GEO ENVIRON
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
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Job No. 12-668P-02
July 20, 2012

Mr. David Yum
626 S. Plymouth Blvd.
Los Angeles, Ca 90005

Subject: **Results of Onsite Effluent Disposal System Testing and Preliminary System Design (Seepage Pits), Proposed Commercial Development, 9722 Phelan Road @ Baldy Mesa Road, Phelan, APN 3064-41-02-0000, San Bernardino County, California**

Reference:

1) San Bernardino County Environmental Health Services, "On Site Waste Water Disposal System, Soil Percolation (PERC) Test Report Standards"

Dear Mr. Yum:

In accordance with your request and authorization, percolation tests were performed for the proposed sewage system design (Seepage Pits) at the subject site . The results of those tests are included with this report (Appendix A). Test results indicate that it is feasible and safe from a geotechnical standpoint to utilize a subsurface disposal system to handle the effluent from the proposed facility.

EXECUTIVE SUMMARY

Based on the 5000 gallon (preliminary design for 4 commercial buildings) and the design rate 2.46 gallon/ square feet/day, a total depth 130.0 feet (below inlet) is required using 5 feet diameter standard seepage pit. The total depth should be applied to four (4) seepage pits, 35.0 feet deep below inlet, plus 100 percent expansion areas.

SCOPE

The scope included the following geotechnical functions:

- Review of available literature pertaining to the site and vicinity.
- Evaluation of natural and manmade surface features at the site and contiguous areas.
- Drilling and logging of exploratory boring to determine the character and distribution of earth materials.
- Seepage pit percolation tests.
- Geotechnical engineering analysis of data obtained during the study.
- Preparation of this report and the accompanying illustrations to present the findings, conclusions, and recommendations pertaining to the planned construction.

LOCATION & SITE DESCRIPTION

The subject property upon which the soil exploration has been performed is located at N.E. corner of Phelan Road and Baldy Mesa Road, about 5 miles west of 15 Freeway, Phelan, San Bernardino County, California.

The rectangular shaped site is approximately 2.36 acres sft in size and flat. The site is currently occupied by a abandoned building at north side of the property. Surrounding the property are vacant and commercial properties.

PROPOSED DEVELOPMENT

Preliminary details of the proposed construction and drawings were provided by the project Architect and the owner .

The proposed project is planned to be a commercial development. The project will be comprised of the construction of 1) Fast Food Restaurant Building (2850 sft), 2) Retail & General Office Buildings (20, 448 sft) and associated parking pavement.

A septic tank with seepage pits disposal system is proposed to dispose of on-site sewage effluent.

GEOTECHNICAL CONDITIONS

Earth Materials

The site is underlain surficial top soil extending to a depth of approximately 12 inches, consist of fine silty sand, slightly moist to dry, and moderately compacted The top soil overlies native soils (older alluvium) consist of fine sandy silt/ silty sand, slightly moist, dense to very dense to depths of 50 feet, the maximum depth explored. Detailed description of the earth materials encountered are presented on the log borings in Appendix 'A'. Boring locations are presented on the plot plan in Plate 1.

Groundwater

We drilled up to a depth of 50 feet and groundwater was not encountered during our subsurface exploration. Based on our previous investigation in near vicinity and the field moisture data of the soil samples (documented in the soil boring logs B-1, B-2), the historic groundwater appears to be greater than 50 feet.

FIELD EXPLORATION & PERCOLATION INVESTIGATION

Preliminary sets of percolation tests were performed in order to determine the suitability of the surface soils as an absorb medium for seepage beds. Two (2) hollow- stem auger (8 inches diameters) borings were advanced for this investigation with a truck mounted drill rig. The borings were drilled to depths of 50 feet below existing surface within the subject site. The purpose of this investigation is to conduct percolation tests and to determine depth to groundwater or any impervious layer. Disturbed and undisturbed samples of the soils encountered were obtained at frequent intervals in the borings.

The test holes were filled with clean water and allowed to soak overnight. The following day the water had drained to depths of 42 feet and 44 feet below the ground surfaces, within the borings B-1 and B-2, respectively. The boring was then refilled with clean water to a depth of 5 feet below the ground surface. From a fixed reference point, the drop in water levels were measured over a 30 minute period for six hours; refilling after every reading. The last or the sixth hour, the hole was not refilled, but the drop in water levels were read every ½ hour. The design rate was calculated by the sixth hour reading.

CONCLUSIONS

- The use of on-site sewage disposal, by means of the septic tank/ seepage pit method of disposal is feasible, based on recommended criteria outlined in the SB County Environmental Health Services guidelines standards. Additionally, our recommendations concerning system design, as stated above, should be incorporated during construction, and the system should be also located within our tested limits.
- Based on the 5000 gallon (preliminary design for a commercial facility under one owner ship) and the design rate 2.46 gallon/ square feet/day, a total depth 130 feet (below inlet) is required using 5 feet diameter standard seepage pits. The total depth should be applied to four (4) pits of 35.0 feet deep below inlet with 100 percent expansion areas.
- Based on the size of the lot and the acceptable percolation rates, there appears to be sufficient area for an on-site septic tank/seepage pit disposal system, including 100 percent expansion area
- Groundwater was not encountered at the subject site during our subsurface explorations.

RECOMMENDATIONS

- The seepage pit should be constructed utilizing the design criteria attached herewith.
- The seepage pit shall be placed so that the initial subsurface sewage disposal and the 100 percent expansion must be set aside.
- No swimming pools or other structures should be constructed on or near the disposal system without the County Health Department approval.
- The primary seepage pit area and all required expansion area should be located in natural undisturbed soil in the area and at the depth of the tests performed.

CLOSURE & LIMITATIONS

The findings, conclusions, and recommendations presented reflect our best estimate of subsurface conditions based on the data obtained from a limited subsurface exploration performed during the field study. The conclusions and recommendations are based on generally accepted geotechnical engineering principles and practices. No further warranties are implied nor made.

This opportunity to be of service is appreciated. If you have any further questions regarding this matter, please contact our office at your convenience.

Respectfully submitted,

Geo Environ Eng. Consultants, Inc.

Jabed Masud
President/ Project Manager

REGISTERED PROFESSIONAL ENGINEER
ESMAIL RASTEGARI
No. 43332
3/30/0
CIVIL
STATE OF CALIFORNIA
NOT VALID WITHOUT WET SIGNATURE

Esmail Rastegari
Civil Engineer, RCE 43332

Attachments: Appendix 'A' -Percolation Test Data Calculations
Appendix 'B' - Boring Logs
Appendix 'C' -Related Guidelines
Plate 1 -Drawings

APPENDIX A

PERCOLATION TEST DATA & CALCULATION

SEPTIC TANK CAPACITY CALCULATION

Estimated Waste/ Sewage Flow Rate

Reference: Table K-3, California Plumbing Code

Job No: 12-668P-02

Client: David Eum

Proposed Facility: Commercial Development

Address: 9722 Phelan Road, Phelan Area, San Bernardino County

Date: 7/16/12

1. Type	Building A-2850 sft (Fast Food Rest.)	Est. Waste Usage (Gallon per Day)	Est. Total WasteUsage (Gallon per Day)
Nos. of employee: *Est. 8*		20 g/day/employee	160 g
Nos. Of Customer (Toilet) Est. 90		7 g/day/customer	630 g
Kitchen Waste	*Est. 90*	6 g/ per meal	540 g
Garbage Disposal	*Est 90*	1 g/ per meal/customer.	90 g
Kitchen Waste Disposal	Est 90	2 g/ per meal/customer.	180 g

Waste/ Sewage Usage ---------- 1600 gallon

2. Type	Building B-3746 sft (Com.)	Est. Waste Usage (Gallon per Day)	Est. Total WasteUsage (Gallon per Day)
Nos. of employee: *Est. 7*		20 g/day/employee	140 g
Nos. Of Customer (Toilet) Est. 60		7 g/day/customer	420 g
Kitchen Waste		6 g/ per meal	N/A
Garbage Disposal		1 g/ per meal/customer.	N/A
Kitchen Waste Disposal		2 g/ per meal/customer.	N/A

Waste/ Sewage Usage ---------- 560 gallon

Contd. P/2

Job No: 12-668P-02
Client: David Eum
Proposed Facility: Commercial Development
Address: 9722 Phelan Road, Phelan Area, San Bernardino County
Date: 7/16/12

3. Type	Building C-7,750 sft (Com.)	Est. Waste Usage (Gallon per Day)	Est. Total WasteUsage (Gallon per Day)
Nos. of employee: *Est. 12*		20 g/day/employee	240 g
Nos. Of Customer (Toilet) Est. 100		7 g/day/customer	700 g
Kitchen Waste		6 g/ per meal	N/A
Garbage Disposal		1 g/ per meal/customer	N/A
Kitchen Waste Disposal		2 g/ per meal/customer	N/A

Waste/ Sewage Usage ---------- 940 gallons

4. Type	Building B-8952sft (Com.)	Est. Waste Usage (Gallon per Day)	Est. Total WasteUsage (Gallon per Day)
Nos. of employee: *Est. 14*		20 g/day/employee	280 g
Nos. Of Customer (Toilet) Est. 150		7 g/day/customer	1050 g
Kitchen Waste		6 g/ per meal	N/A
Garbage Disposal		1 g/ per meal/customer	N/A
Kitchen Waste Disposal		2 g/ per meal/customer	N/A

Waste/ Sewage Usage ---------- 1330 gallons

Estimated Waste/ Sewage Usage for 4 buildings ---------- 4430 gallon

Per California Plumbing Code :

Septic Tank Size = Flow x 0.75 + 1125
4430 x 0.75 + 1125 = 4447.50 gallons

Recommended Septic Tank Size = 5000 gallons

PERCOLATION TEST DATA

PROJECT NO 12-668P-02

PROJECT ADDRESS 9722 PHELAN ROAD, PHELAN, SBCo

Proposed System SEEPAGE PIT

Test Hole No. TB-1

Depth of Hole 34.0'

Soil Class SM/ML

Presoak 24 Hrs.

Percolation Tested By G.M.

Date Excavated 7-10-12

Diameter 8"

Field Engr./Geologist J.M.

Date Perc. Started 7-11-12

Reviewed By E.R.

Time	T1	Te	H1	H2	ΔH	Tot. Depth
9:00 AM	30 Mins.		5.0'	12.7	7.7	42.0'
				12.5	7.5	
				12.3	7.3	
				12.1	7.1	
				11.8	6.8	
				11.5	6.5	
				11.3	6.3	
				11.3	6.3	
				11.1	6.1	
				10.9	5.9	
		5 Hrs	5.0'	10.7	5.7	
		5.5 H	10.7	16.1	5.4	
		6.0 H	16.1	21.3	5.2	

T1= Time Interval(min.)
T2 = Total Elapsed Time (min.)
H1 = Initial Water Level (inch.)
H2= Final Water Level (inch.)
ΔH = Change in Water Level

Job No: 12-6687-02

Client: DAVID EVANS

Job Address: 9722 PITCAIRN TRAIL, PITCAIRN, SBCo

Date: 7-16-12

Sheet (1) Of (2)

Boring No. B-1

D =	0.67	Diameter of Hole, ft.
Dt =	42.0	Total Hole Depth, ft.
Wi=	10.7	Initial Water Depth, ft.
Wf=	21.3	Final Water Depth, ft.
L1= Dt - Wi =	31.3	Initial Water Col. Length, ft.
L2= Dt-Wf =	20.7	Final Water Col. Length, ft.
L =(L1+L2) /2 =	26.0	Average wetted length, ft.
F = Wf-Wi =	10.6	Final Water Fall, ft
T= 1		Time period/ hr.
R = F/T =	10.6	rate, ft/hr.

Q = (R x d x 9) /L

$= (10.6 \times .67 \times 9) / 26.0$

$= 2.46$ gal/sft/day

Correction Factor = N/A

Q (corrected) = 2.46 gal/sft/day OK

Design depth below inlet = septic tank capacity/ (Q x 15.7) for 5 feet Seepage Pit

$= (5000) / 2.46 \times 15.7$

Ds = 129.5 feet (total depth of seepage pit below inlet) $\approx$ 130.0'

4 ----PITS, EACH 5.0' FEET DIAMETER @ 35'----DEPTH plus 100% expansion.

PERCOLATION TEST DATA

PROJECT NO 12-668P-02

PROJECT ADDRESS 9725 PHELAN ROAD, PHELAN, 92371

Proposed System SEEPAGE PIT

Test Hole No. B-2

Depth of Hole

Soil Class SM/ML

Presoak 24 HRS

Percolation Tested By G.M.

Date Excavated 7-10-12

Diameter 8"

Field Engr./Geologist J.M.

Date Perc. Started 7-11-12

Reviewed By E.R.

Time	T1	Te	H1	H2	ΔH	Tot. Depth
			5.0'	13.8	8.8	44.5
				13.5	8.5	
				13.3	8.3	
				13.2	8.2	
				12.9	7.9	
				12.6	7.6	
				12.4	7.4	
				12.1	7.1	
				11.6	6.8	
			5.6'	11.5	6.5	
		5 HRS	5.0'	11.2	6.2	
		5.5 H	11.2	17.2	6.0	
		6.0 H	17.2	23.0	5.8	

T1= Time Interval(min.)
T2 = Total Elapsed Time (min.)
H1 = Initial Water Level (inch.)
H2= Final Water Level (inch.)
ΔH = Change in Water Level

Job No: 12-668P-02

Client: DAVID EVANS

Job Address: 9722 SHELAN ROAD, SHELAN, SBCO

Date: 7-16-12

Sheet (1) Of (2)

Boring No. B- 2

D =	0.67	Diameter of Hole, ft.
Dt =	44.5	Total Hole Depth, ft.
Wi=	11.2	Initial Water Depth, ft.
Wf=	23.0	Final Water Depth, ft.
L1= Dt - Wi =	33.2	Initial Water Col. Length, ft.
L2= Dt-Wf =	21.5	Final Water Col. Length, ft.
L =(L1+L2) /2 =	27.3	Average wetted length, ft.
F = Wf-Wi =	11.8	Final Water Fall, ft
T= 1		Time period/ hr.
R = F/T =	11.8	rate, ft/hr.

Q = (R x d x 9) /L

= (11.8 x .67 x 9)/27.3

= 2.6 gal/sft/day

Correction Factor = N/A

Q (corrected) = 2.60 gal/sft/day > 2.46

Design depth below inlet = septic tank capacity/ (Q x 15.7) for 5 feet Seepage Pit

=

Ds = ---------- feet (total depth of seepage pit below inlet)

-----PITS, EACH ---------- FEET DIAMETER @ ----------DEPTH plus 100% expansion.

APPENDIX B

BORING/ TRENCH LOGS

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BORING LOG B-1A

PROJECT NAME: David Eum
PROJECT ADDRESS: 9722 Phelan Road, Phelan
DRILLING COMPANY: 2R Drilling
DRILLING METHOD: H.S.A BORING DIA: 8"
SAMPLING METHOD: 140 LB 30"Drop
W/Automatic Trip Hammer

PROJECT NO: 12-668P
DATE: 7/10/12
LOGGED BY: JM

Depth (ft)	Samp	Blows per 12"	Mois	Dens	USCS	Symb	EARTH MATERIAL DESCRIPTION
0							Top Soil:
2							Natural: Lt. reddish, fine sandy silt, sl. moist, stiff.
5		19	2.2		ML		
		35	3.9		ML		--- fine sandy silt, sl. moist, very stiff.
10							
		35	2.7		SM		Lt. brown, F-M silty sand, sl. moist, very dense.
15							
		25	4.2		ML		Lt. tan, F-M sandy silt, sl. moist, stiff.
20							
		27	1.5		SM		Lt. orange, F-M silty sand, sl. moist, very dense.
25							Lt. reddish, fine silty sand, sl moist, very dense
		33	2.3				

CONTD. P/2

Std. Penetration Test California Ring Bulk Sample

GEO ENVIRON BORING LOG B-1A (contd.)

PROJECT NAME: David Eum
PROJECT ADDRESS: 9722 Phelan Road, Phelan
DRILLING COMPANY: 2R Drilling
DRILLING METHOD: H.S.A BORING DIA: 8"
SAMPLING METHOD: 140 LB 30"Drop
W/Automatic Trip Hammer

PROJECT NO: 12-668P
DATE: 7/10/12
LOGGED BY: JM

Depth (ft)	Samp	Blows per 12"	Mois	Dens	USCS	Symb	EARTH MATERIAL DESCRIPTION
30		19	2.1		SM-ML		Olive, fine silty sand, sl. moist, mod. dense.
35		20	2.7		SM-ML		- - - - - - very silty sand, sl. moist, mod. dense.
40		22	9.8		SM-ML		- - - - - fine silty sand, sl. moist, mod. dense.
45		34	2.7		SM-ML		- - - - - fine silty sand, sl. moist, dense.
50		38	2.2		SP		Lt. brown, f-m sand, w/ some gravel, sl. moist, dense
							END OF BORING @ 51.5' NO GROUNDWATER

Std. Penetration Test California Ring Bulk Sample

GEO ENVIRON BORING LOG B-2A

PROJECT NAME: David Eum
PROJECT ADDRESS: 9722 Phelan Road, Phelan
DRILLING COMPANY: 2R Drilling
DRILLING METHOD: H.S.A BORING DIA: 8"
SAMPLING METHOD: 140 LB 30"Drop
W/Automatic Trip Hammer

PROJECT NO: 12-668P
DATE: 7/10/12
LOGGED BY: JM

Depth (ft)	Samp	Blows per 12"	Mois	Dens	USCS	Symb	EARTH MATERIAL DESCRIPTION
0					SM		Top Soil:
2							Natural: Lt. reddish, fine silty sand, sl. moist, stiff.
		21	3.3				
5					SM		
		16	2.7				
10							
		45			ML		Lt. reddish, fine sandy silt, sl. moist, stiff.
15			2.8				
		42					
20			7.3				Lt. orange, F-M silty sand, sl. moist, very dense.
							Lt. reddish, fine silty sand, sl moist, very dense
		28			SM		
25			6.8				CONTD. P/2
		31					
			4.2				

Std. Penetration Test California Ring Bulk Sample

GEO ENVIRON BORING LOG B-2A (contd.)

PROJECT NAME: David Eum
PROJECT ADDRESS: 9722 Phelan Road, Phelan
DRILLING COMPANY: 2R Drilling
DRILLING METHOD: H.S.A BORING DIA: 8"
SAMPLING METHOD: 140 LB 30"Drop
W/Automatic Trip Hammer

PROJECT NO: 12-668P
DATE: 7/10/12
LOGGED BY: JM

Depth (ft)	Samp	Blows per 12"	Mois	Dens	USCS	Symb	EARTH MATERIAL DESCRIPTION
30		20	2.2		SM-ML		Olive, fine silty sand, sl. moist, mod. dense.
35		22	3.1		SM-ML		- - - - - - very silty sand, sl. moist, mod. dense.
40		19	5.7		SM-ML		- - - - - fine silty sand, sl. moist, mod. dense.
45		32	2.7		SM-ML		- - - - - fine silty sand, sl. moist, dense.
50		41	2.5		SP		Lt. brown, f-m sand, w/ some gravel, sl. moist, dense
							END OF BORING @ 51.5' NO GROUNDWATER

Std. Penetration Test California Ring Bulk Sample

APPENDIX C

RELATED GUIDELINES

MINIMUM REQUIREMENTS FOR LOCATION OF LIQUID WASTE DISPOSAL SYSTEMS

The minimum requirements for the installation of new sewage disposal systems for either new or existing structures shall generally be as follows:

A. Minimum Separations

1. Septic tank to:

a.	Water supply well	100 feet
b.	Buildings or structures[1]	5 feet
c.	Property line adjoining private property	5 feet
d.	Perennial streams[2]	50 feet
e.	Ephemeral streams[3]	50 feet
f.	Large trees[4]	10 feet
g.	Seepage pits or disposal fields	5 feet
h.	Private domestic water lines (building service line)	5 feet
i.	Public domestic water lines (water purveyor's line)	10 feet
j.	Groundwater	5 feet

2. Soil absorption system to:

a. Water supply well - 100, 150, or 200 ft. depending on whether system has a:

Leaching field	100 feet
Seepage pit	150 feet
Any system discharging 5,000 gallons/day or more	200 feet

b.	Building or structures[1]	8 feet
c.	Property line adjoining private property (leach lines)	5 feet
d.	Property line adjoining private property (seepage pits)	8 feet
e.	Large trees[4] (seepage pits)	10 feet

f.	Perennial streams[2]	100 feet
g.	Colorado River/Mojave River	200 feet
h.	Ephemeral streams/ Drainage Courses[3]	50 feet
i.	Septic tank	5 feet
j.	Distribution box	5 feet
k.	Private domestic water line (building service line)	5 feet
l.	Public domestic water line (water purveyor's line)	10 feet
m.	High groundwater table level[5]	
	Leachline	5 feet
	Seepage pit	10 feet
n.	Ground surface on sloping ground (When disposal fields and/or seepage pits are installed in sloping ground, the minimum horizontal distance between any part of the leaching system and ground surface shall be 15 feet.) Also see page A16.	15 feet
o.	Lakes, water reservoirs	200 feet

3. The minimum separations listed herein are largely derived from the Uniform Plumbing Code. In some cases, additions or changes have been made in order to adequately protect the public health. Where differences exist, the greater separation prevails unless specifically waived for cause by the Department of Environmental Health Services.

Footnotes:

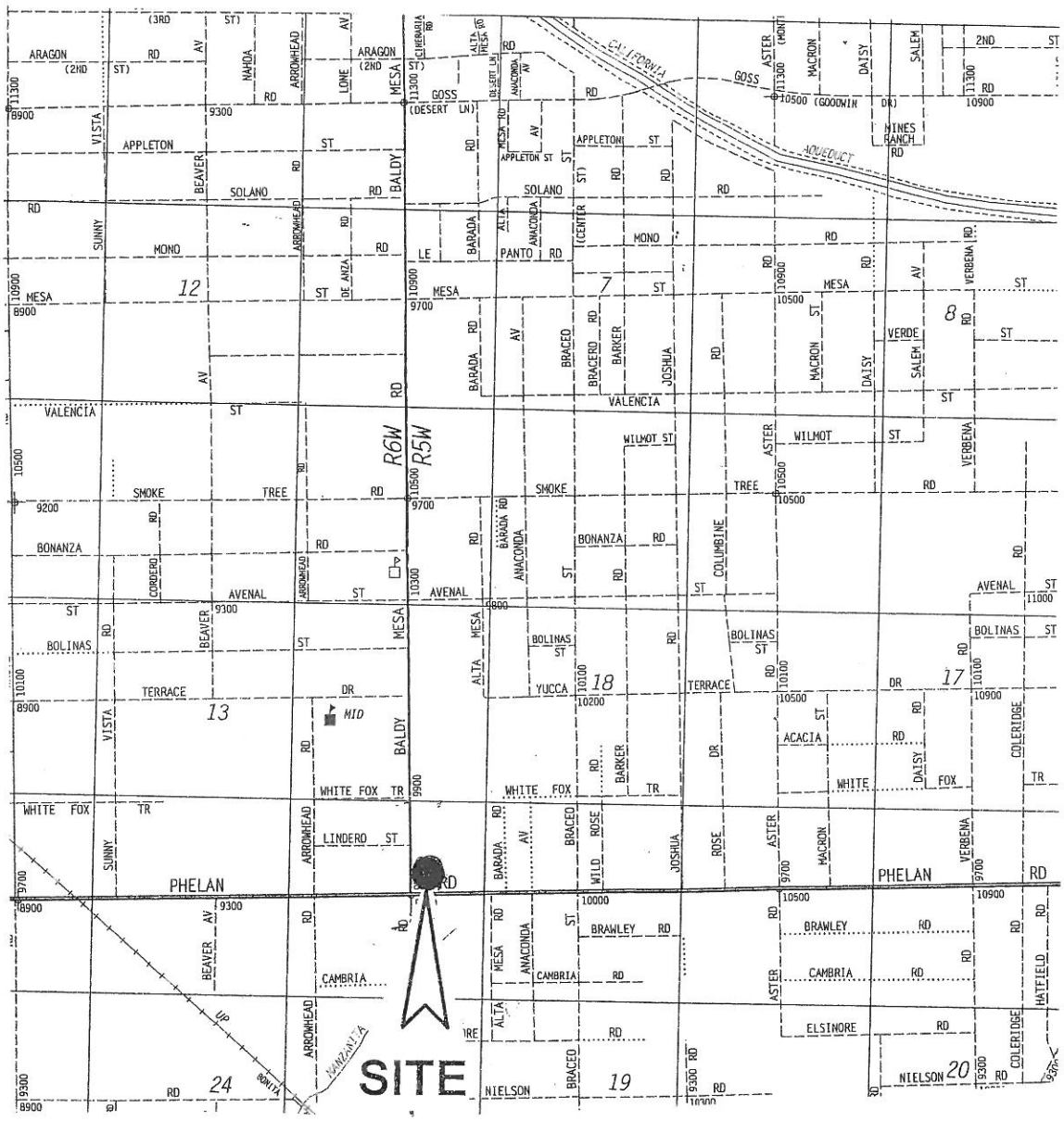
1 Includes porches and steps whether covered or uncovered, breezeways, roofed porte-cocheres, roofed patios, carports, covered walls, covered driveway, and similar structures or appurtenances.

2 A listing of perennial streams will be maintained by the Department of Environmental Health Services. See pages A14.

3 An ephemeral stream/drainage course is any stream not listed as a perennial stream by the Department (see Footnote 2). To determine where the setback restrictions should be applied, the U. S. Geological Survey Maps are used as a guide. If a stream is designated on the USGS Map by a blue dash/dotted line, the setback requirements must be met. If not shown, but there is

PLATE 1

DRAWINGS



THOMAS BROS. MAP
COUNTY: SBCO
PAGE: 4474
GRID: F6

APPROXIMATE SCALE: 1" = 4800'

N

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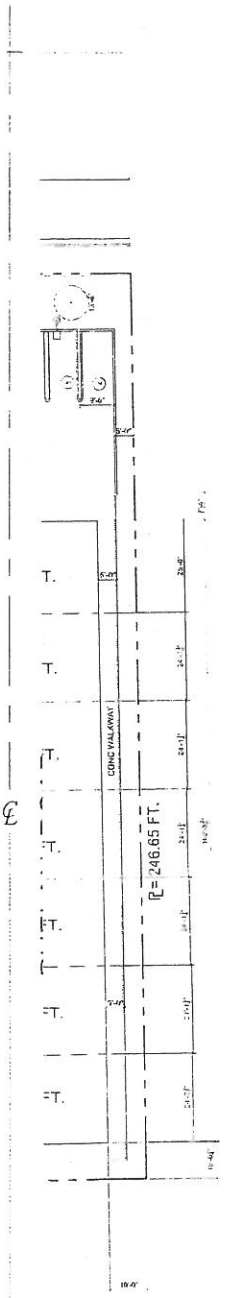
ANAHEIM, CALIFORNIA

9722 PHELAN ROAD
PHELAN, CA

FIG. 1
SITE LOCATION MAP
PROJ. NO. 12-668P

N

APPRX. SCALE 1" = 60'



SITE

9722 PHELAN ROAD
PHELAN, SB COUNTY.

PRELIMINARY SYSTEM DESIGN

5,000 G SEPTIC TANK W/ FOUR (4) 35'-0 DEEP SEEPAGE PITS, 5'-0 DIA BELOW INLET PLUS 100% EXPANSION.

REGISTERED PROFESSIONAL ENGINEER
ESMAIL RASTEGARI
No. 43332
3/30/14
CIVIL
STATE OF CALIFORNIA
NOT VALID WITHOUT WET SIGNATURE

SEEPAGE PIT.

SEEPAGE PIT

GEO ENVIRON
J.N. 12-668P-02
7-20-12

FIG-2