Huddleston-Berry
Engineering & Testing, LLC

GEOTECHNICAL INVESTIGATION
ASPEN VILLAGE TOWNHOMES
1062 18 ROAD AND 1806 J 6/10 ROAD
FRUITA, COLORADO
PROJECT# 00493-0002

MCCURTER LAND DEVELOPMENT COMPANY, LLC
2540 I ROAD
GRAND JUNCTION, COLORADO 81505

JULY 31, 2008

Huddleston-Berry Engineering and Testing, LLC
640 White Avenue, Unit B
Grand Junction, Colorado 81501

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

A geologic hazards and geotechnical investigation was conducted for the proposed Aspen Village subdivision in Fruita, Colorado. The project location is shown on Figure 1 – Site Location Map. The purpose of the investigation was to evaluate the surface and subsurface conditions at the site with respect to geologic hazards, foundation design, pavement design, and earthwork for the proposed construction. This summary has been prepared to include the information required by civil engineers, structural engineers, and contractors involved in the project.

Subsurface Conditions (p. 3)

The subsurface investigation consisted of three test pits, excavated on July 24th, 2008. The locations of the test pits are shown on Figure 2 – Site Plan. The test pits generally encountered sandy silt soils above silty clay soils. Groundwater was encountered in the test pits at a depth of 9.5 feet. The native silt soils are non-plastic and slightly collapsible.

Geologic Hazards (p. 4)

The only identified geologic hazard at the site is the presence of slightly collapsible native silt soils.

Summary of Foundation Recommendations

- *Foundation Type* – Spread Footings or Monolithic Structural Slabs (p. 5)
- *Structural Fill* – Minimum of 24-inches below foundations. The native soils are suitable for re-use as structural fill. Imported structural fill should consist of pit-run, CDOT Class 6 base course, or other granular material approved by the engineer. (p. 5)
- *Maximum Allowable Bearing Capacity* – 1,250 psf. (p. 5)
- *Subgrade Modulus* – 150 pci for native silt soils and 250 pci for pit-run or base course. (p. 5)
- *Lateral Earth Pressure* – 50 pcf (p. 6)

Summary of Pavement Recommendations (p. 7)

Internal Subdivision Roadways
EDLA = 10, Structural Number = 3.10

ALTERNATIVE	PAVEMENT SECTION (Inches)				
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Rigid Pavement	TOTAL
Full Depth HMA	7.0				7.0
A	3.0	13.0			16.0
B	4.0	10.0			14.0
C	3.0	6.0	10.0		19.0
Full Depth RP				6.0	6.0

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Figure 1 – Site Location Map
Figure 2 – Site Plan

APPENDICES

Appendix A – UDSA NRCS Soil Survey Data
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1.0 INTRODUCTION

As part of extensive development in Grand Junction and surrounding areas, 1062 18 Road and 1806 J 6/10 Road in Fruita are proposed to be developed into the Aspen Village subdivision. As part of the development process, Huddleston-Berry Engineering and Testing, LLC (HBET) was retained by the McCurter Land Development Company to conduct a geologic hazards and geotechnical investigation at the site.

1.1 Scope

As discussed above, a geologic hazards and geotechnical investigation was conducted for the proposed Aspen Village subdivision in Fruita, Colorado. The scope of the investigation included the following components:

- Conducting a subsurface investigation to evaluate the subsurface conditions at the site.
- Collecting soil samples and conducting laboratory testing to determine the engineering properties of the soils at the site.
- Providing recommendations for foundation type and subgrade preparation.
- Providing recommendations for bearing capacity.
- Providing recommendations for lateral earth pressure.
- Providing recommendations for drainage, grading, and general earthwork.
- Providing recommendations for pavements.
- Evaluating potential geologic hazards at the site.

The investigation and report were completed by a Colorado registered professional engineer in accordance with generally accepted geotechnical and geological engineering practices. This report has been prepared for the exclusive use of the McCurter Land Development Company.

1.2 Site Location and Description

The site encompasses approximately 8.5 acres at 1062 18 Road and 1806 J 6/10 Road in Fruita, Colorado. The project location is shown on Figure 1 – Site Location Map.

At the time of the investigation the property was generally open and nearly level. Existing structures were observed in the southwestern and southeastern portions of the site. Vegetation at the site consisted primarily of weeds. However, several mature trees were observed around the existing structures. Several irrigation ditches ran through the property. The property was bordered to the south by J 6/10 Road, to the west by 18 Road and to the north and east by existing residential properties.

1.3 Proposed Construction

The proposed subdivision is anticipated to include approximately fourteen multi-family residential structures and utility and street pavement installation. The proposed structures are anticipated to be wood framed buildings constructed over reinforced concrete foundations. Foundation loads on the order of 600 to 2,000 pounds per linear foot wall loads and 6 to 12 kip column loads are expected.

2.0 GEOLOGIC SETTING

2.1 Regional Setting

The site is located in a broad east-west trending strike valley formed in the Mancos Shale by the Colorado River. The strike valley, locally known as the Grand Valley, is nearly completely underlain by the Cretaceous age silty, shallow marine Mancos Shale. The valley is bounded along the north by the overlying cyclothemic sandstone, shale and coal beds of the Cretaceous Mesa Verde Formation. The valley is irregularly bounded along the south by the Colorado River, which generally creates a high cut bank in the Mancos Shale resulting in the area south of the River, locally known as Orchard Mesa, being topographically higher than the north by approximately 50 to 70 feet. The underlying Mancos Shale is approximately 4,000 feet thick, and along with the Mesa Verde Formation, dips approximately 5 to 10 degrees to the north-northeast. The Mancos Shale over the central valley floor is commonly overlain by terrace gravels and sands deposited by the meandering Colorado River, followed by poorly developed sulfate affected silty clay soils.

In the distance to the southwest, and south of the Colorado River is the north end of an uplift feature, which is defined by a large, presumably inactive fault zone. The uplift structure is a part of the north end of a northwest-southeast trending regional feature known as the Uncompahgre Plateau. The Uncompahgre Plateau is a Tertiary aged feature that defines the eastern most portion of the more general Colorado Plateau uplift, a compressive feature broadly related to plate compression from the west. The high-angle reverse fault zone along the monocline uplift is considered dormant with respect to seismic activity; however, minor seismic events (<5.0 Richter) have been anecdotally reported to occur at irregular intervals, centered in the vicinity of Nucla, Colorado approximately 60 miles to the south. The Colorado Geological Survey reports more recent low intensity events in the site vicinity. The site is otherwise in a tectonically stable portion of the North American Plate.

