated Undrained Triaxial Compression
ASTM D4767m





CTL Number:	699-304
Client Name:	Soil Surveys Inc
Project Name:	Eastfield Place
Project Number:	8018
Date:	1/7/2022 By: MD/DC
Total C	1.300 ksf
Total phi	26.2 degrees
Eff. C	N/A ksf
Eff. Phi	N/A degrees ©

Remarks: +1" fragment noted after shear.

Stage	1	2	3	4
Boring	B-2			
Sample	2-2-9			
Depth	2			
Visual Description	Yellow Mottled Dark Gray Clayey GRAVEL w/ Sand (Weathered Rock)			
MC (%)	43.0			
Dry Density (pcf)	68.7			
Saturation (%)	78.1			
Void Ratio	1.543			
Diameter (in)	2.42			
Height (in)	5.03			
	Final			
MC (%)	54.8	53.6	52.9	
Dry Density (pcf)	69.0	69.9	70.4	
Saturation (%)	100.0	100.0	100.0	
Void Ratio	1.535	1.501	1.481	
Diameter (in)	2.42	2.45	2.50	
Height (in)	5.02	4.81	4.61	
Cell Pressure (psi)	86.8	100.8	114.8	
Back Pressure (psi)	79.8	79.7	79.9	
	Total Stresses At:			
Strain (%)	5.0	5.0	3.1	
Deviator (ksf)	5.657	8.879	11.993	
Excess PP (psi)				
Sigma 1 (ksf)	6.669	11.911	17.018	
Sigma 3 (ksf)	1.012	3.032	5.026	
P (ksf)	3.840	7.472	11.022	
Q (ksf)	2.829	4.439	5.996	
Stress Ratio	6.592	3.928	3.386	
Rate (in/min)	0.0252	0.0248	0.0249	

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