

GEOTECHNICAL ENGINEERING REPORT PROPOSED MONARCH MEADOWS RESIDENTAIL DEVELOPMENT 13400 SOUTH 4800 WEST HERRIMAN, UTAH

# Prepared for:

Mr. Ryan Staker Monarch Development of Salt Lake City, L.L.C. 1515 West 2200 South, Suite C Salt Lake City, Utah

#### Prepared by:

PROFESSIONAL SERVICE INDUSTRIES, INC. 2779 South 600 West Salt Lake City, Utah (801) 954-8442

PSI PROJECT NO. 710-25083-2 & 3

March 17, 2003



March 17, 2003

Mr. Ryan Staker Monarch Development of Salt Lake City, L.L.C. 1515 West 2200 South, Suite C Salt Lake City, Utah 84119

Re: Geotechnical Report Addendum - Foundations
Proposed Monarch Meadows
13400 South 4800 West
Herriman, Utah
PSI Project No. 710-25083-3

Dear Mr. Staker:

At the request of Doug Young and yourself, the undersigned engineer and Jason Crosby, P.E. visited the referenced site on February 28, 2003 to observed test pits excavated across the site. PSI previously completed a geotechnical report for the project where test pits were randomly excavated for the project and recommendations made based on the conditions observed. This letter presents the results of our findings as they pertain to the foundation recommendations provided in the original report.

An additional 14 test pits were observed on February 28, 2003. The materials in the test pits consisted of silty clay with sand and a pinhole structure underlain by dense gravel. The silty clay layer varied in thickness from 1 to 2 feet in the west and southern portions of the site to beyond the depth investigated of 10 feet in the east central and northeast portions of the site.

Samples of potentially collapsible soils were obtained from two of the test pits. Others labeled the test pits as TP-5561 and TP-5562. The test pits were located near our original test pits TP-31 and TP-38 as shown on the original report site plan. Samples obtained from 2.5 feet below the surface were tested for their collapse potential. The results of the laboratory tests indicated an approximate collapse potential of 7 percent; and dry units weights and moisture contents of 72 pcf @ 21% and 85 pcf @ 14%.

Based on the recently observed conditions and additional information obtained from the test pits and laboratory work, we recommend the following:

- (1) Foundation recommendations provided in the geotechnical report should be followed for areas where the silty clay to clayey silt soils exist and no fill is placed to build the site up in elevation.
- (2) Foundations located in gravel soils will not require over-excavation below footings.
- (3) In the east central and northeast portions of the site where the silty clay soils with a pinhole structure are present to depths that extend beyond 3 feet below existing site grades, and fill will be used to raise site grades, a portion of the silty clay soils should be removed. The depth of native silty clay removal to depth of fill placed on the site should be on a 1.2 Removal to 1.0 Fill placement ratio. In other, words, if 7 feet of fill is being placed on the site, then 8.5 feet of pinhole type soil should be removed and replaced with structural fill. This will limit severe adverse reactions to building construction due to fill loads on the native soils. Additionally, a minimum of 2 feet of native soil removal below the 1 foot topsoil zone should be completed prior to the placement of any fill in this area.
- (4) As an option to Item (3) above, deep foundations, such as mini-piers, or deep basements extending below the depth of collapsible soils may be utilized at this site.
- (5) The geotechnical engineer should be contacted during foundation excavation operations to observe site conditions prior to the placement of fill or concrete to ensure our recommendations were properly understood.

All other recommendations that pertain to site grading and compaction requirements as presented in the original report should be followed.

We appreciate the opportunity to be of service to you on this project. If you have additional questions, please call.

Respectfully submitted

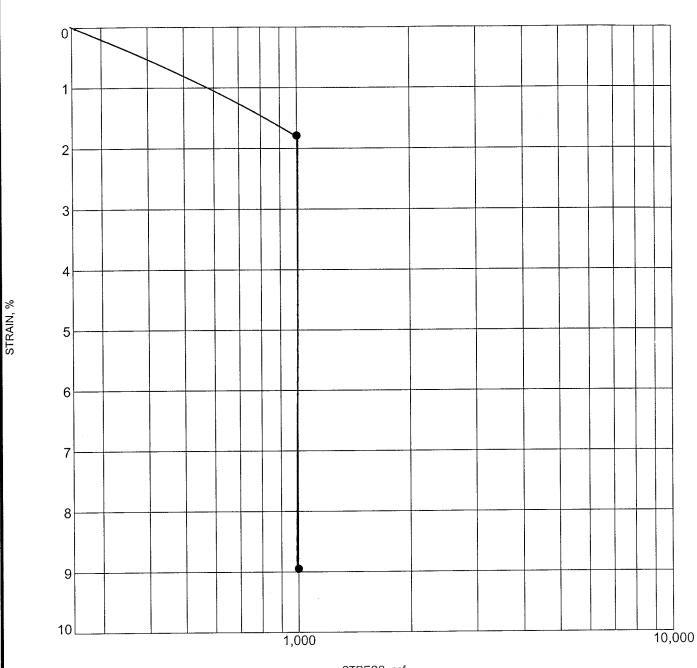
Professional Service

Alan O. Taylor, F District Manager

Reviewed by,

James Niehoff, P.E.

Chief Engineer



STRESS, psf

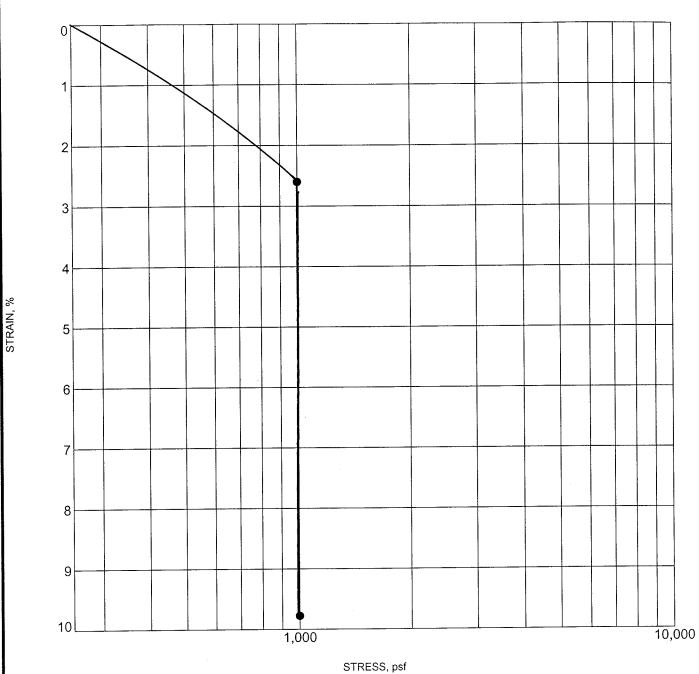
Specimen Ident	ification	Classification	$\gamma_{\rm d}$	М	1C%
● TP-5561	2.5		72	2	21



# **CONSOLIDATION TEST**

PSI Job No.: 710-25083-3
Project: Monarch Meadows
Location: Herriman, Utah

Figure A-1



5	Specimen Iden	tification	Classification	$\gamma_{\rm d}$		MC%
•	TP-5562	2.5		8	5	14



# **CONSOLIDATION TEST**

PSI Job No.: 710-25083-3 Project: Monarch Meadows Location: Herriman, Utah

Figure A-2



March 10, 2003

Mr. Ryan Staker Monarch Development of Salt Lake City, L.L.C. 1515 West 2200 South, Suite C Salt Lake City, Utah 84119

Re: Geotechnical Report Addendum - Pavement Proposed Monarch Meadows 13400 South 4800 West Herriman, Utah PSI Project No. 710-25083-2

Dear Mr. Staker:

At your request, the undersigned engineer and Jason Crosby, P.E. with PSI visited the referenced site on February 28, 2003 to observed test pits excavated across the site. PSI previously completed a geotechnical report for the project where test pits were randomly excavated for the project and recommendations made based on the conditions observed. The purpose of this recent site visit was to observe the conditions in proposed roadway areas. The letter presents the results of our findings as they pertain to the roadway recommendations.

An additional 14 test pits were observed on February 28, 2003. The materials in the test pits consisted on silty clay with sand and a pinhole structure underlain by dense gravel. The silty clay layer varied in thickness from 1 to 2 feet in the west and southern portions of the site to beyond the depth investigated of 10 feet in the east central and northeast portions of the site.

Based on the recently observed conditions and additional information obtained for the test pits, we recommend that the pavement recommendations provided in the geotechnical report be followed for the east central and northeast portions of the site where the silty clay soils with a pinhole structure are present to depths that extend beyond 5 feet below the surface. Where gravel is encountered, the subgrade should be scarified and recompacted 8 inches and the pavement section of 3 inches of asphalt over 6 inches of base course be used. No over-excavation of gravel soils is required in the pavement areas as previously specified. The over-excavation of the soils may be accomplished with deep scarification and recompaction at the contractors option but may be difficult to accomplish due to the nature of the silty soils. If areas are in question

during grading operations, the geotechnical engineer should be contacted to delineate areas that require modification.

We appreciate the opportunity to be of service to you on this project. If you have additional questions, please call.

Respectfully submitted

Professional Service

Alan O. Taylor, P. District Manager

Reviewed by,

James Niehoff, P.E.

Chief Engineer



GEOTECHNICAL ENGINEERING REPORT PROPOSED MONARCH MEADOWS RESIDENTIAL DEVELOPMENT 13400 SOUTH 4800 WEST HERRIMAN, UTAH

#### **Prepared For**

Mr. Doug Young Herriman Land, L.L.C. 3727 South State Street Salt Lake City, Utah 84115

**Prepared By** 

PROFESSIONAL SERVICE INDUSTRIES, INC. 2779 South 600 West Street
Salt Lake City, Utah
(801) 954-8442

**PSI PROJECT 710-25083** 

August 9, 2002



August 9, 2002

Mr. Doug Young Herriman Land, L.L.C. 3727 South State Street Salt Lake City, Utah 84115

Report of Geotechnical Exploration for Proposed Monarch Meadows Residential Development 13400 South 4800 West Herriman, Utah PSI Project No. 710-25083

Dear Mr. Young:

We are pleased to submit this report of our geotechnical engineering study for the proposed Monarch Meadows Residential Development to be constructed at approximately 13400 South 4800 West, Herriman, Utah. Details of our findings and recommendations along with the supporting field data are presented in the attached report.

A total of forty-two (42) test pits were excavated within the development area. The test pits revealed that subsurface conditions generally consists of up to 18 inches of silty topsoil underlain by stiff silt (ML) and/or clay (CL), medium dense to dense silty sand (SM), and silty gravel (GM). Collapsible soil was encountered throughout the site and extended to the depth explored in several of the test pits. Groundwater was not encountered during the field investigation.

Based upon our field and laboratory tests, the site appears to be generally suitable for the proposed development provided the recommendations of this report are properly followed. The proposed structures may be supported on conventional spread footings. For residences without basements, we recommend that collapsible soils be removed a minimum of 2 feet below foundations and be replaced with structural fill. Floor slabs may also be supported on 12 inches of properly placed and compacted structural fill below the collapsible soil. If basements are to be excavated, spread footings and floor slabs may be placed on the native soil. Footings may be designed using an allowable bearing capacity of up to 1,500 psf. Prior to placement of footings, we recommend

inspection of footing subgrades on a lot by lot basis to ensure the removal of collapsible soil to a depth of at least 2 feet below founding bearing elevation. Additional details are provided in the attached report.

It has been a pleasure to serve you on this project. Please call us if you have any questions or need additional information.

Very truly yours,

PROFESSIONAL SERVICE INDUSTRIES, INC.

JASON D. CROSBY, P.E.

Manager, Seotechnical Services

BRIAN GARRETT, E.I.T.

Project Engineer

Reviewed By:

JAMES NIEHOFF, P.E.

Chief Engineer

JDC/JN/BG/ckh

Submitted in three copies.

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August 9, 2002 PSI Job No. 710-25083 Page 1

#### INTRODUCTION

# Authorization and Purpose

This report presents the findings of a geotechnical study for the proposed Creek View Meadows Residential Development at approximately 13400 South 4800 West, Herriman, Utah. The services for this project were performed in general accordance with our proposal No. 710-25053 dated May 13, 2002 as authorized by Mr. Doug Young, Herriman Land, L.L.C.

The purpose of this exploration was to generally characterize subsurface conditions at the site and to provide recommendations regarding site development and parameters for foundation and floor slab design for the proposed construction.

#### **Project Information**

Based upon our discussions and upon provided plans, we understand that the proposed development will consist of overlot grading and construction of streets and utilities for a 200-acre subdivision for one to two story single family residences. It is anticipated that the proposed homes will be of typical wood frame construction possibly underlain by a full basement. This report was prepared with the anticipation that the maximum column loads (if any) will be about 50 kips and the maximum wall loads will range from 2 to 4 kips per linear foot

The geotechnical recommendations presented in this report are based on the available project information, building location, and the subsurface materials described in this document. If any of the noted information is incorrect, please inform PSI in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

#### SITE AND SUBSURFACE CONDITIONS

#### Site Location and Description

The proposed development is located at approximately 13400 South 4800 West, Herriman, Utah. The proposed site consists of about 200 acres of open farmland, and is currently covered with planted wheat. The site is neighbored by residential developments on the south and west, 4800 West Street on the east, and 13400 South Street on the north. The general site topography is rolling with a variable downward slope to the north/northeast.

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#### **Regional Geology**

Based on published maps, no known faults exist on the property or within the immediate vicinity. The nearest known fault of concern is the Wasatch Fault located about 12 miles to the east. We recommend that earthquake related design parameters be obtained from the International Building Code (IBC) 2000 Edition, using a Site Class Definition = D, and spectral accelerations  $S_s = 1.15g$  and  $S_L = 0.42g$  for a 2% probability of exceedence in 50 years. No other special seismic considerations are recommended for this site.

#### Site Analysis

#### Field Investigation

Subsurface conditions at the project site were evaluated by excavating a total of forty-two test pits (TP-1 through TP-42). The test pits were excavated throughout the proposed development and were located on the site by the owner prior to our arrival. The approximate locations of these pits are shown on Figure A-2, *Site Plan and Approximate Locations of Test Pits* presented in the Appendix. The test pits were excavated using a track hoe to a depth ranging from 10 to 14 feet below the existing ground surface.

#### Laboratory Testing

The soil samples collected were visually classified in accordance with the Unified Soil Classification System (USCS) in the field, placed in air-tight containers, and transported to our soil laboratory in Salt Lake City, Utah. Representative soil samples were tested to assess applicable properties of the soils, and included Atterberg Limits, mechanical sieve analysis, and collapse/swell analysis. The results of the analyses are presented in Figures A-46 to A-50 in the Appendix of this report.

#### **Subsurface Conditions**

#### Soil Profile

The test pits revealed that subsurface conditions generally consists of up to 18 inches of silty topsoil underlain by stiff silt (ML) and/or clay (CL), medium dense to dense silty sand (SM), and dense silty gravel (GM) extending to the maximum depth explored. For a detailed description of the conditions encountered at each test pit location, please refer to the Test Pit Logs, Figures A-3 through A-44 in Appendix A. Figure A-45 is the key to symbols and abbreviations used on the Test Pit Logs.

The above subsurface description is of a generalized nature, provided to highlight the major subsurface stratification features and material characteristics. The Test Pit Logs included in the Appendix should be reviewed for specific information as to individual test pit locations. The stratification shown on the Test Pit Logs represent the conditions only at the actual test pit locations. Variations may occur and should be expected

Geotechnical Study Monarch Meadows,13400 South 4800 West Herriman, Utah August 9, 2002 PSI Job No. 710-25083 Page 3

between test pit locations. The stratification represents the approximate boundary between subsurface materials and the transition may be gradual. The samples that were not altered by laboratory testing will be retained for 30 days from the date of this report and then will be discarded.

#### Collapsible Soils

Collapsible soils occur naturally and are associated with relatively dry alluvial fans, colluvium and wind-blown deposits. These soils are typically comprised of silts and sands with a small amount of clay. Collapsible soils are characterized by low density, porous structures, high shear strength when dry, and susceptibility to large settlement when wetted.

Collapsible soil was encountered at many locations within the proposed Monarch Meadows Residential Development site. The depth of collapsible soil varied throughout the site and extended to the depth explored in several of the test pits.

# Groundwater Measurements

Groundwater was not encountered during the field investigation. It should be noted that it is possible for the groundwater table to fluctuate during the year depending upon climatic and rainfall conditions. Additionally, discontinuous zones of perched water may exist within the overburden materials. The groundwater levels presented in this report are the levels that were measured at the time of our field activities. We recommend that the building contractors evaluate the groundwater levels at the site at the time of the construction activities.

# **EVALUATION AND RECOMMENDATIONS**

#### **Geotechnical Discussion**

The following geotechnical related recommendations have been developed on the basis of the subsurface conditions encountered and our understanding of the proposed development. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

Due to the presence of collapsible soils, we recommend that footings and slabs ongrade should bear on a minimum of 2 feet of new, properly compacted fill. The on-site soils may be used as structural fill. If basements are to be excavated, spread footings may be placed directly on native material. Footing bearing capacities and additional geotechnical details are provided in the following paragraphs. Geotechnical Study Monarch Meadows,13400 South 4800 West Herriman, Utah August 9, 2002 PSI Job No. 710-25083 Page 4

#### **Site Preparation Recommendations**

#### General Site Grading

Topsoil, man-placed fill or soft soils in the construction areas should be stripped from the site and either wasted or stockpiled for later use in landscaping. The building and roadway areas should be excavated to a depth of at least 2 feet below final grades. After stripping and excavating to the depth noted above, the building and road areas should be proof-rolled to a smooth, non-yielding surface with rubber tire equipment or a smooth-drum compactor. Soils that are observed to rut or deflect excessively under the moving load should be excavated and replaced with properly compacted structural fill. The proof-rolling and excavation activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather. If the subgrade is too soft/wet to proof-roll, we recommend that a stabilization fill be placed prior to placement of structural fill.

and the control of th

#### Stabilization Fill

Areas of extremely soft subgrade may require stabilization prior to structural fill placement. Additional lifts of stabilization fill may be required in areas of particularly poor subgrade. The stabilization fill can be counted as part of the required structural fill section below the footings. Exposed native subgrades not requiring stabilization should be proof-rolled with a heavy truck or similar equipment to check for soft spots. Soft spots detected should be removed and replaced with either stabilization fill as defined above or structural fill as defined below.

#### Structural Fill

Structural fill should consist of a well graded sand or gravel material which is free of organic or other deleterious materials, have a maximum particle size less than 4 inches, retain less than 30 percent on the ¾ inch sieve, and contain less than 25 percent fines (materials passing the No. 200 sieve). The liquid limit of the fines should not exceed 35 percent and the plasticity index should be less than 25. Structural fill should be placed in maximum lifts of 8 inches of loose material and compacted on a horizontal plane. Moisture should be maintained at moisture content within 2 percent of the optimum moisture determined by ASTM D 1557. Structural fill should be compacted to at least 95 percent of modified proctor maximum dry density (ASTM D 1557) in structurally loaded areas. Fills placed in landscape areas not supporting structural loads should be compacted to at least 90 percent of the modified proctor maximum dry density. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of compacted-engineered fill should be tested by a representative of the geotechnical engineer prior to placement of subsequent lifts.

Geotechnical Study Monarch Meadows,13400 South 4800 West Herriman, Utah August 9, 2002 PSI Job No. 710-25083 Page 5

#### **Utility Trenches**

Utility trenches may be backfilled with imported structural fill or the on-site soils. Backfill soils used in areas not structurally loaded should be placed in maximum 10-inch lifts and compacted to 90 percent of the modified Proctor (ASTM D 1557). The upper 2 feet of trench backfill within pavement sections or beneath footings should be compacted to 95 percent of the maximum density.

If unstable soils are encountered at invert elevations, it may be necessary to excavate an additional depth and replace the unstable soils with structural/stabilization fill. The depth of over-excavation, if necessary, should be determined by field observation.

#### **Excavations**

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor should evaluate the soil exposed in the excavations as part of the his/her safety procedures. In no case should slope height, slope inclination, or excavation depth including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

For temporary excavations not exceeding 4 feet in height, we recommend a maximum slope of 1 to 1 (H:V). For excavations up to 10 feet in height, we recommend slopes be limited to 1.5:1. If unstable soils or groundwater conditions are encountered during excavation, bracing, benching, shoring or flatter slopes may be necessary.

We are providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's (or other parties) compliance with local, state, and federal safety or other regulations.

#### **Foundations**

Provided that the sites are properly prepared as noted above and below, homes may be supported by spread footing foundations. For residences without basements, we recommend that collapsible soils be removed a minimum of 2 feet below foundations and be replaced with structural fill. If basements are to be excavated, spread footings may be placed directly on native soil. Footings constructed in this manner should be designed using an allowable bearing capacity of up to 1,500 psf. The following design parameters are recommended for footing construction:

- Footings should bear at a minimum depth of 30 inches below final grade for frost protection. For non-frost areas, such as interior footings, a minimum embedment depth of 18 inches is recommended.
- Foundations should have minimum widths of 18 inches for continuous wall footings and 24 inches for isolated column footings.

- Structural fill should extend a minimum of ½ the depth of fill laterally away from the edge of the footing.
- The allowable bearing pressures presented above may be increased up to 33 percent for transient loading for such as wind and seismic load combinations.
- We recommend that the footings, foundations and below grade walls be designed in accordance with the IBC, 2000 edition.

Footings should not be installed on loose or disturbed soil or within ponded water. If unsuitable soils are encountered near the footing subgrade, they should be removed and replaced with properly compacted structural fill.

#### **Estimated Settlement**

If footings are design according to the recommendations described above, total estimated settlement under static conditions should not exceed one inch. Differential settlement is expected to approach 50 to 75 percent of the total settlement. Most of this settlement should occur during the construction phase.

#### Floor Slabs

Due to the collapsible characteristics of the on-site soils, concrete slab on grade floors should be supported on at least 24 inches of properly placed and compacted structural fill provided a minimum of 4 inches of free-draining gravel is placed immediately below the slabs and/or exterior flatwork. The free-draining gravel will enhance drainage.

The soil subgrade in the area of concrete slab-on-grade support is often disturbed during foundation and superstructure construction. We recommend that floor slab subgrades be evaluated by a representative of PSI immediately prior to beginning floor slab construction. If disturbed subgrade soils are present which cannot be adequately densified in place, such soils should be removed and replaced with additional structural/stabilization fill.

# **Surface Drainage Considerations**

It is absolutely critical at this site that adequate surface drainage be maintained during and after construction. Water should not be allowed to collect near the foundations or floor slab areas of the building or in pavement areas. Undercut or excavated areas should be sloped towards one corner to facilitate removal of collected rainwater, groundwater seepage, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the buildings and beneath floor slabs. Grades should be sloped away from the building, and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill of the buildings.

#### **Lateral Resistance and Earth Pressure**

Resistance to lateral loads on foundations may be achieved by frictional resistance between foundations and the load bearing soils, and by passive earth pressure from soils placed adjacent to the foundations. Retaining walls and below grade walls should be designed to resist pressures induced by the backfill soils. Basement walls or stem walls restrained at the top can be designed for "at rest" earth pressure conditions. Retaining walls that are free to deflect can be designed for "active" earth pressure conditions. The "passive" earth pressure state should be used for soils supporting retaining structures, such as toe backfill. Lateral earth pressures applied to walls may be computed by multiplying the vertical depth of the backfill by the appropriate equivalent fluid density. The table below presents recommended values of earth pressure coefficients using imported granular fill for the backfill materials, assuming an approximate angle of internal friction of 32 degrees, and the respective equivalent fluid densities, based on a total unit weight of 115 pcf.

Earth Pressure State	Earth Pressure Coefficient	Equivalent Fluid Density
At-Rest	0.47	54 pcf
Active	0.31	36 pcf
Passive	3.25	374 pcf

PSI recommends that only ½ the passive pressure be used in design due to the large movement required to mobilize this resistance. The design values and recommendations presented above assume that the backfill behind the walls will be horizontal with no surcharge loads and that a permanent drainage system will be installed behind the walls to prevent the development of hydrostatic pressures. Also, relatively free draining sands or crushed stone materials should be used as backfill behind retaining walls in place of the native clays.

For analysis of sliding resistance of the base of the retaining walls, the ultimate coefficient of friction may be taken as 0.4 between concrete and soil.

#### **Pavement Recommendations**

PSI understands that a flexible pavement is desired in the road areas for the development. We have prepared a pavement design section assuming anticipated soil characteristics and light traffic loads. For design purposes, we have assumed the subgrade to consist of the firm and unyielding, proof-rolled, non-organic native soils and/or structural/stabilization fill. We have further assumed a minimum subgrade California Bearing Ratio (CBR) value of 7. For the traffic loads, we anticipate 500 cars and 2 heavy trucks per day. Based on these assumptions, we recommend a minimum pavement section of 3 inches of bituminous concrete over 6 inches of aggregate base. The subgrade should also be scarified to a depth of 12 inches and recompacted to at least 95 percent of the maximum modified proctor dry density (ASTM D 1557). These design recommendations were based on AASHTO design procedures and the following assumptions:

- Pavement to be placed only after the subgrade has been properly prepared,
- Construction materials such as bituminous concrete and aggregate base will meet project specifications requirements,
- Aggregate base and granular fill will be compacted to at least 95 percent of the maximum modified proctor dry density (ASTM D 1557) and bituminous concrete will be compacted to at least 95 percent of the Marshal mix design density.

Subgrades should be properly prepared as recommended above for asphalt pavements. Construction of concrete flatwork should be in accordance with Portland Cement Association (PCA) guidelines. Consideration should be given to constructing exterior concrete slabs over a minimum of 4 inches of an aggregate pad/structural fill leveling coarse.

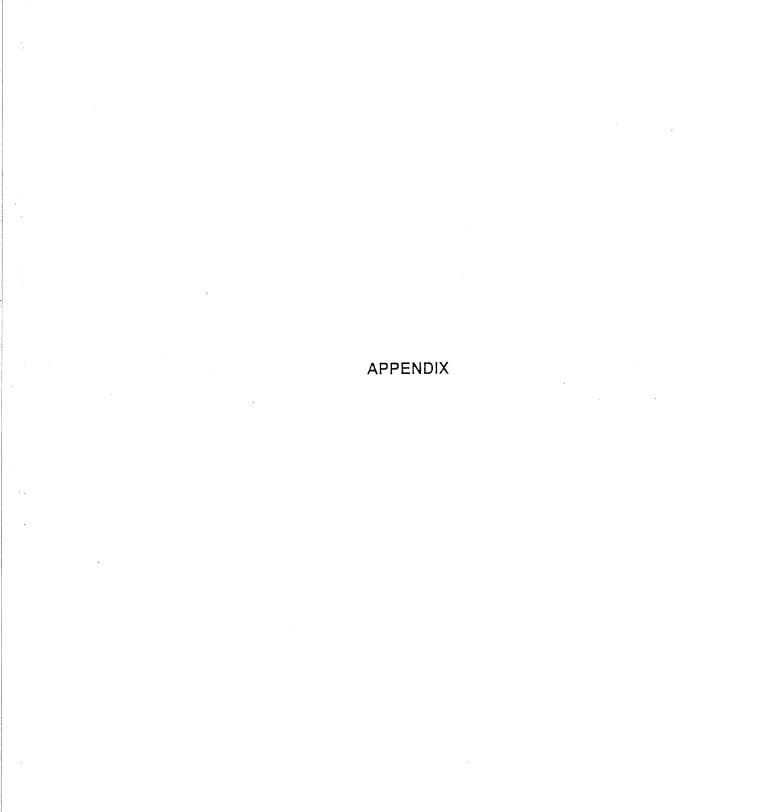
# ADDITIONAL INSPECTION RECOMMENDED

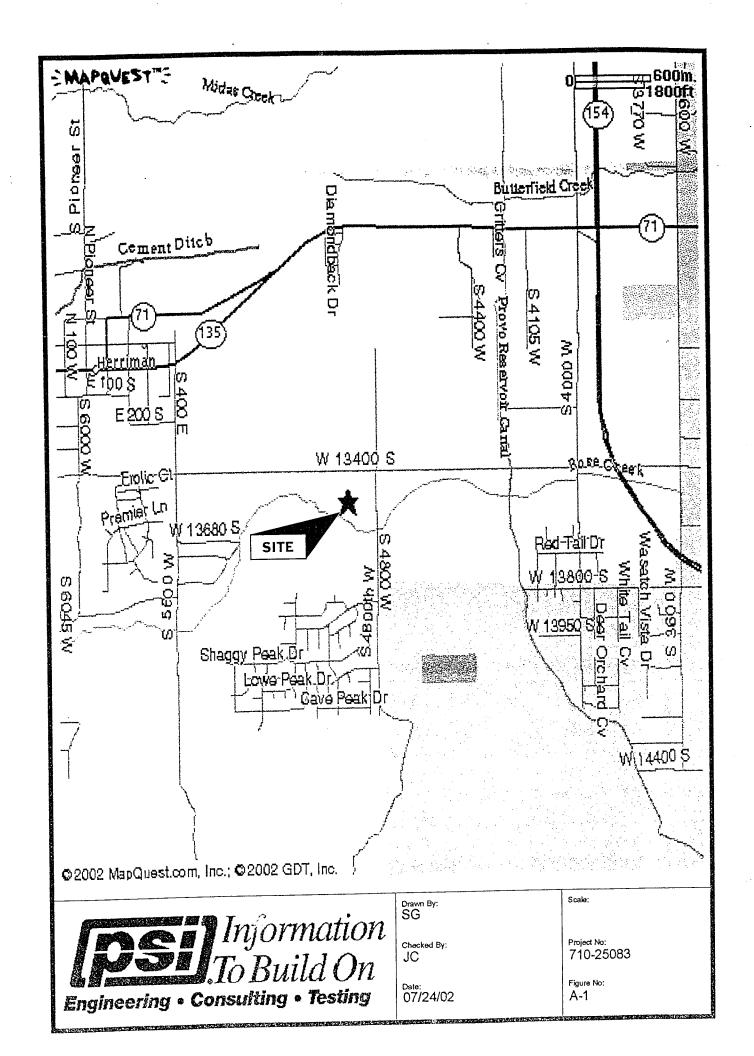
Due to the variable soil conditions and the potential for collapsible soil to be encountered, we recommend additional inspection to be performed on a lot by lot basis prior to placement of footings.

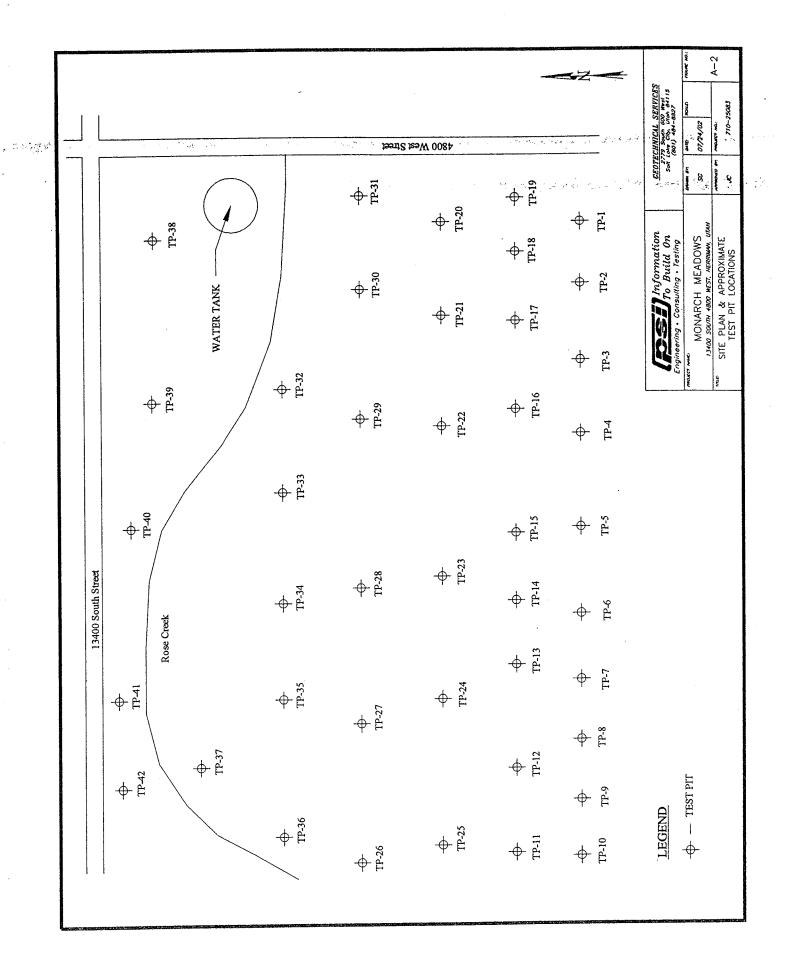
#### REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by PSI, and information provided by Herriman Land, L.L.C. and their design consultants. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation, or other recommendations are required. If PSI is not retained to perform these functions, PSI can not be responsible for the impact of those conditions on the performance of the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.









# **LOG OF TEST HOLE: TP-1**

Sheet 1 of 1

WATER LEVELS **Drilling Method:** 710-25083 PSI Job No .: Sampling Method: ☑ While excavating N/A ft Project: Monarch Meadows 13400 South and 4800 West Hammer Type: Location: After excavating N/A ft Latitude: Herriman, Utah 💆 24 hours later N/A ft Longitude: STANDARD PENETRATION SPT Blows per 6-inch **TEST DATA** USCS Classification N in blows/ft \varTheta Elevation, (feet) Sample Type Recovery (%) Graphic Log ሄ Depth, (feet) Sample No. PL Moisture Moisture, **NOTES** LL MATERIAL DESCRIPTION STRENGTH, tsf Ж Qp Surface Elev .: ft SILT, loose to medium stiff, dry, light brown, pinholes. ML 1 GRAVEL, silty, very dense, dry, light brown to GM SILT, with sand, loose to medium stiff, dry, light brown, pinholes. ML GRAVEL, silty, medium dense, dry, light brown GM to gray.
SAND, silty, with gravel layers, medium dense, dry to moist, light brown, some pinholes. 2 SM 10 EOTP @ 13 feet. Groundwater was not encountered. Remarks: Sample Types: 13.0 ft Completion Depth: 7/15/02 Date Boring Started: Shelby Tube **Auger Cutting** Date Boring Completed: 7/15/02 Grab Sample Split-Spoon S.Greenberg Logged By: Figure A-3 Mod. California Rock Core **Drilling Contractor:** 



13400 South and 4800 West

710-25083

Monarch Meadows

Herriman, Utah

PSI Job No.:

Project:

Location:

# LOG OF TEST HOLE: TP-2

Sheet 1 of 1 WATER LEVELS **Drilling Method:** Sampling Method: ☑ While excavating N/A ft Hammer Type: After excavating N/A ft Latitude:

		,			<b>,</b>	Long	gitude:					<b>⊻</b> 24	hours la	ter	N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESCRIP  Surface Elev.: ft	o sosn	SPT Blows per 6-inch	Moisture, %	× 1	TEST N in ble Moisture	25 GTH, tsf			TES
Сотр	- 5			2	13.51	SILT, loose to medium stiff, dry, light pinholes.  GRAVEL, well-graded, dense, dry, g SILT, medium stiff, dry, light brown, g SAND, silty, medium dense, dry to m EOTP @ 13 feet. Groundwater was not encountered.	gray. GW pinholes. ML		Rema						
1					7/45/			1							

Completion Depth: Date Boring Started:

Date Boring Completed:

Logged By: Drilling Contractor:

13.5 ft 7/15/02 7/15/02

S.Greenberg

Auger Cutting Split-Spoon Rock Core

Shelby Tube Grab Sample Mod. California

Figure A-4

2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

13400 South and 4800 West

# LOG OF TEST HOLE: TP-3

Sheet 1 of 1

PSI Job No.:

710-25083

Project: Location:

**Drilling Contractor:** 

Logged By:

Date Boring Completed:

7/15/02

S.Greenberg

Monarch Meadows

Herriman, Utah

Drilling Method:

Sampling Method:

Hammer Type:

Latitude: Longitudo WATER LEVELS

☑ While excavating

After excavating

N/A ft

Figure A-5

	· · · · · · · · · · · · · · · · · · ·						Longitude	e:						¥ 24 1	hours la	nter N	/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATER	RIAL DESCRIPTIO	N	USCS Classification	SPT Blows per 6-inch	Moisture, %	× !	N in blowdoor N	DATA wws/fi	PL LL 50 Qp Qu 4.0	_	
	pinholes.						dium stiff, dry, light brov	y.	ML GM								
		SAND, sirty, med to light brown, pir				to light brown, pinh	noles.		SM								
						brown to gray.  EOTP @ 13 feet. Groundwater was		igit.	GM		-						
	npletion Depth: 13.0 ft e Boring Started: 7/15/02					02	Sample Types:  Auger Cutting	She	elby Tu		Rema	rks:				***************************************	

Split-Spoon.

Rock Core

Grab Sample

Mod. California

# 2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

Drilling Contractor:

# LOG OF TEST HOLE: TP-4

Sheet 1 of 1

PSI Job No.: 710-25083							Drilling Method:								R LEVELS	
Project: Monarch Meadows Location: 13400 South and 4800 West							Sampling Metho	d:					Δv	/hile exca	vating N/A	ſ
Location	n:					4800 West	Hammer Type:							fter exca		
1		He	mim	an, U	itah		Latitude:								•	
					r		Longitude:	·	·	<del></del>				4 hours la	ter N/A	1
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ے								8	SPT Blows per 6-inch			TE	ST DATA	١.		
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	<u>.</u>	Recovery (%)			USCS Classification	ဖြ	1 8	:		blows/ft			
جّ	(fe	C.L.	E	e e	2	MATERIAL REG	<b>3 m</b> 1 <b>m m</b> 1 <b>m</b> 1 <b>m</b> 1	污渍	De l	ع ا	:   ×	Moist	ıre 📮	B PL	NOTES	
Ę	ţ,	ρhi	출	<u>d</u>	Še	MATERIAL DESC	SKIPTION	8	S S	Moisture %	1_		25	<b>▶ LL</b> 50		
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ū	<del> </del>		9	••	α.			l š				STR	ENGTH, t	sf		
			Н						N P	ļ	.   .	A	*	€ Qp		
ļ	0-	777	$\vdash$			Surface Elev.: ft	P 141		ļ		<u> </u>		2.0	Qu 4.0		
						SILT, loose to medium stiff, dry pinholes.	, light brown,									
]	_					piriloico.		ML								
													1			
									1							
İ				4		SAND, silty, medium dense, dr	y to moist, light						-			
				1		brown to gray, pinholes.		1		- 1		-				
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i i													ł			
								SM	ļ							
	- 5 -										-			-		
									l							
						CDAY/EL silky with sabilities are	al barrial and	_								
•		0/0				dense, dry, gray.	y, with cobbles and boulders, ray.							1		
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		30.														
	- 10 -	0 - 1	1 1			EOTP @ 10 feet.		7					_		•	
						Groundwater was not encounted	ered.						ĺ			
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Comple					13.01					ĸem	arks:					
Date Bo					7/15/		Cutting 📑	Shelby Tu	ube							
Date Bo		omple	eted		7/15/9	02 Split-Sr		- Grab San								
	gged By: S.Greenberg							Mod. Cali							Figure A-6	
Drilling							- 74 '									

Mod. California

#### 2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-5

Fax: (801) 954-8485 Sheet 1 of 1 **Drilling Method:** WATER LEVELS PSI Job No.: 710-25083 Project: Monarch Meadows Sampling Method:  $\overline{\Sigma}$  While excavating N/A ft Hammer Type: Location: 13400 South and 4800 West After excavating N/A ft Latitude: Herriman, Utah ¥ 24 hours later Longitude: N/A ft STANDARD PENETRATION TEST DATA SPT Blows per 6-inch USCS Classification Elevation, (feet) N in blows/ft @ Sample Type Depth, (feet) Graphic Log Sample No. Recovery (%) 8 4 Moisture **NOTES** LL MATERIAL DESCRIPTION STRENGTH, tsf ж Qp Surface Elev .: ft SILT, soft, dry, light brown. ML GRAVEL, silty, with sand, cobbles, and boulders, dense, dry, gray. GM EOTP @ 10 feet. Groundwater was not encountered. Sample Types: Remarks: Completion Depth: 10.0 ft 7/15/02 Date Boring Started: Auger Cutting Shelby Tube 7/15/02 Date Boring Completed:

Split-Spoon

Rock Core

S.Greenberg

Logged By:

**Drilling Contractor:** 

Grab Sample

Mod. California

Figure A-7



2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442

7/15/02

S.Greenberg

Date Boring Completed:

Logged By:

Drilling Contractor:

# LOG OF TEST HOLE: TP-6

Fax: (801) 954-8485 Sheet 1 of 1 WATER LEVELS Drilling Method: PSI Job No.: 710-25083 Project: Monarch Meadows Sampling Method: ☑ While excavating N/A ft 13400 South and 4800 West Location: Hammer Type: After excavating N/A ft Latitude: Herriman, Utah 24 hours later Longitude: N/A ft STANDARD PENETRATION SPT Blows per 6-inch TEST DATA USCS Classification Elevation, (feet) N in blows/ft @ Depth, (feet) Graphic Log Sample Type Recovery (%) Sample No. Moisture, X Moisture **NOTES** MATERIAL DESCRIPTION STRENGTH, tsf **₩** Qp A Surface Elev.: SILT, with cobbles, soft to medium stiff, dry, light brown. ML GRAVEL, silty, with sand, cobbles, and boulders, dense, dry, gray. GM EOTP @ 10 feet. Groundwater was not encountered. Remarks: Sample Types: Completion Depth: 10.0 ft 7/15/02 Date Boring Started: Shelby Tube **Auger Cutting** 

Grab Sample

Mod. California

Figure A-8

Split-Spoon

Rock Core



# **LOG OF TEST HOLE: TP-7**

Sheet 1 of 1

PSI Job No.: 710-25083 Project: Monarch Meadows						Drilling Met									R LEVE	ELS		
Project								Sampling N							∑Wh	ile exca	vating	N/A ft
Location	n:			Sout an, U		4800 West		Hammer T Latitude:	уре:						<b>▼</b> Afte	er excav	rating	N/A ft
		ne	11111	ian, C	ılan			Longitude:							<u>V</u> 24 l	hours la	ter	N/A fi
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATER Surface Elev.: ft		CRIPTION		USCS Classification	SPT Blows per 6-inch	Moisture, %	× 1	N in blo	PENETR DATA DWS/ft 49 23 49 3TH, tsf	PL LL 50	NC	DTES
<del> </del>	0	ш	Н			SILT with cobbles	medium st	iff. drv. light					0	1	20 (	Qu 4.0		<del></del>
						SILT, with cobbles, brown.  GRAVEL, sity, with dense, dry, gray.  EOTP @ 10 feet. Groundwater was to	n sand, cobb	oles, and bou		ML								
Completion Depth: 10.0 ft Sample						Ca			L	L	Pom	arko:	l	L	L			
					10.0 7/15/		Sample T		11271			Rem	ai NS.					
Date B				d:	7/15/		Auger			nelby T	1							
	Date Boring Completed: .ogged By:					eenberg	Split-S		GI GI	rab Sar							<b></b> -	4.0
	ogged By: rilling Contractor:				_	-	Rock C	Core	M M	od. Cal	itornia		**********	-			Figure	A-9



2779 South 600 West South Sait Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

# **LOG OF TEST HOLE: TP-8**

Sheet 1 of 1

**Drilling Method:** 710-25083 PSI Job No.: Sampling Method: Monarch Meadows Project: Hammer Type: 13400 South and 4800 West Location: Latitude: Herriman, Utah

WATER LEVELS N/A ft After excavating N/A ft

Herriman, Uta		itude: ngitude:		24 hours late	er N/Aft
Elevation, (feet)  Depth, (feet)  Graphic Log  Sample Type  Sample No.	MATERIAL DESCRIF	USCS Classification	Woisture % Mo	ARD PENETRATION TEST DATA In blows/ft     In blows/ft   In	NOTES
0 1 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SILT, with cobbles, medium stiff, dibrown.  GRAVEL, sitty, with sand and cobbidry, gray.	ML			
	EOTP @ 10 feet. Groundwater was not encountered				
Completion Depth:	10.0 ft Sample Type 7/15/02		Remarks:		

Date Boring Started: Date Boring Completed: Logged By:

Drilling Contractor:

7/15/02 7/15/02 S.Greenberg Auger Cutting Split-Spoon Rock Core

Shelby Tube Grab Sample Mod. California

Figure A-10



# LOG OF TEST HOLE: TP-9

Sheet 1 of 1

PSI Job No.: 710-25083 Project: Monarch Meadows							Drilling Method:								R LEVE	:LS	
Project								Sampling Metho	od:					Ž₩	ile exca	vating	N/A ft
Location	n:					4800 West		Hammer Type: Latitude:							er excav		N/A ft
		me	mm	ian, U	tan			Lautude. Longitude:							hours la		N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL	DESC	-	USCS Classification	SPT Blows per 6-inch	Moisture, %			PENETR DATA ws/ft @	ATION		)TES
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ш	_		0		I DE				Sn	4			STREN	GTH, tsf			
						Surface Elev.: ft				O		0	:	<b>米</b> 2.0	Qp Qu 4.0		
	-0					SILT, soft to medium stit	ff, dry, l	ight brown,									
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		Щ	.			CAND -36 Lands			_								
			1			SAND, silty, loose to me moist, light brown.	ealum a	ense, ary to									
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			1														
						EOTP @ 13 feet.					1						
						Groundwater was not er	ncounte	red.									
			$  \  $		1												
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l																	
Comple	etion D	epth:			13.0	ft Sar	mple Ty	pes:		1	Rem	arks:				· · · · · · · · · · · · · · · · · · ·	
Date B			<b>i</b> :		7/15/	02 [1]	Auger C		Shelby To	ube							
Date B	oring (				7/15/	<sup>02</sup>   🛱 .	Split-Sp	ooon e	Grab Sar								
Logged					S.Gr		Rock C		Mod. Cali							Figure	A-11
Drilling	Contra	ector:			_	11 11 11 11 11 11 11 11 11 11 11 11 11		··- P74								9410	



# **LOG OF TEST HOLE: TP-10**

Sheet 1 of 1

PSI Job No.: 710-25083 Project: Monarch Meadows					Drilling Method:				71.95				RLEVELS		
Project:					vs 4800 West	Sampling Method Hammer Type:						∑Wh			ft
Location:			an, U		4000 VVESL	Latitude:						Afte			ft
	110		u.,, C			Longitude:						¥ 24 I	hours la	ter N/A	ft
Elevation, (feet) Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESC		USCS Classification	SPT Blows per 6-inch	Moisture, %		TEST N in blo Moisture	PENETR. DATA ws/ft ©		NOTES	
	Ö	Sa	Š	Rec			Sc	<u> </u>	≥		STREN	GTH lef			
"							>	SP		<b>A</b>	OTTLET	*	Qp		
	. 4 7/1	$\sqcup$			Surface Elev.: ft		<u> </u>	<u> </u>		0	<del>,</del>		Qu 4.0		
- 10 -			1		SAND, silty, loose to medium of moist, light brown to gray.  SILT, with organic material, mogray, pinholes.  EOTP @ 13 feet. Groundwater was not encounted.	dense, dry to Dist, light brown to	GM SM								
							1								i
										<u> </u>	<u> </u>	<u> </u>			
Completion D	epth:			13.0	1	ypes:			Rem	arks:			,		
Date Boring	Started			7/15/		Cutting S	helby T	ube							
Date Boring (	Compl	etec	d:	7/15/	02 Split-S	poon R G	rab Sar								
Logged By:	logged By: S.Greenberg						lod. Cal							Figure A-12	
Drilling Contra	actor:		*****	_	L	<u> </u>			-						-



**Drilling Contractor:** 

2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

#### **LOG OF TEST HOLE: TP-11**

Sheet 1 of 1

WATER LEVELS **Drilling Method:** 710-25083 PSI Job No.: Sampling Method: Project: Monarch Meadows N/A ft Hammer Type: 13400 South and 4800 West Location: After excavating N/A ft Latitude: Herriman, Utah 24 hours later Longitude: N/A ft STANDARD PENETRATION Blows per 6-inch TEST DATA JSCS Classification Elevation, (feet) N in blows/ft @ Sample Type Recovery (%) Depth, (feet) Graphic Log Sample No. × ☑ PL Moisture, 9 Moisture **NOTES** LL MATERIAL DESCRIPTION SPT STRENGTH, tsf Ж Qр Surface Elev.: ft SILT, loose to medium stiff, dry, light brown, pinholes. ML SAND, silty, medium dense, dry, light brown to gray. SM SILT, stiff, dry to moist, brown to light brown, iron oxide stains, pinholes. ML GRAVEL, sandy, dense, dry, reddish brown. GP EOTP @ 13 feet. Groundwater was not encountered. Remarks: Sample Types: 13.0 ft Completion Depth: 7/15/02 Date Boring Started: Shelby Tube Auger Cutting 7/15/02 Date Boring Completed: Split-Spoon Grab Sample S.Greenberg Logged By: Mod. California Figure A-13 Rock Core



**Drilling Contractor:** 

# **LOG OF TEST HOLE: TP-12**

Sheet 1 of 1

WATER LEVELS Drilling Method: PSI Job No.: 710-25083 Sampling Method: Monarch Meadows N/A ft Project: Hammer Type: 13400 South and 4800 West Location: After excavating N/A ft Latitude: Herriman, Utah 24 hours later N/A ft Longitude: STANDARD PENETRATION SPT Blows per 6-inch TEST DATA **USCS Classification** N in blows/ft @ Elevation, (feet) Sample Type Recovery (%) Graphic Log Depth, (feet) Sample No. PL 4 X Moisture **NOTES** MATERIAL DESCRIPTION STRENGTH, tsf Ж Qp Surface Elev.: SILT, with sand, loose to stiff, dry, light brown to gray, pinholes. ML SAND, silty, loose to medium dense, dry to moist, light brown to gray. SM 10 GRAVEL, silty, dense, dry, reddish brown. GM EOTP @ 13 feet. Groundwater was not encountered. Remarks: Sample Types: 13.0 ft Completion Depth: 7/15/02 Shelby Tube Date Boring Started: Auger Cutting 7/15/02 Date Boring Completed: Grab Sample Split-Spoon S.Greenberg Logged By: Figure A-14 Mod. California Rock Core



# LOG OF TEST HOLE: TP-13

Sheet 1 of 1

PSI Job No.: 710-25083 Project: Monarch Meadows							Drilling Met									R LEV	ELS	
Location						vs 4800 West		Sampling M Hammer Ty								ile exca		N/A f
				nan, U				Latitude:								er exca		N/A fi
	<del></del>	r <del></del>				<del></del>	<u>.                                    </u>	Longitude:	· · · · · · · · · · · · · · · · · · ·				<del></del>		₹ 24	hours la		N/A f
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL	_ DESC	CRIPTION		USCS Classification	SPT Blows per 6-inch	Moisture, %		N in bl Moisture	DATA ows/ft	PL LL 50		OTES
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ļ	0	111	$\vdash$			Surface Elev.: ft SILT, with cobbles, loos	ee dry li	ight brown			-		0	<del></del>		Qu 4.0	ļ	
							GRAVEL, silty, with cobbles and boulders, dense, dry, gray.											
	- 5 -									GM								
	 	\$ 00 \$ 00 \$ 00 \$ 00 \$ 00 \$ 00 \$ 00 \$ 0				EOTP @ 10 feet.		***************************************		GIVI								,
						Groundwater was not e	encounter	red.										
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Comple					10.0 f	n	mple Typ					Rem	arks:					
Date Bo					7/15/0 7/15/0	)2	Auger C		She	elby Tu								
Logged		ompie	, LGU			enhera I 🗸	Split-Spo			b San								<u></u> .
	illing Contractor:					U	Rock Co	ore	M Mod	d. Cali	fornia						Figure	A-15



**Drilling Contractor:** 

2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

# LOG OF TEST HOLE: TP-14

Sheet 1 of 1

WATER LEVELS **Drilling Method:** PSI Job No.: 710-25083 Sampling Method: Project: Monarch Meadows ☑ While excavating N/A ft Hammer Type: Location: 13400 South and 4800 West After excavating N/A ft Latitude: Herriman, Utah 24 hours later Longitude: N/A ft STANDARD PENETRATION SPT Blows per 6-inch **TEST DATA USCS Classification** Elevation, (feet) N in blows/ft @ Sample Type Recovery (%) Graphic Log Depth, (feet) Sample No. 7 PL Moisture, 9 X Moisture **NOTES** MATERIAL DESCRIPTION STRENGTH, tsf Ж Qp Surface Elev.: ft SILT, with cobbles, loose, dry, light brown. ML GRAVEL, silty, with cobbles and boulders, dense, dry, gray. GM EOTP @ 11 feet. Groundwater was not encountered. Remarks: Sample Types: Completion Depth: 11.0 ft 7/16/02 Date Boring Started: Shelby Tube Auger Cutting 7/16/02 Date Boring Completed: Grab Sample Split-Spoon S.Greenberg Logged By: Rock Core Mod. California Figure A-16



# **LOG OF TEST HOLE: TP-15**

PSI Jol	No.:			083				Drilling Metho						[	V	VATE	RLEVELS
Project: Monarch Meadows Location: 13400 South and 4800 West			Sampling Met							<b>∑</b> Wh	ile exca	vating N/A ft					
Locatio	n:					4800 West		Hammer Type Latitude:	e:						▼ Afte	er excav	rating N/A ft
		не	mm	an, U	tan			Longitude:						j	<b>V</b> 24 1	hours la	
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERI	IAL DESC	CRIPTION	-	USCS Classification	SPT Blows per 6-inch	Moisture, %	× 1	IDARD P	ENETR. DATA ws/ft		NOTES
ш									ĺ	<b>¬</b>	Sb.		•	O,	*	Qp	
	- 0 -		Ш			Surface Elev.: ft	1	1.1.4.1					0	1 2		Qu 4.0	
	Ī					SILT, with cobbles,	loose, dry, I	ight brown.									
	- 5 -					GRAVEL, silty, with dense, dry, gray.	cobbles an	d boulders,		ML							
	3 1 1 1 1									GM							
Cample	- 10 -	and the second			10.0	EOTP @ 10 feet. Groundwater was n						Rema	arks:				
Comple			4.		10.0 7/16/		Sample Ty		1003		1	Kema	arks:				
Date B Date B				<b>i</b> :	7/16/		Auger (			elby Tu							
Logged				•		eenberg	Split-Sp			ab Sar							Figure A 17
Drilling		actor:			-		Rock C	ore	Mo	d. Cal	ioma		_				Figure A-17



710-25083

PSI Job No.:

2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

## LOG OF TEST HOLE: TP-16

Sheet 1 of 1

WATER LEVELS

Project					eadov			Sampling M							<b>∑</b> w⊦	nile exca	vating	N/A ft
Location	on:			Sout nan, L		4800 West		Hammer Ty Latitude:	/pe:							er excav		N/A ft
ļ		ne	:11111	iaii, C	Juli			Landitude:								hours la		N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL	e kirili ya	्ष्मा क्षेत्रक पुरस्क उत्तर्भ - यम		USCS Classification	SPT Blows per 6-inch	Moisture, %	×	N in bl Moisture	DATA DATA DWS/ft	PL LL S		OTES
l	١.					Surface Elev.: ft					S		•		<b>米</b> 2.0	Qp Qu 4.0		
	- 5 -					GRAVEL, sitty, with coldense, dry, gray.  EOTP @ 10 feet. Groundwater was not e	bbles and	d boulders,		ML								
Comple	etion D	epth:	لـــا		10.0	ft Sa	ample Typ	pes:				Rema	rks:	<del></del>	·	L		
Date B			<b>i</b> ;		7/16/		Auger C		Ch.	elby Tu	uhe							
Date B				<b>1</b> :	7/16/	02	Split-Sp	-		ab Sar								
Logged	By:				S.Gre	eenberg A	Rock Co				ifornia						Figure	Δ_18
Drilling	Contra	ctor:			_		TOOK O	7) G	V MICH	u. Vali	, on la						i iguit	, /¬- I U

Drilling Method:



PSI Jol				680				Drilling Method:						٧	VATE	R LEVI	ELS
Project					adow			Sampling Method	:					<b>∑</b> wr	ile exca	vating	N/A ft
Locatio	n:					4800 West		Hammer Type: Latitude:							er excav		N/A ft
		пе	111111	an, U	itan :			Longitude:							hours la		N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATER Surface Elev.: ft	IAL DESC	CRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	× 1	N in bk	PENETR DATA DWs/ft	PL LL 50	No	DTES
	- 0 -	ПТ	╂┤			SILT, with cobbles,		ight brown.	<del> </del>			10	T	20	Qu 4.0		······································
	- 5					GRAVEL, sitty, with dense, dry, gray.  EOTP @ 10 feet. Groundwater was r	n cobbles an	d boulders,	GM								
Comple	tion D	epth:	ш		10.0	ft	Sample Ty	rpes:		<u> </u>	Rema	rks:	• • • • • • • • • • • • • • • • • • • •		<del></del>		
Date B			<b>i</b> :		7/16/	02	Auger C		helby Tı	ube							
Date B	oring C				7/16/		Split-Sp		rab Sar	t t							
Logged					S.Gre	enberg	Rock C		lod. Cali							Figure	A-19
Drilling	Contra	ctor:			-	ŧ	TI WOOK O	V. C. 14	Ju. Cui							, iguio	, , , v



PSI Jo	b No.:			5083				Drilling Metho							V	VATE	R LEVI	ELS
Project: Monarch Meadows Location: 13400 South and 4800 West						Sampling Met							$\Sigma$ wh	ile exca	vating	N/A fi		
Herriman, Utah				4800 West		Hammer Type Latitude:	e:						X Afte	er exca	rating	N/A fi		
							Longitude:							<u>V</u> 24 I	hours la	ter	N/A fi	
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DI Surface Elev.: ft	ESC			USCS Classification	SPT Blows per 6-inch	Moisture, %	× M	TEST N in bk Moisture	DATA  DATA			
	<del>  0</del>	Ш	П		<del>                                     </del>	SILT, gravelly, loose to stif	ff, dry	, light brown										
				1		SAND, silty, medium dens brown to brown, pinholes.	se, dr	y to moist, light	<u>t</u>	ML						-		
	<b>-</b>																	
	- 5 -									SM								
	[ ]									0								
				2							-							
	<u> </u>	11.1.				SAND, with gravel, dense,	, dry	to moist, light										
	L _					brown to gray.	brown to gray.											
1											1							
1	<b>-</b>									SP					ļ			
	10-		-														Ī	
1															:			
						EOTP @ 11 feet. Groundwater was not enco	ounte	ered.				-						
															·			
	ŧ																	
	ľ																	
												ŀ						
												-						
	İ										•							
												ļ						
															}			
															1			
Compl	etion F	enth:	1		11.0	ft Samp	ole Ty	pes:	J			Rema	arks:	l	L	I	l	
Date E					7/16	/02 III Au		Cutting	Sh	elby T	- 1							
Date E	oring (			d:	7/16/	<sup>/02</sup>   M <sup>2</sup> s <sub>n</sub>	olit-Sp		-	ab Sar								
Date Boring Completed: 7/16/02 Logged By: S.Greenberg				ock C			od. Cal							Figure	A-20			



Drilling Contractor:

# 2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

## **LOG OF TEST HOLE: TP-19**

PSI Jol				5083			Drilling Method:		,			ļ			K LEVEL	
Project: Monarch Meadows Location: 13400 South and 4800 West					Sampling Method	1:					Ā₩	ile exca	vating	N/A ft		
Locatio	n:			Souti an, U		4000 vvest	Hammer Type: Latitude:						¥ Afte	er excav	ating	N/A ft
		110	FI 1 64 4 1	iari, C	·wiii	•	Longitude:						<u>¥</u> 24 l	nours la	ter	N/A ft
et)	Q		ا و		(9)		Strate with the	ation	SPT Blows per 6-inch		STAN					
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DES	CRIPTION	USCS Classification	s ber	Moisture, %	×	Moisture		PL LL	NOT	ES
vatio	eptt	rapl	amb	am	000			SSC	<u>%</u>	Mois	<u> </u>		<u> </u>	50		
Ele	Δ	O	S	U)	N.			nsc	l d			STREN				
						Surface Elev.: ft			ळ				<b>*</b>	Qp Qu 4.0		
	- 0	Ш	$\Box$			SILT, with gravel, loose to stif	f, dry, light brown,			_		T				
						pinholes.								•		
												l		-		
								ML								
	-															
						SAND, with silt and gravel, lo	ose to medium									
	- 5 -					dense, dry to moist, light brow	vn to gray.					ļ				
										- [						
	-															
								SP								
	┡ -															
	- 10 -										-				İ	
			1													
	-															
	<u> </u>									İ						
	<u> -</u>					EOTP @ 13 feet.		$\dashv$				]				
						Groundwater was not encoun	tered.									
							•			İ		İ				
															!	
										i						
•																
Comple	etion D	epth:	لــــــــــــــــــــــــــــــــــــــ	L	13.0		Types:			Rema	arks:					
Date B	oring S	Starte	d:		7/16/		r Cutting	Shelby T	ube							
Date B		Compl	lete	d:	7/16/	<sup>702</sup> Split-		Grab Sar								
Logged		actor:			J.UI	eenberg Rock	Core 7	Mod. Cal	ifornia						Figure A	\-21



#### **LOG OF TEST HOLE: TP-20**

Sheet 1 of 1

N/A ft

N/A ft

Fax: (801) 954-8485 WATER LEVELS Drilling Method: 710-25083 PSI Job No.: Sampling Method: Monarch Meadows Project: Hammer Type: 13400 South and 4800 West Location: ▼ After excavating Latitude: Herriman, Utah 24 hours later Longitude:

Herriman, Ut	ah	Latitude: Longitude:		24 hours later	N/A ft
Elevation, (feet) Depth, (feet) Graphic Log Sample Type Sample No.	Mecovery (%)	sification	Blows per 6-included with the state of the s	PENETRATION ST DATA olows/ft 😂	NOTES
1 1 2 5 -	Surface Elev.: ft  CLAY, soft to dense, dry, light	brown, pinholes.			
3 3 10 - 3	SAND, silty, medium dense, o brown, iron oxide.	dry to moist, light			
	GRAVEL, silty, with sand, der brown.  EOTP @ 13 feet. Groundwater was not encoun	- GWI			
Completion Depth: Date Boring Started: Date Boring Completed: Logged By:		Types: er Cutting Shelby T Spoon Grab San	mple		Figure A-22



Date Boring Completed:

S.Greenberg

Logged By:

**Drilling Contractor:** 

## **LOG OF TEST HOLE: TP-21**

Sheet 1 of 1

PSI Job				083			Drilling Method:								R LEVE	LS
Project					adow		Sampling Method:	The same except and the terminal termin								
Locatio	n:			Soutt an, U		4800 West	Hammer Type: Latitude:						<b>▼</b> Afte	er excav	ating	N/A fi
		110	14411	an, o	wii		Longitude:						¥ 24 i	nours la	ter	N/A fi
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESC Surface Elev.: ft	CRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	× м	DARD F TEST N in blo oisture	DENETRA DATA wws/ft ② 25 4 25 3 3 3 4 3 3 4 3 4 3 4 4 4 4 4 4 4 4 4		NC	TES
	-0-	П	H			SILT, soft to stiff, dry, light brov	vn.			<del>                                     </del>			Ĭ	30 4.0		
	- 5					GRAVEL, sitty, with cobbles, do brown to gray.  EOTP @ 12 feet.  Groundwater was not encounted.	ense, dry, light	GM								
Comple					12.0				]	Rema	ırks:			,		
Date Bo					7/16/0 7/16/0		Cutting Sh	elby Tu	ıbe							

Split-Spoon

Rock Core

Grab Sample

Mod. California



Location: 13400 South and 4800 West Hammer Type: Herriman, Utah Hammer Type: Latitude:  After excavating N/A	PSI Joi	No.:	710	0-25	5083				Drilling Method:						· V	VATE	RLEVE	LS
Continue   Taking   Continue   Taking   Continue   Taking   Taki															₽wh	ile exca	vating	N/A ft
STANDARD PENETRATION   STANDARD PENETRATION   No indowns of the property of	Locatio	n:					4800 West								<b>▼</b> Afte	: er excav	ating	N/A ft
Surface Elev:   ft   Sill, soft to stiff, dry, light brown.   Sill, soft to	ļ		He	mm	ian, C	itan												N/A ft
Surface Elev.: ft  SiLT, soft to stiff, dry, light brown.  ML  GRAVEL, sity, with sand and cobbles, dense, dry, gray.  GM  GM  EOTP @ 12 feet. Groundwater was not encountered.	vation, (feet)	epth, (feet)	Sraphic Log	ample Type	Sample No.	ecovery (%)		, ,		CS Classification	Blows per 6-inch	Moisture, %		TEST N in bk Moisture	PENETR DATA ows/ft @	ATION PL LL	, NC	
Surface Elev.: ft  SiLT, soft to stiff, dry, light brown.  ML  GRAVEL, sity, with sand and cobbles, dense, dry, gray.  GM  GM  EOTP @ 12 feet. Groundwater was not encountered.	쁩		U	8	0,	2				nsc	Į.			STREN				
SILT, soft to stiff, dry, light brown.  GRAVEL, silty, with sand and cobbles, dense, dry, gray.  GRAVEL silty, with sand and cobbles, dense, dry, gray.  GRAVEL silty, with sand and cobbles, dense, dry, gray.  GM  GM  GM  EOTE @ 12 feet. Groundwater was not encountered.							Surface Flev : ft				ळ		1			Qp		
GRAVEL, silty, with sand and cobbles, dense, dry, gray.  GRAVEL, silty, with sand and cobbles, dense, dry, gray.  GRAVEL, silty, with sand and cobbles, dense, dry, gray.  GRAVEL, silty, with sand and cobbles, dense, dry, gray.  GRAVEL, silty, with sand and cobbles, dense, dry, gray.  GRAVEL, silty, with sand and cobbles, dense, dry, gray.		-0-	Ш				SiLT, soft to stiff, dry, light b	rown	າ.				Ĭ	T	Ĭ	1		·
dry, gray.  dry, gray.  GM  GM  EOTP @ 12 feet. Groundwater was not encountered.							GRAVEL, silty, with sand an	nd co	obbles, dense,	ML							·	
EOTP @ 12 feet. Groundwater was not encountered.																		
EOTP @ 12 feet. Groundwater was not encountered.		- 5 - 																
EOTP @ 12 feet. Groundwater was not encountered.										GM								
Groundwater was not encountered.		 - 10 -																
Groundwater was not encountered.		 					EOTP @ 12 feet.											•
Completion Depth: 12 0 ft Sample Types: Remarks:							Groundwater was not encou	untere	ed.									
Completion Depth: 12 0 ft Sample Types; Remarks:																		
Completion Depth: 12 0 ft Sample Types: Remarks:																		
Completion Depth: 12 0 ft Sample Types: Remarks:																		
Completion Depth: 12 0 ft Sample Types: Remarks:																		
Toombiguon Dobum 144 K Tarrier West 1 Tarrier West 1	Comple	etion F	epth:	لــــــــــــــــــــــــــــــــــــــ	l	12.0	ft Sample	е Тур	pes:		<del>'</del> T	Rema	arks:				· v=	
Date Boring Started: 7/16/02 Auger Cutting Shelby Tube	Date B	oring S	Started	<b>j</b> :		7/16/	/02   Ti Aug		utting 🎉 St	elbv T	ube							
	Date B	oring (			d:		<sup>/02</sup>   M <sup>™</sup> s <sub>plit</sub>		oon G									
Date Boring Completed: 7/16/02 Logged By: S.Greenberg Drilling Contractor: - Split-Spoon Grab Sample Rock Core Mod. California Figure A-24			actor:			S.Gr			ore M								Figure	A-24



Sheet 1 of 1

WATER LEVELS **Drilling Method:** PSI Job No .: 710-25083 Sampling Method: Monarch Meadows Project: N/A ft Hammer Type: 13400 South and 4800 West Location: After excavating N/A ft Latitude: Herriman, Utah 24 hours later N/A ft Longitude: STANDARD PENETRATION SPT Blows per 6-inch TEST DATA USCS Classification Elevation, (feet) N in blows/ft 😝 Graphic Log Sample Type Recovery (%) Depth, (feet) æ Sample No. Moisture, X Moisture **NOTES** LL MATERIAL DESCRIPTION STRENGTH, tsf ₩ · Qp Surface Elev.: SILT, soft to stiff, dry, light brown. ML GRAVEL, silty, with sand and cobbles, dense, dry, gray. GM EOTP @ 10 feet. Groundwater was not encountered. Remarks: Sample Types: 10.0 ft Completion Depth: 7/16/02 Date Boring Started: **Auger Cutting** Shelby Tube 7/16/02 Date Boring Completed: Grab Sample Split-Spoon S.Greenberg Logged By: Mod. California Figure A-25

Rock Core

**Drilling Contractor:** 



Sheet 1 of 1

Figure A-26

PSI Job No.: Project:

710-25083

Location:

Monarch Meadows 13400 South and 4800 West

Herriman, Utah

**Drilling Method:** 

Sampling Method: Hammer Type:

Latitude:

WATER LEVELS

☑ While excavating

After excavating

N/A ft

N/A ft

24 hours later N/A ft Longitude: STANDARD PENETRATION SPT Blows per 6-inch TEST DATA USCS Classification Elevation, (feet) N in blows/ft 4 Sample Type Recovery (%) Depth, (feet) Graphic Log Sample No. Moisture Moisture, **NOTES** MATERIAL DESCRIPTION STRENGTH, tsf \* Qp Surface Elev .: ft SILT, soft to stiff, dry, light brown. ML GRAVEL, sitty, with sand, dense, dry, light brown to brown. GM EOTP @ 12 feet. Groundwater was not encountered. Sample Types: Remarks: Completion Depth: 12.0 ft 7/16/02 Date Boring Started: Shelby Tube **Auger Cutting** 7/16/02 Date Boring Completed: Grab Sample

Split-Spoon

**Rock Core** 

Mod. California

S.Greenberg

Logged By:

**Drilling Contractor:** 



**Drilling Contractor:** 

AND THE PROPERTY OF

2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

#### **LOG OF TEST HOLE: TP-25**

Sheet 1 of 1

Figure A-27

WATER LEVELS **Drilling Method:** PSI Job No.: 710-25083 Sampling Method: ☑ While excavating Project: Monarch Meadows N/A ft Hammer Type: Location: 13400 South and 4800 West After excavating N/A ft Latitude: Herriman, Utah 24 hours later Longitude: N/A ft STANDARD PENETRATION Blows per 6-inch **TEST DATA** USCS Classification Elevation, (feet) N in blows/ft @ Sample Type Recovery (%) Depth, (feet) Graphic Log Sample No. ፠ Moisture Moisture, **NOTES** Ш MATERIAL DESCRIPTION SPT STRENGTH, tsf Qp Ж Surface Elev .: ft CLAY, with gravel, loose to stiff, dry, light brown, pinholes. CL GRAVEL, with sand, dense, dry, reddish brown. GW SAND, silty, medium dense, dry to moist, brown. SM GRAVEL, silty, with sand and cobbles, dense, dry, gray. GM EOTP @ 13 feet. Groundwater was not encountered. Remarks: Sample Types: 13.0 ft Completion Depth: 7/16/02 Date Boring Started: Auger Cutting Shelby Tube 7/16/02 Date Boring Completed: Grab Sample Split-Spoon S.Greenberg Logged By:

Mod. California

**Rock Core** 



PSI Job No.:			083			Drilling Method									R LEVE	LS
Project: Monarch Meadows Location: 13400 South and 4800 West				Sampling Met							$\overline{\Delta}$ Wh	ile exca	vating	N/A fi		
Location:			Souti an, U		4800 West	Hammer Type Latitude:	e:						¥ Afte	er excav	ating	N/A ft
1	116		an, 0	tair		Longitude:							<u>V</u> 24	hours la	ter	N/A fi
Elevation, (feet) Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DES	ingen Marketa		USCS Classification	SPT Blows per 6-inch	Moisture, %	× 1	TEST	PENETR DATA W/s/ft	PL LL 50	NO	TES
		$\vdash$			Surface Elev.: ft SILT, soft to stiff, dry, light bro	wm ninholes				╂	0	1 3	20	Qu 4.0	<u> </u>	
			1		SILT, SOIL to Sun, dry, agric bro	wii, panoies.		ML								
- 5 -			2		SAND, silty, dry to moist, light pinholes.	brown to brown	,	SM								
					GRAVEL, silty, dense, dry, gr	ay.										
- 10 -								GM								
	<u>• PIC</u>				EOTP @ 12 feet. Groundwater was not encoun	tered.										
Completion D	epth:	با		12.0		Гуреs:				Rema	arks:				<del></del>	
Date Boring	Starte			7/16/		Cutting	She	elby Ti	ube							
Date Boring (	Compl	etec	1:	7/16/ S.Gr	02 sephera Split-	Spoon	<b>G</b> Gra	b Sar	nple							
Logged By: Drilling Contra	actor:			-	Rock	Core	Mod	d. Cal	ifornia						Figure	A-28



710-25083

PSI Job No .:

2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

#### **LOG OF TEST HOLE: TP-27**

Sheet 1 of 1

WATER LEVELS

Project: Monarch Meadows Sampling Method: ☑ While excavating Location: 13400 South and 4800 West Hammer Type: After excavating N/A ft Latitude: Herriman, Utah 24 hours later Longitude: N/A ft STANDARD PENETRATION SPT Blows per 6-inch TEST DATA JSCS Classification Elevation, (feet) Sample Type Recovery (%) N in blows/ft @ Depth, (feet) Graphic Log Sample No. × 4 X Moisture Moisture, **NOTES** MATERIAL DESCRIPTION LL STRENGTH, tsf Ж Qр Surface Elev.: ft SILT, with gravel, loose to stiff, dry, light brown. ML GRAVEL, silty, with sand and cobbles, dense, dry, gray. GM CLAY, sandy, medium dense, dry to moist, light brown. CL EOTP @ 13 feet. Groundwater was not encountered. Completion Depth: Sample Types: Remarks: 13.0 ft Date Boring Started: 7/16/02 **Auger Cutting** Shelby Tube 7/16/02 Date Boring Completed: Split-Spoon Grab Sample Logged By: S.Greenberg Mod. California Rock Core Figure A-29 Drilling Contractor:

Drilling Method:



PSI Job	No.:	71	0-25	083			Drilling Method:						٧	VATE	R LEV	ELS
Project:					eadow		Sampling Method:						<b>∑</b> Wh	ile exca	vating	N/A ft
Location	ո:					4800 West	Hammer Type: Latitude:					1	<b>▼</b> Afte			N/A ft
		He	mm	an, U	tah		Lautude: Longitude:							nours la		N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESC		USCS Classification	SPT Blows per 6-inch	Moisture, %	× N	TEST N in blo Molsture	PENETR. DATA  ows/ft ②  25  GTH, tsf		N	OTES
	-0-	П	$\vdash$			SILT, loose to stiff, dry, light b	rown.	<u> </u>	<u> </u>	1	<u> </u>	T				
	5					GRAVEL, silty, with sand and dry, gray.  SAND, silty, medium dense, d brown.	cobbles, dense,	МL								
	- 10 -  					EOTP @ 13 feet. Groundwater was not encount	ered.	SM								
Comple Date Bo Date Bo	oring ( oring (	Starte	d:	d:	12.5 7/16, 7/16, S.Gr	/02 /02 sephera Split-S	Cutting Spoon S G	helby T	ube mple	Rema	arks:					
Logged		actor.			J.GI	Rock	Core M	od. Cal	lifornia						Figur	e A-30
Drilling	∪ontr	aulor:			-		<u> [.]</u>				-				-	



PSI Job	No.:	71	0-25	083				Drilling Method:						٧	VATE	R LEVI	ELS
Project					adow			Sampling Method	:					Vwr	ile exca	vating	N/A ft
Locatio	n:					4800 West		Hammer Type: Latitude:						<b>▼</b> Aft	er exca\	/ating	N/A ft
		ne	: 11111	an, U	laii	1		Longitude:						¥ 24	hours la	ter	N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL D	ESC		USCS Classification	SPT Blows per 6-inch	Moisture, %			PENETR DATA ows/ft @	PL LL 50	NO	DTES
	0					Surface Elev.: ft				, , , , , , , , , , , , , , , , , , ,		0			Qu 4.0		
						SILT, loose to stiff, dry, lig	iht bi	rown.	ML								
						GRAVEL, silty, with sand,	dens	se, dry, gray.	GM								
	- 5 -	77.				SAND, clean, soft to medi moist, light brown to gray.	um o	dense, dry to	SP								
١						SAND, silty, medium dens brown.	e, dr	y to moist, light					**************************************				
	- 10 -								SM								
	•• •• •					EOTP @ 13 feet. Groundwater was not enco	ounte	ered.									
<u> </u>			Ш		125	ft Samp	le T	was.		<del></del>	Rem	arks.	L	L	I	L	<del></del>
Comple Date B Date B	oring S	Starte	d:	d:	12.5 7/16/ 7/16/	02 03	ıger	Cutting S	helby Ti irab Sar		1,0111	NO.					
Logged	l By:				S.Gr			·	lod, Cal	1						Figure	A-31



#### **LOG OF TEST HOLE: TP-30**

Sheet 1 of 1

Figure A-32

PSI Job No.: Project:

710-25083

Location:

Monarch Meadows 13400 South and 4800 West

S.Greenberg

Date Boring Completed:

Logged By:

**Drilling Contractor:** 

Drilling Method: Sampling Method: Hammer Type:

WATER LEVELS 

After excavating N/A ft

STANDARD PE TEST D N in blow	DATA  vs/ft (2)  Fig. 12  PL  Fig. 12  So	NOTES
Surface Elev.: ft	¥ Qp	
O SILT, with gravel, loose to stiff, dry, light brown.		
SAND, silty, medium dense, dry to moist, gray,		
iron oxide stains.		
SM SM		
GRAVEL, silty, dense, dry, gray.		
- 1000 - 1000 - 1000		
SAND, silty, medium dense, moist, gray, iron oxide stains, pinholes.		
EOTP @ 13 feet. Groundwater was not encountered.		
Completion Depth: 13.0 ft Sample Types: Remarks:  Pate Boring Started: 7/16/02 Auger Cutting Shelby Tube  Pate Boring Completed: 7/16/02 Shelby Tube		

Grab Sample

Mod. California

Split-Spoon

Rock Core



#### **LOG OF TEST HOLE: TP-31**

Sheet 1 of 1

Figure A-33

PSI Job No.: Project:

710-25083

Monarch Meadows

Location:

13400 South and 4800 West

7/17/02

B.Garrett

Date Boring Completed:

Logged By:

Drilling Contractor:

Drilling Method: Sampling Method: Hammer Type:

WATER LEVELS ☑ While excavating After excavating

N/A ft

ocation:			nan, L		4800 West		Latitude: Longitude:							r excavatii iours later	
Elevation, (feet) Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DI	1.59		USCS Classification	SPT Blows per 6-inch	Moisture, %	N × Moi	ARD PI TEST I I in blow isture	ENETRA DATA ws/ft ②  Zi  STH, tsf  **	PL LL 50	NOTES
	$\dagger \Pi \Pi$	T		<del>                                     </del>	SILT, with gravel, loose, da	lark bro	own, dry.								
-								ML							
	-01	֓֞֜֝֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֡֓֓֓֡֓֓֓֓֓֡֓֡֓֡֓֡			GRAVEL, siity, dense, dry	y, light	brown.	GM							
F	الاه	Ω			SAND, clean, medium der			SP							
-	-				SAND, silty, medium dens	se, dry	, light brown.								
- 5	-111							SM							
-	-														
						P 141									
					SILT, medium stiff, moist, stains.	, light b	rown, Iron oxide								
	111		1												
+	-							ML							
- 10	-														
-		Щ			SAND, silty, medium dens	se. drv	, light brown, iron								
L			2		oxide stains.			SM					<b>2</b>		
					EOTH @ 12.5 feet.			1							
					Groundwater was not enc	counter	red.								
ompletion	Depti	h:		12.5	oft Sam	nple Ty	pes:	<u>.l</u>		Rem	arks:			<del></del>	
ate Borin	y Starf	ed:	_ d.	7/17 7/17		luger C	Cutting S	helby Tı	ube						

Grab Sample

Mod. California

Split-Spoon

Rock Core



## **LOG OF TEST HOLE: TP-32**

Sheet 1 of 1

PSI Job No.: Project:

710-25083

Location:

Monarch Meadows 13400 South and 4800 West

Herriman, Utah

Drilling Method: Sampling Method: Hammer Type:

Latitude:

WATER LEVELS

☑ While excavating

After excavating

N/A ft

		He	rrim	an, U	ltah		Latitude: Longitude:							nours lat	-	N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DES	•	USCS Classification	SPT Blows per 6-inch	Moisture, %	× 1	DARD P TEST N in blo Moisture	DATA DATA Wes/fit @9  GATA  GA	PL LL 50	NOTE	
	-0-	1	$\vdash$		-	Surface Elev.: ft SILT, loose, dry, dark brown,	pinholes.	1		<del> </del>	0	2	20 (	Qu 4.0		
	-					OLE, 10050, dry, dank 5.00mg	pullioco.	ML								
	- 5 -			1		GRAVEL, silty, dense, dry, gr		GM								
	- 3 -			'		SILT, medium stiff, dry, brown	n, pinholes.	ML								
	-					GRAVEL, silty, dense, dry, lig	ht brown.									
	- 10 -							GM								
		(a)		2		SILT, medium stiff, moist, bro		ML				Mercenta - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				
1						Groundwater was not encoun	itered.									
													The state of the s			
								1								
Comp	l letion l	Depth:	 :	L	12.5		Types:			Rem	arks:			·		
Date E	Boring	Starte	d:	.ı.	7/17	ing Tage	r Cutting	Shelby To	1							
Date E Logge		Comp	ete	d:	7/17. B.Ga	Spill-	• •	Frab Sar							Figure A	-34
Drilling	. Conti	ractor:			_	Rock	Core M	Aod. Cal	noma	ومساديه					i iyule P	∖⁻◡∸



## **LOG OF TEST HOLE: TP-33**

Sheet 1 of 1

PSI Job No.: Project:

710-25083

Monarch Meadows

13400 South and 4800 West

Drilling Method: Sampling Method:

Hammer Type: Latitude

WATER LEVELS

While excavating

Locatio	n:			Sout an, L		4800 West	Hammer Type: Latitude:						<b>▼</b> Afte	er excav	ating N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DES	Longitude:	USCS Classification	SPT Blows per 6-inch	Moisture, %	× M	TEST N in bk Noisture	PENETR. DATA ows/ft ② 25 GTH, tsf	PL LL 50	ter N/A ft
	- 0 -					SILT, loose, dry, dark brown.		ML							
						SILT, medium stiff, dry, light b	prown, pinholes.								
	 			1				ML							
	- 5 -					GRAVEL, silty, with cobbles, brown.	dense, dry, light	GM							
		.06	<b>A</b>	2		SILT, sandy, medium stiff, mo oxide stains.	oist, brown, iron								·
	- 10 -							ML							
						EOTP @ 13 feet.				-					
						Groundwater was not encoun	tered.					-		-	
	Paradominate de la companya de la co														
Comple	etion (	)enth:			13.0	ft Sample	Types:		<u> </u>	Rema	arks:	<u></u>	<u></u>		-
Date B Date B	oring oring	Starte	d:	d:	7/17/ 7/17/ B.Ga	/02 /02 X Split-	r Cutting	Shelby Tu Grab San	nple						
Logged Drilling		actor:			D.U6	Rock	Core	Mod. Cali	fornia	ananya 14.74	P. Distribution 1		Target State Control Control		Figure A-35



PSI Job	No.:			083				Drilling Method:			<del></del>						R LEVEL	
Project:	:	Мо	naro	ch Me	adows			Sampling Metho						- 1		le excav	-	N/A ft
Location	n:					4800 West		Hammer Type: Latitude:								r excav		N/A ft
		He	mm	an, U	ıan			Lautude:								ours lat		N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL [ Surface Elev.: ft	DESC	Terrent and the second and the secon		USCS Classification	SPT Blows per 6-inch	Moisture, %	× M	DARD PI TEST N in blo Moisture	ENETRA DATA ws/ft ②		NOT	••
	0	TIT	$\dagger \dagger$			SILT, with gravel, loose,	dry, da	ark brown,		ML								
			]			pinholes.			┙'	IVIL			١					
		:NC	1		[	GRAVEL, silty, dense, d	ıry, ligh:	t brown.		1			١			-		
		1,000	V 1 4			SAND, silty, medium der	nse dry	/ light brown.	_ (	GM	!							
		排							5	ѕм			1					
	- 5 -	財				1								<u> </u>	<del>                                     </del>		<u> </u>	
		1								l			1					
		ТΤ	1			SILT, medium stiff, dry to	o mois	t, light brown.			•		1					
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	<u> </u>	1111																
												1						
		1																
1	- 10 -	$\  \  \ $								ML				<u> </u>	ļ	<del> </del>	ļ	
	- 10-			1														
																	1	
	:													1				
1	<b>h</b> -															1		
	[.														1	1		
	[	]																
1	-	Ш	Ц			EOTP @ 14 feet.												
						Groundwater was not er	ncounte	ered.										
1																		
1											ļ				}			
l													1					
										 الـــــــــــــــــــــــــــــــ	L	<u></u>		<u> </u>	<u></u>	<u> </u>	L	
Comp					14.0		mple T	•	SP		1	Rema	arks:					
Date 5				d٠	7/17 <i>/</i> 7/17	/no		Cutting Spoon	Shel	lby Tu								
Date E Logge		oun	אוטוע	u.		arrett W	Split-S	Spoon (	y Gral	b Sar	1						Figure .	A-36
Drilling		actor			,		Rock (	Core	Mod	ı. Cal	lifornia	-		WANT OF THE PERSON NAMED IN	way (mrohim)	-	rigure.	/-\"- <b>Ų</b> Ο



Sheet 1 of 1

WATER LEVELS **Drilling Method:** PSI Job No.: 710-25083 Sampling Method: Vhile excavating Project: Monarch Meadows 13400 South and 4800 West Hammer Type: Location: After excavating N/A ft Latitude: Herriman, Utah ▼ 24 hours later N/A ft Longitude: STANDARD PENETRATION SPT Blows per 6-inch **TEST DATA** USCS Classification Elevation, (feet) N in blows/ft @ Sample Type Recovery (%) Depth, (feet) Graphic Log Sample No. ್ಯ 🔼 PL X Moisture Moisture, **NOTES** MATERIAL DESCRIPTION STRENGTH, tsf ж Qр Surface Elev.: ft SILT, loose, dry, dark brown. ML SILT, medium stiff, dry, brown, pinholes. 1 ML 2 EOTH @ 13 feet. Groundwater was not encountered. Remarks: Sample Types: 13.0 ft Completion Depth: 7/17/02 Date Boring Started: Auger Cutting Shelby Tube 7/17/02 Date Boring Completed: Split-Spoon Grab Sample Logged By: B.Garrett Mod. California Figure A-37 Rock Core **Drilling Contractor:** 



PSI Jo				5083			Drilling Method:								K LEVE	LS
Projec				ch Me			Sampling Metho						ДWh	ile exca	vating	N/A ft
Location	on:					4800 West	Hammer Type: Latitude:							er excav		N/A ft
		ne	mm	an, U	itan		Landide:							hours la		N/A fi
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	USCS Classification	SPT Blows per 6-inch	% %		TEST	ENETR DATA ows/ft 6	ATION PL		:
log	£	ohic	용	pje	Ver	MATERIAL DES	CRIPTION	SE SE	S¥.	Moisture,	1		25	LL 50	NOT	TES .
×at	)ebl	Srag	am	San	မ္မ			SS	Bo	Š		J	I	I		
ŭ	"		တ	٠,	2			l so	4	1		STREN				
						Surface Elev.: ft			တ		0			Qp Qu 4.0		
	<del>  0                                   </del>	Ш	1-1			SILT, loose, dry, light brown.			<u> </u>	_	ا ا	T		1		·
	1					, , ,		ML		1						
	-					SILT, medium stiff, dry, light bi	rown, pinholes.									
								ML								
	- 5 -													·		
	-					GRAVEL, silty, dense, dry, ligh	nt brown to gray.									
	-					·										
								GM								
	- 10 -															
	-						.,,									
						EOTH @ 11.5 feet. Groundwater was not encount	ered.	-								
Compl					11.5		ypes:			Rem	arks:			•		
Date E	oring S	Starte			7/17/		Cutting	Shelby Tu	ube							
Date E		Compl	etec	<b>i</b> :	7/17/	/02   M splits	200	Grab Sar								
Logge		antor.			B.Ga	Rock (	Соге	Mod. Cal							Figure A	<b>A-38</b>
Drilling	CONT	autur.	C-1000000		-			The state of the s	·	_						****



PSI Jol	No.:	71	0-2	5083				Drilling Method:						٧	VATE	R LEVE	ELS
Project	:	Mo	onar	ch Me	adow			Sampling Method:						∑wh	ile exca	vating	N/A ft
Locatio	n:					4800 West		Hammer Type:							er excav		N/A ft
		He	errin	an, U	ltah			Latitude: Longitude:							nours la		N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL Surface Elev.: ft			USCS Classification	SPT Blows per 6-inch	Moisture, %	× A	TEST N in bk floisture	PENETR DATA DWE/ft (9)	PL LL 50	NC	DTES
	0	П	H		-	SILT, loose, dry, light b	rown.			<u> </u>	1-	ļ	Γ	Ī	Ju - 1.0		
						SILT, medium stiff, dry		own, pinholes.	ML.						 		
									ML								
	- 5 -	000				GRAVEL, silty, dense,	dry, gray	<del>y</del> .	GM	3							
			-			SILT, sandy, medium s	stiff, dry,	light brown.	ML								
			4			GRAVEL, silty, dense,	dry, gray	y.									
									GM								
	- 10 -	<u>~10</u> 6				EOTH @ 10 feet. Groundwater was not e	encounte	ered.									
															**************************************		
	<u> </u>	<u> </u>	L	L	10.0	# 0	ample Ty	Whee.		Ι	Rema	arks:	L	J		ļ	
Comple Date B					7/17/	1	~		halke T	uba	1 (011)						
Date B				d:	7/17/		Auger	press;	helby T								
Logged					B.Ga	, , ,	Split-	poon C G	rab Sar od. Cal							Figure	Δ_30
Drilling		actor:			_		LOCK C	ore M	uu. Udl	norma						riguit	, /\-UU



PSI Jol				5083				Drilling Metho								VATE		ELS
Project Locatio					eadov	<i>r</i> s 4800 West		Sampling Me Hammer Typ								ile exca		N/A ft
Locauo	11.			ian, L		4000 YYESI		Latitude:								er excav		N/A ft
								Longitude:							<b>▼</b> 24	hours la	ter	N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL D	)ES(	CRIPTION		USCS Classification	SPT Blows per 6-inch	Moisture, %	× 1	TEST N in bk Moisture	25 I GTH, tsf		N	OTES
	-0-	Ш				SILT, loose, moist, light b	rown.				<b> </b>	1	ļ	T		Ju 4.0		
	- 5 -			1		SAND, silty, medium den	se, m	oist, brown.		ML								
	- 10 -			2		SILT, sandy, medium stiff  EOTP @ 13 feet.  Groundwater was not enc		•		ML								
Comple	tion D	epth:			13.0	t Sam	ple Ty	/pes:				Rema	rks:					
Date Bo	oring S	tartec			7/17/	02 N A			Sh	elby Tu	ube							
Date Bo		ompl	eted		7/17/0		plit-Sp	ooon		ab San								
Logged Drilling		ctor:			B.Gai -		ock C	ore	Мо	d. Cali	fornia						Figure	A-40



PSI Joi	No.:	71	0-25	083				Drilling Method:							٧	VATE	R LEVE	LS
Project					adow			Sampling Meth							☑ Wh	ile exca	vating	N/A ft
Locatio	n:					4800 West 🥠		Hammer Type: Latitude:							▼ Afte	er excav	ating	N/A ft
		пе	111411	an, L	lali			Longitude:							¥ 24 1	nours la	ter	N/A ft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL Surface Flavor #	L DESC		rejection of our	COCO CIASSIRATORI	SPT Blows per 6-inch	Moisture, %	× 1	DARD P TEST N in blo Moisture	ENETRA DATA wws/ft ② 2d 	PL LL 50	NO	TES
ļ	0	111	╁╌╁			Surface Elev.: ft SILT, loose, moist, ligh	nt brown.	pinholes.				<del>                                     </del>	0		.0 (	Qu 4.0		
				1		GRAVEL, silty, cobble			M									
				2		SILT, sandy, medium	stiff, moi	st, light brown.		IL.								
Compl					14.0	,	Sample T	ypes:			1	Rema	arks:					
Date B				۹٠	7/17 <i>.</i> 7/17		Auger		Shelb									
Date B		ounp	ic (e)	u.	B.Ga	1 1	Split-S										<b></b> .	
Drilling		actor:			_		Rock C	Core	Mod.	Cal	ifornia						Figure	A-41



**Drilling Contractor:** 

#### LOG OF TEST HOLE: TP-40

Sheet 1 of 1

WATER LEVELS Drilling Method: PSI Job No.: 710-25083 Sampling Method: Monarch Meadows ☑ While excavating Project: Hammer Type: 13400 South and 4800 West Location: After excavating N/A ft Latitude: Herriman, Utah 24 hours later Longitude: N/A ft STANDARD PENETRATION SPT Blows per 6-inch **TEST DATA** JSCS Classification Elevation, (feet) N in blows/ft ② Graphic Log Recovery (%) Sample Type Depth, (feet) Sample No. Moisture, % Moisture NOTES MATERIAL DESCRIPTION STRENGTH, tsf \* Qp Surface Elev .: ft SILT, loose, dry, light brown, pinholes. ML GRAVEL, silty, with sand and cobbles, dense, dry, light brown. GM SILT, medium stiff, moist, brown, pinholes. ML GRAVEL, silty, with cobbles, dense, dry, gray. GM CLAY, medium stiff, moist, brown. 2 CL EOTP @ 14 feet. Groundwater was not encountered. Remarks: Sample Types: 14.0 ft Completion Depth: Date Boring Started: 7/17/02 Shelby Tube **Auger Cutting** Date Boring Completed: 7/17/02 Grab Sample Split-Spoon B.Garrett Logged By: Mod. California Figure A-42 Rock Core



## **LOG OF TEST HOLE: TP-41**

Sheet 1 of 1

N/A ft

WATER LEVELS **Drilling Method:** 710-25083 PSI Job No.: Project: Monarch Meadows Sampling Method: ✓ While excavating Location: 13400 South and 4800 West Hammer Type: After excavating Latitude: Herriman, Utah X 24 hours later Longitude:

Completion Depth:   Comp	1		He	rrim	an, U	ltah		Latitude:							haura la		IVA II
TET DATE OF THE PROPERTY OF TH	<b></b>			П				Longitude.			Т	Ι				lei	N/A ft
Surface Elev: 1  Surface Elev: 1  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GM  GM  Silt, Issandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 14.0 tt 71702 Auger Cutting Split-Spoon Made Cellifornia Grab Sample Cellifornia Grab Sample Logged By: B. Garrett Made Cellifornia Grab Sample Cellifornia									_	년		STAN			ATION	7.5	
Surface Elev: 1  Surface Elev: 1  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GM  GM  Silt, Issandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 14.0 tt 71702 Auger Cutting Split-Spoon Made Cellifornia Grab Sample Cellifornia Grab Sample Logged By: B. Garrett Made Cellifornia Grab Sample Cellifornia	<b>ਦੇ</b>	_c	<b>5</b> 3	ايو	<i>.</i> :	ا چ			ation	- 등			N in blo	ws/ft 😝			
Surface Elev: 1  Surface Elev: 1  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GM  GM  Silt, Issandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 14.0 tt 71702 Auger Cutting Split-Spoon Made Cellifornia Grab Sample Cellifornia Grab Sample Logged By: B. Garrett Made Cellifornia Grab Sample Cellifornia	ႜၟ	fee	Ŝ	4	ž	6) (			Sifica	) Se	8	×			PL		
Surface Elev: 1  Surface Elev: 1  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GM  GM  Silt, Issandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 14.0 tt 71702 Auger Cutting Split-Spoon Made Cellifornia Grab Sample Cellifornia Grab Sample Logged By: B. Garrett Made Cellifornia Grab Sample Cellifornia	fig	), ‡	phic	읦	nge	ver	MATERIAL DESC	CRIPTION	Class	S <sub>X</sub>	stru	1		25	LL 50	TON	ES
Surface Elev: 1  Surface Elev: 1  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GM  GM  Silt, Issandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 14.0 tt 71702 Auger Cutting Split-Spoon Made Cellifornia Grab Sample Cellifornia Grab Sample Logged By: B. Garrett Made Cellifornia Grab Sample Cellifornia	eva	Эер	Gra	am	San	၁၁			SS	8	8		L	<u> </u>	L		
Surface Elev: 1  Surface Elev: 1  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GRAVEL, silty, with cobbles, dense, moist, light brown, jimboles.  GM  GM  Silt, Issandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 14.0 tt 71702 Auger Cutting Split-Spoon Made Cellifornia Grab Sample Cellifornia Grab Sample Logged By: B. Garrett Made Cellifornia Grab Sample Cellifornia	ũ	L.		0	••	œ			ŝ	4		i	STREN		_		
SILT, sandy, medium stiff, moist, light brown, pinholes.  GRAVEL, silty, with cobbbles, dense, moist, light brown, from side stains.  SILT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: Date Boring Started: 7/17/02 Date Boring Started: 7/17/02 Date Boring Completed: 7/17/02 Selection Depth: Selection Depth: 7/17/02 Selection Depth: 7/17/0	l						Surface Elev.: ft			σ.		l .	2			•	
GRAVEL, sifty, with cobbles, dense, moist, light brown.  SILT, sandy, medium stiff, moist, brown, iron oxide stairs.  SILT, sandy, medium stiff, moist, brown, iron oxide stairs.  ML  EOTP @ 14 feet. Groundwater was not encountered.  ML  Eotr @ 14 feet. Groundwater was not encountered.  Figure A43  Remarks:  Remarks		0-	TIT	П			SILT, loose to medium stiff, mo	oist, light brown,									
GRAVEL, sity, with cobbles, dense, moist, light brown.  GRAVEL, sity, with cobbles, dense, moist, light brown.  GM  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Groundwater was not encountered.  Apper Cutting Apper Cutting Spik-Spoon Grab Sample Tube.  Apper Cutting Apper Cutting Times Apper Cut							pinholes.				1					·	
GRAVEL, sity, with cobbles, dense, moist, light brown.  GRAVEL, sity, with cobbles, dense, moist, light brown.  GM  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Groundwater was not encountered.  Apper Cutting Apper Cutting Spik-Spoon Grab Sample Tube.  Apper Cutting Apper Cutting Times Apper Cut	İ																
GRAVEL, sity, with cobbles, dense, moist, light brown.  GRAVEL, sity, with cobbles, dense, moist, light brown.  GM  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Groundwater was not encountered.  Apper Cutting Apper Cutting Spik-Spoon Grab Sample Tube.  Apper Cutting Apper Cutting Times Apper Cut	ļ												<u> </u>				
GRAVEL, sity, with cobbles, dense, moist, light brown.  GRAVEL, sity, with cobbles, dense, moist, light brown.  GM  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Groundwater was not encountered.  Apper Cutting Apper Cutting Spik-Spoon Grab Sample Tube.  Apper Cutting Apper Cutting Times Apper Cut									ML		1						
GRAVEL, silty, with cobbles, dense, moist, light brown.  GM  GM  SILT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 7/17/02 Auger Cutting Shelby Tube Date Boring Completed: 7/17/02 Auger Cutting Spit-Spoon Graphetes: 7/17/02											1		ŀ				
GRAVEL, silty, with cobbles, dense, moist, light brown.  GM  GM  SILT, sandy, medium stiff, moist, brown, iron oxide stains.  ML  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: 7/17/02 Auger Cutting Shelby Tube Date Boring Completed: 7/17/02 Auger Cutting Spit-Spoon Graphetes: 7/17/02																	
Completion Depth: 14.0 ft Sample Types: Date Boring Started: 7/17/02 Date Boring Completed: 7		L 4		1	1		•						•				
Completion Depth: 14.0 ft Sample Types: Date Boring Started: 7/17/02 Date Boring Completed: 7	1												[				
Completion Depth:  14.0 ft  Bate Boring Started:  7/17/02  Date Boring Completed:  Date Boring Complet	ł	- 5 -					GRAVEL sitty with cobbles d	ense moist light						<del> </del>			
SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: Date Boring Started: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 8 Spilt-Spoon 9 Grab Sample 9 Grab Sample 9 Spilt-Spoon 9 Grab Sample 9 Spilt-Spoon	1		000	1				crise, moist, light					}				
SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: Date Boring Started: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 8 Spilt-Spoon 9 Grab Sample 9 Grab Sample 9 Spilt-Spoon 9 Grab Sample 9 Spilt-Spoon	ł	├ -	3,6	1													
SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  SiLT, sandy, medium stiff, moist, brown, iron oxide stains.  EOTP @ 14 feet. Groundwater was not encountered.  Completion Depth: Date Boring Started: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 7/17/02 Date Boring Completed: 8 Spilt-Spoon 9 Grab Sample 9 Grab Sample 9 Spilt-Spoon 9 Grab Sample 9 Spilt-Spoon																	
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Logged By: B.Gallett   D.Book Corp. Mod. California   Figure A-43			ompl	etec	3:		02 Split-Si	poon 👸 Gr	ab Sar	nple							
			actor.			p.Ga			od. Cali	ifornia						Figure A	\- <b>4</b> 3



## LOG OF TEST HOLE: TP-42

Sheet 1 of 1

PSI Job No.: 710-25083 Project:

Location:

Monarch Meadows 13400 South and 4800 West

Herriman, Utah

Drilling Method: Sampling Method:

Hammer Type: Latitude:

WATER LEVELS

☑ While excavating N/A ft

After excavating N/A ft

		He	rrim	an, U	tah		Latitude: Longitude:					{		ours lat	er N/Aft
Elevation, (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (%)	MATERIAL DESC	CRIPTION	USCS Classification	SPT Blows per 6-inch	Moisture, %	× N	DARD P TEST N in blo floisture	ENETRA DATA ws/ft @ Zd	ATION	NOTES
	- 5 -			1		SILT, loose to medium stiff, me pinholes.	oist, light brown,	, ML				-			
	- 10 -			2	And the state of t	GRAVEL, silty, with cobbles, of stains.		GM ML							
						EOTP @ 12.5 feet. Groundwater was not encount	ered.								
		Starte	d:	d:	12.5 7/17 7/17 B.Ga	/02 N Auger	Cutting Spoon	Shelby Tu Grab Sar Mod. Cali	nple	Rema	L	<u> </u>	<u> </u>	L	Figure A-44

# **KEY TO SYMBOLS**

**USCS Silt** 



USCS Low Plasticity Clay



**USCS Silty Gravel** 



USCS Well-graded Gravel



USCS Poorly-graded Sand



**USCS Silty Sand** 

HSA = Hollow Stem Auger

CFA = Continuous Flight Auger

SS = Split-spoon Sampler

ST = Shelby Tube Sampler

RC = Rock Core

DD = Dry Density

LL = Liquid Limit

PL = Plastic Limit

Qu = Unconfined Compressive Strength

Qp = Pocket Penetrometer

RQD = Rock Quality Designation

REC'D = Rock Core Recovery Percentage

PID = Photo Ionic Detector (ppm)

MR\* = Unable to determine depth of water due to mud rotary drilling methods

The test pits were excavated to the desired depth using a trackhoe. Disturbed bag samples and relatively undisturbed tube and block samples were obtained at various intervals in each test pit. Each tube and bag sample was sealed and transported to the laboratory for testing.



2779 South 600 West South Salt Lake, UT 84115 Telephone: (801) 954-8442 Fax: (801) 954-8485

PSI Job No.: 710-25083

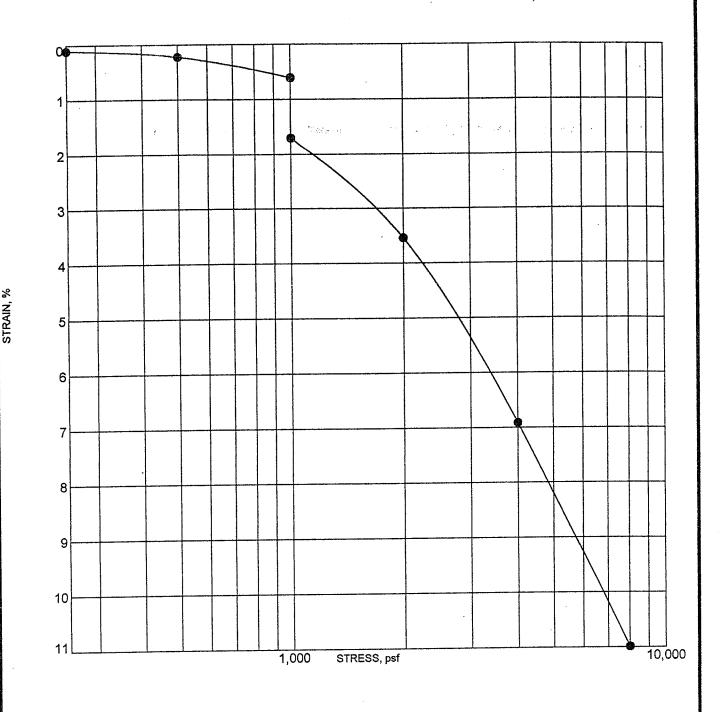
Project: Location: Monarch Meadows 13400 South and 4800 West

Herriman, Utah

TABLE 1: SUMMARY OF LABORATORY TESTING

						2 2 3 5 5 5 5 5	AND THE WAR STATE
Sample No.	Sample Depth (ft.)		anical S Analysis		Atterber	g Limits	USCS Soil Classification
		%	%	%	Liquid	Plastic	
		Gravel	Sand	Fines	Limit	Index	
					(%)	(%)	
TP-5	PILE	66.2	27.8	6.0		1	GP-GC
TP-11	4.0	0.0	61.5	38.5			SM
TP-20	2.5				27	13	CL -
TP-25	2.5				32	16	CL
TP-27	8.0	0.0	7.9	92.1	28	8	CL
TP-31	12.0	0.0	14.0	86.0	26	5	ML
TP-38	4.0	0.9	57.8	41.3			SM
TP-38	11.0	0.0	33.7	66.3	NP*	NP	ML
TP-40	5.0				26	3	ML
TP-40	10.0				32	15	CL

<sup>\*</sup>NP = Non-Plastic as per ASTM D 4318 Section 11.4.



5	Specimen Ide	ntification	Classification	γ <sub>α</sub>	MC%
8	TP-20	2.5			9
					-
_					1
_					-
-					



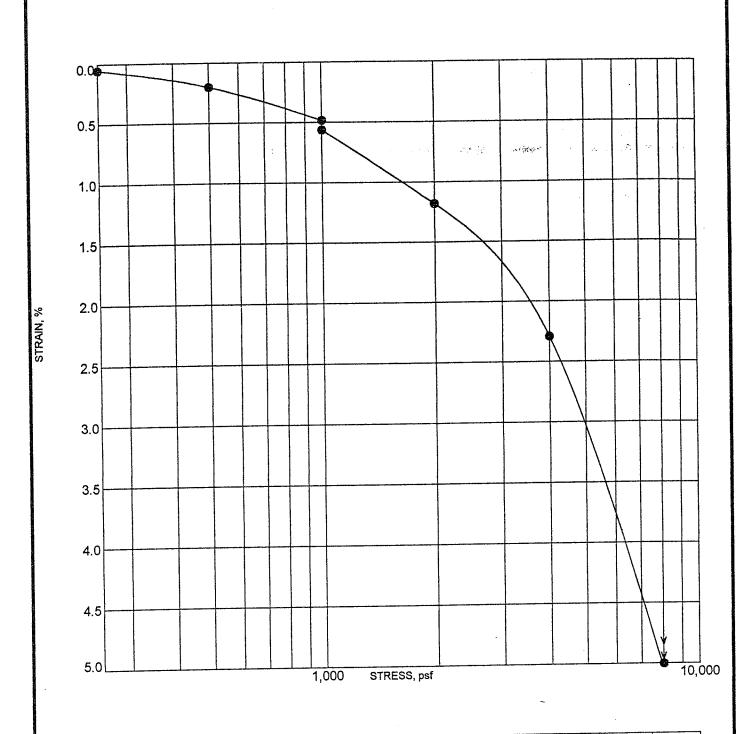
PSI Job No.: 710-25083

Project:

Monarch Meadows

Location:

Herriman, Utah



Specimen Identification		ntification	Classification	$\gamma_{\rm d}$		MC%
•	TP-25	2.5		93	3	7
+						

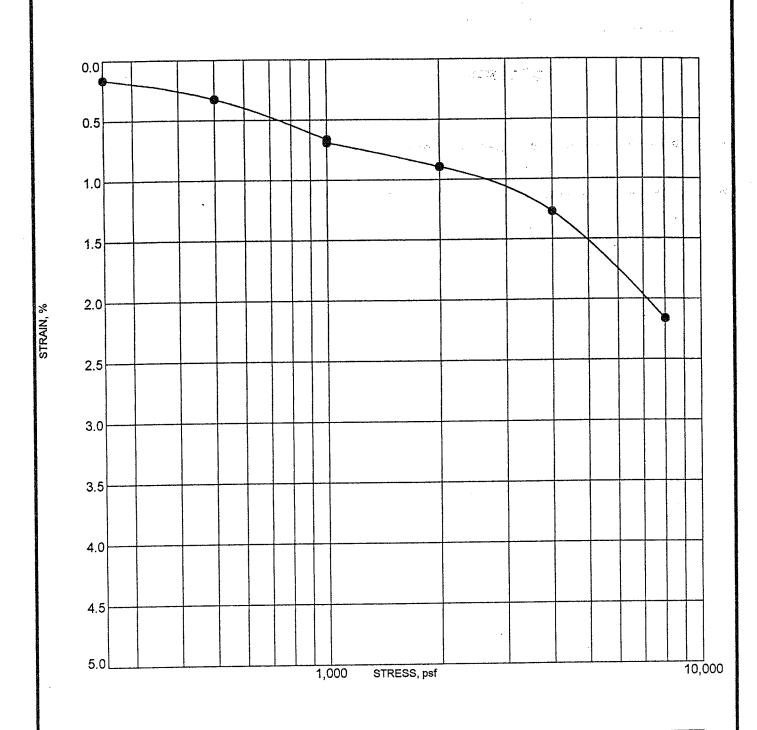


PSI Job No.: 710-25083

Project:

Monarch Meadows

Herriman, Utah Location:



Specimen Identification		ntification	Classification	γ <sub>4</sub>	MC%
•	TP-40	5.0		90	21
					ļ
					ļ
					-



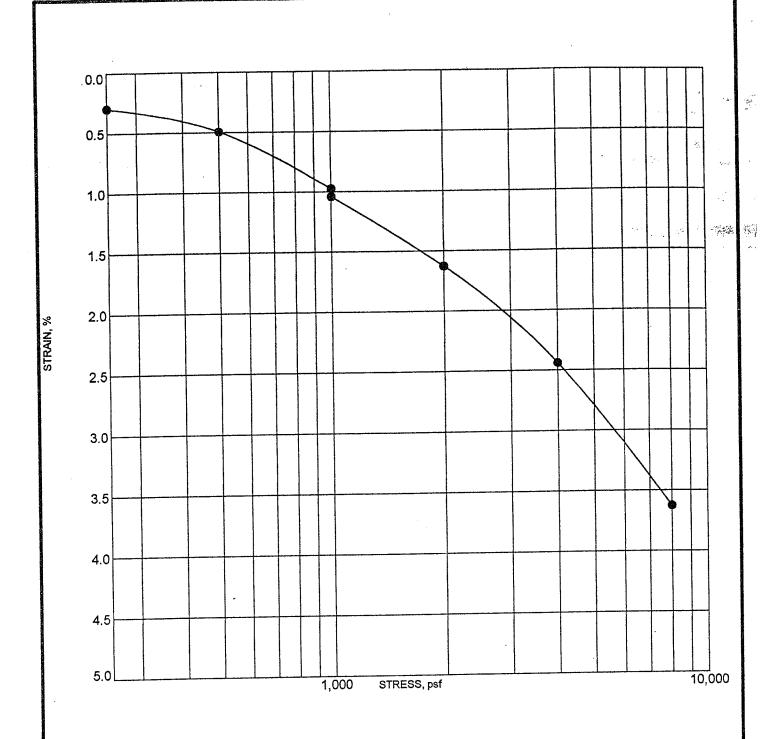
PSI Job No.: 710-25083

Project:

Monarch Meadows

Location:

Herriman, Utah



Specimen Identification			Classification	γ,	MC%
•	TP-40	10.0		86	34
					-
_					
-					1
$\dashv$					



PSI Job No.: 710-25083

Project: Monarch Meadows

Location: Herriman, Utah