2.2 Soils

Soils data was obtained from the USDA Natural Resource Conservation Service Web Soil Survey. The data indicates that the soils at the site consist of Sagers silty clay loam, 0 to 2 percent slopes. Soil survey data, including a description of the soil unit, is included in Appendix A.

Residential construction is described as somewhat limited in the Sagers soils due to the potential for shrink-swell. The Sagers soils are described as prime farmland if irrigated.

2.3 Geology

According to the *Geologic Map of Colorado* by Ogden Tweto (1979), the site is underlain by Quaternary Gravels. The gravels are underlain by Mancos Shale bedrock. The Mancos Shale unit is thick in the Grand Valley and has a low to moderate potential for swelling.

2.4 Groundwater

Groundwater was encountered in the test pits at a depth of 9.5 feet.

3.0 FIELD INVESTIGATION

3.1 Subsurface Investigation

The subsurface investigation was conducted on July 24th, 2008 and consisted of three test pits, excavated to depths of between 8.0 and 10.0 feet below the existing ground surface. The locations of the test pits are shown on Figure 2 – Site Plan. The test pits were located in the field relative to existing site features. Typed test pit logs are included in Appendix B. Samples of the native soils were collected using hand drive samplers and bulk sampling methods at the locations shown on the logs.

As indicated on the logs, the subsurface conditions at the site were fairly consistent. The test pits generally encountered 1.0 foot of sandy silt with organics topsoil above tan to brown, dry to moist, loose to medium dense sandy silt to depths of between 7.5 and 8.0 feet. Below the silt, brown, moist to wet, soft to medium stiff silty clay extended to the bottoms of the excavations. Groundwater was encountered in the test pits at a depth of 9.5 feet.

3.2 Field Reconnaissance

The field reconnaissance included walking the site during the subsurface investigation. In general, the site was fairly level and no evidence of landslides, debris flows, rockfalls, etc. was observed.

4.0 LABORATORY TESTING

Selected native soil samples collected from the test pits were tested in the Huddleston-Berry Engineering and Testing LLC geotechnical laboratory for natural moisture and density, California Bearing Ratio (CBR), grain size analysis, maximum dry density and optimum moisture (Proctor), Atterberg limits, swell/consolidation, and soluble sulfates content. The laboratory testing results are included in Appendix C.

The laboratory testing results indicate that the native silt soils are non-plastic. In addition, the silt soils were shown to be slightly collapsible with up to approximately 2.5% collapse measured in the laboratory. The native clay soils were indicated to be slightly plastic. Water soluble sulfates were detected in the site soils in a concentration of 20 parts-per-million (ppm).

5.0 GEOLOGIC INTERPRETATION

5.1 Geologic Hazards

The only potential geologic hazard at the site is the presence of slightly collapsible native soils.

5.2 Geologic Constraints

The primary geologic constraint to construction at the site is the slightly collapsible native soils. However, shallow groundwater was encountered in the test pits. Therefore, groundwater may impact deep utility installation at the site. In addition, the soft/loose soils at depth may impact utility and foundation construction.

5.3 Water Resources

No water supply wells were observed on the property. As discussed previously, shallow groundwater was encountered in the test pits at a depth of 9.5 feet. Although there is a possibility of higher groundwater levels in the future, residential construction at the site is not anticipated to adversely affect groundwater.

5.4 Mineral Resources

No significant mineral resources were identified on the property. Potential mineral resources in the Grand Valley generally include gravel, uranium ore, and commercial rock products such as flagstone. No significant gravel, uranium bearing bedrock, or other mineable bedrock units were encountered on the subject site at the time of the investigation, nor was any literary or cartographic information discovered that indicate the existence or potential existence of commercial quality mineral deposits.

6.0 CONCLUSIONS

Based upon the available data sources, field investigation, and nature of the proposed subdivision, HBET does not believe that there are any geologic conditions which should preclude subdivision of the site.

7.0 RECOMMENDATIONS

7.1 Foundations

Based upon the results of the subsurface investigation, shallow foundations are recommended. Spread footings and monolithic (turndown) structural slabs are both appropriate alternatives. However, as discussed previously, the native soils were shown to be slightly collapsible. Therefore, to limit the potential for excessive differential settlements, it is recommended that the foundations be constructed above a minimum of 24-inches of structural fill.

The native silt soils, exclusive of topsoil, are suitable for reuse as structural fill. Imported structural fill should consist of a granular, non-expansive, non-free draining material such as pit run or CDOT Class 6 base course. However, if pit-run is used as structural fill, a minimum of six inches of Class 6 base course should be placed on top of the pit-run to prevent large point stresses on the bottoms of the foundations due to large particles in the pit-run.

Prior to placement of structural fill, it is recommended that the bottoms of the foundation excavations be scarified to a depth of 6 to 8-inches and re-compacted to a minimum of 95% of the standard Proctor maximum dry density, within ±2% of the optimum moisture content as determined in accordance with ASTM D698. However, as discussed previously, soft/loose soils were encountered at depth in the subsurface. As a result, compaction of the subgrade may be difficult and subgrade stabilization using geotextile and/or geogrid reinforcement in conjunction with additional granular fill may be required. HBET should be contacted to provide specific recommendations for subgrade stabilization, as necessary.

Structural fill should extend laterally beyond the edges of the foundation a distance equal to the thickness of structural fill. Structural 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 or modified Proctor maximum dry density for coarse grained soils, within ±2% of the optimum moisture content as determined in accordance with ASTM D698 or D1557C, respectively. Pit-run materials should be proofrolled to the Engineer's satisfaction.

For foundation building pads prepared as recommended with structural fill consisting of the native soils or imported granular materials, a maximum allowable bearing capacity of 1,250 psf may be used. In addition, a modulus of subgrade reaction of 150 pci may be used for structural fill consisting of the native silt soils and a modulus of 250 pci may be used for structural fill consisting of pit-run or base course. It is recommended that the bottoms of exterior foundations be at least twenty-four inches below the final grade for frost protection.

