WESTERN
COLORADO
TESTING,
INC.

GEOTECHNICAL INVESTIGATION FOR GRAND VALLEY ESTATES SUBDIVISION FRUITA, COLORADO

Prepared For:

Grand Valley Estates Development, LLC
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Grand Junction, CO 81502

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November 8, 2005
Job No. 215005

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INTRODUCTION

This report presents the results of a geotechnical investigation performed for the Grand Valley Estates Subdivision, to be located on approximately 14 acres in Fruita, Colorado. The site location is shown on Figure 1. The proposed development consists of single-family residences on approximately 52 lots, and utility and street pavement installation. This investigation was authorized by Mr. Loren Ennis of Grand Valley Estates Development LLC.

Included in this investigation were six test pits, laboratory testing, and a report of our conclusions and recommendations. The scope of our report was limited to the following:

- Evaluating the engineering properties of the sub-soils encountered for the proposed construction.
- Recommending types and depths of foundation elements.
- Evaluating bearing capacity and estimated settlement.
- Presenting recommendations for earthwork and related construction with respect to the sub-soils encountered.
- Presenting recommended alternative pavement sections.

This report was prepared by the firm of Western Colorado Testing, Inc. (WCT) under the supervision of a registered professional engineer. Recommendations are based on the applicable standards of the profession at the time of this report within this geographic area. This report has been prepared for the exclusive use of **Grand Valley Estates Development LLC** for the specific application to the proposed project in accordance with generally accepted geotechnical engineering practices. The scope of this investigation did not include any environmental assessment for the presence of hazardous or toxic materials in the soil or groundwater on or near this site.

SITE CONDITIONS

The vicinity of the site includes predominantly rural residential and agricultural/pasture land. The site is bordered by J 2/10 Road to the north, existing residences and agricultural/pasture land to the south and east, and existing residences to west.

At the time of the field investigation, the site was generally open and nearly level with a very slight slope down to the southwest. Vegetation at the site consisted primarily of low grasses and weeds. An irrigation ditch and ditch road ran through the southern portion of the site. An existing modular home occupied the northwestern corner of the site and an existing garage occupied the northeastern corner of the site.

PROPOSED CONSTRUCTION

The proposed construction will consist of residential structures on approximately 52 lots, and utility and street pavement installation. The proposed structures are anticipated to be constructed of conventional wood framing with siding or brick veneer. The structures will likely be built over reinforced concrete foundations. Below grade construction is not anticipated. Foundation loads on the order of 600 to 2,000 pounds per linear foot wall loads and 4 to 8 kip column loads are likely.

FIELD EXPLORATION

The field exploration was conducted on October 20, 2005. The exploratory program consisted of six test pits as shown on Figure 2 – Site Plan. The test pits were located in the field by pacing distances from existing landmarks. The locations of the test pits shown on the plan should be considered accurate only to the degree implied by the method used.

The test pits were excavated to depths of between 6.5 and 7.5 feet below the existing ground surface with a trackhoe. Soil samples were collected at the depths shown on the test pit logs, included in Appendix A. Recovered samples were placed in bulk sample bags or brass containers, labeled and protected for transportation to the laboratory for testing. Stratification lines shown on the logs represent the approximate boundaries between stratum; however, the transition may be gradual.

SUBSURFACE CONDITIONS

As shown on the Test Pit Logs, the subsurface conditions encountered at the site were slightly variable. Test Pit TP-1, conducted in the northeastern portion of the site, encountered 1.5 feet of silty clay with organics topsoil above brown to gray, dry to wet, medium dense to very loose

silty sand to the bottom of the excavation. Groundwater was encountered in the excavation at a depth of 6.0 feet.

Test Pit TP-2, conducted in the southeastern portion of the site, encountered 1.0 foot of silty clay with organics topsoil above brown to gray, dry to wet, medium dense to very loose/stiff, interbedded silty sand and silty clay. The interbedded sand and clay soils extended to the bottom of the excavation. Groundwater was encountered in the excavation at a depth of 6.5 feet.

Test Pit TP-3, conducted in the south-central portion of the site, encountered 1.5 feet of silty clay with organics topsoil above brown, dry, medium dense silty sand to a depth of 4.0 feet. The silty sand was underlain by brown to gray, moist to wet, medium stiff to very soft silty clay to the bottom of the excavation. Groundwater was encountered in the excavation at a depth of 6.5 feet.

Test Pit TP-4, conducted in the southwestern portion of the site, encountered 1.0 foot of silty clay with organics topsoil above brown, dry, medium dense silty sand to a depth of 3.0 feet. The silty sand was underlain by light gray, dry, loose sand with gravel to a depth of 3.5 feet. Below the sand, brown to gray, moist to wet, medium stiff to very soft silty clay was encountered. The clay extended to a depth of 6.0 feet and was underlain by brown to gray, wet, loose silty sand. Groundwater was encountered in the excavation at a depth of 7.0 feet.

Test Pit TP-5, conducted in the northwestern portion of the site, encountered 1.5 feet of silty clay with organics topsoil above brown, dry to moist, medium dense/ medium stiff, interbedded silty sand and silty clay to the bottom of the excavation. Groundwater was not encountered in TP-5 at the time of the investigation.

Test Pit TP-6, conducted in the north-central portion of the site, encountered 1.5 feet of silty clay with organics topsoil above brown to gray, dry to wet, medium dense to loose/stiff to very soft, interbedded silty sand and silty clay to the bottom of the excavation. Groundwater was encountered in the excavation at a depth of 6.0 feet.

LABORATORY TESTING

The Field Test Pit Logs were reviewed to outline the depths, thickness, and extent of the subsurface strata, and a testing program was established to evaluate the engineering properties of the recovered samples. Specific tests that were performed include grain size analysis, Atterberg limits determination, swell/consolidation, natural moisture and density determination, and soluble sulfates content. These tests were performed in general accordance with current ASTM or state-of-the-art test procedures. An R-value test was also performed. The R-value was determined according to the Colorado Department of Transportation (CDOT) procedures (CPL-3101), which are a modification to ASTM D-2844. The laboratory testing results are presented in Appendix B.

The laboratory test results indicate that the site soils are moderately plastic. In addition, the soils were indicated to be slightly to moderately collapsible.

Based on the results of the testing program, the field logs were reviewed and supplemented as presented in Appendix A. These final logs represent our interpretation of the field logs, and reflect the additional information gained in the laboratory testing program.

CONCLUSIONS AND RECOMMENDATIONS

FOUNDATIONS

As indicated above, the laboratory testing results show that the soils at the site are moderately plastic. In addition, the soils at the site are slightly to moderately collapsible. For residential structures at this site, spread footings or monolithic structural slabs are both appropriate foundation alternatives. However, to reduce the risk of foundation movements, shallow foundations should rest on a minimum 24 inches of structural fill.

With the exception of topsoil, the clay and sand soils encountered in the test pits are suitable for use as structural fill. Imported structural fill should consist of a granular, non-expansive, non-free draining material approved by the engineer. Structural fill should extend down from the bottom of the foundations at a one horizontal to one vertical projection. The fill should be

moisture conditioned, placed in maximum 8-inch loose lifts, and compacted to a minimum of 95% of the standard Proctor maximum dry density for fine grained soils and modified Proctor maximum dry density for coarse grained soils, within (+/-) 2% of optimum moisture content as determined in accordance with ASTM D698 and D1557, respectively. Prior to placement of structural fill, the bottom of the excavation should be scarified to a depth of 6 to 8 inches, moisture conditioned, and recompacted in accordance with the above recommendations for structural fill placement.

Using the native soils as structural fill, the maximum allowable bearing capacity of the foundation building pads prepared as recommended is 1,250 psf. A modulus of subgrade reaction of 150 pci may be used for structural fill consisting of the native sand and clay soils, prepared as recommended. Local building codes should be consulted; however, it is recommended that footings subject to frost be at least 24 inches below the final grade.

