



G e o t e c h n i c a l E n g i n e e r i n g S e r v i c e s

GEOTECHNICAL ENGINEERING REPORT

**Proposed Road Widening Project
River Road (between Magdalena Drive and Mission Lane)
San Miguel vicinity of San Luis Obispo County**

for:

**County of San Luis Obispo
Attn: Genaro Diaz, P.E.
County Government Center, Room 208
San Luis Obispo, CA 93408**

Date: January 30, 2013

Report No. 15339

File No. 13-6923

Revision 1

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1 INTRODUCTION

This report presents the results of our geotechnical investigation performed at the site of the proposed road widening project located on River Road in the San Miguel vicinity of San Luis Obispo County.

The principal purpose of this investigation was to determine the geotechnical properties of the surface and subsurface soils in order to provide recommendations for the proposed road widening. From a geotechnical stand point the site appears to be suitable to support the proposed structures when prepared as recommended herein.

Research and exploratory work was conducted in accordance with presently accepted procedures consistent with the scope of work you have requested for this development. No warranty regarding the uniformity of subsurface conditions is implied.

2 SCOPE OF THE GEOTECHNICAL INVESTIGATION

The scope of our geotechnical investigation consisted of the following:

- a. 1 track mounted auger boring extended to a depth of 35 feet below grade, 1 truck mounted auger boring extended to a depth of 20 feet below grade and 2 hand auger borings extended 4 to 5 feet below grade. The location and identification of the excavations are shown on the attached drawings.
- b. Observing existing man-made and natural field conditions.
- c. Obtaining and testing representative bulk and undisturbed soil samples and logging the formations encountered.
- d. Analysis of the field observations and laboratory testing.

3 SUMMARY OF FINDINGS

3.1 SITE DESCRIPTION

The proposed road widening project will extend from Mission Lane south to Magdalena Drive and will increase the improved roadway by up to five feet on each side. A retaining wall is proposed at a location about 700 feet south of Mission Lane on the west side of the road in the area of an existing erosion rill that has migrated to the guard rail. The terrain to the west of the roadway in the area of boring B1 descends to the west at steeper than a 0.5:1 (H:V) slope. A portion of the roadway located about 850 feet north of Magdalena Drive where River Road crosses a well-defined swale feature may require a retaining structure or reinforced fill to allow for the proposed widening. Fill heights of up to 15 feet are present in this area although proposed retained heights will be limited to about 6 feet. The fill slopes are currently about a 2:1 (H:V) slope with some areas of steeper slopes. The cut slope gradients south of the swale crossing are proposed to be 1.5:1 (H:V).

3.2 EXISTING SOIL CONDITIONS

Area 1 (700 feet south of Mission Lane)

The loose sandy surface soils were encountered to about 3 feet below grade and are underlain with generally hard sandy material. Cobbles were encountered at about 9 feet below grade and caving sands were noted at about 11 to 18 feet below grade in the area of the test boring.

Area 2 (850 feet north of Magdalena Drive)

Loose sandy surface soils and fill material were encountered to about 4 to 8 feet below grade in areas of the test borings. Medium dense to hard sandy material was observed at about 8 feet below grade in the area of boring B2. Large boulders and debris that appeared to be acting as slope armor were encountered in borings B3 and B4 at about 4 to 5 feet below the nearest adjacent grade. Due to the visible sag in the roadway in this area, it should be expected that the embankment fill will not be suitable to support a rigid or "gravity" type retaining wall in the in situ condition.

3.3 GROUNDWATER CONDITION

At the time of our investigation no ground water was encountered in the excavations to a depth of 35 feet below existing grade. Fluctuation in the level of the ground water may occur due to variation in rainfall, temperature, or other factors.

3.4 LIQUEFACTION POTENTIAL

We have reviewed the subsurface data to provide an opinion regarding the liquefaction potential of the site. An exploratory boring was extended 35 feet deep in Area 1 and 20 feet deep in Area 2. In both excavations, generally hard sandy material was noted within about 3 to 8 feet of the existing grade. In addition, no groundwater was observed in either test boring. Liquefaction is generally considered a result from development of pore pressure in loose saturated sandy soil during a seismic event. The potential for liquefaction is based on the seismicity of the site, the presence and depth of groundwater, the presence of sandy soil, and density of the soil. We have not extended an exploratory boring more than 35 feet deep in the area of the proposed road repair. Based on the presence of hard material at a depth of about 3 to 8 feet, and no groundwater encountered in any of the soil borings, it is our opinion that the likelihood of liquefaction of the site is very low.

4 GRADING RECOMMENDATIONS

The following recommendations are made based on your representations that the existing road edge in Area 1 will be supported with a series of sheet piles driven to a depth of at least 35 feet below the existing grade. Due to the steepness of portions of the site, it is anticipated that all grading proposed for the area of the roadway repair will be performed, as much as possible, to the inside of the edge of the shoulder. It is anticipated that the grading performed at the site will be limited to the repair of the roadway and shoulder once the retaining structures have been installed. It is your responsibility to notify the geotechnical engineer of any changes to the proposed development. If changes occur, the recommendations contained in this report will be reviewed and may need to be revised.

4.1 GENERAL GRADING RECOMMENDATIONS

- a. All grading work should be done in a professional manner and in conformance with the current local jurisdiction's grading ordinances and per the grading recommendations stated herein. In addition, all grading work shall be observed by the geotechnical engineers representatives.
- b. All pile installation and backfill compaction shall be observed by the representative of th geotechnical engineer MID-COAST Geotechnical, Inc. when grading operations or construction begins so that the required observations can be made.
- c. All surface vegetation and debris shall be removed from the work area as grading operations begin.
- d. A careful search shall be made for subsurface structure during grading operations. If any such subsurface cavities are encountered, they shall be removed down to the firm underlying soil and properly backfilled and compacted as directed by a representative of the geotechnical engineer.
- e. Special inspections should be performed in accordance with Table 1704.7 below:

**TABLE 1704.7
REQUIRED VERIFICATION AND INSPECTION OF SOILS**

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify materials below footings are adequate to achieve the design bearing capacity.	-----	X
2. Verify excavations are extended to proper depth and have reached proper material.	-----	X
3. Perform classification and testing of controlled filled materials.	-----	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill.	X	-----
5. Prior to placement of controlled fill, observe subgrade and verify that the site has been prepared properly.	-----	X

*2010 California Building Code

4.2 REMOVAL DEPTH RECOMMENDATIONS

If rigid retaining structures are utilized to support the road widening, any loose surface soils or fill material shall be removed to at least 24 inches below the bottom of the structure's foundation. The removal shall extend at least 3 feet beyond the perimeter of the footing on both sides.

If gravity type retaining structures that can typically tolerate localized settlement are used, the removal should extend as deep as the site conditions will allow or down to firm material whichever is shallower. If loose material is encountered in the removal bottom, the geotechnical engineer shall be notified and remedial measures will be offered.

In those areas where road widening only is occurring, the surface soils and loose fill material shall be removed to a minimum depth of 24 inches below the existing ground surface as observed at the time of our field investigation. If loose material is encountered below the specified removal depth or shallow underground utilities are expected, a geotextile stabilization fabric (Mirafi HP570 or equivalent) shall be placed in the removal bottom.

4.3 BOTTOM CHECK AND PROCESSING OF REMOVAL AREA

Field observations will be required to confirm that the removal bottom has been established in firm natural material prior to processing operations or that the removal bottom is sufficiently smooth to receive stabilization fabric. The exposed material at the bottom of the removal areas shall then be properly prepared (if possible) and brought to near optimum moisture content before any fill is placed. The removal soil may be used as backfill providing all deleterious materials, if any, are picked out.

4.4 STRUCTURAL PAVEMENT SECTION RECOMMENDATIONS

Structural pavement section recommendations for the roadway improvements associated with the subject project are provided below. The following analysis is based upon a Traffic Index (T.I.) of 8.0 as provided by the County of San Luis Obispo and an average "R" Value of 67 for the subgrade material as determined by our office. Our analysis was based on the Caltrans Highway Design Manual as described in the enclosed design criteria, Plate A. The recommended structural sections are summarized below.

<i>Area</i>	<i>R-Value</i>	<i>T.I.</i>	<i>Recommended Section</i>
River Road (STA 10+25 - 43+00)	67	8.0	3" AC/ 6" AB

AC denotes asphaltic concrete, AB denotes Class II Base or equivalent (R-Value 78)

NOTE: The section noted above must be approved by the local jurisdiction to construction.

All subgrade soils shall be compacted to a minimum of 95 percent of the maximum density (ASTM D-1557) to a minimum depth of 12 inches below subgrade elevation unless Subgrade Enhancement Geotextile (SEG_T) and/or Subgrade Enhancement Geogrid (SEG_G) is placed on the prepared subgrade. If the SEG_T and/or SEG_G is used, the subgrade material may be prepared without scarification of the subgrade soils, however, the finished surface should be rolled smooth with a steel drum roller and the finished surface should be free of large stones and clods. Aggregate base material shall be placed in shallow lifts and compacted to a minimum of 95 percent of the maximum density (ASTM D-1557). Subgrade Enhancement Geotextile shall be equivalent to a Mirafi HP 570 woven stabilization fabric. Subgrade Enhancement Geogrid shall be equivalent to a Mirafi BXG120 geogrid.

4.5 PLACEMENT OF FILL

All fill shall be placed in layers approximately 8 inches in depth, brought to a moisture content near optimum moisture content, and compacted to the required specification up to final pad subgrade. Fill compacted at high moisture content may be subject to yielding. Yielding or pumping grades will not be approved by this office. Material placed as certified fill shall be free of debris and rocks greater than six inches in width across the widest point.

4.6 IMPORT MATERIAL

All imported material, if any, to be used for structural fills shall be observed and approved by a representative of the geotechnical engineer prior to transport to the site. Imported fill material shall be free of debris and rocks greater than six (6) inches at the widest point. Imported soils shall be similar or less expansive than those existing on the site. The rock-to-soil ratio of the import material shall not exceed 50 percent.

4.7 CUT SLOPE CONSTRUCTION

Cut slopes located south of the swale crossing may be constructed at a maximum 1.75:1 gradient up to a total slope height of 12 feet. The cut slope shall be observed by a representative from our office during excavation. Any loose or raveling material left on the cut slope after grading should be removed. It should be noted that routine cleaning of the debris deposited at the toe of the slope may be necessary. All surface drainage shall be directed away from the face of the slope.

4.8 SITE DRAINAGE

Final grading shall provide a positive drainage away from the site. This is especially important when construction takes place during the rainy season. All roadway drainage should be directed to non-erosive discharge locations away from slopes and embankments. All drainage plans shall be in compliance with the local jurisdictions grading requirements.

5 FOUNDATION DESIGN RECOMMENDATIONS

The foundation design recommended below shall be confirmed or modified, if necessary, depending upon the nature of the soils encountered during construction.

5.1 DEEP FOUNDATION: SHEET PILES

Sheet piles may be used to support the distressed roadway south of Mission Drive. The piles should be installed a minimum of 35 feet below the ground surface at the shoulder edge. The piles should be designed to resist an active pressure wedge extending at a 0.5:1 (H:V) gradient from the 675 elevation. The piles may need to be tied back to a soil anchor or additional pile to provide additional resistance to the active pressure loads. Specific details of the active and passive design pressures are described below.

5.2 FOUNDATION NEAR SLOPES

All foundation excavated on or adjacent to any existing or proposed slopes will require a minimum 10 feet horizontal distance to daylight. The horizontal distance is measured from the bottom of the foundation to daylight on the slope or to the extent of the competent material on the slope, i.e, all slough or loose material on the slope will be discounted when measuring the distance to daylight.

5.3 PASSIVE AND FRICTIONAL RESISTANCE

Resistance to lateral loading may be provided by passive earth pressure. Passive earth pressure may be computed using a passive coefficient (K_p) of 3.7. The passive pressure wedge is assumed to begin at about 7 feet below grade in the area of boring B1.

5.4 RETAINING STRUCTURES: ACTIVE EARTH PRESSURE

The retaining structures may be designed for an equivalent fluid pressure of 38 psf per foot of depth. Additional active pressure should be added for a surcharge condition due to vehicular traffic. The allowable passive earth pressure may be found in the preceding

section. The surface water drainage should be directed away from any structure and shall meet the requirements of the local jurisdiction.

5.5 RESTRAINED CONDITION: AT-REST EARTH PRESSURES

If the pile foundation is restrained at both top and bottom, such as with tie backs, it shall be designed for at-rest earth pressures. The piles should be designed for an equivalent fluid pressure of 60 pcf if the at-rest condition applies. As noted above, additional surcharge should be added to the lateral loading if there is vehicular traffic adjacent to the wall. As with other retaining walls, adequate measures should be taken to relieve any excess hydrostatic pressures.

6 OBSERVATIONS AND TESTING

All piles installation and any footing excavations should be observed by a representative of our office to confirm similar subsurface conditions. All removal excavation bottoms shall be observed and approved by a geotechnical engineer or his representative prior to placement of backfill. Any fill placed for engineering purposes should be tested and certified.

Temporary wall excavations should be observed by a representative of this firm. It is your responsibility to notify MID-COAST Geotechnical, Inc. at each stage of the excavations so that observations can be made. If the examination reveals any hazard, appropriate treatment will be recommended. Please advise this office at least 24 hours prior to any required observations.

7 LIMITS AND LIABILITY

Please be aware that our contract fee for our services to prepare this report do not include additional work which may be required such as grading observation and testing, pile installation observation, etc. Since the extent of grading and the amount of our services varies for each project, our services are normally billed on an hourly rate or per-test basis.

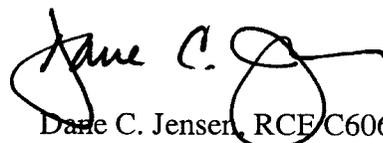
This report provides recommendations and comments in accordance with currently accepted practice applicable to the scope of your project. Further requirements may be imposed by the reviewing agency or necessary as a result of changes to your building or grading plans. Where additional services are requested or required, you will be billed for any equipment costs and on an hourly basis for consultation or analysis.

All documents, including maps, plans, drawings, specification and test results which we prepare or furnish or which are prepared or furnished by our independent professional associates and consultants pursuant to this agreement are considered instruments of service with respect to the project, and we will retain an ownership and property interest therein, whether or not the project is completed. Without limiting the foregoing, we reserve the right to make use of all information obtained in the performance of our services in projects for other clients, including without limitation, the right to use all test results and reports in performing services for future owners of your property.

The limits of our liability for data contained in this report and our warranty are presented on the following page. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to assure that the information and recommendations contained herein are called to the attention of the designers and builders for the project.



Respectfully submitted,
MID-COAST Geotechnical, Inc.


Dane C. Jensen, RCE/C60675
Expiration Date 12/31/2014

DCJ/cmm
County of San Luis Obispo (1 + email)

8 WARRANTY

This report is based on the development plans provided to our office. In the event that any significant changes in the design or location of the structure(s) as outlined in this report are planned, the conclusions and recommendations contained in this report may not be considered valid unless the changes are reviewed and the conclusions of this report are modified or approved by the geotechnical engineer.

The subsurface conditions, excavations, and characteristics described herein have been projected from individual borings or test pits placed on the subject property. The subsurface conditions, excavation, and characteristics shown should in no way be construed to reflect any variation which may occur between these borings or test pits.

It should be noted that fluctuations in the level of the groundwater may occur due to variation in rainfall, temperature, changes in drainage and grading, and other factors not evident at the time measurements were made and reported herein. MID-COAST Geotechnical, Inc. assumes no responsibility for variations which may occur across the site.

If conditions encountered during construction appear to differ from those disclosed, this office shall be notified so as to consider the need for modifications. No responsibility for construction compliance with the design concepts, specifications or recommendations is assumed unless on-site construction review is performed during the course of construction which pertains to the specific recommendations contained herein.

This report has been prepared in accordance with generally accepted practice. No warranties, either express or implied, are made as to the professional advice provided under the terms of the agreement and included in this report.

APPENDIX

(Laboratory results, maps, and logs)

9 LABORATORY TEST RESULTS

9.1 MOISTURE-DENSITY DETERMINATIONS

Maximum Density-Optimum Moisture data were determined in the laboratory from soil samples using the ASTM D-1557-07 Method of Compaction.

<u>SOIL TYPE</u>	<u>SOIL DESCRIPTION</u>	<u>MAXIMUM DRY DENSITY (lbs/cu.ft)</u>	<u>OPTIMUM MOISTURE (%)</u>
S4	Lt brown poorly graded SAND	115.5	10.0
S6	Lt brown silty SAND	127.0	7.5
S6	Lt brown silty SAND	130.0	7.0

9.2 FIELD MOISTURE CONTENT SUMMARY

<u>TEST NO.</u>	<u>DEPTH (FT)</u>	<u>SOIL TYPE</u>	<u>FIELD MOISTURE CONTENT (%)</u>
B1	8	S3	2.8
B1	12	S4	3.8
B1	15	S4	2.8
B1	25	S5	2.3
B1	30	S5	2.2
B1	35	S5	5.1
B2	5	S6	8.6
B2	10	S7	8.4
B2	15	S7	4.6
B2	20	S7	4.0

9.3 PARTICLE SIZE ANALYSIS (ASTM D422-63{2007})

Soil Boring	B1	B1	B1	B2	B2
Depth (ft)	8	15	35	5	20
Soil Type	S3	S4	S5	S6	S7
% Gravel	42	22	32	29	19
% Sand	51	69	63	58	67
% Silt	4	7	3	2	5
% Clay	2	2	2	2	5
Symbol	SP	SP	SP	SP	SP

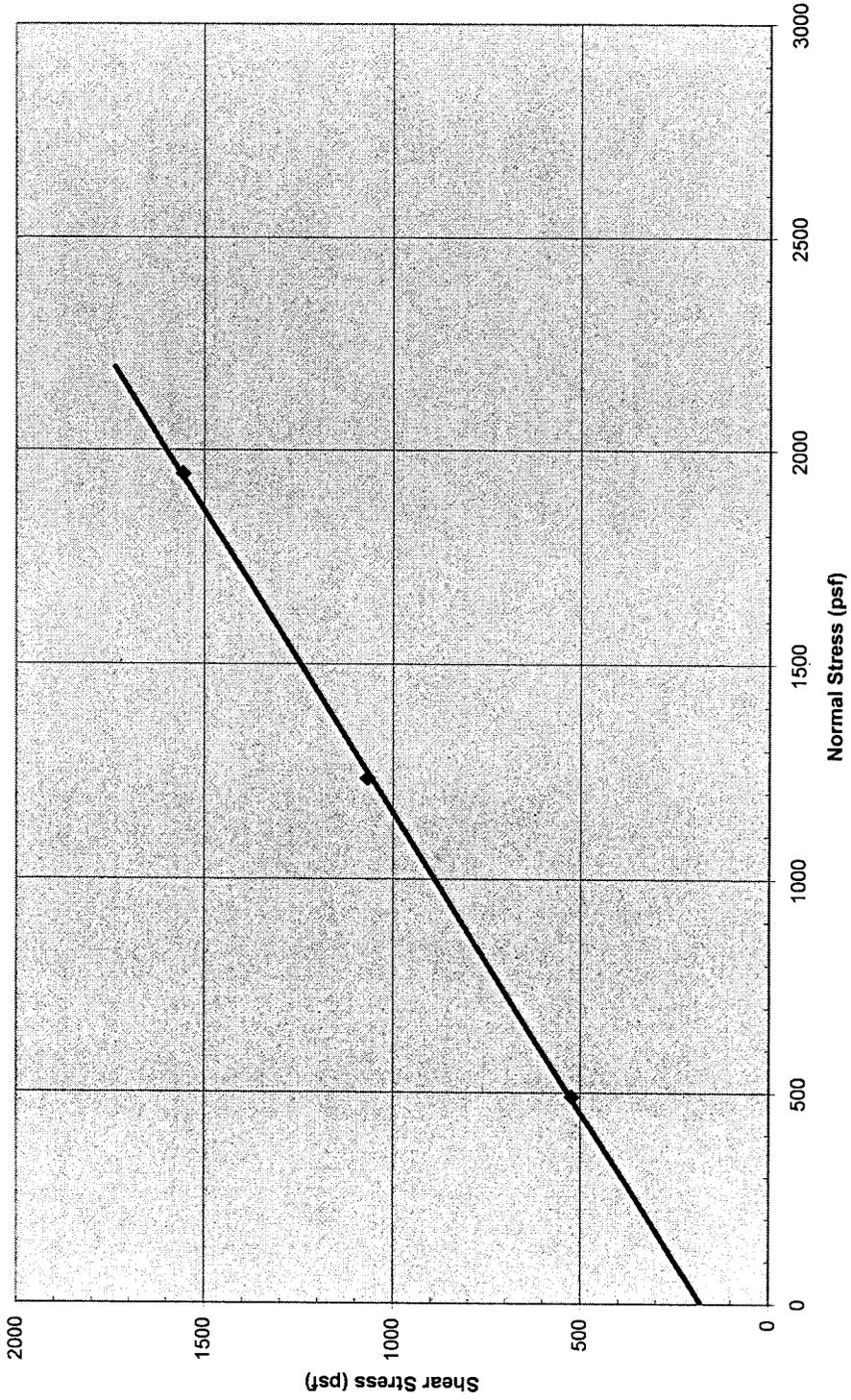
9.4 SHEAR TEST (ASTM D-3080-11)

A Direct Shear Test was performed on remolded soil samples trimmed in 1.0" x 2.41" diameter rings and tested under saturated conditions. The results follow:

<u>SOIL TYPE</u>	<u>TYPE OF TEST</u>	<u>COHESION (PSF)</u>	<u>FRICTION ANGLE</u>
S4	remold ult.	200	35.4
S6	remold ult.	200	35.2
S6	remold ult.	300	36.3

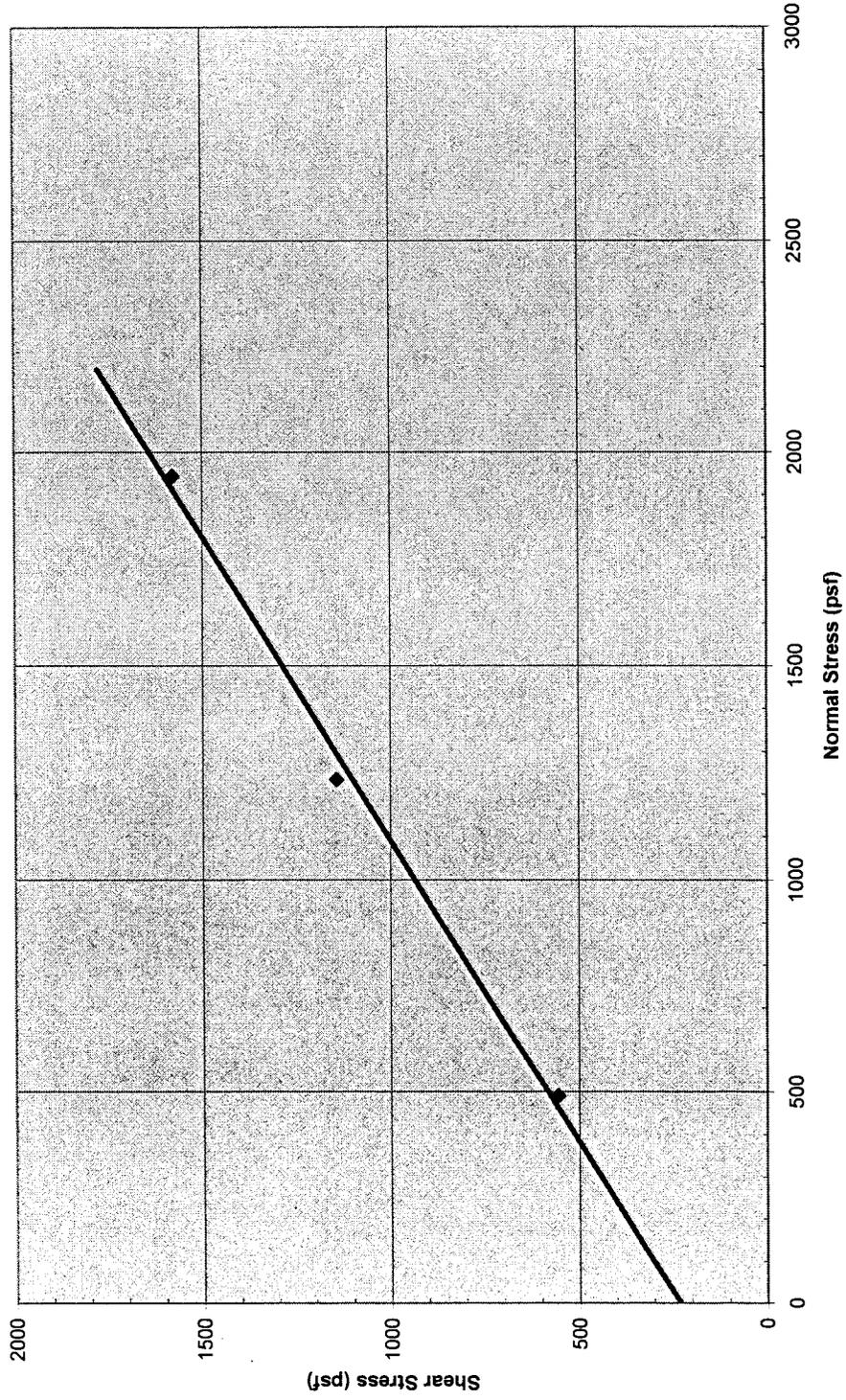
DIRECT SHEAR TEST (ASTM D-3080)

Date: 11/13/13 Test Type: rem. ult.
File No.: 13-6923 Dry Density: 104
Checked by: DJ Cohesion: 200
Sample: B1 11-18 Friction Angle: 35.4



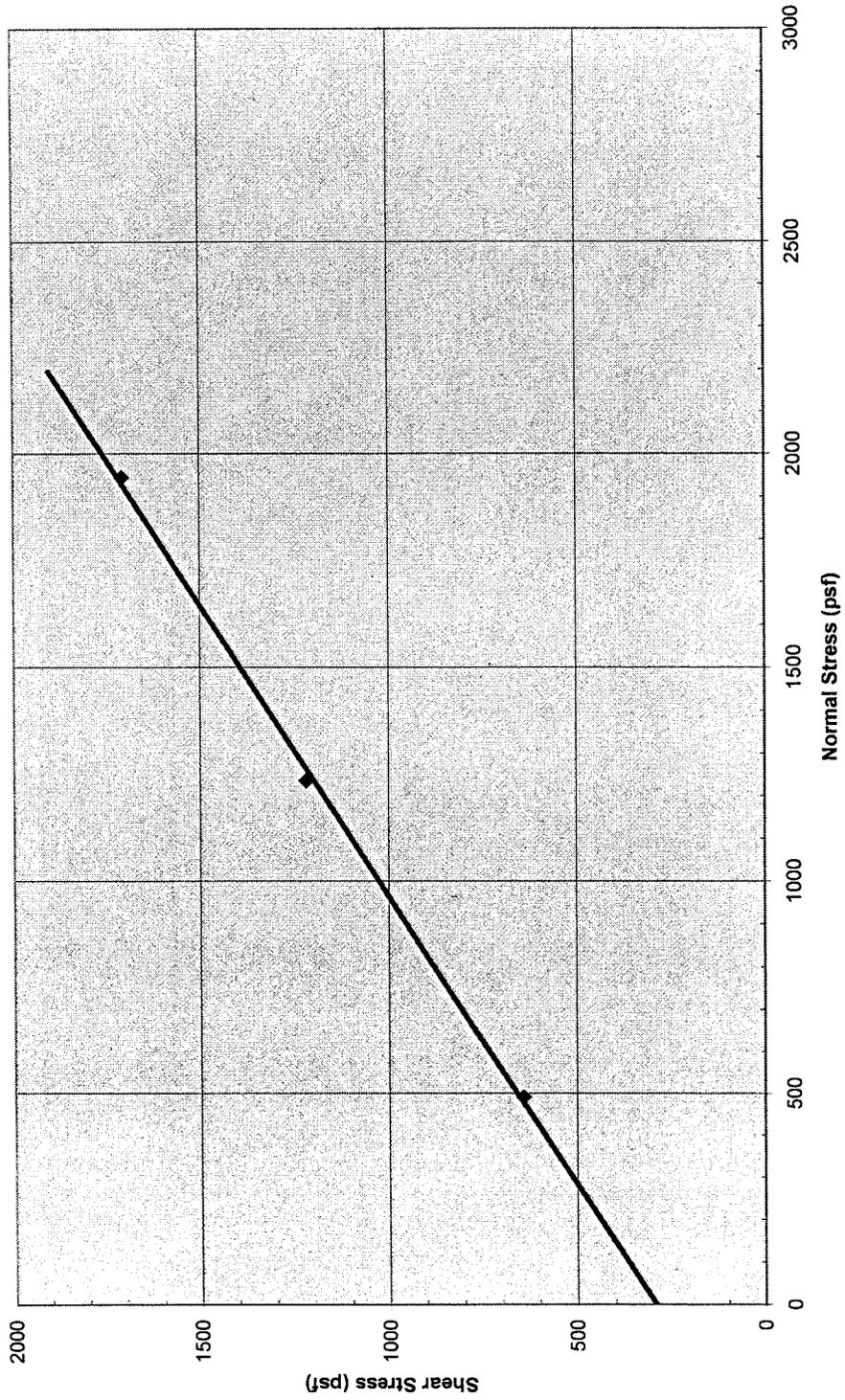
DIRECT SHEAR TEST (ASTM D-3080)

Date: 11/13/13 Test Type: rem. ult.
File No.: 13-6923 Dry Density: 114.3
Checked by: DJ Cohesion: 200
Sample: HB3 7-10 Friction Angle: 35.2



DIRECT SHEAR TEST (ASTM D-3080)

Date: 11/13/13 Test Type: rem. ult.
File No.: 13-6923 Dry Density: 116.9
Checked by: DJ Cohesion: 300
Sample: HB4 8-11 Friction Angle: 36.3



County of San Luis Obispo
River Road, San Miguel

RESISTANCE 'R' VALUE AND EXPANSION PRESSURE

CTM 301

January 22, 2014

Light brown silty SAND with gravel

Dry Density @ 300 psi Exudation Pressure: 132.2-pcf

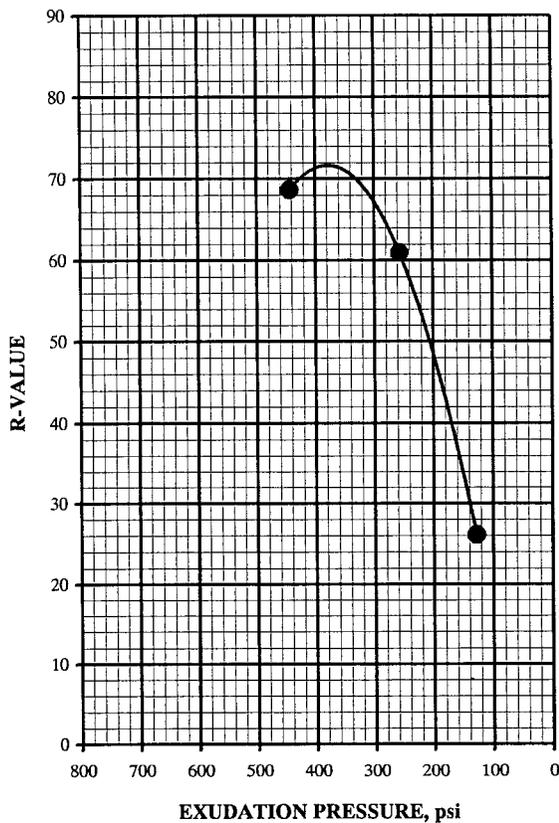
%Moisture @ 300 psi Exudation Pressure: 8.6%

R-Value - Exudation Pressure: 67

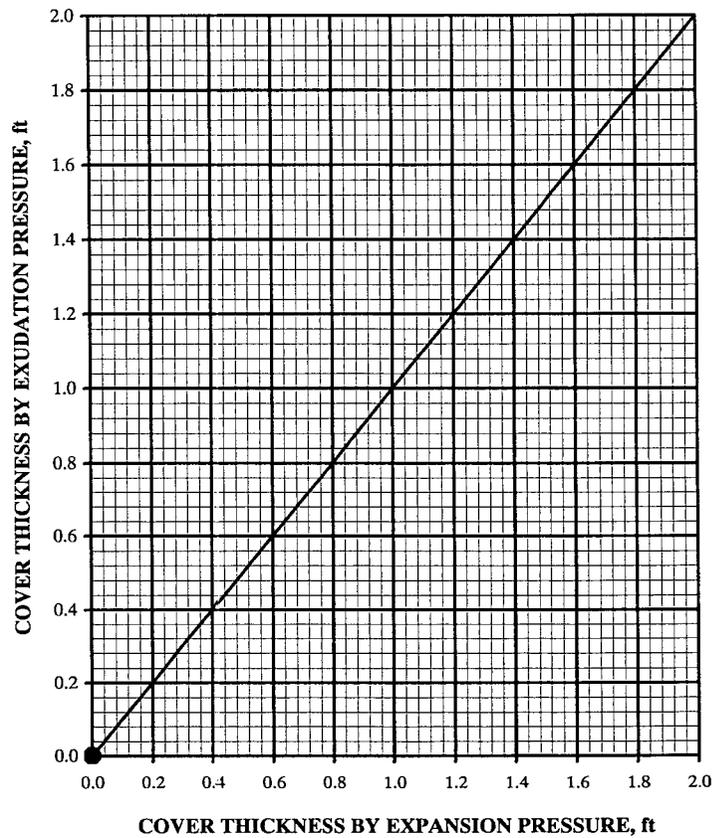
R-Value - Expansion Pressure: N/A

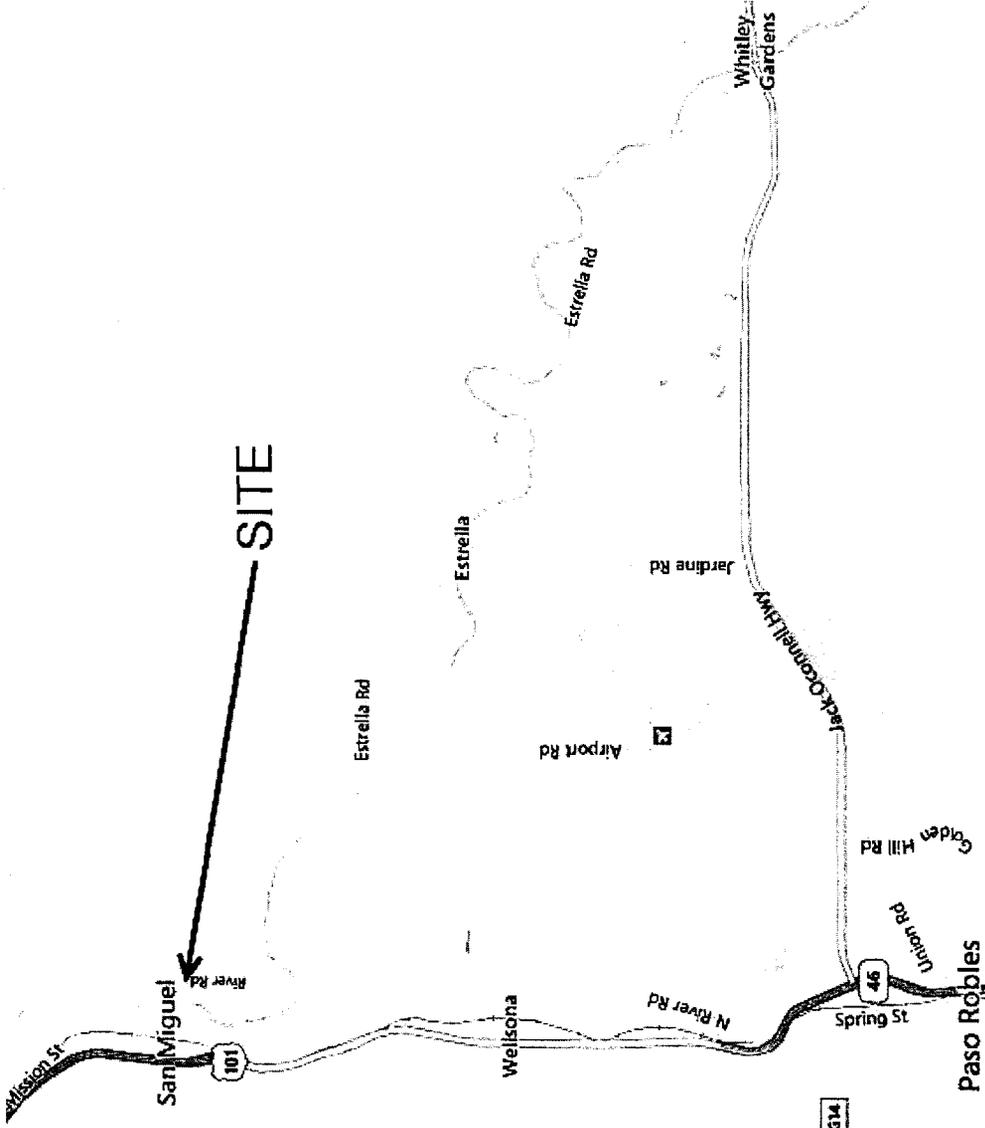
R-Value @ Equilibrium: 67

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART





Vicinity Map _____ N.T.S.

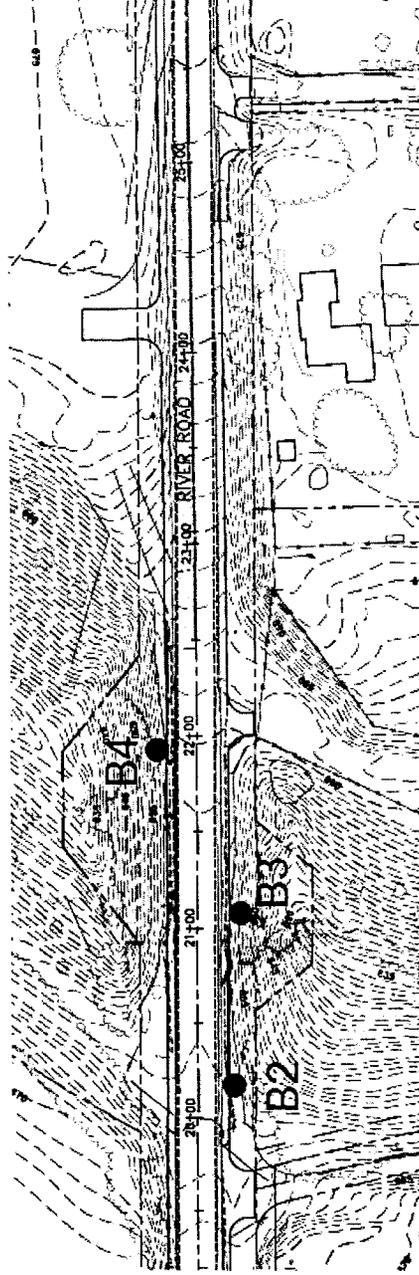
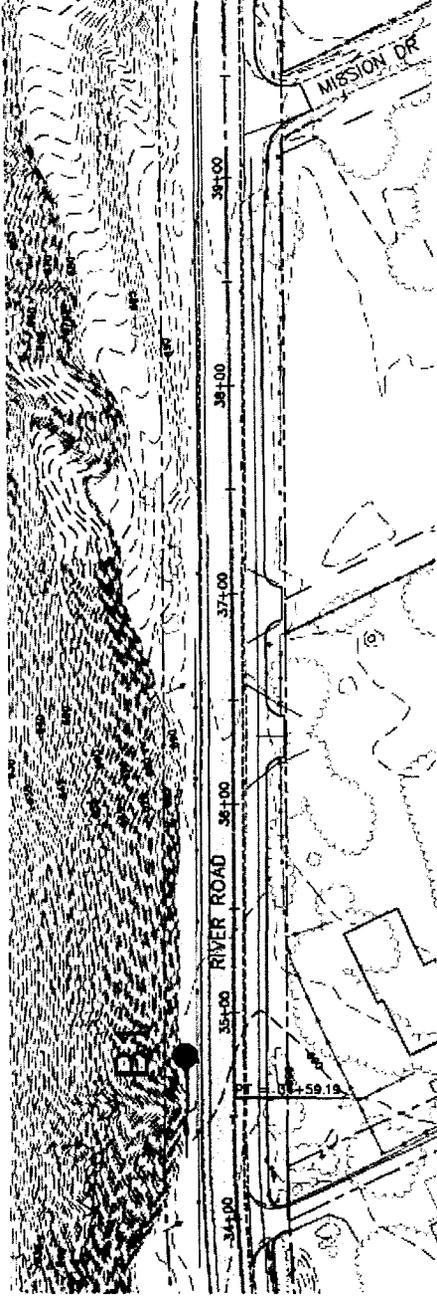
*MAP PROVIDED BY BING MAPS

County of San Luis Obispo
 Proposed Road Widening Project
 River Road
 San Miguel vicinity of San Luis Obispo County
 California

Date: 11/13/13

Plate 1





Legend

N.T.S.

Exploratory Soils Boring

*PLAN PROVIDED BY OTHERS



County of San Luis Obispo
 Proposed Road Widening Project
 River Road
 San Miguel vicinity of San Luis Obispo County
 California

Date: 11/13/13

Plate 2

LOG OF BORING B1



3124 El Camino Real Atascadero, CA 93422
 Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: County of San Luis Obispo
 PROJECT: River Road Widening
 LOCATION: River Rd, San Miguel
 NUMBER: 13-6923
 DATE(S) DRILLED: 11/5/2013

FIELD DATA		LABORATORY DATA										CLASS.		DRILLING METHOD(S): Copro E-210 Auger Drill Rig	
DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	RELATIVE COMPACTION (%)	ATTERBERG LIMITS			EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	GROUNDWATER INFORMATION: No groundwater was encountered at time of drilling	
						LL	PL	PI						SURFACE ELEVATION: DESCRIPTION OF STRATUM	
													S1	Brown silty SAND, loose, humid	
5													S2	Brown clayey SAND, hard, damp	
10			3							SP		S3	Brown poorly graded SAND with gravel, hard, damp Large cobbles encountered at 9 feet below grade.		
15			4							SP		S4	Light brown poorly graded SAND with gravel, hard, damp		
20			2							SW		S5	Brown well graded SAND with gravel, hard, damp		
25			2												
30			2												
35			5											Boring terminated at 35' below grade	
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH													REMARKS: Boring was backfilled with auger clippings		

LOG OF BORING: 13-6923_SOILS.GPJ MIDCOAST.GDT 1/2/14

LOG OF BORING B2



3124 El Camino Real Atascadero, CA 93422
 Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: County of San Luis Obispo
 PROJECT: River Road Widening
 LOCATION: River Rd, San Miguel
 NUMBER: 13-6923
 DATE(S) DRILLED: 11/5/2013

FIELD DATA		LABORATORY DATA										CLASS.		DRILLING METHOD(S):
DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	RELATIVE COMPACTION (%)	ATTERBERG LIMITS			EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	Mobile B24 Auger Drill Rig
						LL	PL	PI						GROUNDWATER INFORMATION:
													No groundwater was encountered at time of drilling	
													SURFACE ELEVATION:	
													DESCRIPTION OF STRATUM	
5			9								SM	S6	Light brown silty SAND with gravel, loose, humid	
10			8								SM	S7	Brown silty SAND with gravel, medium dense to hard, damp	
15			5											
20			4										Boring terminated at 20' below grade	
													REMARKS: Boring was backfilled with auger clippings	
													N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH	

LOG OF BORING 13-6923.SOILS.GPJ MIDCOAST.GDT 12/14

LOG OF BORING B3



3124 El Camino Real Atascadero, CA 93422
 Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: County of San Luis Obispo
 PROJECT: River Road Widening
 LOCATION: River Rd, San Miguel
 NUMBER: 13-6923
 DATE(S) DRILLED: 11/5/2013

FIELD DATA		LABORATORY DATA							CLASS.		DRILLING METHOD(S): Hand Auger			
DEPTH (FT)	SAMPLES N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	RELATIVE COMPACTION (%)	ATTERBERG LIMITS			EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	GROUNDWATER INFORMATION: No groundwater was encountered at time of drilling	
					LL	PL	PI						SURFACE ELEVATION:	
												DESCRIPTION OF STRATUM		
1													Light brown silty SAND with organics and gravel, loose, damp	
2											S6			
3														
4														
												REMARKS: Boring was backfilled with auger clippings		

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE
 T - POCKET TORVANE SHEAR STRENGTH

LOG OF BORING 13-6923-SOILS.GPJ MIDCOAST.GDT 11/2/14

LOG OF BORING B4



3124 El Camino Real Atascadero, CA 93422
 Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: County of San Luis Obispo
 PROJECT: River Road Widening
 LOCATION: River Rd, San Miguel
 NUMBER: 13-6923
 DATE(S) DRILLED: 11/5/2013

FIELD DATA		LABORATORY DATA							CLASS.		DRILLING METHOD(S): Hand Auger				
DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ.FT T: TONS/SQ.FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	RELATIVE COMPACTION (%)	ATTERBERG LIMITS			EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	GROUNDWATER INFORMATION: No groundwater was encountered at time of drilling	
						LL	PL	PI						SURFACE ELEVATION:	
DESCRIPTION OF STRATUM															
1												S6		Light brown silty SAND with gravel and organics, loose, humid	
2															
3															
4															
5														Boring terminated at 5' below grade on large boulders and debris	
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH												REMARKS: Boring was backfilled with auger clippings			

LOG OF BORING 13-6923.SOILS.GPJ MIDCOAST.GDT 11/2/14

SLOPE SETBACKS

Based on Uniform Building Code Section 2907 (d)

FOUNDATIONS ON OR ADJACENT TO SLOPES:

The placement of buildings and structures on or adjacent to slopes steeper than 3 horizontal to 1 vertical shall be in accordance with the following illustrations. The provisions are intended to provide protection for the building from slope drainage, erosion, mudflow, loose debris shallow slope failures and foundation movements