As discussed previously, water soluble sulfates were detected in the site soils in a concentration of 20 ppm. This concentration of soluble sulfates represents a negligible degree of potential sulfate attack on concrete exposed to these materials. Therefore, sulfate resistant cement may not be required for construction at this site.

7.2 Floor Slabs and Exterior Flatwork

The native soils are generally suitable for support of slabs-on-grade. However, in order to reduce the potential for excessive differential settlements, it is recommended that exterior flatwork be constructed above native soils, below the topsoil, that have been scarified to a depth of 9 to 12-inches, moisture conditioned, and compacted to a minimum of 95% of the standard Proctor maximum dry density, within ±2% of optimum moisture content as determined in accordance with ASTM D698.

7.3 Lateral Earth Pressures

Stemwalls or retaining walls should be designed to resist lateral earth pressures. For backfill consisting of the native soils or imported granular, non-free draining, non-expansive material, we recommend that the walls be designed for an equivalent fluid unit weight of 50 pcf in areas where no surcharge loads are present. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls.

7.4 Drainage

In order to improve the long-term performance of the foundations and slabs-on-grade, grading around the structures should be designed to carry precipitation and runoff away from the structures. It is recommended that the finished ground surface drop at least twelve inches within the first ten feet away from the structures. Downspouts should empty beyond the backfill zone. It is recommended that landscaping within three feet of the structures include primarily desert plants with low water requirements. In addition, it is recommended that automatic irrigation within ten feet of foundations be minimized or controlled with automatic shut off valves.

As discussed previously, shallow groundwater was encountered in the test pits. Therefore, it is recommended that structures utilizing a structural floor and crawlspace include a perimeter foundation drain. Perimeter foundation drains should consist of prefabricated drain materials or perforated pipe and gravel systems with the flowline of the drain at least one foot below the bottoms of the foundations (at the highest point). Perimeter drains should slope at a minimum of 1.5% to daylight or to a sump. However, site specific drain recommendations can be developed by HBET, as necessary.

7.5 Excavations

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. Trenching and excavations should be sloped back, shored, or shielded for worker protection in accordance with applicable OSHA standards. The soils generally classify as Type C soil with regard to OSHA's *Construction Standards for Excavations*. For Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands– Mesa County Area, Colorado		
Map Symbol	**Map Unit Name**	**Farmland Classification**
Bc	Sagers silty clay loam, 0 to 2 percent slopes	Prime farmland if irrigated

Data Source Information

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

APPENDIX B
Typed Test Pit Logs

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

TEST PIT NUMBER TP-1

CLIENT McCurter Land Company
PROJECT NAME Aspen Village
PROJECT NUMBER 00493-0002
PROJECT LOCATION Fruita, CO
DATE STARTED 7/24/08 COMPLETED 7/24/08
GROUND ELEVATION
TEST PIT SIZE
EXCAVATION CONTRACTOR Hi-River
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION 9.5 ft
LOGGED BY AS CHECKED BY MAB
AT END OF EXCAVATION 9.5 ft
NOTES
AFTER EXCAVATION ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy SILT with Organics (TOPSOIL), brown, dry										
		Sandy SILT (ML), reddish brown to brown, dry to moist, medium dense to loose	MC 1									
2.5		GB1: Lab Classified	GB 1				91	3	NP	NP	NP	53
5.0												
7.5		Silty CLAY (CL-ML), with sandy gravel lenses, brown, moist to wet, medium stiff GB2: Lab Classified	GB 2					32	25	19	6	91
		Bottom of test pit at 9.5 feet.										

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TEST PIT NUMBER TP-2

CLIENT McCurter Land Company
PROJECT NAME Aspen Village
PROJECT NUMBER 00493-0002
PROJECT LOCATION Fruita, CO
DATE STARTED 7/24/08 COMPLETED 7/24/08
GROUND ELEVATION
TEST PIT SIZE
EXCAVATION CONTRACTOR Hi-River
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION dry
LOGGED BY AS CHECKED BY MAB
AT END OF EXCAVATION dry
NOTES
AFTER EXCAVATION ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy SILT with Organics (TOPSOIL), brown, dry										
		Sandy SILT (ML), tan to brown, dry to moist, medium dense to loose	MC 1									
2.5		GB1: Lab Classified	GB 1				92	4	NP	NP	NP	64
5.0												
7.5		Silty CLAY (cl-ml), brown, moist, medium stiff										
		Bottom of test pit at 8.0 feet.										

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970-255-6818

TEST PIT NUMBER TP-3

CLIENT McCurter Land Company
PROJECT NAME Aspen Village
PROJECT NUMBER 00493-0002
PROJECT LOCATION Fruita, CO
DATE STARTED 7/24/08 **COMPLETED** 7/24/08
GROUND ELEVATION ____ **TEST PIT SIZE** ____
EXCAVATION CONTRACTOR Hi-River
GROUND WATER LEVELS:
EXCAVATION METHOD Backhoe
AT TIME OF EXCAVATION 9.5 ft
LOGGED BY AS **CHECKED BY** MAB
AT END OF EXCAVATION 9.5 ft
NOTES ____
AFTER EXCAVATION ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Sandy SILT with Organics (TOPSOIL), brown, dry										
		Sandy SILT (ml), tan to brown, dry to moist, medium dense to loose										
2.5			MC 1				98	11				
5.0												
7.5												
		Silty CLAY (cl-ml), brown, moist to wet, medium stiff to soft										
10.0												

Bottom of test pit at 10.0 feet.