It is important to note that the use of structural fill will reduce, but not eliminate the risk of foundation movement. With the over excavation, the collapsible soils are at a depth that with controlled watering and drainage, should be adequate to limit movement to acceptable levels. However, if water is allowed to pond around or under the structures, such that moisture infiltrates to the depth of the collapsible soils some movement can be expected.

As indicated above, shallow groundwater was encountered at the site. Therefore, if spread footing foundations are used in conjunction with structural floors and crawlspaces, perimeter foundation drains are recommended.

LATERAL EARTH PRESSURES

Any foundation walls and landscape retaining walls should be designed to resist lateral earth pressures. For backfill consisting of the native soils, walls should be designed to resist a lateral earth pressure corresponding to an equivalent fluid unit weight of 50 pcf in areas where no surcharge loads are present. The lateral earth pressures should be increased appropriately to reflect any surcharge loadings behind the walls. Backfill should be compacted and graded to prevent infiltration of water into the backfill.

FLOOR AND EXTERIOR SLABS

It is anticipated that slab-on-grade construction may be used in and around the structures. In order to reduce the risk of slab movements, it is recommended that slabs-on-grade be constructed over a minimum of 12 inches of structural fill, with fill and subgrade preparation as discussed in the Foundations section of this report.

EARTHWORK AND EXCAVATIONS

Prior to overall site grading, all old fill, trash, organic topsoil, including surface vegetation and the root zone, and all deleterious materials should be stripped and stockpiled. In areas to accept fill, the top 6 to 8 inches of the native ground surface should be scarified and re-compacted to eliminate a plane of weakness along the contact surface.

In general, fill should be placed in appropriate lifts depending on materials and compaction equipment used. Fill materials that classify as testable should be placed in maximum 8 inch loose lifts and compacted to a minimum 95% of the maximum dry density as determined by ASTM D-698, standard Proctor density. If the fill material is too rocky to test by the Proctor means, it shall be proof rolled to the engineer's satisfaction. Moisture contents at the time of compaction should be controlled to (+/-) 2% of optimum. Fill placed in non-structural, landscaped areas should be placed in thin, loose lifts and compacted to a minimum 90% of the maximum dry density (ASTM D-698, standard Proctor).

It is recommended that a technician working under the supervision of an experienced soils engineer from Western Colorado Testing, Inc. (WCT) monitor earthwork operations to evaluate compliance with the above recommendations.

Vertical cuts and excavations may stand for short periods of time, but should not be considered stable. All excavations should be sloped back, shored, or shielded for protection of workers according to current OSHA standards. The site soils generally classify as Type C soil according to OSHA's Construction Standards for Excavations. In general, the maximum allowable slope in temporary cuts for Type C soil is 1.5:1 (horizontal : vertical) slope.

WATER SOLUBLE SULFATES

A sample of the on-site soils from Test Pit TP-1 was tested to determine the concentration of water soluble sulfates. The test results indicated a sulfate content of between 100 and 250 parts per million (ppm). This concentration of water soluble sulfates represents a moderate degree of potential sulfate attack on concrete exposed to the site soils. Therefore, locally available Type I-II sulfate resistant cement is recommended for construction at this site.

SURFACE DRAINAGE AND LANDSCAPING

The success of the foundations and slabs–on-grade is contingent upon keeping the bearing soils at a more or less constant moisture content, and by not allowing surface drainage a path to the subsurface. Positive surface drainage away from the structures must be maintained at all times. Landscaped areas should be designed and built such that irrigation and other surface water will be collected and carried away from foundation elements.

The ground surface surrounding the exterior of the building and any overlying pavement, concrete slabs or sidewalks should have a positive slope away from foundation walls on all sides. We recommend a minimum slope of 12 inches in the first 10 feet; however, the slope can be decreased to 4 inches in 10 feet if the ground surface adjacent to foundations is covered with concrete slabs, sidewalks, or pavement.

Backfill material should be placed near optimum moisture content and compacted to at least 90% of maximum standard Proctor density in landscaped areas and to at least 95% maximum standard Proctor density beneath structural areas (sidewalks, etc.). All roof downspouts, drains and faucets should discharge well beyond the limits of all backfill. Irrigation within ten (10) feet of foundations should be carefully controlled and minimized.

STREET PAVEMENTS

Pavement section thickness alternatives for street construction are presented. The required pavement section thickness is dependent mainly on the subgrade conditions and traffic loadings. The pavement subgrade materials are generally indicated to be collapsible sand and clay soils.

An R-value test was performed on the subsurface soils from Test Pit TP-5 from 2.0 to 4.0 feet below the existing ground surface. Results of the R-value test provided a minimum value of less than 5 at an exudation pressure of 300 psi. Based on the test results, design manual procedures, freeze/thaw conditions, and experience with similar projects, the following minimum pavement section alternatives are recommended:

PAVEMENT ALTERNATIVE SECTIONS

R-value	18 K-ESAL	RF (%)	SN	Alternate	HBP	ABC	ASC	RP	Total
5	10	80	3.10	A	7.0				7.0
				B	3.0	13.0			16.0
				C	4.0	10.0			14.0
				D	3.0	6.0	10.0		19.0
				E				6.0	6.0

R-value - CDOT Procedure
18 K-ESAL - Equivalent Single Axle Load, 18,000 lbs
RF – Reliability Factor
SN – Design Structural Number

HBP - Hot Bituminous Pavement
ABC - Aggregate Base Course (Class 6)
ASC – Aggregate Sub base Course (Class 3)
RP – Rigid Pavement (concrete)

Prior to construction, the existing surface within the roadway prism should be stripped of debris, vegetation, topsoil, frozen soils and any unsuitable materials.

Aggregate base course should conform to Class 6 (minus ¾ inch) specifications of the Colorado Department of Transportation (CDOT) and be compacted to a minimum 95% of AASHTO T-180 at (+/-) 2% of optimum moisture. A separation fabric should be placed and appropriately lapped under the base course material.

Pavement performance is directly affected by the degree of compaction, uniformity, and the stability of the subgrade. It is recommended that the subgrade be proof rolled immediately prior to

placement of the base course materials to detect any localized areas of instability. Unstable areas should be reworked to provide a uniform subgrade.

Hot bituminous pavement (HBP) should conform to CDOT grading "SX" or "S" specifications, and consist of an approved 75 gyration Superpave method mix design giving the mix physical properties, job mix tolerances and recommended mixing and placement temperatures. Hot bituminous pavement should be compacted to 92% to 96% of maximum theoretical density. An end point stress of 50 psi should be used.

Positive drainage should be provided during construction and maintained throughout the life of the pavement. Adequate drainage is essential for continuing performance. As discussed previously, collapsible soils are present at the site. If moisture is permitted to infiltrate into the subgrade soils, excessive movement of the pavements may occur. Therefore, water should be carried away from the pavements; and ditches and culverts must be maintained to prevent ponding of water.

GENERAL

In the event that any changes in the nature or design of the structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analysis and recommendations submitted in this report are based in part upon the data obtained from the six test pits. The nature and extent of variation between the test pits may not become evident until construction. If variations then appear, it will be necessary to re-evaluate the recommendations in this report.

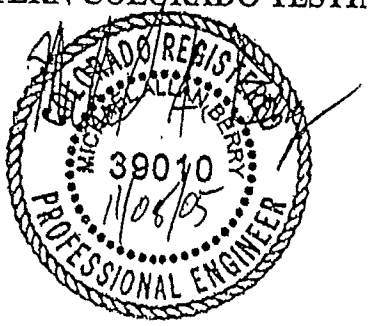
It is recommended that the geotechnical engineer be provided the opportunity for general review of the final design and specifications in order that earthwork and foundation recommendations be properly interpreted and implemented in the design and specifications. It is also recommended that the geotechnical engineer, or a qualified technician under his supervision, be retained to provide continuous engineering services during construction of the foundation, excavations, and earthwork phases of the work. This is to observe compliance with the design concepts, specifications, or

recommendations and to modify these recommendations in the event that the subsurface conditions differ from those anticipated.

WCT is pleased to be of service to your project. We welcome any questions or comments you may have regarding the contents of this report.

