TRAVELERS STATION

Geotechnical / Soils Evaluation

Surveys Group Inc.

July, 2019

SOIL SURVEYS GROUP INC.

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

July 9, 2019
Job #7352

Mr. Al Saleh
8 Williams Road
Salinas, CA 93905

Dear Mr. Saleh:

Submitted herewith is the report of our Geotechnical Investigation for the proposed gas station, market and tank pad to be located near the corner of Highway 129 and Highway 101, APN 012-030-023, in San Juan Bautista, California. Three borings were drilled on May 10, 2019, 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 market and gas station with above ground tanks. 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 A. Taluban, P.E.
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Engineering Geologist 2668

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BAT/MMG/mmg

cc. County of San Benito

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SOIL SURVEYS GROUP INC.
103 CHURCH ST • SALINAS, CALIFORNIA 93901 • TELEPHONE (831) 757-2172

GEOTECHNICAL INVESTIGATION

FOR THE PROPOSED GAS STATION AND MARKET

TO BE LOCATED NEAR THE INTERSECTION

OF HIGHWAY 129 AND HIGHWAY 101

APN 012-030-023

SAN JUAN BAUTISTA, CALIFORNIA

MR. AL SALEH

JULY 9, 2019; JOB #7352

I. INTRODUCTION:

This Geotechnical Investigation was made to determine the suitability of the soils at the project site for the proposed gas station, market, and tank pad to be located near the intersection of Highway 129 and Highway 101, APN 012-030-023, in San Juan Bautista, California. Three borings were drilled on May 10, 2019 to depths of 31.5 feet, 21.5 feet and 21.5 feet, respectively, 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 gas station and market.**
2. **Unsuitable or unstable soil conditions, if any.**
3. **Foundation design criteria for the proposed construction.**
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 the construction of a market and a gas station with above ground tank within the property. The subject 2.5 acre parcel is located to the southwest of the Highway 129 and Highway 101 intersection within San Benito County and is currently undeveloped. The site slopes gently to the south. There is no evidence of major erosion, mass movement, or sliding on the at the subject site.

II. LABORATORY TEST DATA[1]:

Twenty moisture density tests were made from the driven core samples. Standard Penetration Tests (SPT) were performed with a Terzaghi Split Spoon sampler driven into the soil by a 140 lb. hammer dropped a vertical distance of 30 inches at the sample locations. 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	2-2.5	18.0	93.3	20	2.25
B-1	4-4.5	16.7	101.1	11	2.25
B-1	6-6.5	22.6	76.5	11	2.25
B-1	11-11.5	10.1	71.8	23	2.0
B-1	16-16.5	8.6	86.3	21	0.75
B-1	21-21.5	8.0	105.5	26	---
B-1	26-26.5	28.1	101.9	11	1.5
B-1	31-31.5	30.7	99.2	20	3.0
B-2	2-2.5	6.0	90.6	10	---
B-2	4-4.5	35.3	50.1	4	---
B-2	6-6.5	15.1	81.2	15	2.0
B-2	11-11.5	20.0	92.0	17	3.5
B-2	16-16.5	18.8	86.3	11	3.25
B-2	21-21.5	30.5	90.7	10	0.75
B-3	2-2.5	13.8	94.8	16	4.25
B-3	4-4.5	20.8	89.2	13	3.0
B-3	6-6.5	23.8	86.5	8	1.0
B-3	11-11.5	12.5	92.3	21	3.75
B-3	16-16.5	15.3	88.4	17	4.0
B-3	21-21.5	27.4	99.9	8	1.0

[1] Boring Logs are located in Appendix A

Five 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	2-2.5	100	99	97	96	93	56	47
B-1	11-11.5	100	100	100	100	100	97	82
B-2	2-2.5	82	77	69	62	53	23	17
B-2	4-4.5	94	85	78	74	68	47	40
B3	2-2.5	100	100	99	98	95	47	36

Five 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	2-2.5	93	47	35	15	20
B-1	11-11.5	100	82	33	19	14
B-2	2-2.5	53	17	20	15	5
B-2	4-4.5	68	40	39	30	9
B-3	2-2.5	95	36	25	14	11

The test results for samples taken from the borings indicate that the fine fraction of the near surface and subsurface fine to coarse grained, clayey or silty sands and sandy silts encountered in the borings are slightly to moderately expansive and moderately plastic.