APPENDIX C
Laboratory Testing Results

Huddleston-Berry Engineering & Testing, LLC
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Grand Junction, CO 81501
970-255-8005
970-255-6818

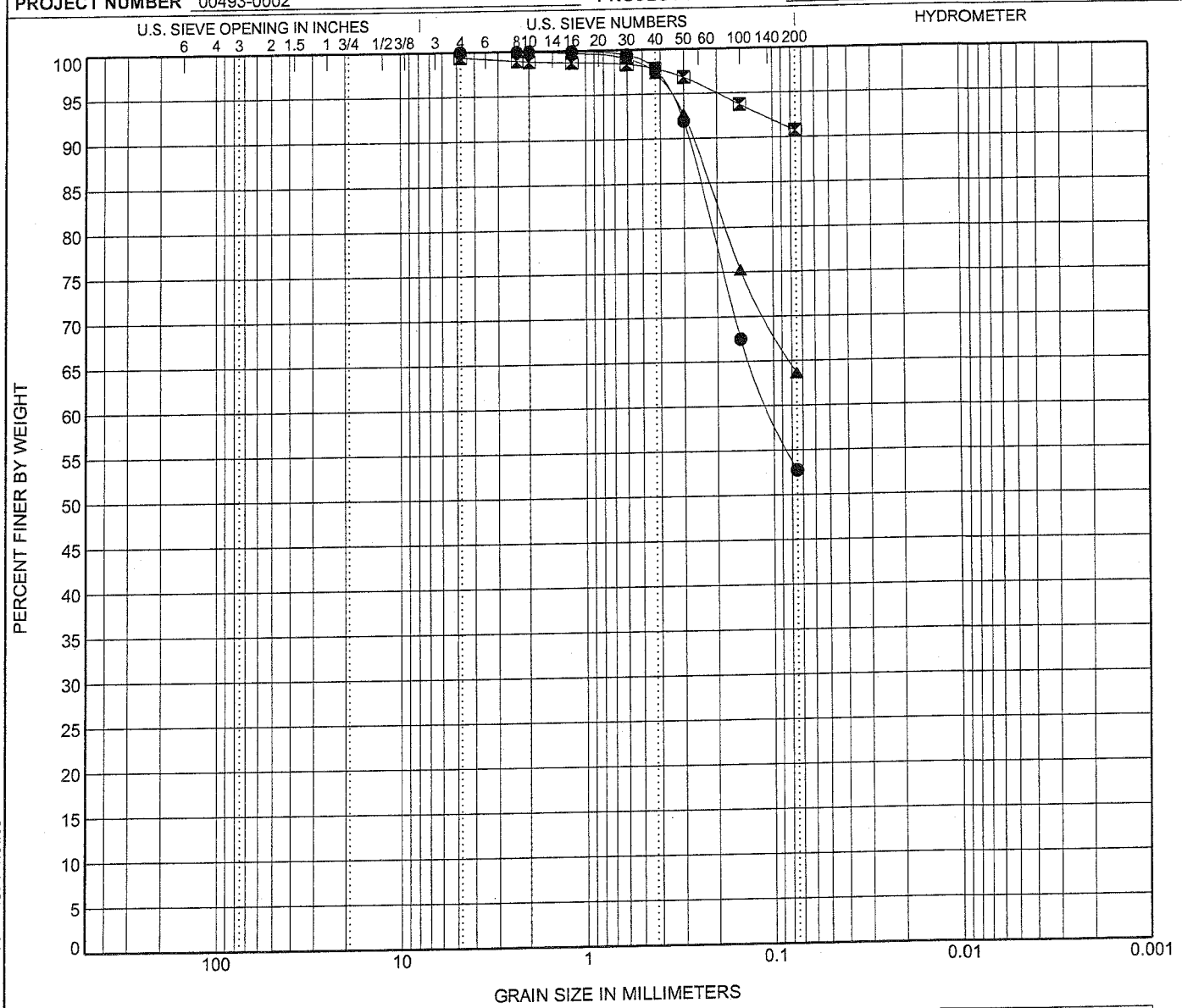
GRAIN SIZE DISTRIBUTION

CLIENT McCurter Land Company

PROJECT NAME Aspen Village

PROJECT NUMBER 00493-0002

PROJECT LOCATION Fruita, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	TP-1, GB1 07/08	SANDY SILT(ML)	NP	NP	NP		
⊠	TP-1, GB2 07/08	SILTY CLAY(CL-ML)	25	19	6		
▲	TP-2, GB1 07/08	SANDY SILT(ML)	NP	NP	NP		

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TP-1, GB1 07/08	4.75	0.105				47.2	52.8	
⊠	TP-1, GB2 07/08	4.75					8.6	90.7	
▲	TP-2, GB1 07/08	2.36					36.3	63.6	

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970-255-6818

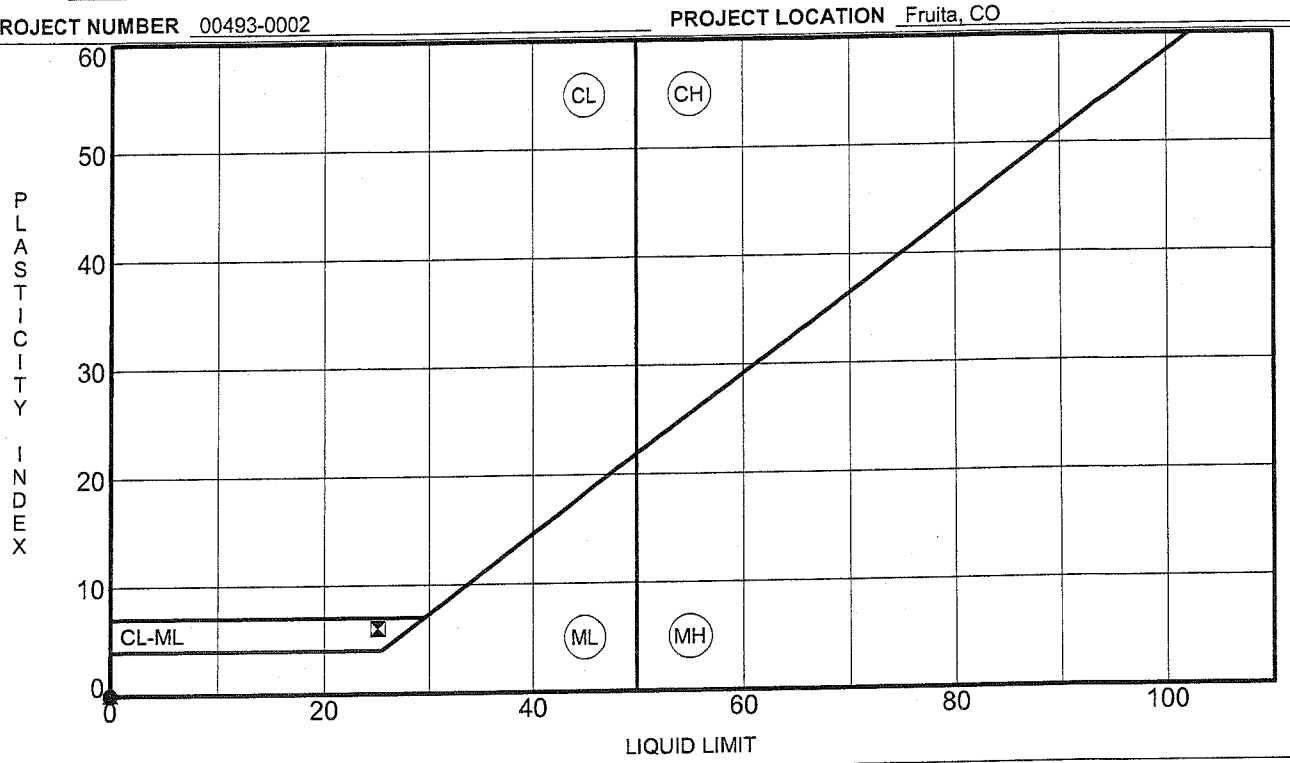
ATTERBERG LIMITS' RESULTS

CLIENT McCurter Land Company

PROJECT NAME Aspen Village

PROJECT NUMBER 00493-0002

PROJECT LOCATION Fruita, CO



	Specimen Identification		LL	PL	PI	#200	Classification
●	TP-1, GB1	7/24/2008	NP	NP	NP	53	SANDY SILT(ML)
⊠	TP-1, GB2	7/24/2008	25	19	6	91	SILTY CLAY(CL-ML)
▲	TP-2, GB1	7/24/2008	NP	NP	NP	64	SANDY SILT(ML)

Huddleston-Berry Engineering & Testing, LLC
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970-255-6818

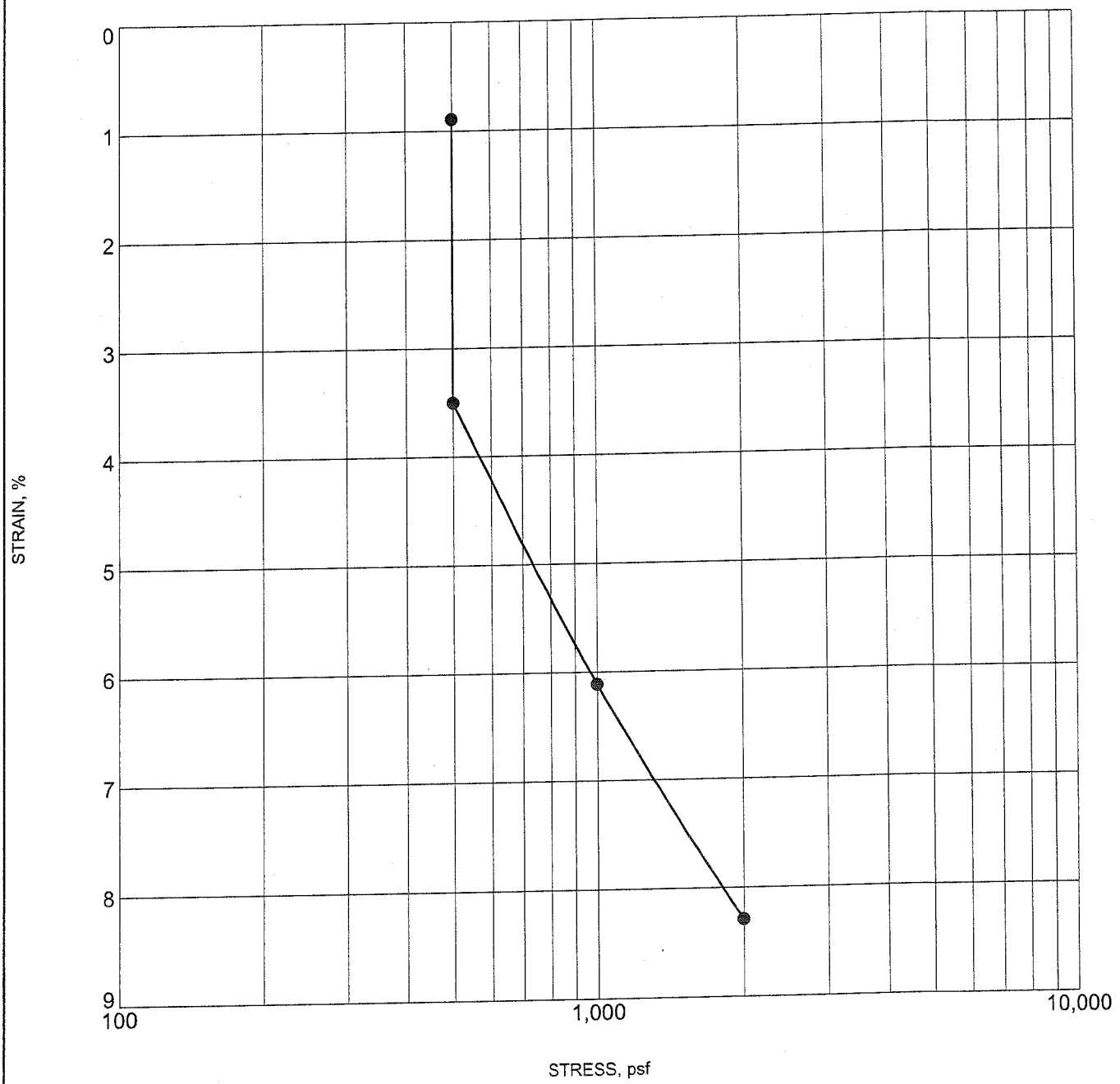
CONSOLIDATION TEST

CLIENT McCurter Land Company

PROJECT NAME Aspen Village

PROJECT NUMBER 00493-0002

PROJECT LOCATION Fruita, CO



Specimen Identification		Classification	γ_d	MC%
● TP-1	2.5	SANDY SILT(ML)	91	5

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CONSOLIDATION TEST

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PROJECT NAME Aspen Village

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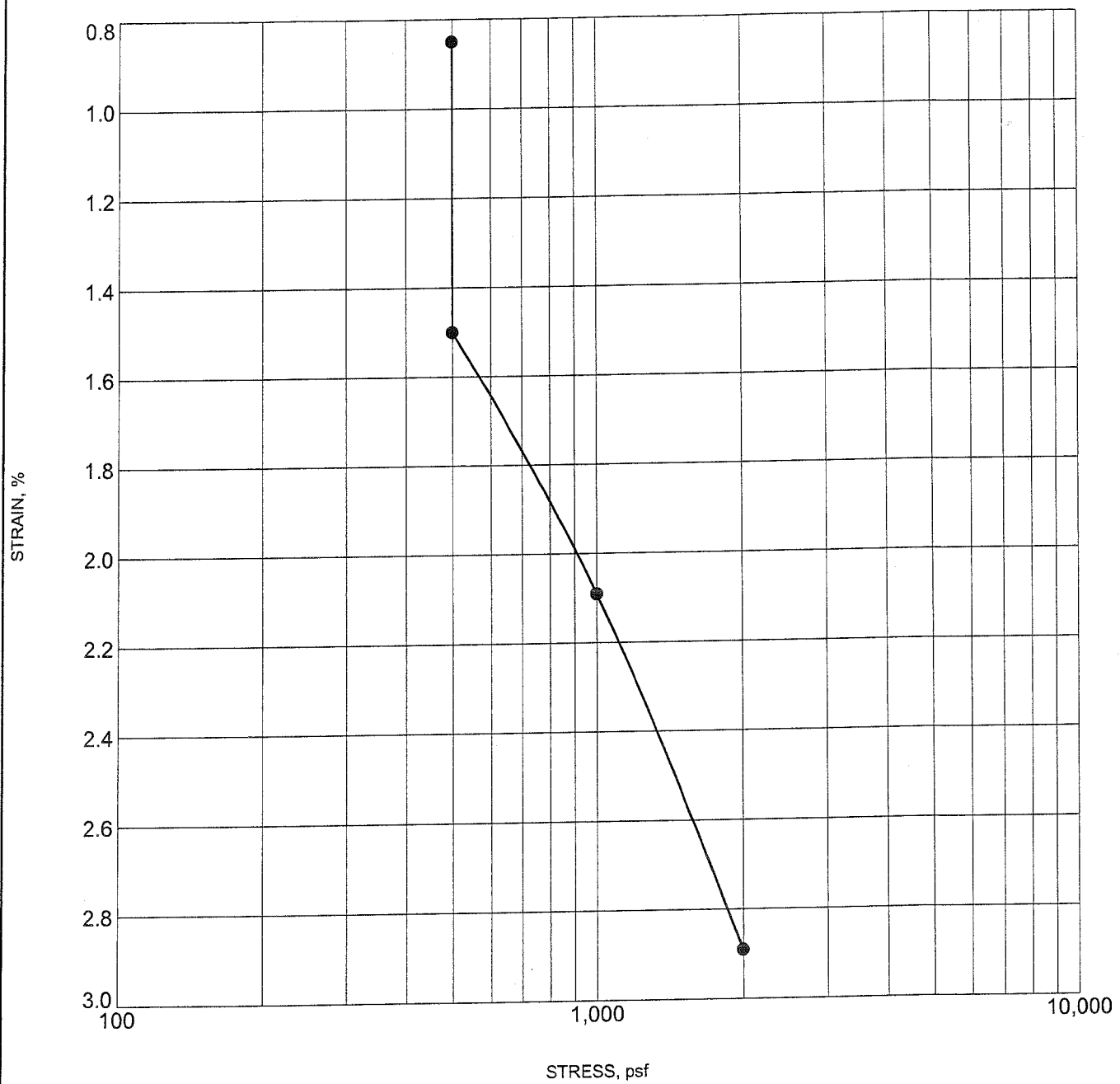

Specimen Identification			Classification	γ_d	MC%
●	TP-2	2.5	SANDY SILT(ML)	92	2

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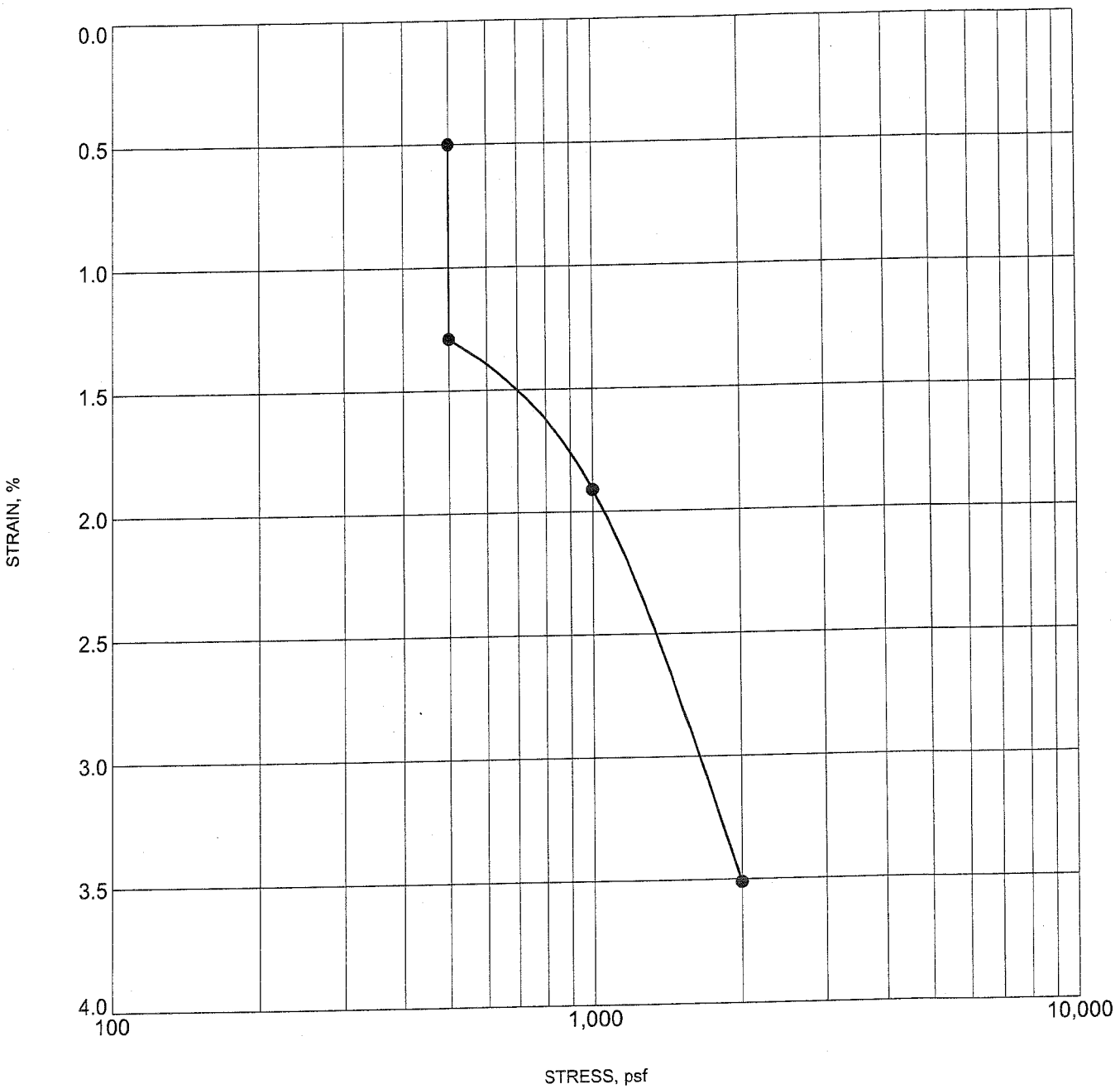
PROJECT NUMBER 00493-0002

PROJECT LOCATION Fruita, CO



Specimen Identification			Classification	γ_d	MC%
●	TP-3	2.5		98	11

Huddleston-Berry Engineering & Testing, LLC
640 White Avenue, Unit B
Grand Junction, CO 81501
970-255-8005
970-255-6818

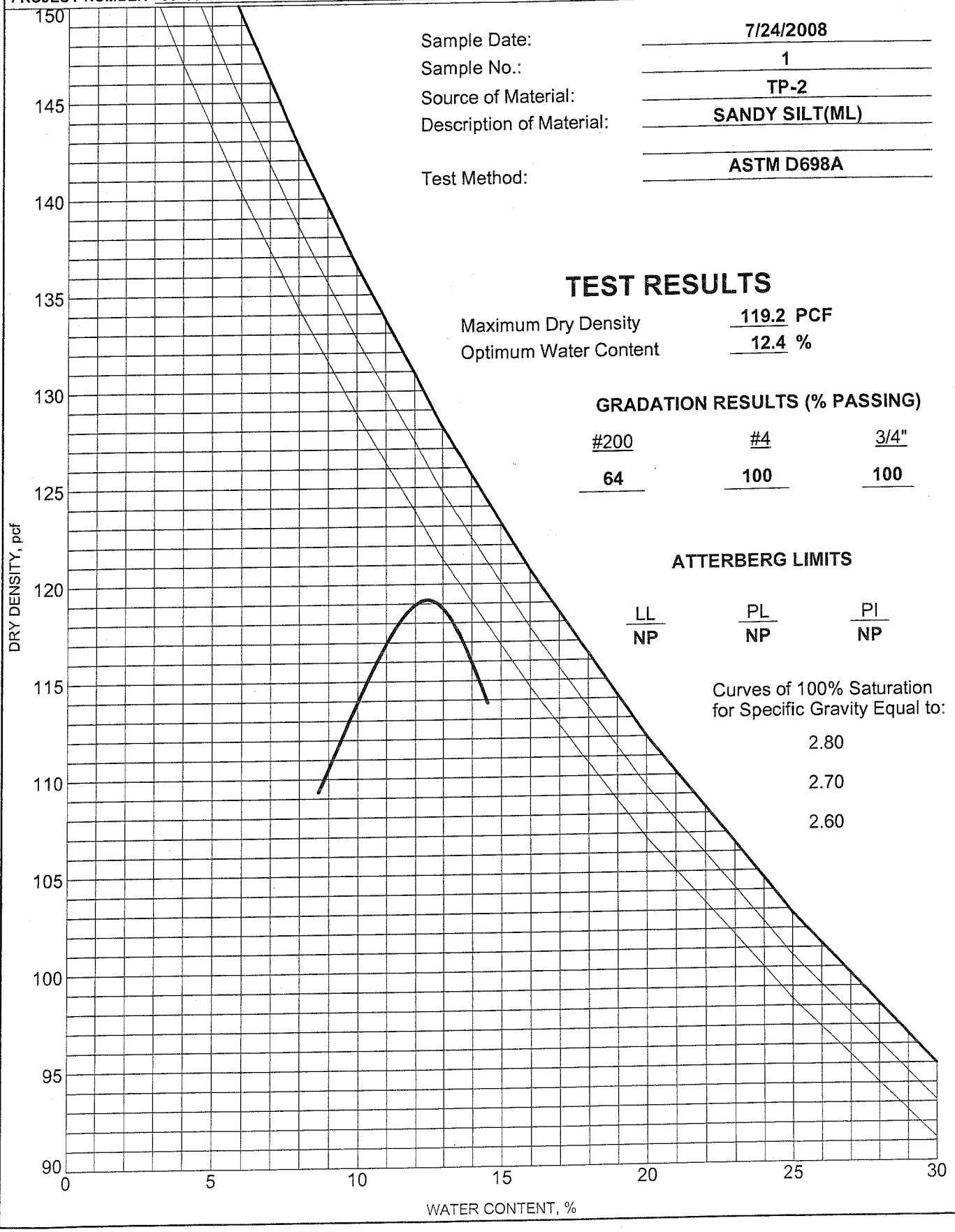
MOISTURE-DENSITY RELATIONSHIP

CLIENT McCurter Land Company

PROJECT NAME Aspen Village

PROJECT NUMBER 00493-0002

PROJECT LOCATION Fruita, CO



Sample Date: 7/24/2008

Sample No.: 1

Source of Material: TP-2

Description of Material: SANDY SILT(ML)

Test Method: ASTM D698A

TEST RESULTS

Maximum Dry Density 119.2 PCF

Optimum Water Content 12.4 %

GRADATION RESULTS (% PASSING)

#200	#4	3/4"
64	100	100

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

Huddleston-Berry
Engineering & Testing, LLC

CALIFORNIA BEARING RATIO
ASTM D1883

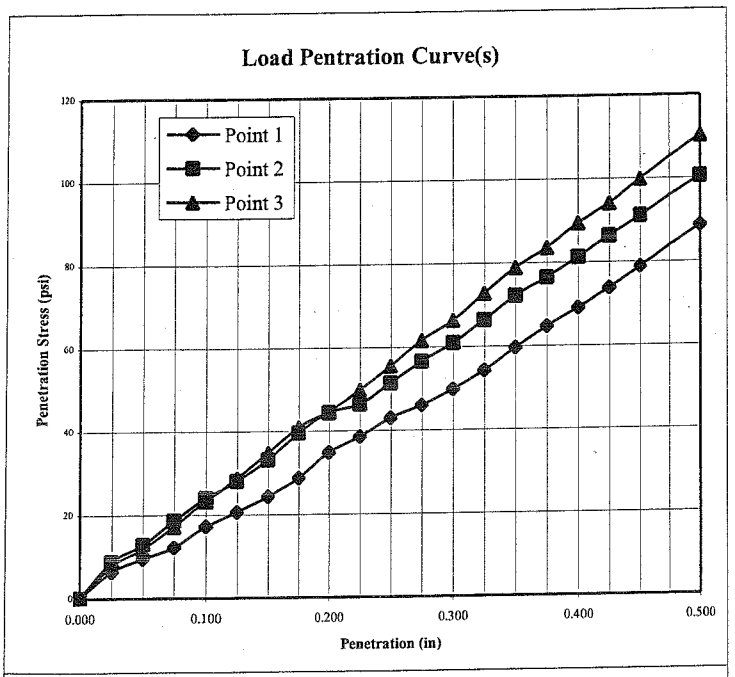
Project No.: 00493-0002
Project Name: Aspen Village
Client Name: McCurter Land Development Company
Sample Number: 08-1038 **Location:** TP-2, GB1

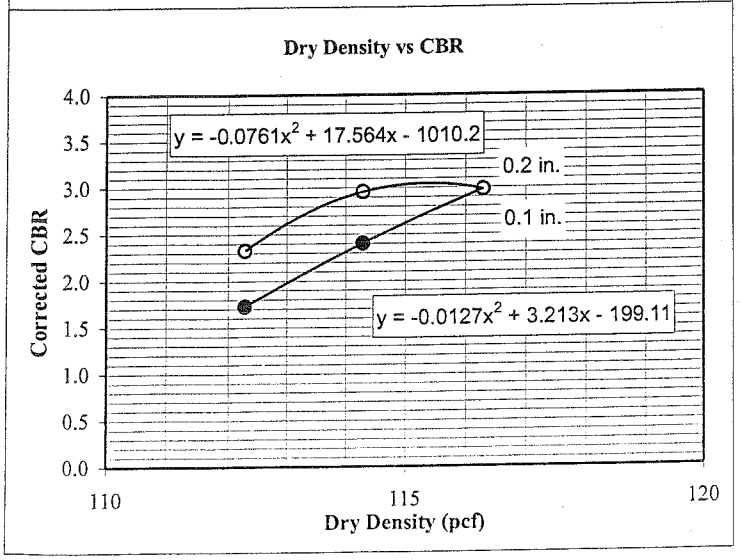
Authorized By: Client **Date:** 07/24/08
Sampled By: AS **Date:** 07/24/08
Submitted By: AS **Date:** 07/24/08
Reviewed By: MAB **Date:** 07/31/08

Compaction Method ASTM D698, Method A

Maximum Dry Density (pcf): 119.2
Opt. Moisture Content (%): 12.4
Sample Condition: Soaked
Remarks:

		Sample Data		
		Point 1	Point 2	Point 3
Blows per Compacted Lift:		15	25	56
Surcharge Weight (lbs):		10.0	10.0	10.0
Dry Density Before Soak (pcf):		112.3	114.3	116.3
Dry Density After Soak (pcf):		112.3	114.3	116.3
Moisture Content (%)	Bottom Pre-Test	13.6	13.9	13.5
	Top Pre-Test	13.7	13.8	12.7
	Top 1" After Test	17.2	15.5	15.5
	Average After Soak:	14.8	14.5	14.3
Percent Swell After Soak:		0.0	0.0	0.0





Penetration Data								
Point 1			Point 2			Point 3		
Dist. (in)	Load (lbs)	Stress (psi)	Dist. (in)	Load (lbs)	Stress (psi)	Dist. (in)	Load (lbs)	Stress (psi)
0.000	0	0	0.000	0	0	0.000	0	0
0.025	19	6	0.025	26	9	0.025	23	8
0.050	28	9	0.050	38	13	0.050	35	12
0.075	36	12	0.075	55	19	0.075	51	17
0.100	51	17	0.100	71	24	0.100	69	23
0.125	61	21	0.125	83	28	0.125	85	29
0.150	72	24	0.150	98	33	0.150	103	35
0.175	85	29	0.175	117	40	0.175	121	41
0.200	103	35	0.200	131	44	0.200	132	45
0.225	114	39	0.225	137	46	0.225	147	50
0.250	127	43	0.250	152	51	0.250	164	55
0.275	136	46	0.275	167	56	0.275	182	62
0.300	147	50	0.300	180	61	0.300	196	66
0.325	160	54	0.325	196	66	0.325	215	73
0.350	176	60	0.350	213	72	0.350	233	79
0.375	191	65	0.375	226	76	0.375	247	84
0.400	204	69	0.400	240	81	0.400	264	89
0.425	218	74	0.425	255	86	0.425	278	94
0.450	233	79	0.450	269	91	0.450	295	100
0.500	262	89	0.500	297	100	0.500	326	110

Corrected CBR @ 0.1"		
1.7	2.4	3.0
Corrected CBR @ 0.2"		
2.3	3.0	3.0

Penetration Distance Correction (in)		
0.000	0.000	0.000

Figure: _____