Respectfully Submitted:

WESTERN COLORADO TESTING, INC



Michael A. Berry, P.E.
Principal Geotechnical Engineer

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FIGURES

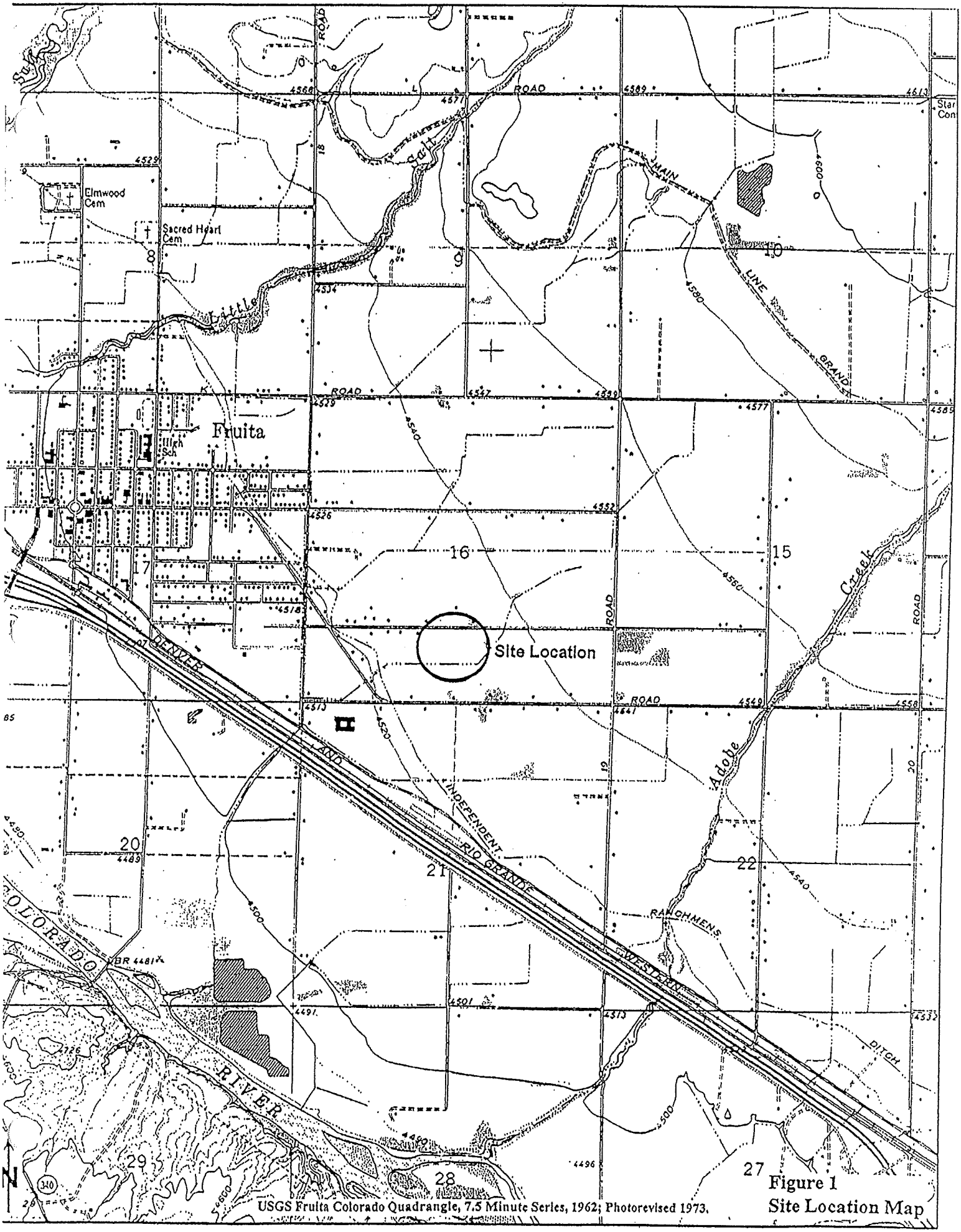


Figure 1
Site Location Map

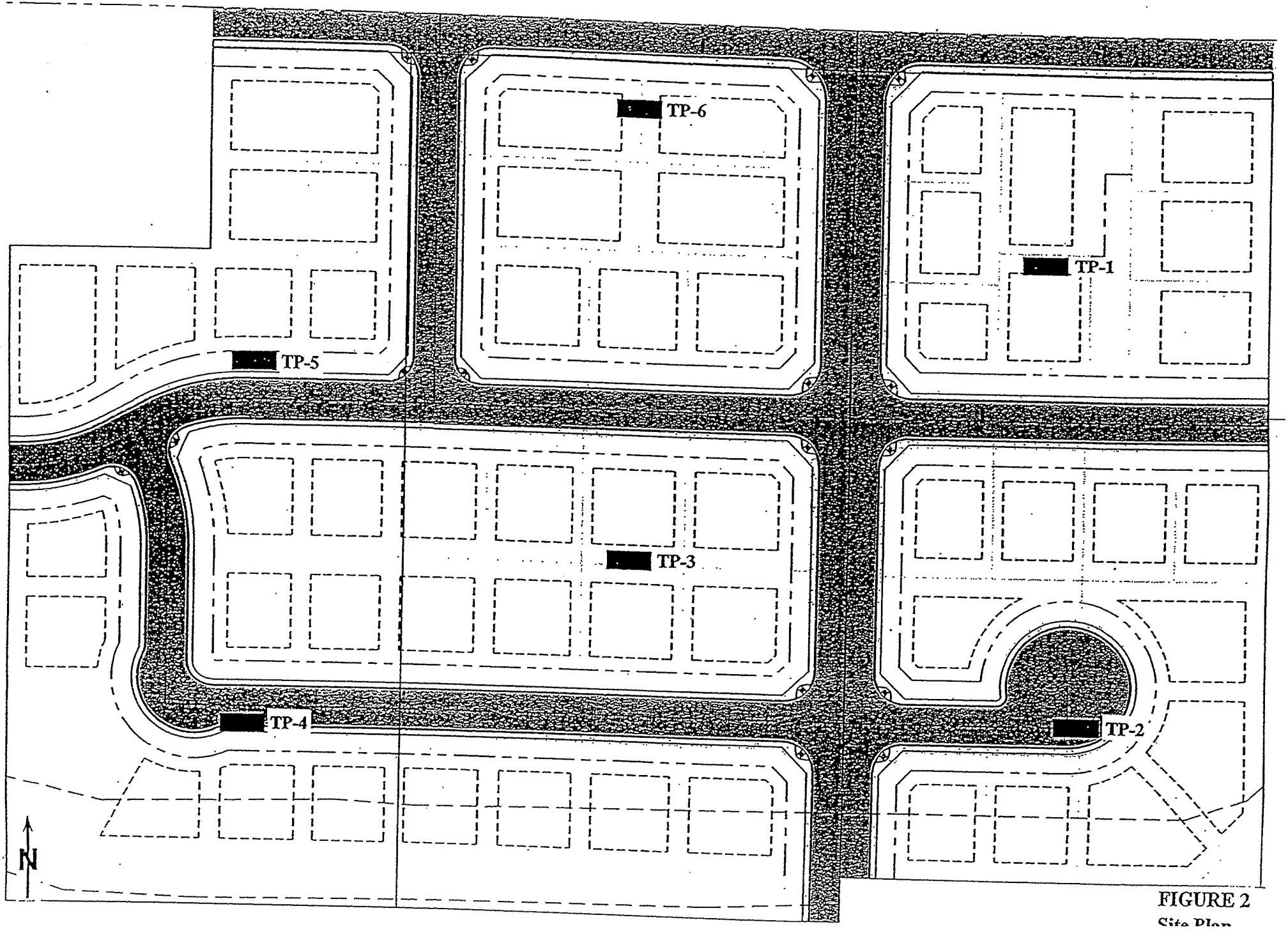


FIGURE 2
Site Plan

APPENDIX A
Typed Test Pit Logs

WESTERN COLORADO TESTING, INC.