Boring 1 was located near the northwestern portion of the property, as shown on Figure II. The near surface soil consists of medium dense, silty, clayey, fine to coarse grained sand with gravel to a depth of three feet. Below this depth, the soil consists of stiff, fine grained, sandy, silty clay to a depth of ten feet overlying very stiff, fine grained, sandy silt to a depth of 20.0 feet. Below this depth, the soil consists of medium dense, silty, fine grained sand to a depth of 23 feet overlying stiff to very stiff, silty clay to the bottom of the boring at 31.5 feet in depth.

Boring 2 was located near the northwestern portion of the property, as shown on Figure II. The near surface soil consists of loose to medium dense, silty, fine to coarse grained sand with gravel to a depth of 4.25 feet, underlain by stiff, slightly clayey silt to a depth of five feet. Below this depth, the near surface soils consist of stiff to very stiff, fine to coarse grained, sandy, silty clay to the bottom of the boring at 21.5 feet.

Boring 3 was located near the southern end of the potential building area, as shown on Figure II. The near surface soil consists of medium dense, silty, clayey, fine to medium grained sand to a depth of four feet, overlying stiff, silty clay to a depth of ten feet. Below this depth, the soil consists of very stiff, fine grained, sandy silt to a depth of 15 feet underlain by very stiff, fine grained, sandy, clayey silt to a depth of 20 feet. Below this depth, the soil consists of stiff, silty clay 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 31.5 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 soil up to 4.5 feet in depth and slightly to moderately expansive soils at footing depths. In our opinion, the site is suitable for the proposed market and gas station with the recommendations made herein, specifically the recommendations for the recompaction of loose soils 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 4.5 feet is anticipated). Spread footings shall be installed to a minimum depth of 18 inches for both single story and any two story portions of the proposed market and gas station. The minimum depths shall be measured from the **inside building pad soil subgrade.** Mitigation for recompaction of all loose soil conditions must be followed.

Allowable foundation pressures after subexcavation and recompaction of the building pad areas are:

Continuous footings	**= 1600 p.s.f.**
Isolated rectangular footings	**= 1900 p.s.f.**

Continuous footings shall be reinforced with three #4 steel reinforcement bars; two placed near the bottom of the footing and one 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 San Benito Building ordinances for width, thickness, embedment, and reinforcement steel. The new market, gas station, 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 VII-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.*** The pad for the above ground tanks shall be designed as a structural slab by the project Structural Engineer.

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 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 AND EXPANSIVE SOIL MITIGATIONS:

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

1. Any existing loose soil within the proposed new building pad(s) 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, if any, within the building perimeter after clearing and grubbing are completed. Subexcavation and recompaction should be extended under any proposed patios or other permanent flatwork.

2. Spread footings shall be constructed a minimum of 18 inches deep for both single story and any two story portions of the proposed new building(s) as measured from the lowest adjacent grade, and continuous non-retaining footings shall be reinforced with three #4 reinforcement bars, two placed near the bottom and one 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. 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.

5. Soil Surveys Group, Inc. shall be retained to inspect and test the recompaction of all 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 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(s), any new paved areas and ground adjacent to any building shall be graded so that rainfall runoff does not become trapped or flow against any 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 pad(s), 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(s). 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 are completed as up to 4.5 feet of loose materials was encountered in one of 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. If no subexcavation is required, the soil shall 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(s) shall be compacted to at least 90 percent relative compaction, and any cut portions of the new building pad(s), 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. ***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. The tank pad(s) shall be a minimum of six inches or as designed by the structural 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.

