MID-COAST GEOTECHNICAL, INC.

Geotechnical Engineering Services

GEOTECHNICAL ENGINEERING REPORT

Proposed Multi-Family Residential Development

Tract 2527, Ninth Street

San Miguel vicinity of San Luis Obispo County

for:

People's Self-Help Housing Corporation

Attn: Sheryl Flores

3533 Empleo Street

San Luis Obispo, CA 93401

Date: December 5, 2014

Report No. 15966

File No. 14-7147

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1 INTRODUCTION

This report presents the results of our geotechnical investigation performed at the site of the proposed residential development located off Ninth Street 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 general site grading and to design suitable foundations for the proposed residences. From a geotechnical stand point the site appears to be suitable to support the proposed development 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. 10 truck mounted auger borings extended to depths of 10 to 25 feet. 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 development will be situated between the S.P.R.R. right-of way on the west and the Salinas River on the east. The terrain generally descends to the east at less than 2 percent slope. At the time of the investigation, an existing residence is located on the northwest portion of the site. Grass and scrub brush are located throughout the site.

3.2 EXPANSIVE NATURE OF THE SOIL

The surface and subsurface soils are a very low expansive sandy material.

3.3 EXISTING SOIL CONDITIONS

The loose to medium dense sandy surface soils were encountered to about 5 feet below grade throughout the site and are generally underlain with medium dense to hard sandy material and firm to stiff clayey and silty soils.

3.4 GROUND WATER CONDITION

At the time of our investigation ground water was encountered at 15 feet below grade in the B5 excavation. Fluctuation in the level of the ground water may occur due to variation in rainfall, temperature, or other factors.

3.5 SEISMIC PARAMETERS

We have reviewed the available information regarding the site locations and soil type. The purpose of our review was to determine the appropriate seismic parameters for the 2013 CBC Section 1613 requirements. The site is underlain with generally hard sandy material according to the logs available from the area. Density of the soil with respect to blow counts, shear strength, or shear wave velocities to a depth of 100 feet, has not been determined. However, due to the hard nature of the near-surface material and the high blow counts in the upper 15 feet of material, we recommend that a site class D be used for the project. Based on information provided in IBC Figures 1613.5(3) and 1613.5(4) and Tables 1613.5.3, the maximum considered earthquake spectral response acceleration values, adjusted for site class effects, are as follows:

short periods: $S_{DS} = 0.992g$

1-second periods: $S_{D1} = 0.534g$

3.6 LIQUEFACTION POTENTIAL

We have reviewed the subsurface data to provide an opinion regarding the liquefaction potential of the site. Exploratory borings were extended 25 feet deep in the project area. In all of the excavations, generally dense sandy material was noted within about 5 feet of the existing grade. Additionally, the saturated sandy layers were found to be dense and constrained by a clayey layer above.

Liquefaction is generally considered a result from development of pore pressure in loose saturated sandy soil during a seismic event. The potential of 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 25 feet deep in the project area. Based on the presence of dense sandy material at a depth of about 5 feet and the presence of firm clayey material to at least 14 feet, 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 a multi-family residential development will be constructed on the site. 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 removal areas, keys and footing excavations shall be observed by the representative of the geotechnical engineer before any fill or steel reinforcement is placed. It is your responsibility to notify 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 debris and abandoned water wells, septic tanks, etc., 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 1705.6 below:

TABLE 1705.6
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

*2013 California Building Code

4.2 BUILDING AREA REMOVAL DEPTH

The existing surface soils and any uncertified fill material underlying the proposed building areas shall be removed to a minimum depth of 24 inches below the bottom of the proposed footings or down to firm natural material, whichever is deeper.

NOTE: Certified structural fill is required for any fill to be used for an engineering purpose. All fill beneath structures, on slopes greater than 5:1, in embankments or other earthen structures, must be certified structural fill. All other fills, deeper than 12 inches, not to be used for structural support should be compacted but in some cases may not require certification. These uncertified fill areas, such as landscape fills, must be approved by this office and the local jurisdiction prior to grading.

4.3 PREPARATION OF DRIVELANES AND PARKING AREAS

The following guidelines are to be used for grading in the drivelanes and parking areas:

a. **Fill areas:** In those areas to receive fill, the existing surface soils shall be removed to a minimum depth of 24 inches below the original grade.

   The exposed soils at the bottom of the removal areas shall then be scarified to a depth of 8 inches, brought to near optimum moisture content, and compacted to a minimum of 90 percent of the maximum density (ASTM D-1557) before any fill is placed. The area prepared as suggested above will provide adequate support for the proposed pavement but will not be certified as structural fill.

b. **Cut areas:** In those areas where the existing surface elevation is to be lowered more than 18 inches below the original grade, the exposed material at the bottom of the cut areas shall be processed and recompacted to a minimum of 95 percent of maximum density (ASTM D-1557) for a minimum depth of 12 inches below the structural section.

c. **Present Elevation:** In those areas where the existing surface elevation will remain the same, the top 24 inches of subgrade soils shall be removed and recompacted to a minimum of 95 percent of maximum density (ASTM D-1557).

4.4 TENTATIVE STRUCTURAL ROADWAY SECTION

Tentative structural sections for the paved roadways, drivelanes and parking areas are as follows:

Area	*R-Value*	*T.I.*	*Recommended Section*
On-site Roads	11	6	3" AC / 12.5" AB

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 the subgrade elevation. Aggregate Base (AB) shall be defined as "Processed Miscellaneous Base" or "Class II Base" material as required by the local jurisdiction. AB shall be extended under curbs and gutters where subgrade soils exceed an expansion index of 50. The structural sections shall be confirmed or modified by R-value testing as necessary when the subgrade is prepared.

4.5 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.

The exposed material at the bottom of the removal areas shall then be properly prepared and brought to near optimum moisture content before any fill is placed. The removal shall extend a minimum of 5 feet beyond the foundation perimeter or equal to the depth of removal, whichever is greater. The removed soil may be used as backfill providing all the deleterious materials, if any, are picked out.

4.6 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 a minimum of 90 percent of the maximum density (ASTM D1557) 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.

4.7 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.

4.8 SITE DRAINAGE

Small ponds of water near any structure should be eliminated. Final grading shall provide a positive drainage away from the footings. If a swale is required to collect the flow, the swale bottom should preferably be at least 5 feet from the footings or outside of the foundation wall backfill and sloped sufficiently to direct the runoff away from the building area and lot. All pad and roof drainage should be collected and transferred away from the buildings in non-erosive devices. Proper drainage shall also be provided away from the building footings and from the lot during construction. This is especially important when construction takes place during the rainy season. All drainage plans should also 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, after grading operations are completed, depending upon the nature of the soils resulting on the surface of the graded building pad.

5.1 SOIL EXPANSION POTENTIAL

At a minimum, any foundation design should take into consideration construction on soils in the expansion index range of 0 to 20. The actual expansion index range may vary depending on the nature of the soil resulting after the completion of grading. Structural details of any foundations, such as footing thickness, concrete strength and the amount of reinforcement should be established by your structural engineer.

5.2 SUB-SLAB MOISTURE BARRIER

In order to reduce the migration of moisture through the foundation and into the living spaces, we recommend that 3/4" or larger clean gravel be placed in a minimum thickness of 6 inches above pad grade. A vapor retarder shall be placed over the gravel with a minimum of 2 inches of sand or gravel placed over the plastic and beneath the slab. The vapor retarder shall conform to the requirements of ASTM E1745-11 and shall be installed in conformance with ASTM E1643.

5.3 BEARING CAPACITY: CONTINUOUS FOOTINGS

Continuous footings supported on certified fill material are adequate for foundation support of the proposed residences and may be designed using a bearing pressure of 1650 psf. The footing depth should meet the minimum recommendations noted above. The recommended bearing values are based on an assumed embedment of a minimum of 18 inches into certified fill material and be a minimum of 12 inches wide. A 5 percent increase of bearing pressure values is allowable for each additional 6-inch increment of width or depth up to a maximum value of 2500 psf.

5.4 FOUNDATIONS NEAR SLOPES

All foundations 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 footings 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.

5.5 WIND AND SEISMIC LOADS

The bearing pressures given are for the total of dead and frequently applied live loads and may be increased by one-third for short duration loading which includes the effects of wind or seismic forces.

5.6 PASSIVE AND FRICTIONAL RESISTANCE

Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure. An allowable coefficient of friction of 0.35 may be used with the dead load forces in the certified fill material.

Passive earth pressure may be computed as an equivalent fluid having a density of 350 pcf with a maximum earth pressure of 1750 psf. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

5.7 RETAINING WALLS: ACTIVE EARTH PRESSURE

Retaining walls may be designed for an equivalent fluid pressure of 35 psf per foot of depth. Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic, or adjacent structures. The allowable bearing, friction, and passive earth pressure may be found in the preceding sections.

All other retaining walls may be designed for the corresponding active pressures shown on the table below:

Surface Slope of Retained Material Horizontal to Vertical	Equivalent Fluid Weight (pcf)
Level	35
5 to 1	37
4 to 1	40
3 to 1	43
2 to 1	48

All walls should be backfilled with a minimum 1-foot wide layer of free draining soil, approved by MID-COAST Geotechnical, Inc., synthetic drain product, or clean, uniform sized gravel placed against the wall up to 18 inches below finish grade. Where the cavity to be filled behind a wall is less than 18 inches at the surface, the use of gravel is allowed without testing if compacted to the satisfaction of the geotechnical engineer. In the case of walls constructed with gravel backfill in areas where subsurface water is anticipated, we recommend that a geotextile fabric be placed between the backfill and cut.

In order to reduce the migration of water behind the wall, the surface of the gravel backfill should be sealed by pavement or covered by 18 inches of compacted soil. The surface water drainage shall be directed away from the wall and shall meet the requirements of the current local jurisdiction's building code. Where weep holes are not used at the base of the retaining wall, a perforated pipe shall be placed within a bed of approved rock at the base of the retaining wall and shall be drained to discharge into an approved drainage course.

5.8 ESTIMATED SETTLEMENT

Based upon test results, field observations, and compliance with these recommendations, a total settlement of less than 1/2 inch and differential settlement of less than 1/4 inch is expected in a distance of 20 feet.

6 ADDITIONAL RECOMMENDATIONS

6.1 PERIMETER SLABS AND GARDEN WALLS

Perimeter slabs (walkways, patios, etc.) and garden walls shall be designed as free-floating and independent of the adjacent structure. Subgrade materials in areas to receive slab-on-grade shall be prepared and presaturated as per the "Foundation" recommendations provided herein.

6.2 COMPACTION OF EXCESS SOIL

Soils generated during footing excavation operations should not be placed across the pads unless the materials are compacted to at least 90 percent relative compaction. This also applies to sand, agricultural, and landscape fill exceeding 12 inches in depth. Compaction tests should be taken in additional fills placed in order to confirm that the minimum relative compaction requirements are achieved. It is your responsibility to notify MID-COAST Geotechnical, Inc. if testing is needed.

6.3 ROOF GUTTERS AND DOWN SPOUTS

We advise that gutters and down spouts be installed on all buildings as a means of improving the flow of run-off away from the foundation and building area. Gutters and down spouts are of particular importance when the structure is located on expansive soil, on sandy soil underlain with low permeability material, on structures with subterranean areas, or other conditions which may be sensitive to excess moisture. Down spouts should be connected to PVC pipe and drained to an approved drainage course such as a street or storm drain.

7 OBSERVATIONS AND TESTING

All foundation excavations should be approved by this firm prior to placing concrete or any steel reinforcement. 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.

8 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, footing observations, presaturation observations, etc. Since the extent of grading and the amount of involvement 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
P.S.H.H.C. (2 + email)

9 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)

10 LABORATORY TEST RESULTS

10.1 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.

SOIL TYPE	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (lbs/cu.ft)	OPTIMUM MOISTURE (%)
S3	Dark brown silty SAND	126.0	8.5
S1	Light brown silty SAND w/gravel	121.0	11.5
S3	Dark brown silty SAND	122.0	10.0
S5	Dark brown silty SAND w/gravel	129.5	8.0

10.2 FIELD DENSITY SUMMARY (Ring Density Method)

TEST NO.	DEPTH (FT)	SOIL TYPE	FIELD MOISTURE CONTENT (%)	DRY DENSITY (lbs/cu.ft)	% OF MAX. DRY DENSITY
B1	2	S1	15.3	93.7	77
B1	5	S3	10.4	108.3	86
B1	10	S3	16.3		
B1	15	S4	7.2		
B2	2	S3	11.5	104.4	86
B2	5	S2	4.8	92.7	74
B2	10	S3	13.4		
B2	15	S4	6.2		
B3	2	S3	8.1	116.2	95
B3	5	S3	15.0	109.9	90
B3	10	S3	22.1		
B4	2	F1	8.7	106.5	87
B4	5	M1	7.8	95.3	74
B4	10	M1	14.1		
B4	15	M1	16.6		
B5	2	S1	2.4		
B5	5	S3	17.0	90.5	70
B5	10	S3	6.1		
B5	15	S3	22.6		
B5	20	S5	18.8		

FIELD DENSITY SUMMARY (Continued)

TEST NO.	DEPTH (FT)	SOIL TYPE	FIELD MOISTURE CONTENT (%)	DRY DENSITY (lbs/cu.ft)	% OF MAX. DRY DENSITY
B5	25	S4	12.0		
B6	2	S3	14.8	102.5	84
B6	5	S1	13.0	95.8	79
B6	10	S3	18.5		
B6	15	S4	15.0		
B7	2	S3	5.0		
B7	5	S3	13.0		
B7	10	S3	21.9		
B7	15	C1	24.5		
B8	2	S2	4.1	85.9	68
B8	5	S1	13.1	83.3	69
B8	10	C1	33.5	80.3	66
B8	15	S4	6.3		
B9	2	S2	15.7	94.8	75
B9	5	S3	23.4	93.7	77
B9	10	S3	22.2		
B9	15	C1	25.2		
B10	2	S3	15.3		
B10	5	S5	14.7		
B10	10	C1	24.3		
B10	15	S3	14.1		

10.3 HYDROMETER ANALYSIS

Soil Boring	B1	B5	B5
Depth	10	20	25
Soil Type	S3	S5	S4
% Gravel	3	1	45
% Sand	41	68	51
% Silt	38	19	2
% Clay	17	12	1
LL	31	26	-
PL	19	17	-
PI	12	9	-
Symbol	ML	SM	SP

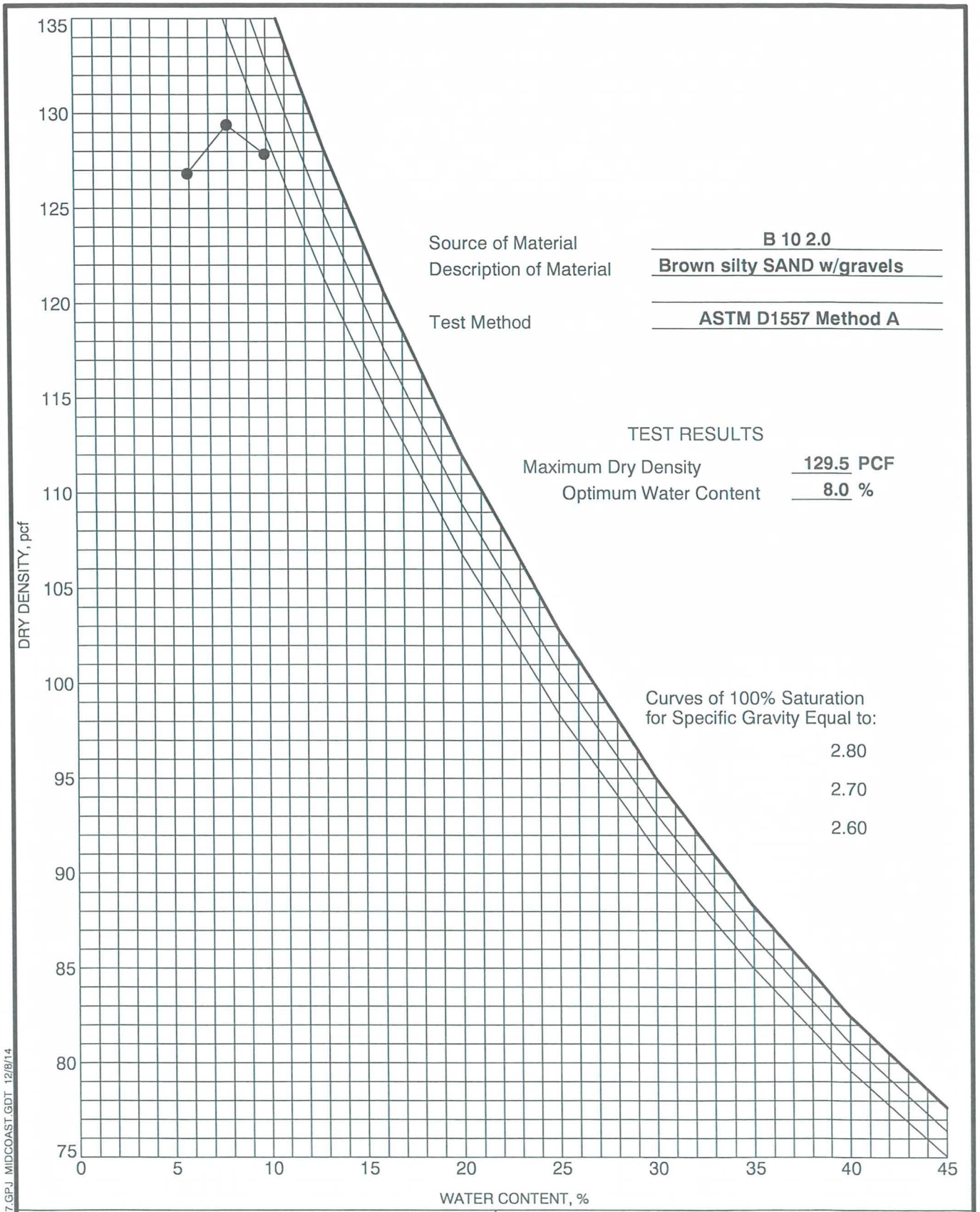
10.4 EXPANSION INDEX TEST

Each Expansion Index Test was performed on a representative bulk sample of the soil collected during our investigation. Expansion index test procedure is performed in accordance with ASTM D4289-03. The results follow:

SOIL TYPE	LOCATION	EXPANSION INDEX
S1	B3 0-2'	9
S3	B3 2-10'	13

10.5 CONSOLIDATION TEST

Each Consolidation Test was performed on an undisturbed soil sample trimmed in a 1.0" x 2.41" diameter ring. Loads were added in increments up to 8,000 psf. Each sample was flooded at 1,000 psf to simulate adverse field conditions. The results are shown graphically in the Appendix of this report.



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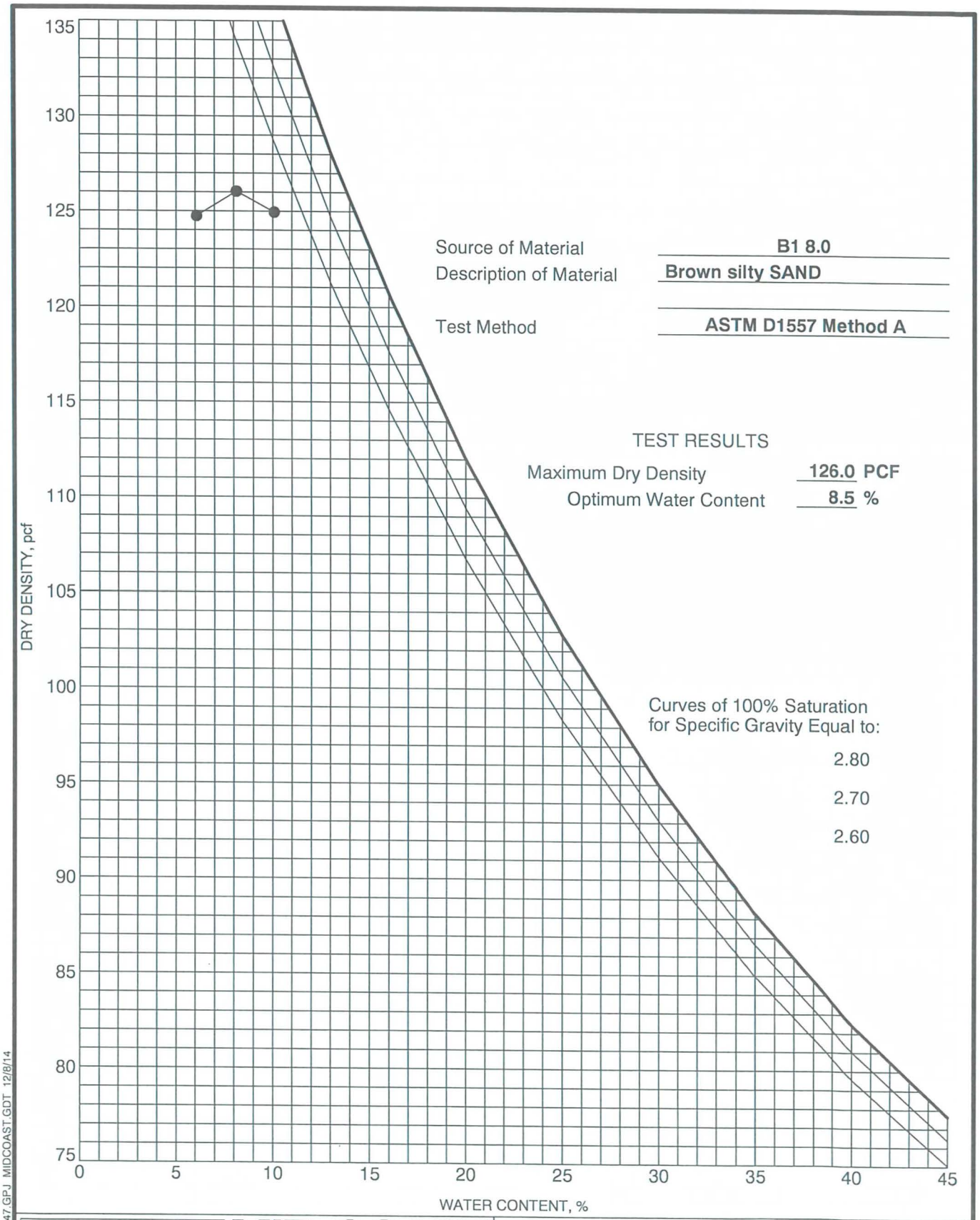
MOISTURE-DENSITY RELATIONSHIP

Client: P.S.H.H.C
Project: Tract 2527
Location: San Miguel
Number: 14-7147

COMPACTION #3 14-7147.GPJ MIDCOAST.GDT 12/8/14



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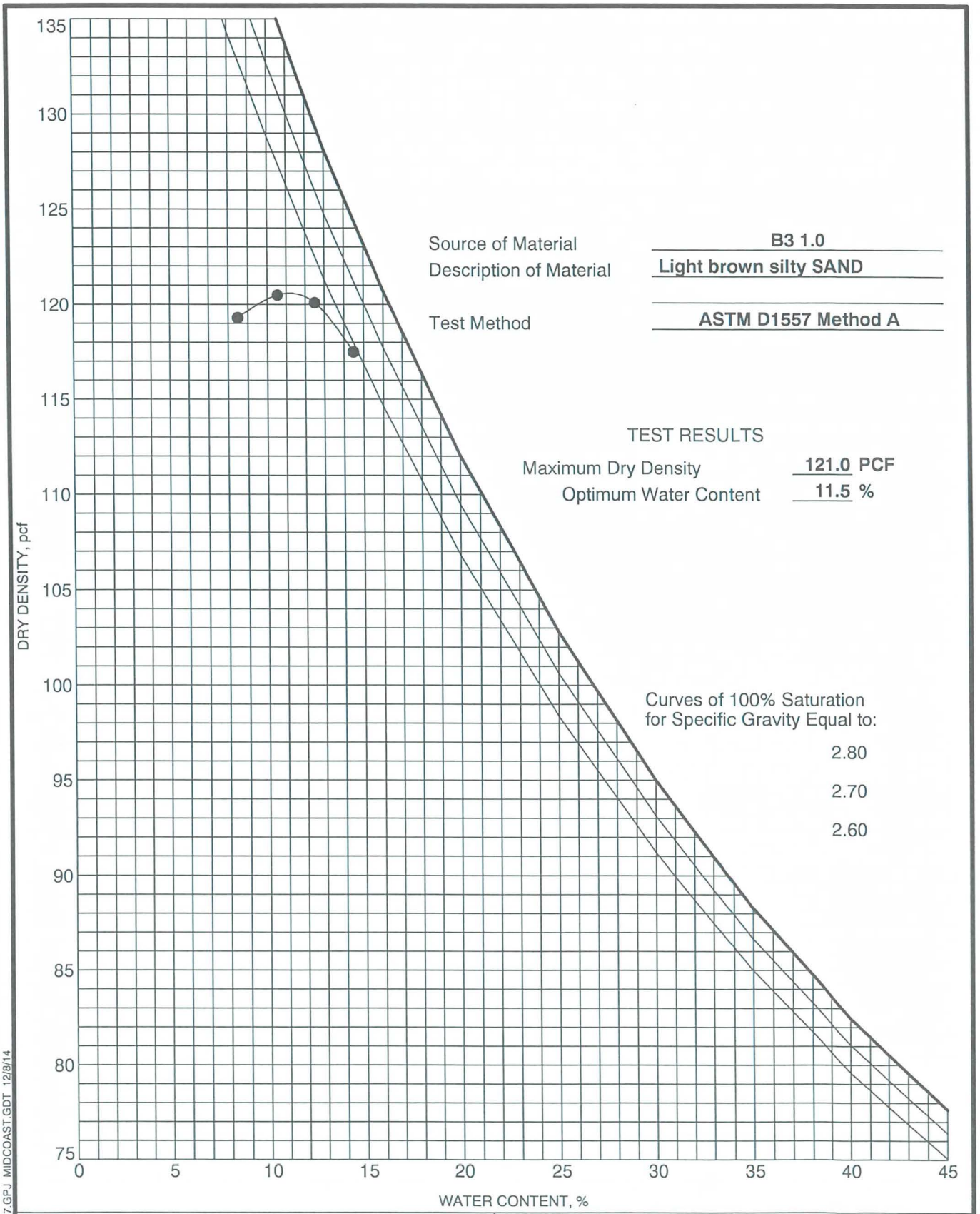

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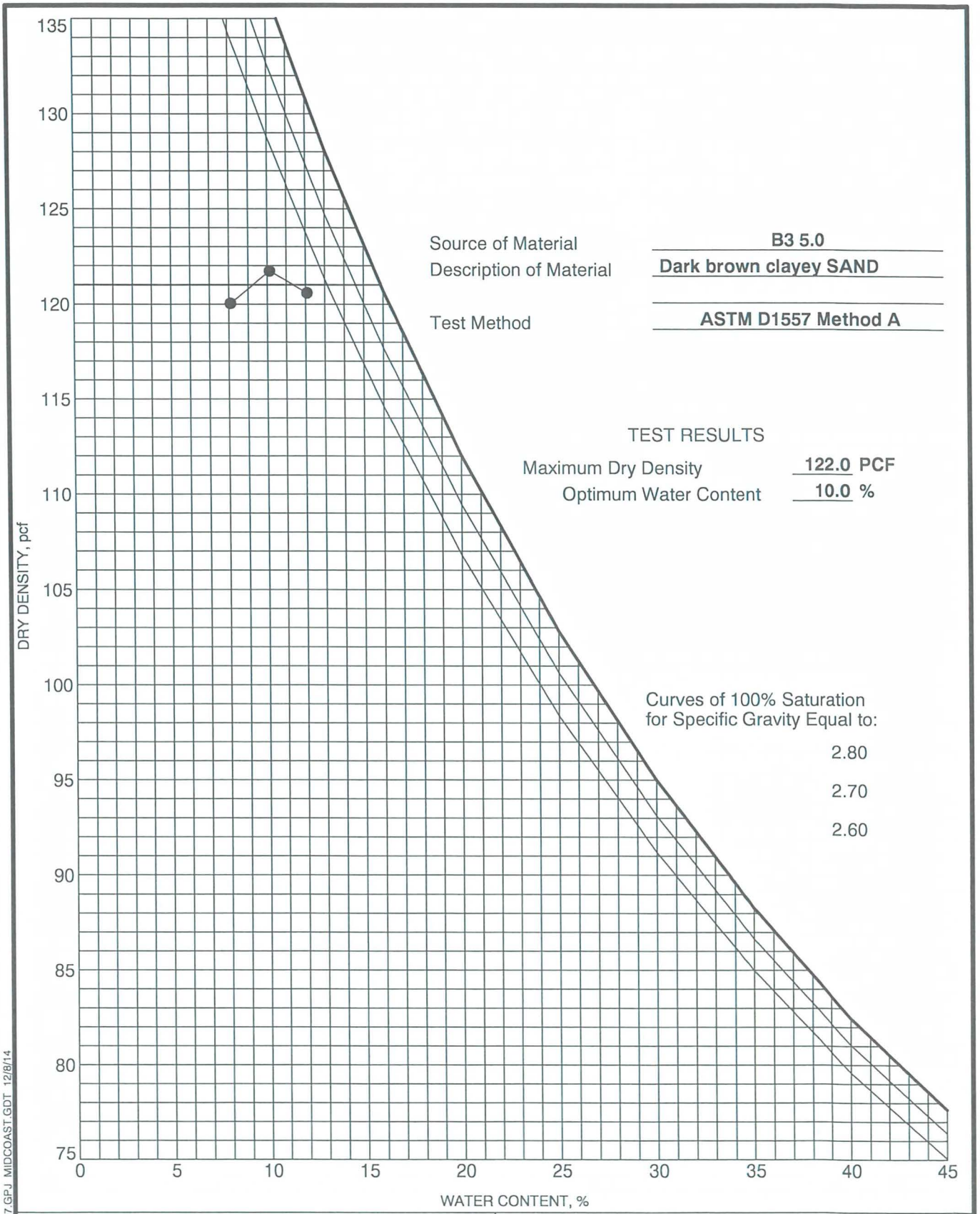

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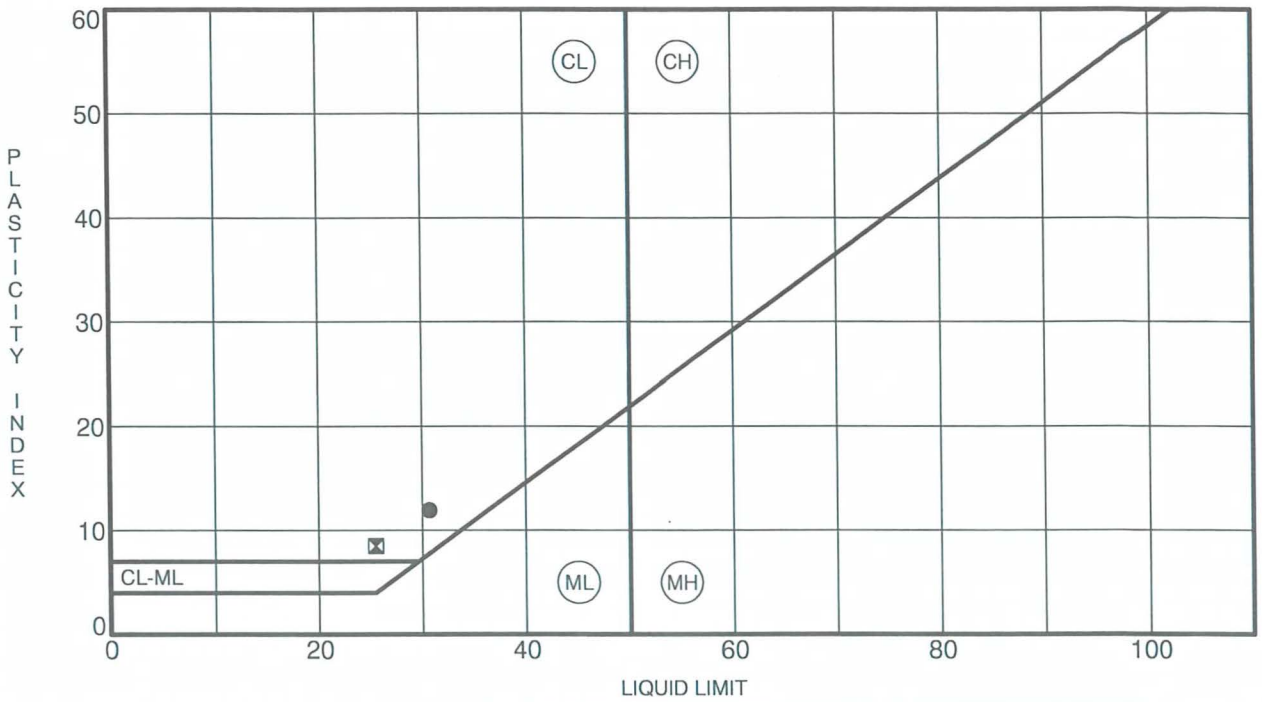


	Specimen Identification		LL	PL	PI	Fines	Classification
●	B4	10.3	31	19	12		Dark brown silty SAND
⊠	B5	20.3	26	17	9		Dark brown silty SAND

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

ATTERBERG LIMITS' RESULTS

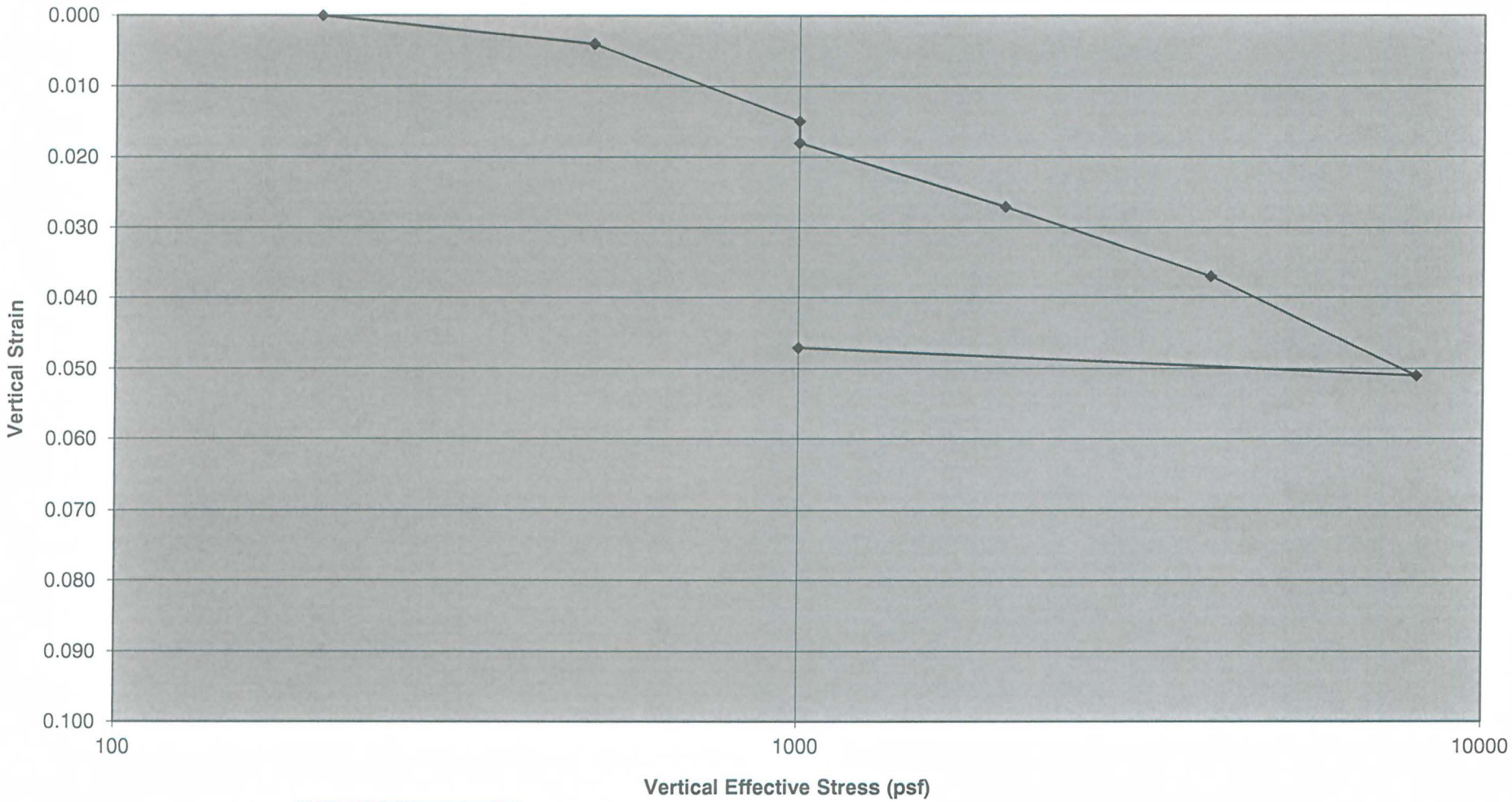
Client: P.S.H.H.C
Project: Tract 2527
Location: San Miguel
Number: 14-7147

US ATTERBERG LIMITS 14-7147.GPJ MIDCOAST.GDT 12/8/14

File #: 14-7147

Sample: B1 5'

Consolidation Test (ASTM D 2435)

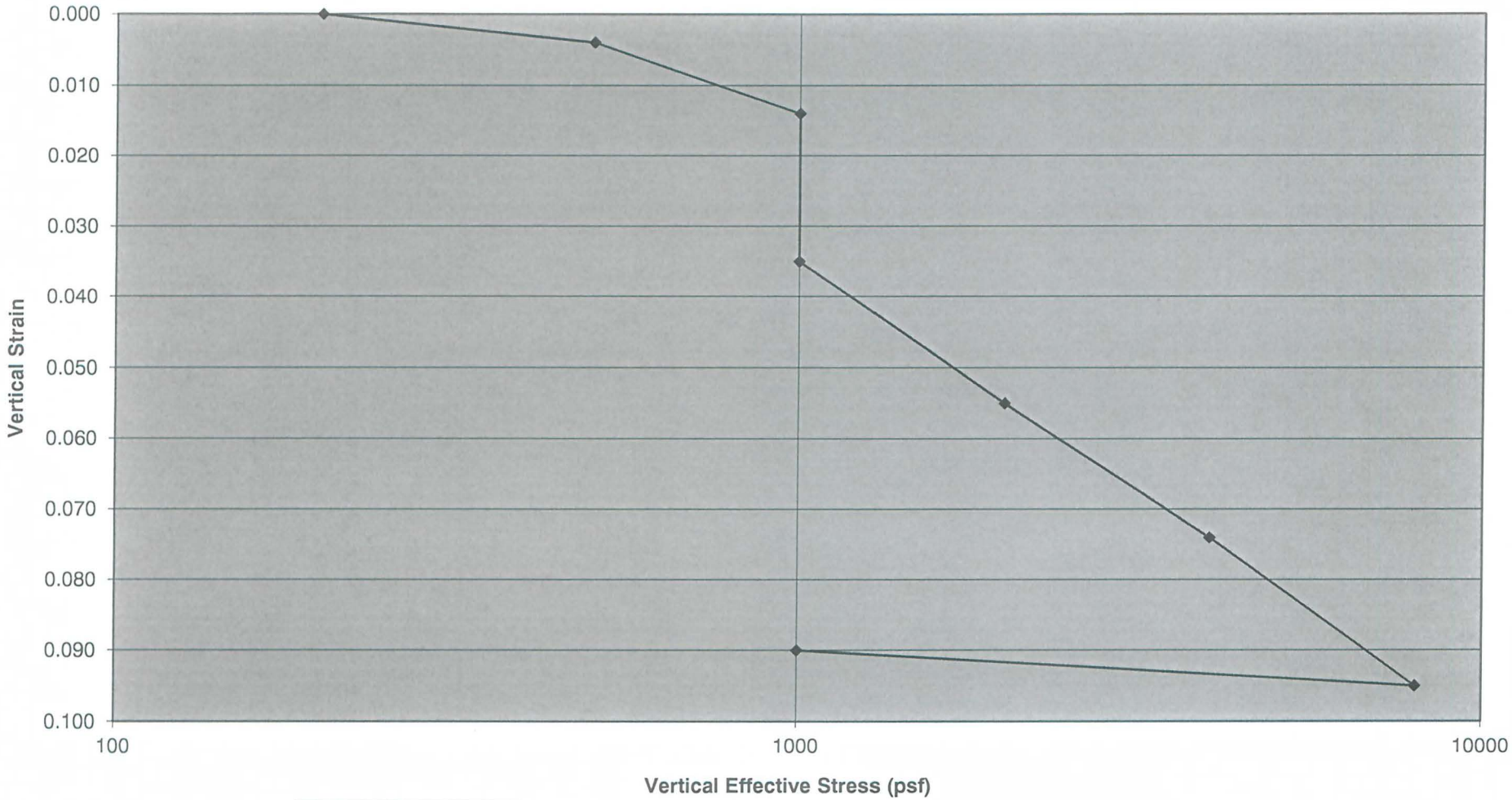


e (o) =	0.55
e (f) =	0.48

File #: 14-7147

Sample: B2 2'

Consolidation Test (ASTM D 2435)

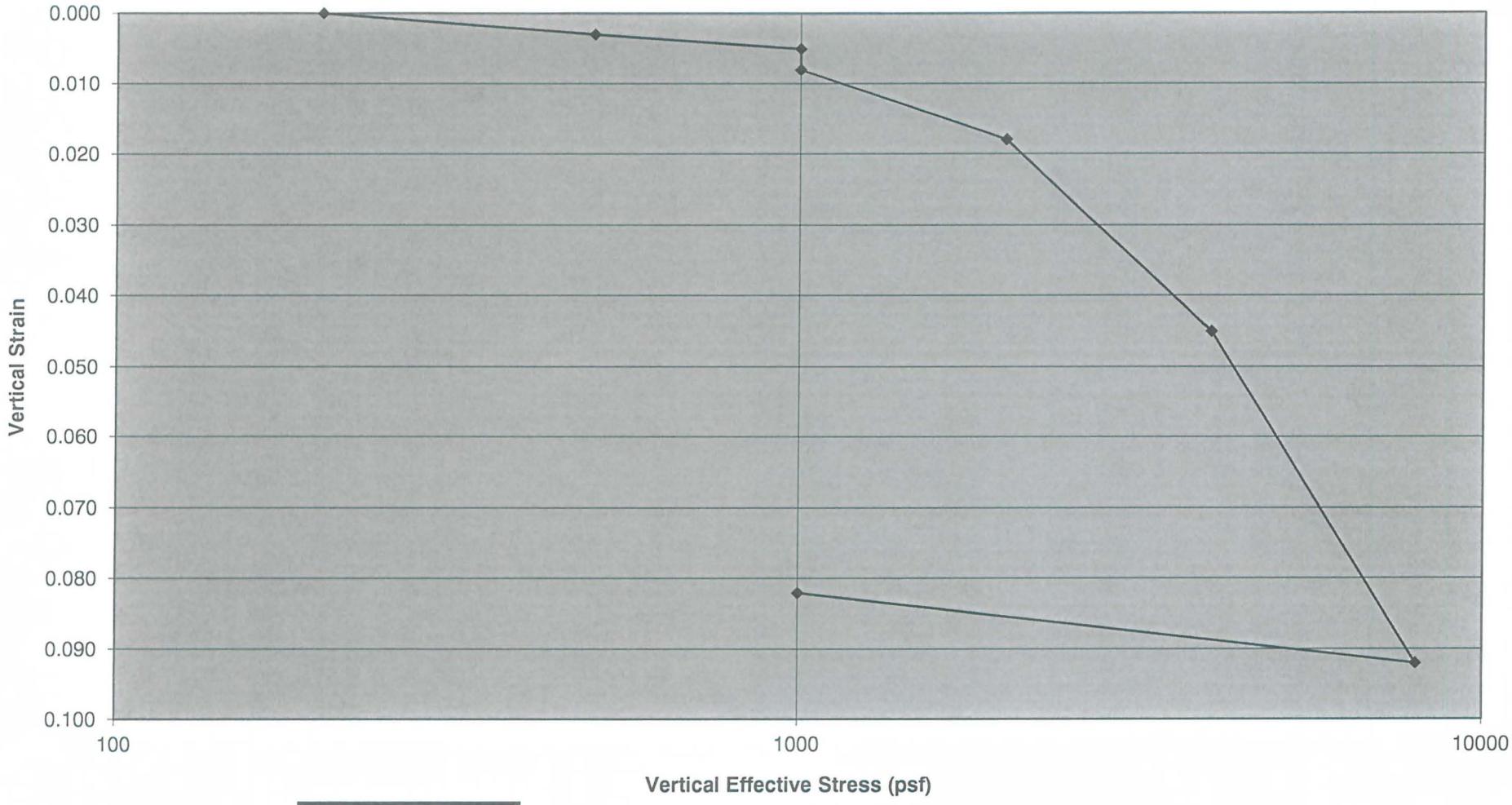


e (o) =	0.61
e (f) =	0.47

File #: 14-7147

Sample: B9 2'

Consolidation Test (ASTM D 2435)



e (o) =	0.80
e (f) =	0.65

PSHHC
B7 0-7

RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

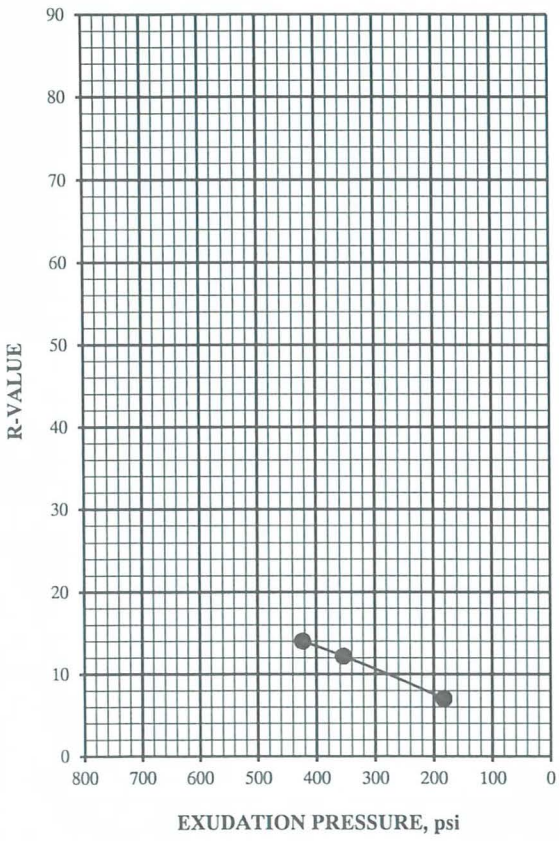
CTM 301

December 6, 2014

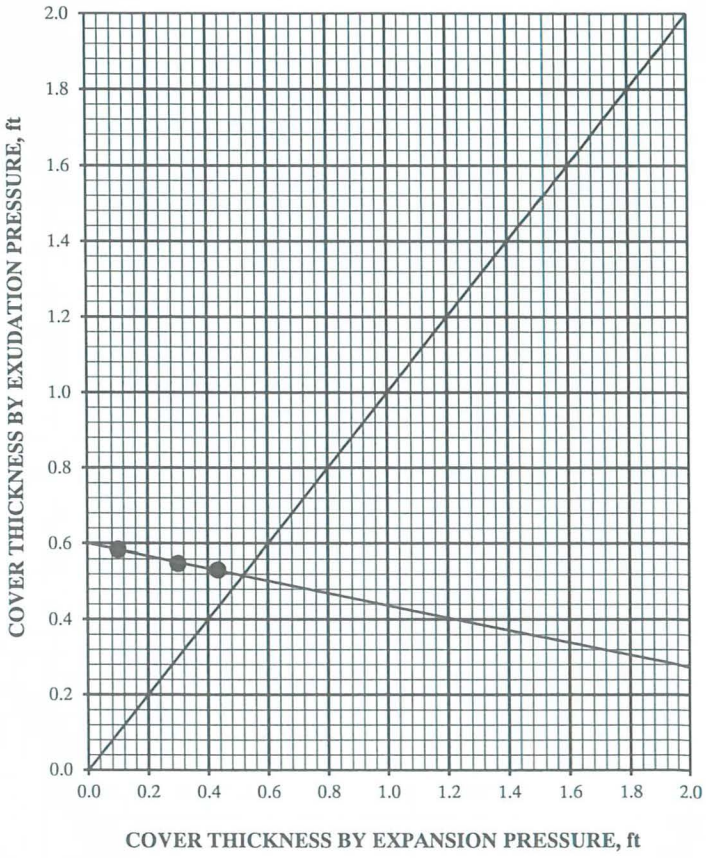
Dark brown clayey SAND with gravel

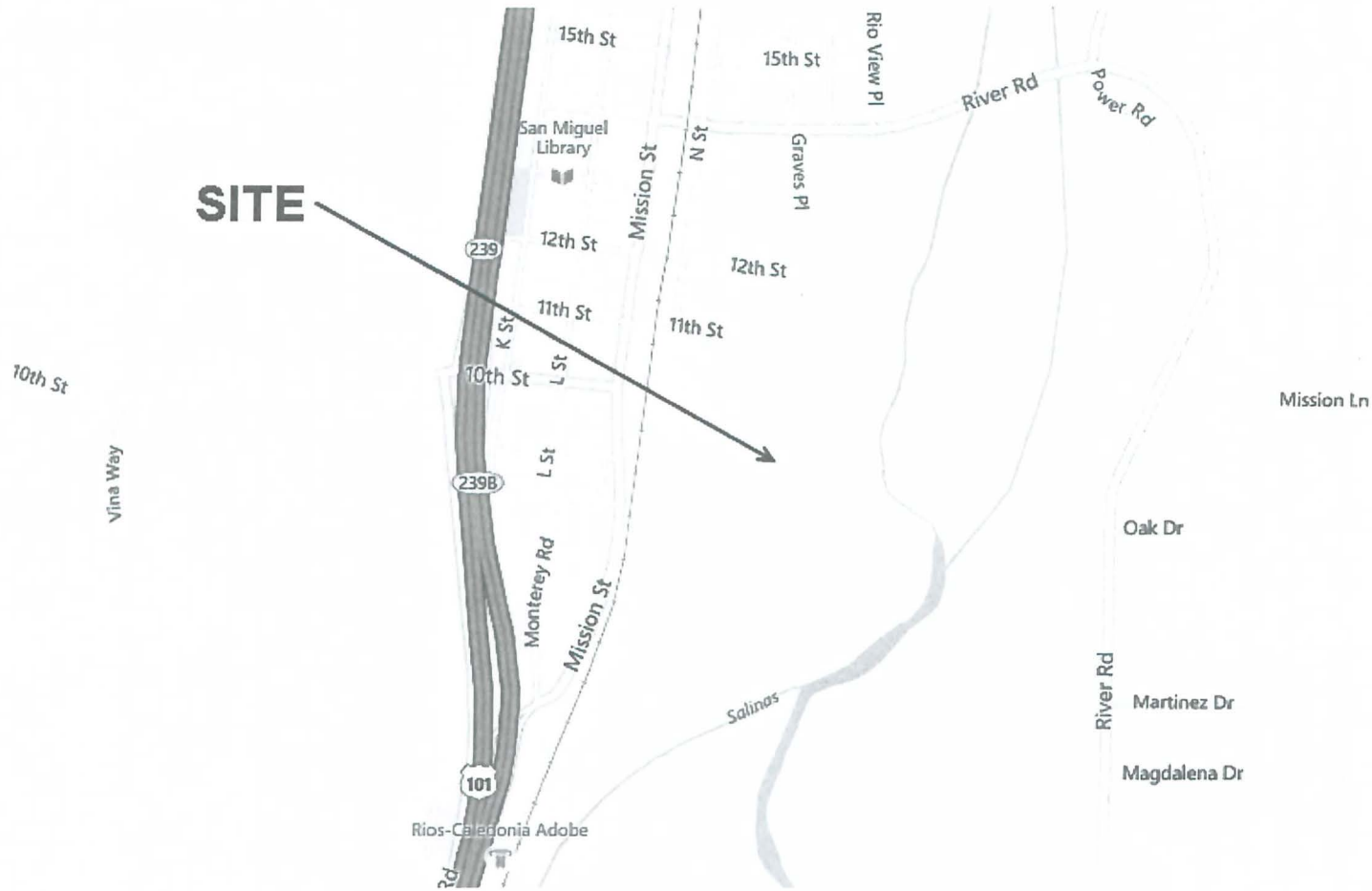
Dry Density @ 300 psi Exudation Pressure: 119.8-pcf
%Moisture @ 300 psi Exudation Pressure: 12.6%
R-Value - Exudation Pressure: 11
R-Value - Expansion Pressure: 18
R-Value @ Equilibrium: 11