Project: Grand Valley Estates
Location: Fruita, Colorado
Job No.: 215005 Date: 11/8/2005

TEST PIT LOG

TEST PIT NO.	LOCATION OF TEST PIT	STATION	ELEVATION	DATUM
TP-1				

WATER LEVEL OBSERVATIONS		CONTRACTOR	INSPECTOR	EQUIPMENT
		Client	M. Berry	Trackhoe
0 HOUR	24 HOUR	TOTAL DEPTH	REMARKS	
6.0 ft	Not Measured	7.0 ft		

DEPTH FT.	SAMPLE DATA				LABORATORY DATA					DEPTH FT
	SAMPLE NO. & TYPE	MOIST	USCS	GEOLOGIC DESCRIPTION AND REMARKS	MC (%)	DRY DENS (pcf)	PI	Swell (%)	Soluble Sulfates (ppm)	
0				Silty CLAY with Organics (TOPSOIL), brown, moist						0
1.5				Silty SAND (SM), brown to gray, dry to wet, medium dense to very loose						1.5
3	HD1	m	sm		4.6	93.6		-0.7		3
	SD1	m	SM	SD1: Lab Classified	8.1		NP		<250	
4.5										4.5
6										6
7.5										7.5
9										9
10.5										10.5

FIGURE

WESTERN COLORADO TESTING, INC.

Project: Grand Valley Estates
Location: Fruita, Colorado
Job No.: 215005 Date: 11/8/2005

TEST PIT LOG

TEST PIT NO.	LOCATION OF TEST PIT	STATION	ELEVATION	DATUM
TP-2				

WATER LEVEL OBSERVATIONS		CONTRACTOR	INSPECTOR	EQUIPMENT
		Client	M. Berry	Trackhoe
0 HOUR	24 HOUR	TOTAL DEPTH	REMARKS	
6.5 ft	Not Measured	7.0 ft		

DEPTH FT.	SAMPLE DATA				LABORATORY DATA					DEPTH FT
	SAMPLE NO. & TYPE	MOIST	USCS	GEOLOGIC DESCRIPTION AND REMARKS	MC (%)	DRY DENS (pcf)	PI	Swell (%)	Soluble Sulfates (ppm)	
0				Silty CLAY with Organics (TOPSOIL), brown, moist						0
1.5				Interbedded Silty SAND (sm) and Silty CLAY (CL), brown to gray, dry to wet, medium dense to very loose/stiff						1.5
	SD1	d	CL	SD1: Lab Classified	12.0		25			
3										3
	SD2	m	cl							
4.5										4.5
6										6
7.5										7.5
9										9
10.5										10.5

FIGURE

WESTERN COLORADO TESTING, INC.

Project: Grand Valley Estates
Location: Fruita, Colorado
Job No.: 215005 Date: 11/8/2005

TEST PIT LOG

TEST PIT NO.	LOCATION OF TEST PIT	STATION	ELEVATION	DATUM
TP-3				

WATER LEVEL OBSERVATIONS		CONTRACTOR	INSPECTOR	EQUIPMENT
		Client	M. Berry	Trackhoe
0 HOUR	24 HOUR	TOTAL DEPTH	REMARKS	
6.5 ft	Not Measured	6.5 ft		

DEPTH FT.	SAMPLE DATA				LABORATORY DATA					DEPTH FT
	SAMPLE NO. & TYPE	MOIST	USCS	GEOLOGIC DESCRIPTION AND REMARKS	MC (%)	DRY. DENS (pcf)	PI	Swell (%)	Soluble Sulfates (ppm)	
0				Silty CLAY with Organics (TOPSOIL), brown, moist						0
1.5				Silty SAND (sm), brown, dry, medium dense						1.5
3	HD1	d	sm		3.7			-4.2		3
	SD1	d	sm							
4.5				Silty CLAY (cl), brown to gray, moist to wet, medium stiff to very soft						4.5
6										6
7.5										7.5
9										9
10.5										10.5

FIGURE

WESTERN COLORADO TESTING, INC.

Project: Grand Valley Estates
Location: Fruita, Colorado
Job No.: 215005 Date: 11/8/2005

TEST PIT LOG

TEST PIT NO.	LOCATION OF TEST PIT	STATION	ELEVATION	DATUM
TP-4				

WATER LEVEL OBSERVATIONS		CONTRACTOR	INSPECTOR	EQUIPMENT
		Client	M. Berry	Trackhoe
0 HOUR	24 HOUR	TOTAL DEPTH	REMARKS	
7.0 ft	Not Measured	7.0 ft		

DEPTH FT.	SAMPLE DATA				LABORATORY DATA					DEPTH FT
	SAMPLE NO. & TYPE	MOIST	USCS	GEOLOGIC DESCRIPTION AND REMARKS	MC (%)	DRY DENS (pcf)	PI	Swell (%)	Soluble Sulfates (ppm)	
0				Silty CLAY with Organics (TOPSOIL), brown, moist						0
1.5				Silty SAND (sm), brown, dry, medium dense						1.5
3				SAND with Gravel (sw), light gray, dry, loose						3
				Silty CLAY (CL), brown to gray, moist to wet, medium stiff to very soft						
4.5	SD1	m	CL	SD1: Lab Classified	29.2		18			4.5
6				Silty SAND (sm), brown to gray, wet, loose						6
7.5										7.5
9										9
10.5										10.5

FIGURE

WESTERN COLORADO TESTING, INC.

Project: Grand Valley Estates
Location: Fruita, Colorado
Job No.: 215005 Date: 11/8/2005

TEST PIT LOG

TEST PIT NO.	LOCATION OF TEST PIT	STATION	ELEVATION	DATUM
TP-5				

WATER LEVEL OBSERVATIONS		CONTRACTOR	INSPECTOR	EQUIPMENT
		Client	M. Berry	Trackhoe
0 HOUR	24 HOUR	TOTAL DEPTH	REMARKS	
Dry	Not Measured	7.5 ft		

DEPTH FT.	SAMPLE DATA				LABORATORY DATA					DEPTH FT
	SAMPLE NO. & TYPE	MOIST	USCS	GEOLOGIC DESCRIPTION AND REMARKS	MC (%)	DRY DENS (pcf)	PI	Swell (%)	Soluble Sulfates (ppm)	
0				Silty CLAY with Organics (TOPSOIL), brown, moist						0
1.5				Interbedded Silty SAND (sm) and Silty CLAY (cl), brown, dry to moist, medium dense/medium stiff						1.5
	HD1	d	cl							
3										3
	SD1	d	cl							
4.5										4.5
6										6
7.5										7.5
9										9
10.5										10.5

FIGURE

WESTERN COLORADO TESTING, INC.

Project: Grand Valley Estates
Location: Fruita, Colorado
Job No.: 215005 Date: 11/8/2005

TEST PIT LOG

TEST PIT NO.	LOCATION OF TEST PIT	STATION	ELEVATION	DATUM
TP-6				

WATER LEVEL OBSERVATIONS		CONTRACTOR	INSPECTOR	EQUIPMENT
		Client	M. Berry	Trackhoe
0 HOUR	24 HOUR	TOTAL DEPTH	REMARKS	
6.0 ft	Not Measured	7.0 ft		

DEPTH FT.	SAMPLE DATA				LABORATORY DATA					DEPTH FT
	SAMPLE NO. & TYPE	MOIST	USCS	GEOLOGIC DESCRIPTION AND REMARKS	MC (%)	DRY DENS (pcf)	PI	Swell (%)	Soluble Sulfates (ppm)	
0				Silty CLAY with Organics (TOPSOIL), brown, moist						0
1.5				Interbedded Silty SAND (sm) and Silty CLAY (cl), brown to gray, dry to wet, medium dense to loose/stiff to very soft						1.5
	SD1	d	sm							
3										3
	HD1	m	cl		30.3	85.6		0.0		
4.5										4.5
6										6
7.5										7.5
9										9
10.5										10.5