E. PAVEMENT DESIGN CRITERIA:

A representative composite sample of the native subgrade was taken and an R-value test was run. The R-Value was 16. 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 a minimum of 12 inches, moisture conditioned and 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. (inches)	Thickness of A.B. (inches)
5	2.5	13.5
6	3.5	16.0
7	4.0	18.5

As an alternative to new asphalt pavement, concrete pavement can be installed. If concrete pavement is selected, we recommend that the concrete paving be a minimum of six inches thick over six inches of Class II Aggregate baserock compacted to 90 percent relative compaction over soil subgrade compacted to a minimum of 95 percent relative compaction. Concrete shall be reinforced with a minimum of #4 steel bars placed no more than 24 inches on center, each way.

VIII. GEOLOGIC AND SEISMIC CONSIDERATIONS:

San Benito 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
San Andreas	1.2 km	Southwest	County of San Benito GIS
Sargent	5.0 km	Northeast	County of San Benito GIS
Zayante-Vergeles	8.73 km	Southwest	County of San Benito GIS
Calaveras	12.23 km	East	County of San Benito GIS
Quien Sabe	19.47 km	Northeast	County of San Benito GIS

The new market, gas station, 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	36.8831°	-121.5636°	2.491	1.197	1.00	1.50

Frame and semi-rigid structures with proper strengthening connections and hold-down fasteners (where needed) are recommended for the new market, gas station 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 very stiff, sandy silty soils and no ground water was encountered in the borings to a maximum explored depth of 31.5 feet. Considering the deeper silty 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 building(s) 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(s).
2. Soil with a high organic content at the finished subgrade of the building pad(s).
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 market and gas station provided any loose 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 building is 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 building to provide positive drainage away from any 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.

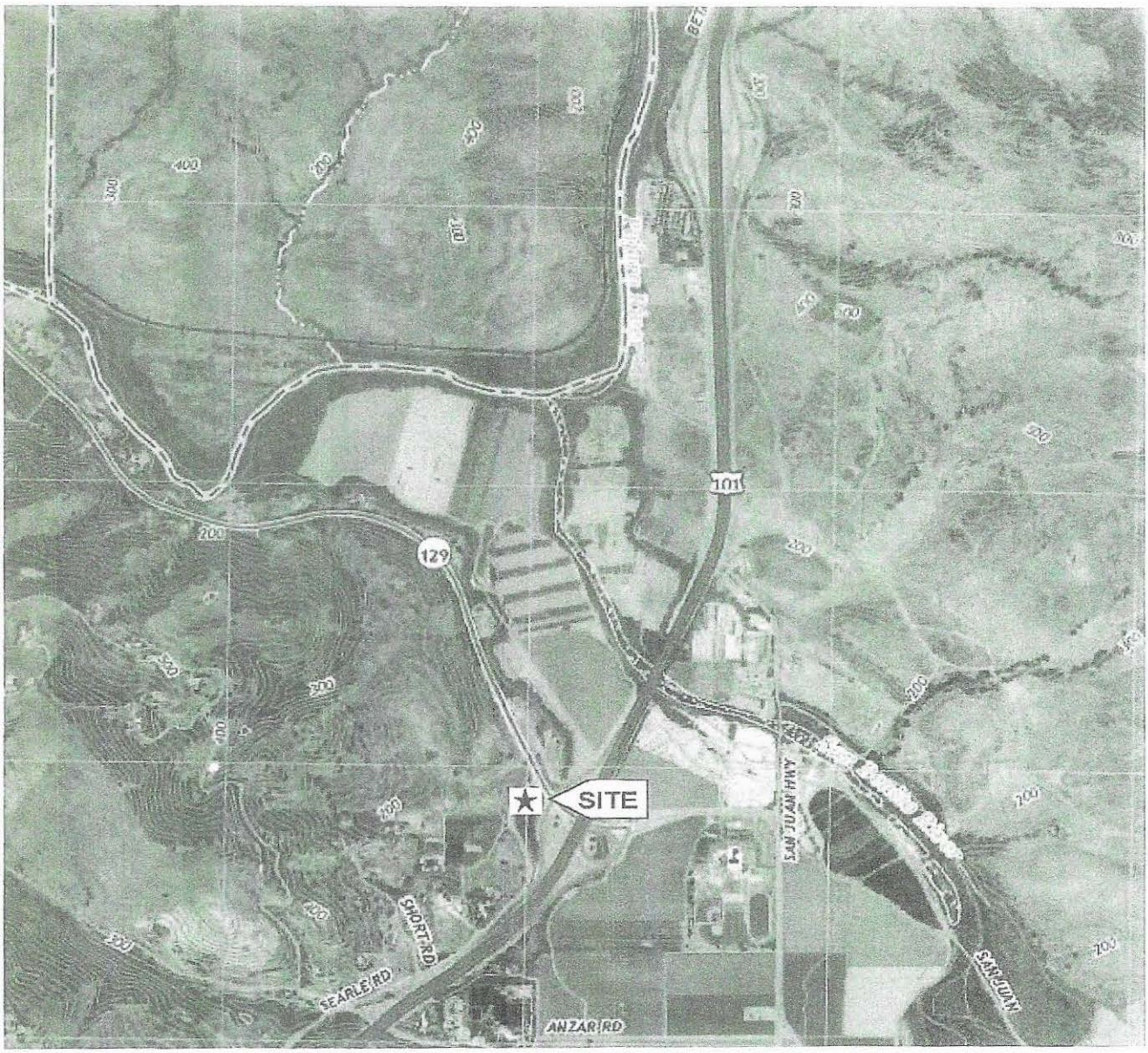
XI. LIMITATIONS:

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 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 IX).

This report is issued with the understanding that it is the responsibility of the Owner 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. Al Saleh, 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 market and gas station with above ground tanks 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, Chittenden 7.5' Quadrangle

San Juan Bautista, CA

FIGURE I: VICINITY MAP

NO SCALE

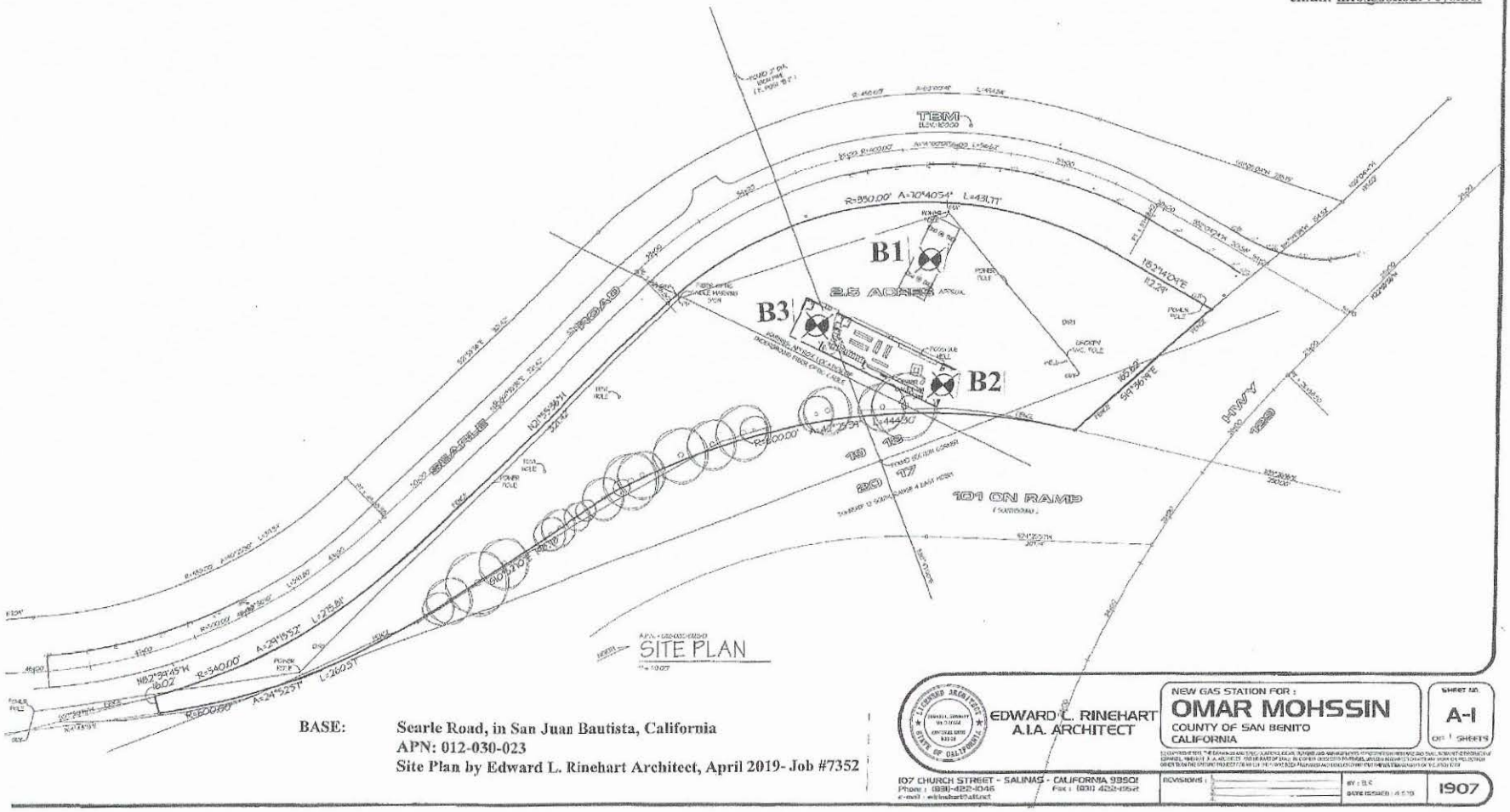
By: Soil Surveys Group, Inc.
103 Church Street
Salinas, CA 93901
831-757-2172