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART





Vicinity Map N.T.S.

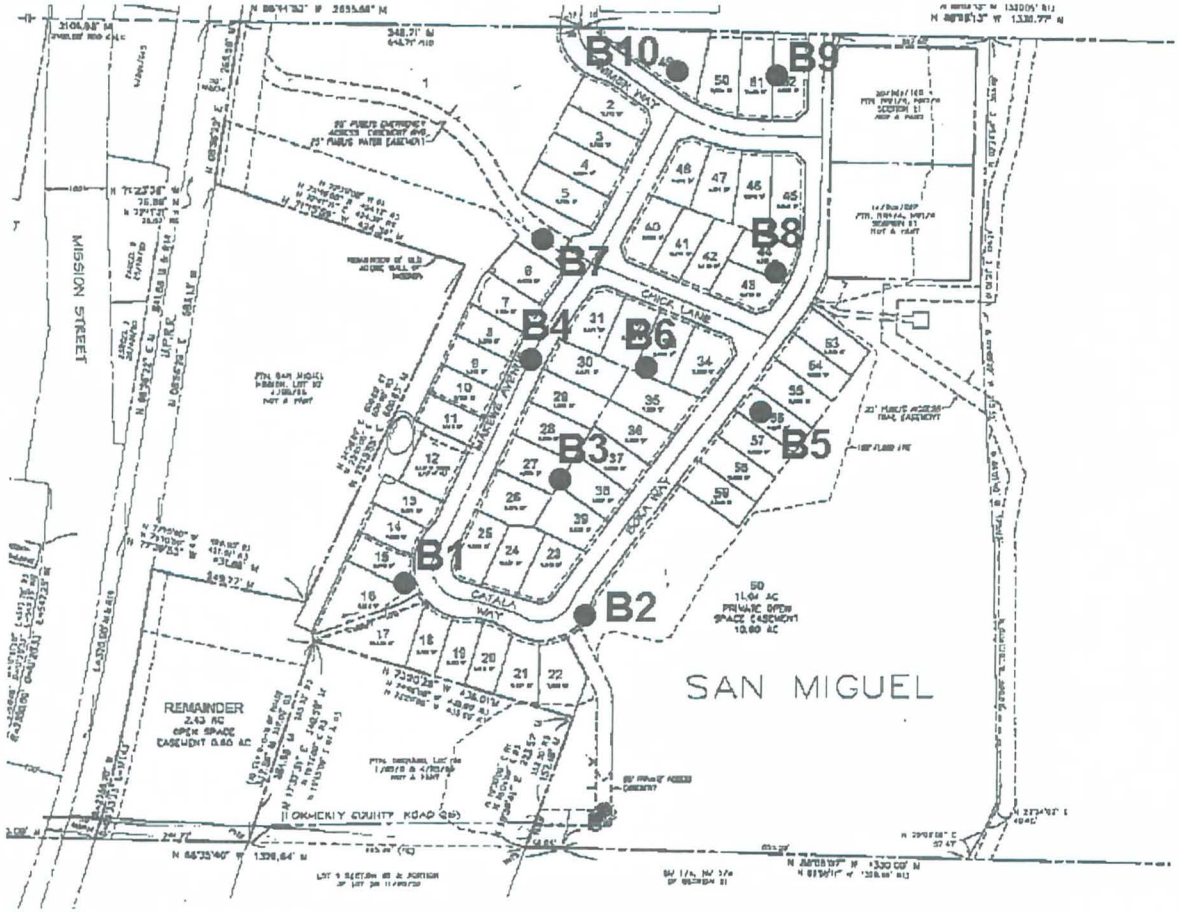
*MAP PROVIDED BY BING MAPS

MID-COAST GEOTECHNICAL, INC.

People's Self Help Housing Corporation
Proposed Multi-Family Development
Tract 2527, Ninth Street
San Miguel vicinity of San Luis Obispo County
California

Date: December 5, 2014

Plate 1



Legend **N.T.S.**

● Exploratory Soils Boring

*PLAN PROVIDED BY OTHERS

MID-COAST GEOTECHNICAL, INC.

People's Self Help Housing Corporation
Proposed Multi-Family Development
Tract 2527, Ninth Street
San Miguel vicinity of San Luis Obispo County
California

Date: December 5, 2014

Plate 2

LOG OF BORING B1

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			DESCRIPTION OF STRATUM
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	
1													S1	Light brown silty SAND, loose, damp
2		N = 19	15	94	77									
3													S2	Brown silty SAND, medium dense, damp
4														
5		N = 21	10	108	86								S3	Dark brown silty SAND, medium dense, moist
6														
7														
8														
9														
10			16											
11													M1	Brown sandy SILT w/gravel, firm, moist
12														
13													S4	Brown poorly graded SAND, hard, damp
14														
15			7											Boring was terminated at 15' 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 B2

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			
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: LIQUID LIMIT (LL)	ATTERBERG LIMITS: PLASTIC LIMIT (PL)	ATTERBERG LIMITS: PLASTICITY INDEX (PI)	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	DESCRIPTION OF STRATUM
1														Dark brown silty SAND, medium dense, damp
2		N = 42	11	104	86								S3	
3														
4														
5		N = 11	5	93	74									Brown silty SAND, loose to medium dense, damp
6														
7													S2	
8														
9														Dark brown silty SAND, medium dense, damp
10			13											
11													S3	
12														
13														
14														Brown poorly graded SAND, hard, damp
15			6										S4	
														Boring was terminated at 15' 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 B3

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			
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 LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	DESCRIPTION OF STRATUM
1									9				S1	Light brown silty SAND with gravel, loose to medium dense, damp
2		N = 50+	8	116	95									Dark brown silty SAND, hard, damp
3														
4														
5		N = 50	15	110	90									
6									13				S3	
7														
8														
9														
			22											
10														Boring was terminated at 10' 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 B4

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			DESCRIPTION OF STRATUM
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 LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	
1														Dark brown silty SAND (fill), hard, damp
2		N = 50+	9	107	87								F1	
3														
4														Dark brown sandy SILT, firm, moist
5			8	95	74									
6														
7														
8														
9											ML		M1	
10			14			31	19	12						
11														
12														
13														
14														
15			17											Boring was terminated at 15' 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 B5

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
Ground water encountered at 15 feet below grade.

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	DESCRIPTION OF STRATUM
		N = 19	2										S1	Light brown poorly graded SAND, loose, humid
5		N = 11	17	90	70								S3	Mottled brown silty SAND, medium dense, damp
													C1	Brown sandy CLAY, firm, moist
10			6										S3	Dark brown silty SAND, medium dense, damp
15			23											Ground water encountered
20			19			26	17	8			SM		S5	Dark brown clayey SAND, hard, damp
25			12								SP		S4	Dark brown poorly graded SAND, hard, wet
														Boring was terminated at 25' 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 B6

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	DESCRIPTION OF STRATUM
1													S3	Dark brown silty SAND, medium dense, damp
2		N = 24	15	102	84									
3													S1	Light brown silty SAND, loose to medium dense, damp
4														
5		N = 27	13	96	79									
6													S3	Dark brown silty SAND, medium dense to hard, moist
7														
8														
9														
10			18											
11													S4	Dark brown poorly graded SAND, medium dense, moist
12														
13														
14														
15			15											Boring was terminated at 15' 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 B7

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			DESCRIPTION OF STRATUM
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	
1														Dark brown silty SAND with cobbles and gravel, medium dense to hard, damp to moist
2			5											
3														
4														
5			13										S3	
6														
7														
8														
9														
10			22											
11														Dark brown sandy CLAY, firm, moist
12														
13													C1	
14														
15			25											Boring was terminated at 15' 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 B8

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			DESCRIPTION OF STRATUM
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	
1														Brown silty SAND, medium dense, damp
2		N = 10	4	86	68								S2	
3														
4														Light brown silty SAND, medium dense, damp
5		N = 10	13	83	69									
6														
7													S1	
8														
9														
10		N = 11	34	80	66									Dark brown clayey SAND, loose, moist
11													C1	
12														Dark grey poorly graded SAND, medium dense, damp
13													S4	
14														
15			6											Boring was terminated at 15' 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 B9

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			DESCRIPTION OF STRATUM
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	
1														Mottled brown silty SAND, medium dense, damp
2		N = 13	16	95	75								S2	
3														
4														
5		N = 20	23	94	77									Dark brown clayey SAND, medium dense to hard, moist
6														
7														
8													S3	
9														
10			22											
11														
12														Brown sandy CLAY. firm, moist
13													C1	
14														
15			25											Boring was terminated at 15' 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 B10

MID-COAST GEOTECHNICAL, INC.
3124 El Camino Real Atascadero, CA 93422
Telephone: 805-237-1462 Fax: 805-237-1483

CLIENT: People's Self Help Housing Corp.
PROJECT: Tract 2527
LOCATION: Ninth Street, San Miguel
NUMBER: 14-7147
DATE(S) DRILLED: 11/25/2014

DRILLING METHOD(S):
Mobile B24 Auger Drill Rig

GROUNDWATER INFORMATION:
No groundwater was encountered at time of drilling

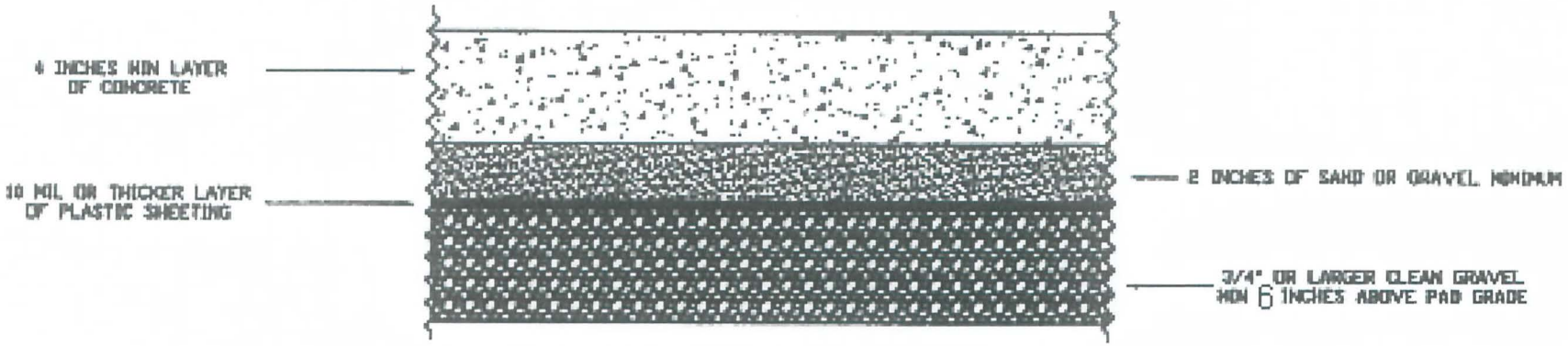
SURFACE ELEVATION:

FIELD DATA			LABORATORY DATA								CLASS.			
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: LIQUID LIMIT LL	ATTERBERG LIMITS: PLASTIC LIMIT PL	ATTERBERG LIMITS: PLASTICITY INDEX PI	EXPANSION INDEX	MINUS NO. 200 SIEVE (%)	USCS	SOIL SYMBOL	SOIL TYPE	DESCRIPTION OF STRATUM
1														Dark brown silty SAND with gravel, medium dense, moist
2			15										S3	
3														
4														
5			15											Dark brown silty SAND, medium dense, damp
6													S5	
7														
8														
9														
10			24										C1	Brown sandy CLAY, firm, moist
11														
12														
13													S3	Brown clayey SAND, medium dense, moist
14														
15			14											Boring was terminated at 15' 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 14-7147.GPJ MIDCOAST.GDT 12/8/14



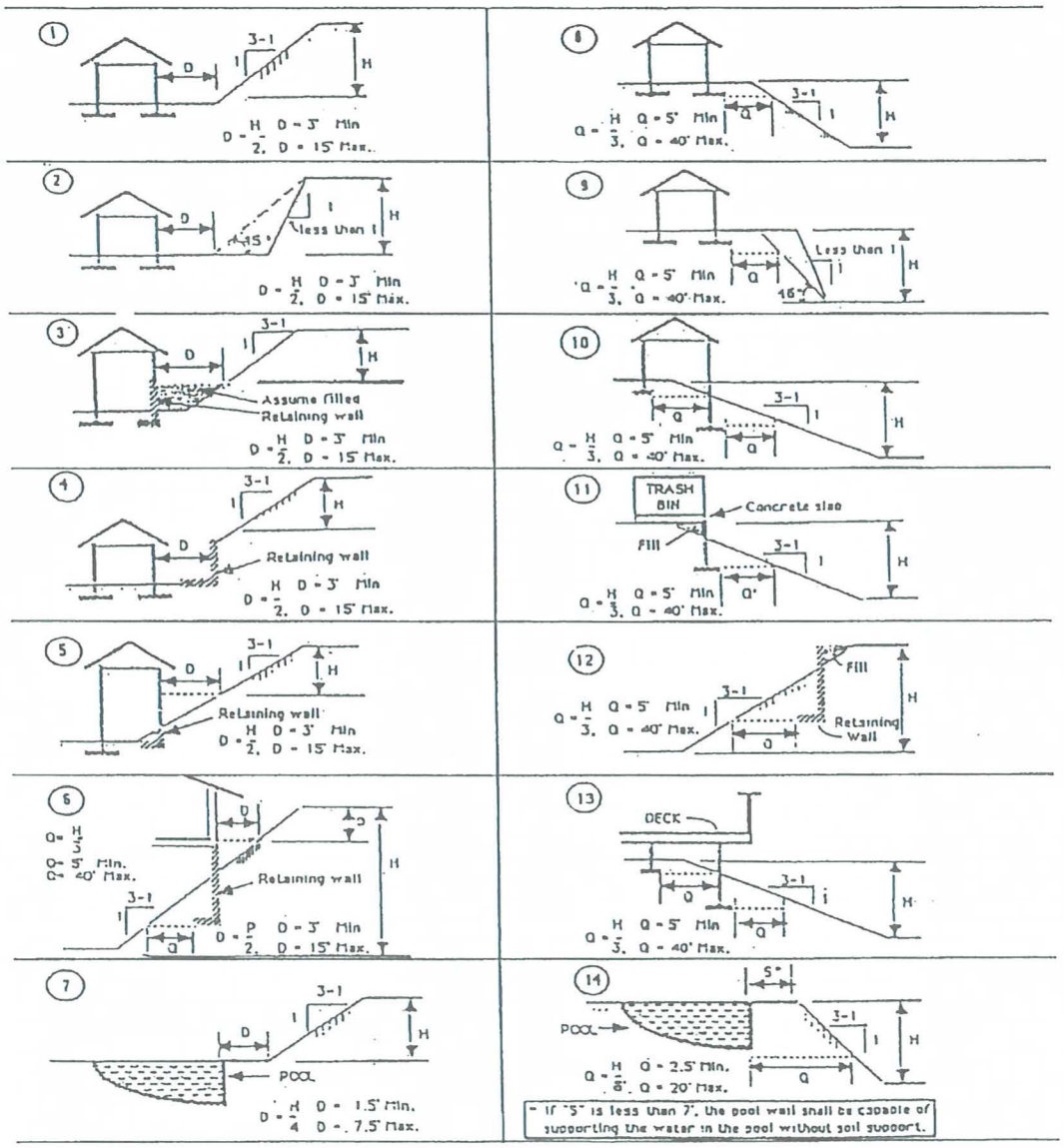
MID-COAST GEOTECHNICAL, INC.

SUB-SLAB MOISTURE BARRIER
(Typical)

Plate S

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