FIGURE

KEY TO SYMBOLS

Symbol	Description
Sampler Abbreviations	
D	Small Disturbed Sample
HD	Hand Drive Sample

otes:

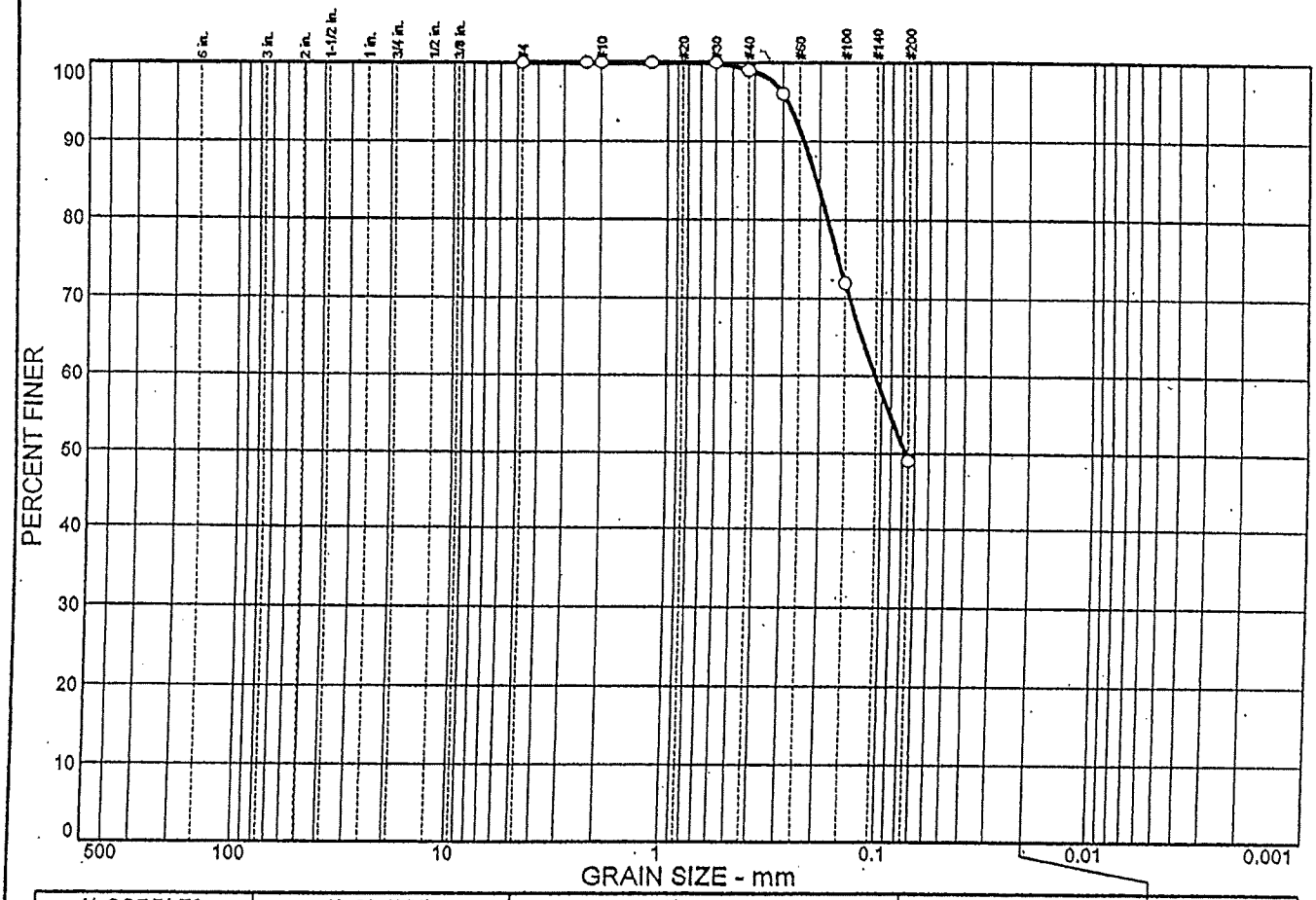
. Results of tests conducted on samples recovered are reported on the test pit logs.

. Groundwater determination based on free water in coarse grained soils, aturated fine grained soil were not considered as groundwater.

Figure 4a

APPENDIX B
Laboratory Testing Results

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	51.0	49.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	100.0		
#40	99.0		
#50	96.0		
#100	72.0		
#200	49.0		

* (no specification provided)

Material Description

Silty sand
Natural Moisture = 8.1%; Soluble Sulfates = 100 - 250 ppm

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.208 D_{60}= 0.107 D_{50}= 0.0775
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Sampled by MAB, 10/24/05
Tested by HH, 11/3/05
Reviewed by AJH, 11/3/05

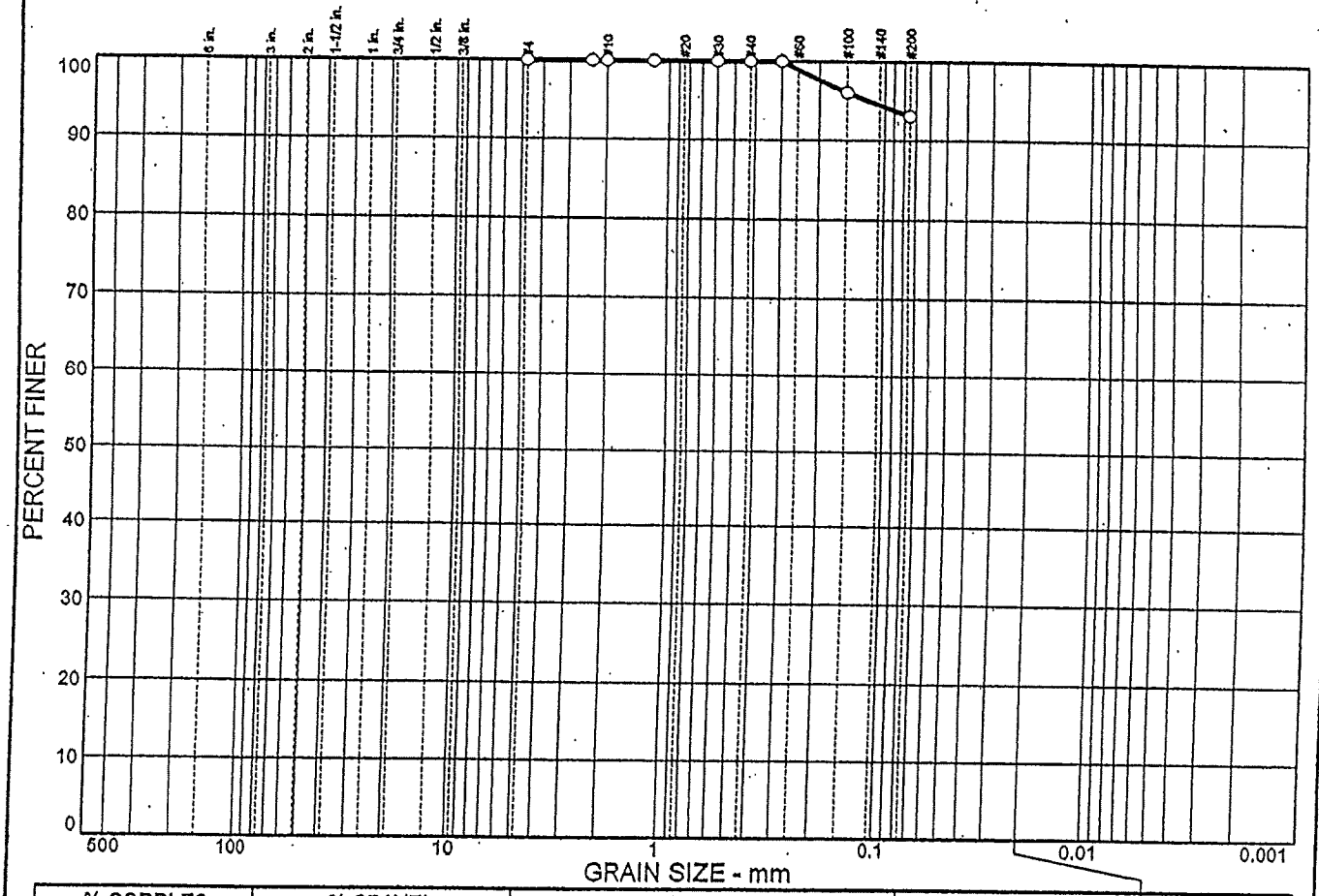
Sample No.: 05-1214 Source of Sample: Date: 11/3/05
Location: Test Pit 1, SD1 Elev./Depth: 3.5'

WESTERN COLORADO TESTING, INC.

Client: Grand Valley Estates Development, LLC
Project: Grand Valley Estates

Project No: 215005 Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	7.0	93.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	100.0		
#40	100.0		
#50	100.0		
#100	96.0		
#200	93.0		

* (no specification provided)

Material Description

Lean clay
Natural Moisture = 12.0%

Atterberg Limits

PL= 18 LL= 43 PI= 25

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(24)

Remarks

Sampled by MAB, 10/24/05
Tested by HH, 11/3/05
Reviewed by AJH, 11/3/05

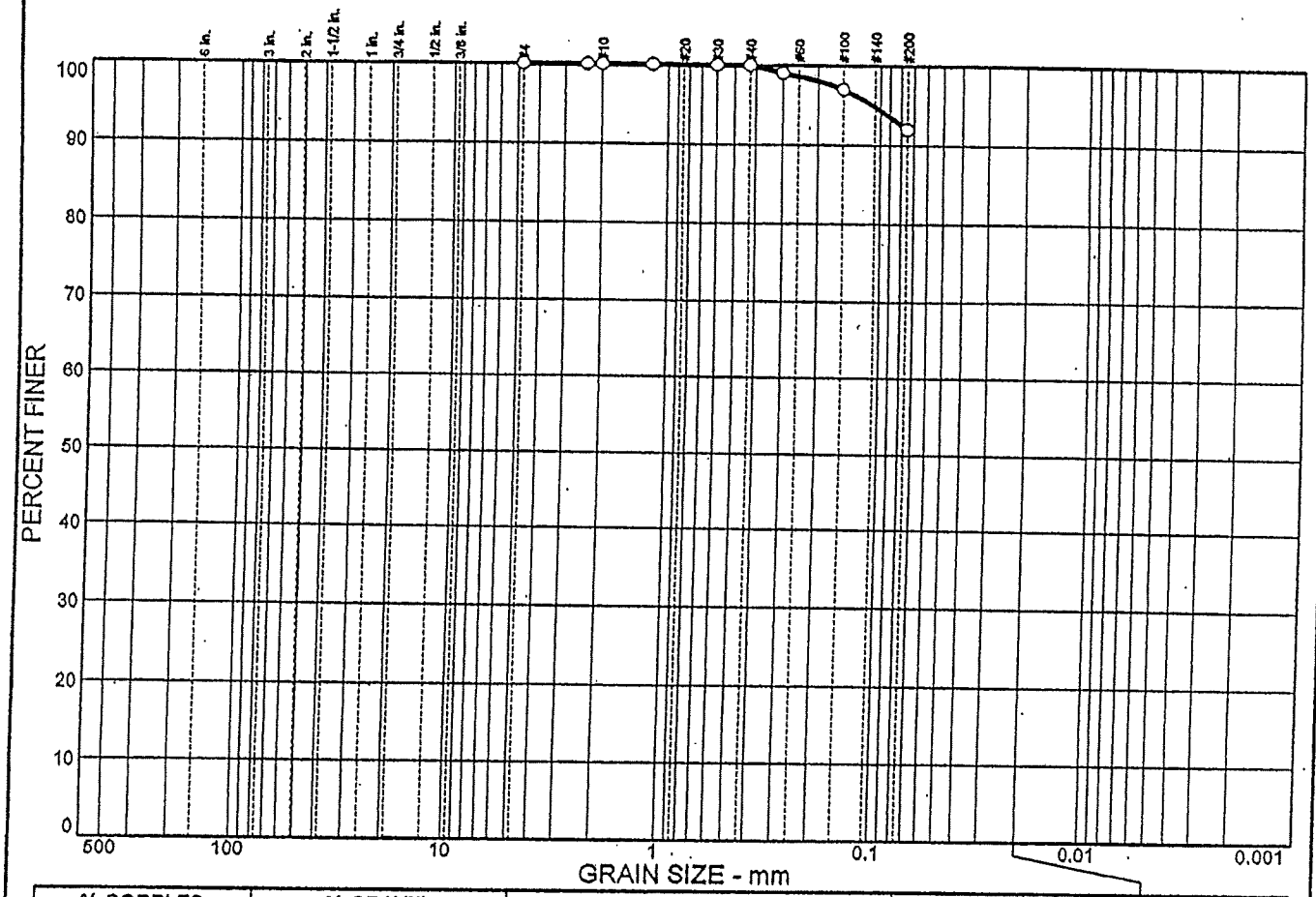
Sample No.: 05-1215 Source of Sample: Date: 11/3/05
Location: Test Pit 2, SD1 Elev./Depth: 2.0'

WESTERN COLORADO TESTING, INC.

Client: Grand Valley Estates Development, LLC
Project: Grand Valley Estates

Project No: 215005 Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	8.0	92.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	100.0		
#30	100.0		
#40	100.0		
#50	99.0		
#100	97.0		
#200	92.0		

* (no specification provided)

Material Description

Lean clay
Natural Moisture = 29.2%

Atterberg Limits

PL= 18 LL= 36 PI= 18

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Sampled by MAB, 10/24/05
Tested by JB, 11/1/05
Reviewed by AJH, 11/3/05

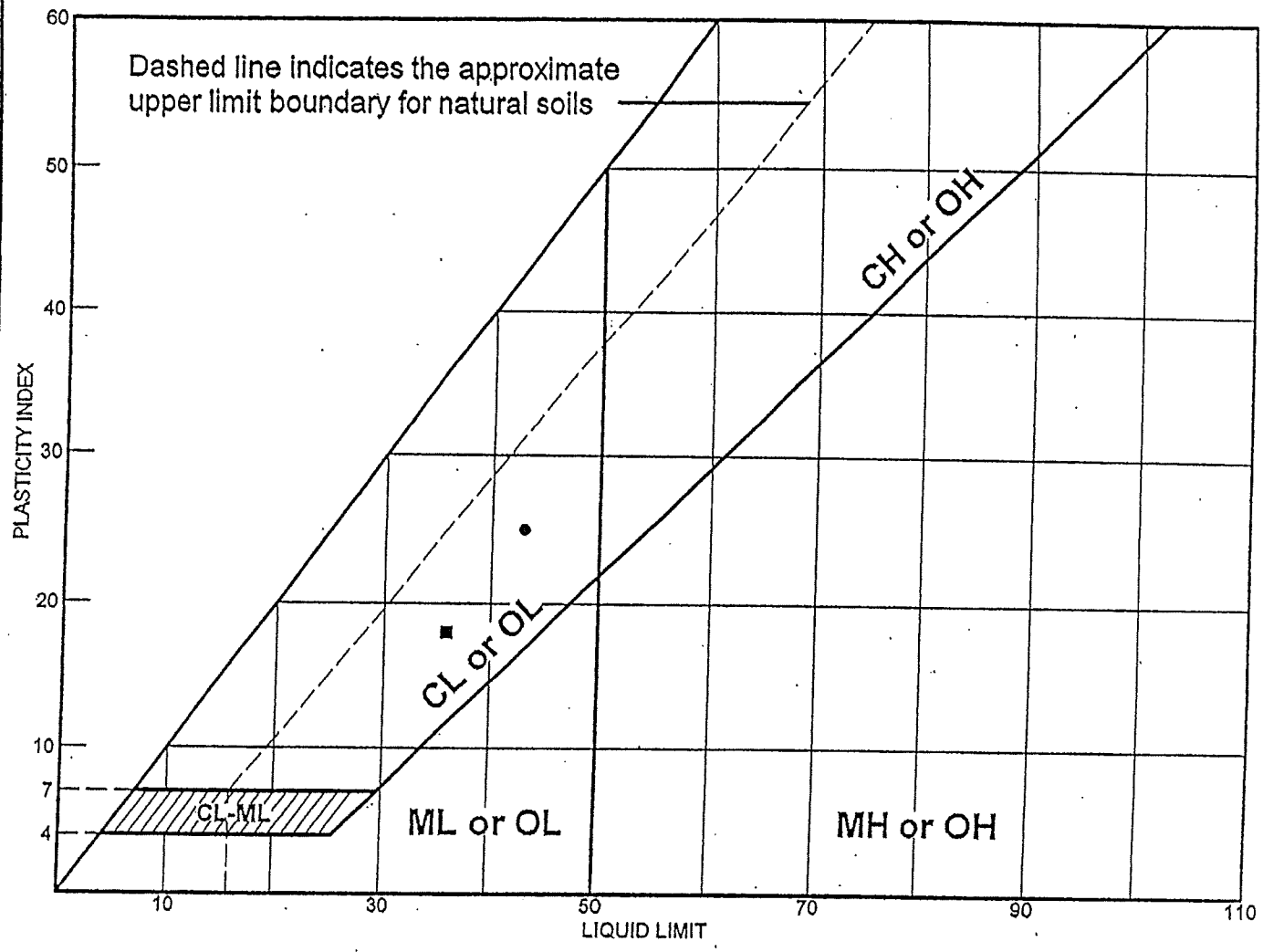
Sample No.: 05-1217 Source of Sample: Date: 11/3/05
Location: Test Pit 4, SD1 Elev./Depth: 4.0'

WESTERN COLORADO TESTING, INC.

Client: Grand Valley Estates Development, LLC
Project: Grand Valley Estates

Project No: 215005 Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay Natural Moisture = 12.0%	43	18	25	100.0	93.0	CL
■	Lean clay Natural Moisture = 29.2%	36	18	18	100.0	92.0	CL

Project No. 215005 **Client:** Grand Valley Estates Development, LLC

Project: Grand Valley Estates

Grand Valley Estates

● **Location:** Test Pit 2, SD1

■ **Location:** Test Pit 4, SD1

Remarks:

● Sampled by MAB, 10/24/05
Tested by LAM, 11/2/05
Reviewed by AJH, 11/3/05

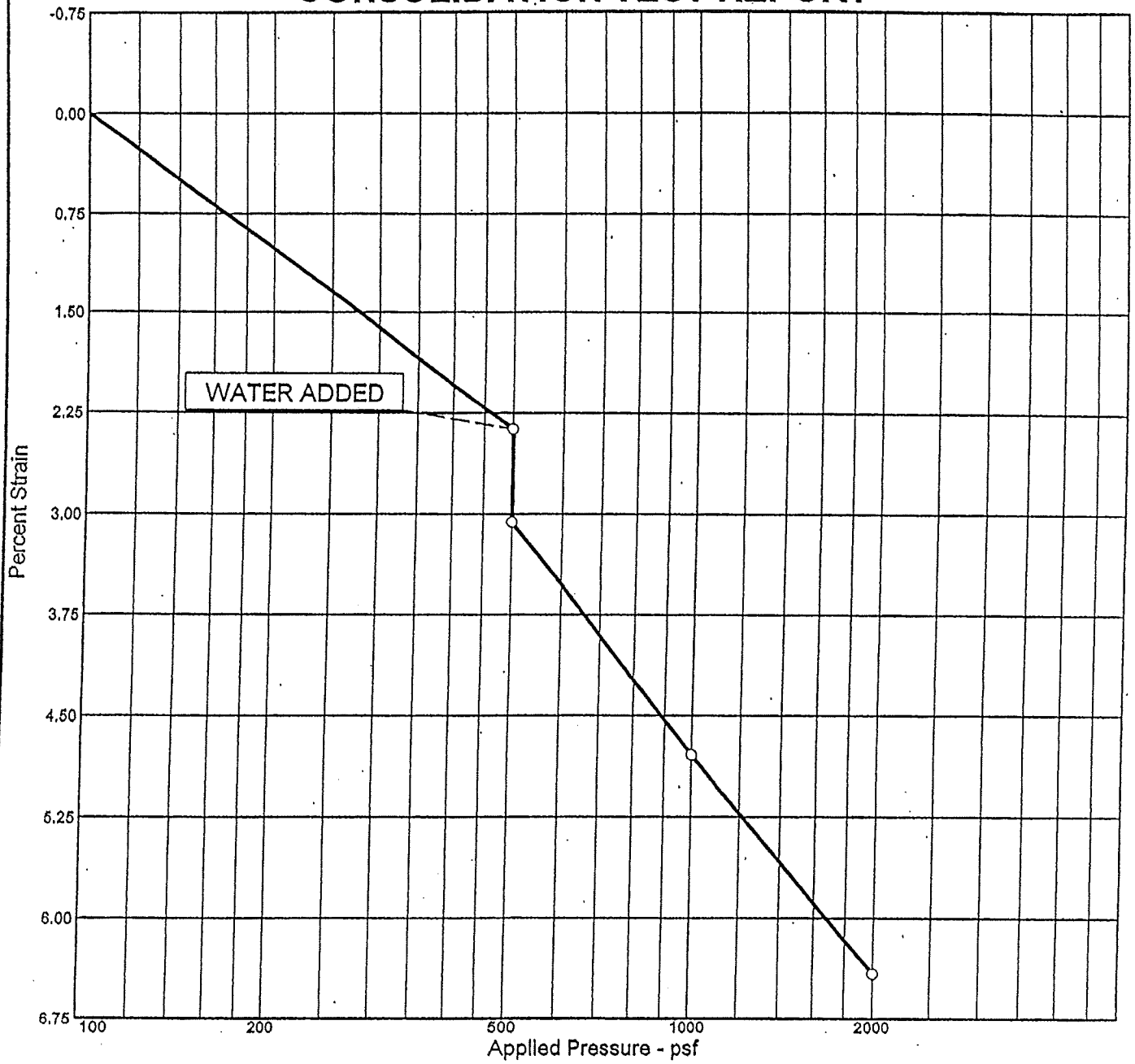
■ Sampled by MAB, 10/24/05
Tested by LAM, 11/2/05
Reviewed by AJH, 11/3/05

LIQUID AND PLASTIC LIMITS TEST REPORT

WESTERN COLORADO TESTING, INC.

Figure

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	C_r	Swell Press. (psf)	Clpse. %	e_o
	4.6 %	93.6					988				0.7	

MATERIAL DESCRIPTION	USCS	AASHTO

Project No. 215005 **Client:** Grand Valley Estates Development, LLC

Project: Grand Valley Estates

Location: Test Pit 1, HD1

Remarks:

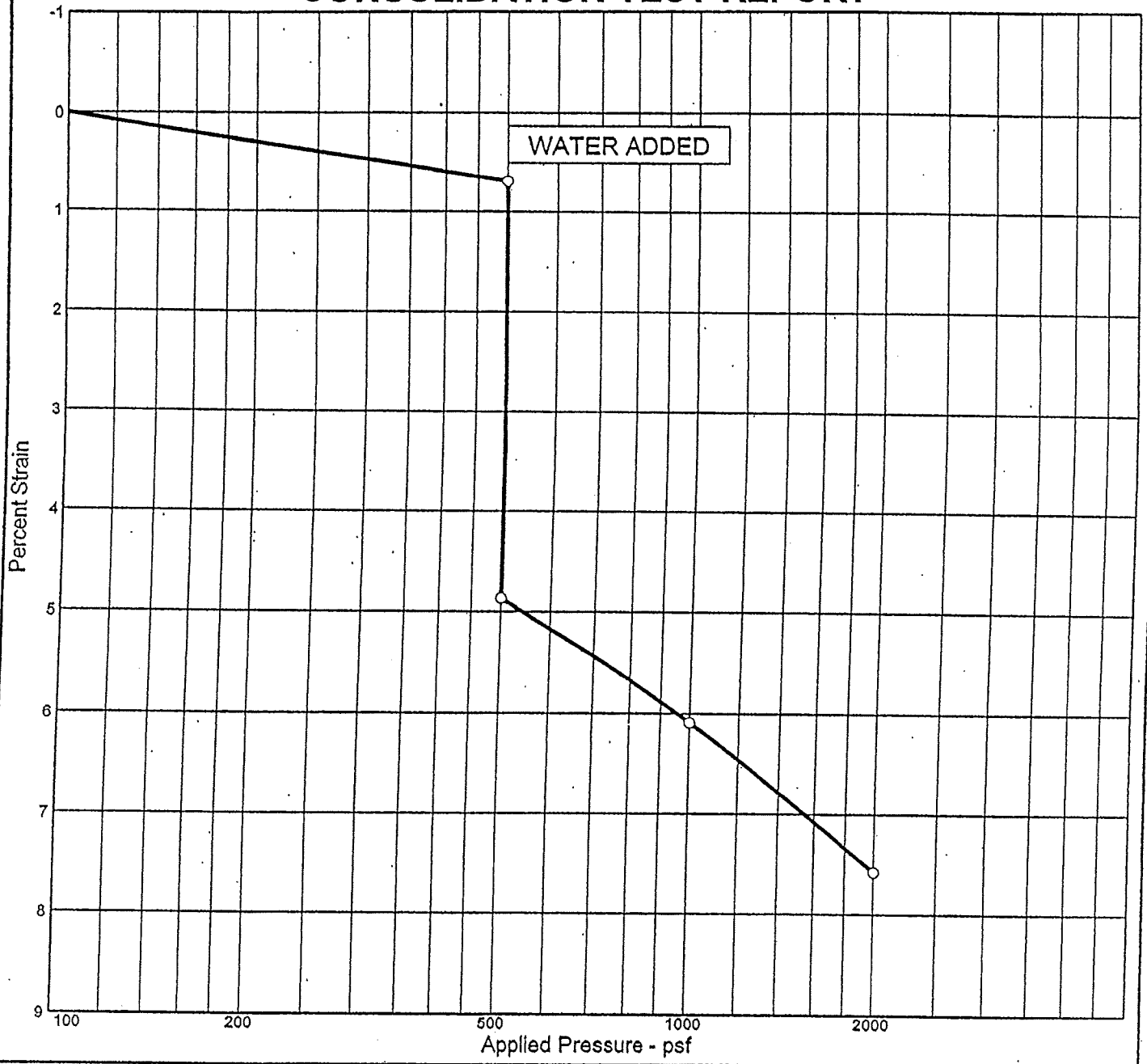
Sampled by MAB, 10/24/05
Tested by AJH, 10/28/05
Reviewed by AJH, 11/3/05

CONSOLIDATION TEST REPORT

WESTERN COLORADO TESTING, INC.

Figure

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	C_r	Swell Press. (psf)	Clpse. %	e_o
							1029				4.2	

MATERIAL DESCRIPTION	USCS	AASHTO

Project No. 215005 **Client:** Grand Valley Estates Development, LLC

Project: Grand Valley Estates

ocation: Test Pit 3, HD1

Remarks:

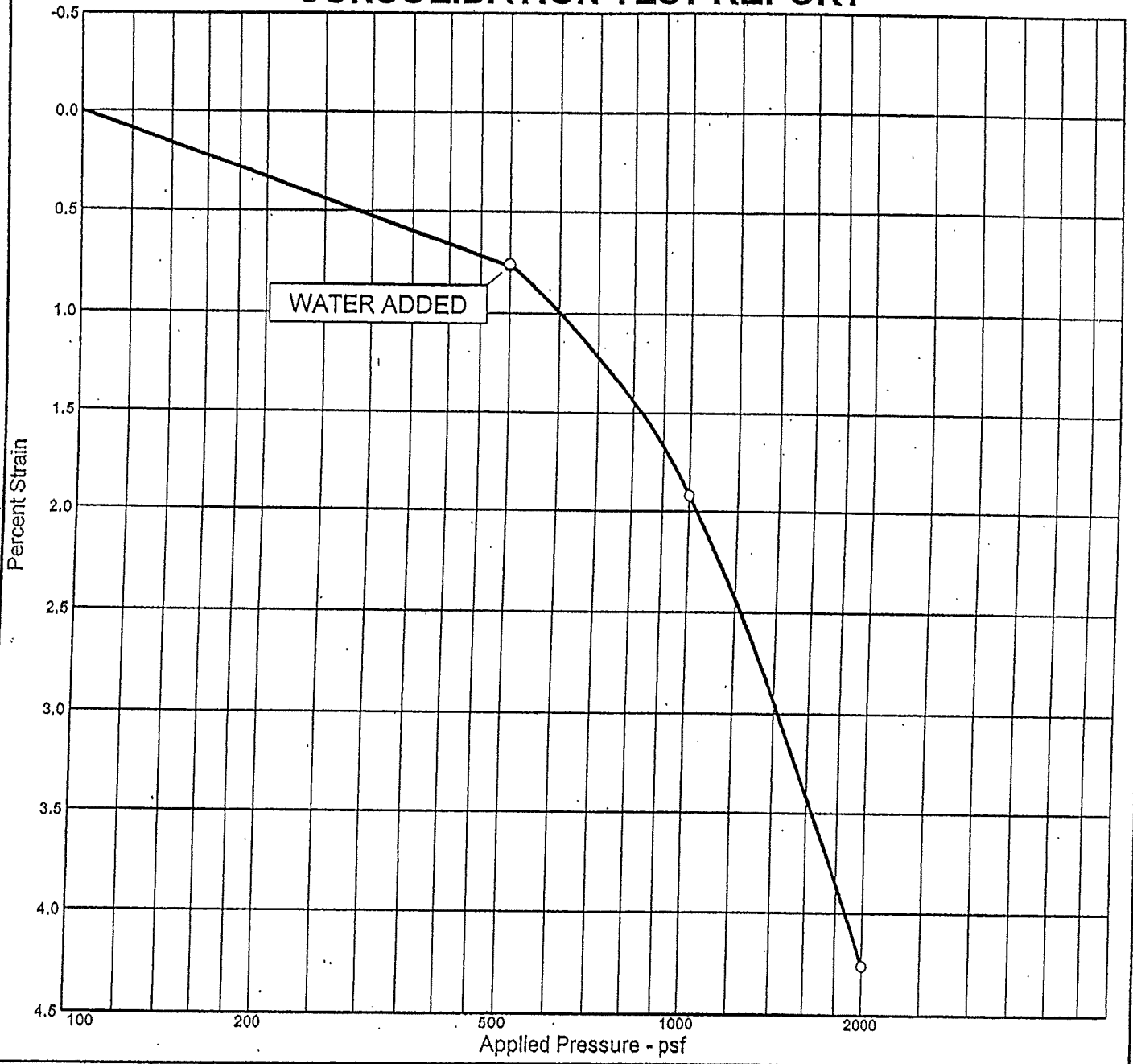
Sampled by MAB, 10/24/05
Tested by AJH, 10/28/05
Reviewed by AJH, 11/3/05

CONSOLIDATION TEST REPORT

WESTERN COLORADO TESTING, INC.

Figure

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	C_r	Swell Press. (psf)	Swell %	e_o
Sat.	Moist.											
	30.3 %	85.6					955			504		

MATERIAL DESCRIPTION	USCS	AASHTO

Project No. 215005 **Client:** Grand Valley Estates Development, LLC

Project: Grand Valley Estates

Location: Test Pit 6, HD1

Remarks:
Sampled by MAB, 10/24/05
Tested by AJH, 10/28/05
Reviewed by AJH, 11/3/05

CONSOLIDATION TEST REPORT

WESTERN COLORADO TESTING, INC.

Figure