Job #7352

FIGURE II

Boring Locations (approx.)

By: **Soil Surveys Group, Inc.**
103 Church Street
Salinas, CA 93901
ph. 831-757-2172
fax 831-755-7330
email: info@soilsurveys.net



BASE: **Searle Road, in San Juan Bautista, California**
APN: 012-030-023
Site Plan by Edward L. Rinehart Architect, April 2019- Job #7352

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

APPENDIX A
BORING LOGS

EXPLORATION DRILL LOG

HOLE NO. B-1

PROJECT Searle Road, Highway 129 and Highway 101 Job #7352 DATE 5.10.19 LOGGED BY JG

DRILL RIG CCD B53 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)
Wood chips over light brown, blue gray, silty,	SC								
clayey, fine to coarse grained SAND with gravel;		1							
moist, medium dense			SPT						
		2							
			XXX	20	93.3	18.0	35	15	2.25
		3							
Dark olive gray, fine grained, sandy CLAY; slightly	CL/ML		SPT						
moist, stiff		4							
			XXX	11	101.1	16.7			2.25
		5							
Dark olive-gray, light gray, fine grained, sandy	CL/ML		SPT						
CLAY; moist, stiff		6							
			XXX	11	76.5	22.6			2.25
		7							
		8							
		9							
		10							
Light tan, fine grained, sandy SILT with clay; moist,	ML		SPT						
very stiff		11							
			XXX	23	71.8	10.1	33	19	2.0
		12							
		13							
		14							
		15							
Light tan, fine grained, sandy SILT; dry, very stiff	ML		SPT						
		16							
			XXX	21	86.3	8.6			0.75
		17							
		18							
		19							
Same	ML								
		20							

DEPTH 31.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE 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, slightly silty, fine, SAND; moist, medium	SM		SPT						
dense		21							
			XXX	26	105.5	8.0			
		22							
		23							
Dark olive brown, silty CLAY; moist, stiff	CL	24							
		25							
			SPT						
		26							
			XXX	11	101.9	28.1			1.5
		27							
		28							
		29							
		30							
Olive-tan, gray, reddish-tan, mottled, fine grained,	CL		SPT						
sandy CLAY with scattered subrounded gravel;		31							
moist, very stiff. Bottom of boring @ 31.5'	CL		XXX	20	99.2	30.7			3.0
		32							
		33							
		34							
		35							
		36							
		37							
		38							
		39							
		40							
		41							
		42							

DEPTH 31.5' Job #7352

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE NO. B-2

PROJECT Searle Road, Highway 129 and Highway 101 Job #7352 DATE 5.10.19 LOGGED BY JG

DRILL RIG CCD B53 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)
Forbes over light tan, brown, silty, fine to coarse	SM								
grained SAND with thin veins of clay and rounded		1							
gravels; moist, loose to medium dense (fill?)			SM						
		2							
			XXX	10	90.6	6.0	20	15	---
		3							
Light reddish, yellowish-tan, slightly silty, fine to	SM/SP		SPT						
coarse grained SAND with rounded gravel; moist,		4							
very loose to loose. Light gray, slightly clayey,	ML		XXX	4	50.1	35.3	39	30	---
SILT; moist, soft		5							
Dark brown, fine to coarse grained, sandy, silty			SPT						
CLAY; moist, stiff	CL	6							
			XXX	15	81.2	15.1			2.0
		7							
		8							
		9							
		10							
Dark gray-brown, fine grained, sandy, silty CLAY;	CL		SPT						
moist, very stiff		11							
			XXX	17	92.0	20.0			3.5
		12							
		13							
		14							
		15							
Dark reddish-brown, fine grained, sandy, silty	CL		SPT						
CLAY; moist, stiff		16							
			XXX	11	86.3	18.8			3.25
		17							
		18							
		19							
		20							

DEPTH 21.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE 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 olive-tan, silty, fine grained, sandy CLAY;	CL		SPT						
moist, stiff		21							
Bottom of boring 21.5'	CL		XXX	10	90.7	30.5			0.75
		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 #7352

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE NO. B-3

PROJECT Searle Road, Highway 129 and Highway 101 Job #7352 DATE 5.10.19 LOGGED BY JG

DRILL RIG CCD B53 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)
Forbs over light gray-tan, sandy SILT; moist	ML								
		1							
Reddish, yellow-tan, silty, clayey, fine to medium	SC		SPT						
grained SAND; moist, medium dense		2							
			XXX	16	94.8	13.8	25	14	4.25
		3							
Reddish-yellow tan, silty, clayey, fine to medium	SC		SPT						
grained SAND; moist, medium dense		4							
Dark reddish-gray, brown, silty CLAY; moist, stiff	CL		XXX	13	89.2	20.8			3.0
		5							
	CL		SPT						
		6							
			XXX	8	86.5	23.8			1.0
		7							
		8							
		9							
		10							
Light tan, dark brown, fine grained, sandy, cemented	ML		SPT						
SILT; slightly moist, very stiff		11							
			XXX	21	92.3	12.5			3.75
		12							
		13							
		14							
		15							
Light tan, fine grained, sandy, clayey, SILT with	ML/CL		SPT						
thin veins of silty CLAY; slightly moist, very stiff		16							
			XXX	17	88.4	15.3			4.0
		17							
		18							
		19							
Same	ML/CL								
		20							

DEPTH 21.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

HOLE NO. B-3 CONTINUED

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Dark reddish-brown, silty CLAY; moist stiff	CL		SPT						
		21							
Bottom of boring 21.5'	CL		XXX	8	99.9	27.4			1.0
		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 #7352

SOIL SURVEYS GROUP, INC.

APPENDIX B

R-VALUE TEST

R-value Test Report (Caltrans 301)

Job No.:	699-182	Date:	06/11/19	Initial Moisture,	11.0
Client:	Soil Surveys Inc	Tested	PJ	R-value	16
Project:	7352	Reduced	RU		
Sample	R-1(B1,B2&B3) @ 0-1.5'	Checked	DC	Expansion Pressure	5 psf
Soil Type:	Olive Gray Clayey SAND				

Specimen Number	A	B	C	D
Exudation Pressure, psi	395	215	712	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	45	60	10	
Weight of Soil & Mold, grams	3154	3159	3252	
Weight of Mold, grams	2064	2116	2102	
Height After Compaction, in.	2.53	2.43	2.54	
Moisture Content, %	15.2	16.6	11.9	
Dry Density, pcf	113.4	111.6	122.6	
Expansion Pressure, psf	26	0	202	
Stabilometer @ 1000				
Stabilometer @ 2000	120	126	90	
Turns Displacement	3.58	3.90	2.76	
R-value	19	14	41	

Remarks: