SCENIC COVE SUBDIVISION

SOILS REPORT

PROPERTY LOCATION:
11800 S. 4350 W.
RIVERTON, UTAH

PREPARED FOR:
PHILLIP SPENCER CONSTRUCTION

AUGUST, 2004

PREPARED BY:
WILDING ENGINEERING
12411 SOUTH FORT STREET
DRAPER, UTAH 84020

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1. INTRODUCTION

The field investigation included the examination of the subsurface soil conditions by excavating 7 test pits. Results of the soil investigation are included in the appendix in the form of test pit logs. The field investigation took place on August 4, 2004. Recommendations in this report are based upon information gathered from the test pit investigations, site inspection, lab testing, and from reviewing geologic maps and reports of the area.

2. PURPOSE AND SCOPE

The purpose of this report is to determine the suitability of on site soils for the construction of a 39 lot residential subdivision with the accompanying roadways and utilities. The investigation includes a review of surface water and ground water conditions and their affects. Engineering and construction recommendations are based on subsurface conditions encountered in the field along with the effects of both subsurface and surface waters.

3. SITE AND PROJECT INFORMATION

3.1. Existing Site Conditions

The site is comprised of roughly 17.4 acres and is located at 11800 South 4350 West in Riverton, Utah. The site is located in Section 27, Township 3 South, Range 1 West, Salt Lake Base and Meridian.

The site is currently undeveloped. The adjoining properties to the south, west, and across 11800 S. are developed as residential subdivisions. The property to the east is an agricultural field.

Midas Creek runs along the rear boundary of phase two, and the Provo Reservoir Canal (or Welby Canal) runs through the center of the subdivision, separating phase one from phase two.

Vegetation on site consists of various weeds and grasses, wetland plants along the canal banks, and many at tallest eight-foot Russian Olive trees in the center of phase two.

The site elevation is 4700 feet above mean sea level. Generally the site slopes west to east.

3.2. Proposed Project Description

The 17.4-acre site will be developed as a residential subdivision. The proposed site plan is located in the Appendix.

4. GENERAL GEOLOGY AND HYDROLOGY

4.1. Surficial Geology

Soils on this site consist of lacustrine deposits from Lake Bonneville. The site is mapped with two USGS soil units; "lbpm- Lacustrine clay and silt, undivided (upper Pleistocene)" (the majority of the site), and "lpg- Lacustrine sand and gravel related to regressive phase (uppermost Pliestocene)".

The lbpm is described as: "Clay, silt, and minor fine sand and pebble gravel; bedding locally disrupted by soft-sediment deformation or liquefaction. Deposited in deep and (or) quiet water in lower part of basin. Usually grades laterally into other deposits of the Bonneville lake cycle. Unit probably contains small deposits of unit clsp (Lateral spread deposits) in urbanized areas. Thickness 1 to >10m."

The lpg is described as: "Clast-supported pebble and cobble gravel, in a matrix of sand and pebbly sand; locally interbedded with beds and lenses of silt and sandy silt. Good sorting within beds; clasts subround to round. Deposited in parallel and crossbedded, thin to thick beds dipping from horizontal as much as 15°. Deposited in beaches, bars and spits, as well as small deltas that no longer retain distinctive morphology.

Mapped at Provo shoreline (1,463 - 1,469 m (4,800 – 4,820 ft) in map area) and below. Contact with unit lbpg is mapped where lpg deposits can no longer be correlated with other regressive – phase deposits or shorelines. Thickness 1 – 25 m.

4.2. Geologic Hazards

4.2.1. Faulting

The site is located nine miles west of the Wasatch Fault.

4.2.2. Liquefaction

Liquefaction is a common earthquake condition in which soils lose virtually all shear strength and act as viscous liquids during severe ground shaking. A physical change occurs to the soil transforming it "from solid ground capable of supporting a structure, to a quicksand-like liquid with a greatly reduced ability to bear the weight of a building."[1] This site is mapped as having a very low potential for liquefaction.[2] The very low potential corresponds to a probability of liquefaction of less than 5 percent in 100 years.

4.3. Subsurface Water

The site is mapped as having a depth to ground water generally less than 30 feet.[3] Ground water was not encountered during the investigation at depths of 12 to 13 feet. Footings are to be at least two feet above the ground water elevation.

4.4. Surface Water

The storm drainage plan must include measures to properly convey surface water runoff from the paved surfaces and structures into the storm drain. The site should be graded to direct any surface flows away from buildings and structures.

This site is mapped by FEMA as having two zones; the majority of the site is a zone X, which is outside the 500-year flood event, then along Midas Creek is zone A, which is at the 100 year flood event level.[4]

5. SUBSURFACE FIELD EXPLORATION

5.1. Subsurface Profile

As part of the field exploration, 7 test pits were excavated to examine subsurface conditions. Stratigraphy and classification of the soil samples are shown in detail in the Appendix. These pits were excavated with a rubber-tired backhoe to depths of twelve to thirteen feet. The test pit locations are shown on the "Test Pit Locations and Site Plan" drawing in the Appendix. Foundations of any structures or driveways that are located on test pit excavation sites require that the disturbed soil be compacted to the requirements as stated in Section 6.2.

The site has 6" of topsoil. Most of the organics are in this first six inches of soil, and should be removed from areas designated to be paved or to have structures.

Soils exposed in the test pits were similar in pits one through five, then pits six and seven were similar to each other. Soils in pits one through five consist of six inches of sandy, silt topsoil, then a tan sandy silt to five to nine feet, then a two foot layer of silty clay, then a grayish, tan clayey silt to the bottom of the pits.

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[1] Liquefaction- A Guide To Land Use Planning, Craig V. Nelson, S.L. County Public Works- Planning Division.

[2] Surface Rupture and Liquefaction Potential, Special Study Areas, Salt Lake County, Utah., Revised February 1997; Reference Anderson, Keaton, Spitzler, and Allen 1985, Liquefaction Potential Map for Salt Lake County.

[3] Shallow Ground Water and Related Hazards in Utah, Utah Geological and Mineral Survey, Suzanne Hecker, Kimm M. Harty, and Gary E. Christensen, 1988

[4] Salt Lake County FEMA; *http://www.slco.org/pw/eng/flood/html/f_plain.html*

Soils in pits six and seven consist of six inches of sandy silt topsoil, next is a layer of well graded gravel (6" minus) in a brown silty sand matrix extending to nine feet in depth in pit six and five feet in pit seven. Below this is a brown silty sand that extended to the bottom of the pit in pit six and to six feet in pit seven. The remaining layers in pit seven are similar to the first five test pits, with brown to tan sandy/clayey silts extending to the bottom of the pit.

Groundwater was not encountered.

5.2. Density of Soils

Soils on site will have max dry densities near 100 to 115 pcf, and are estimated to be between 85 and 95 percent of this density. Pentrometer measurements were taken in some of the test pits. The tan sandy silt was measured to be 3.5 to 4.0 tons per square foot. The brown silty clay at nine to eleven feet in depth measured 2.5 tons/sq.ft.

5.3. Soil Moisture

On site, soils near the surface were dry. Soils became moist near eight feet in depth. Moisture contents in test pits excavated near the canal and Midas Creek were similar to the other test pits.

6. RECOMMENDATIONS

6.1. Site Work

6.1.1. Site Preparation

It is the contractor's responsibility to locate and protect all existing utility lines, whether shown on the drawings or not.

All topsoil or any soil containing organic materials should be removed from the site, where structures or pavement are to be placed. We recommend removing one foot of topsoil. Topsoil may be stockpiled on site for subsequent use in landscape areas. Any unsuitable material, where structures are to be placed, shall be replaced with structural fill according to the standards set forth in section 6.1.4 and 6.1.5 of this report.

Following site stripping and rough grading of the entire site, all exposed subgrades must be proof rolled by running over the surface with a loaded dump truck or water truck or by taking density tests. Any loose, soft, saturated, or otherwise unstable soils encountered must be removed and replaced with granular structural fill.

6.1.2. Excavation

All utilities encountered in excavating shall be carefully supported, maintained, and protected during construction. It is the responsibility of the contractor to have safe working conditions. Temporary construction excavations should be properly sloped or shored, in compliance with current federal, state, and local requirements. Construction excavations up to 4 feet deep may be constructed with near-vertical side slopes. Excavations between 4 feet and 14 feet deep should have side slopes not steeper than 1 to 1, or a trench box or shoring may be used. Excavations are to be made to minimize subsequent filling. Coarse-grained material can easily become unstable and will collapse. Boulders and cobbles larger than six inches should be removed from trenches.

6.1.3. Structural Fill Material

Structural fill shall consist of well-graded granular material, with a maximum aggregate size of 2 inches, and a maximum of 20% passing the #200 sieve. This material is to be free from organics, garbage, ice, and other loose, compressible, or biodegradable materials.

Fine-grained materials (clays and silts) are not suitable for use as fill in areas that will be carrying a structural load such as roads, buildings, and utility trenches in roadways, but may be used as site grading fills in landscaped areas.

6.1.4. Fill Placement and Compaction

Lift thickness of structural fill under roads, driveways, and parking areas and utilities should not exceed 8 inches and shall be compacted to at least 96% of the standard proctor (maximum dry density as determined by the ASTM D 698 method of compaction). Each lift should be tested for adequate compaction (See Section 6.2.1 for fills placement and compaction under foundations).

6.1.5. Utility Trenches

Construction of the pipe bedding shall consist of preparing an acceptable pipe foundation, excavating the pipe groove in the prepared foundation and backfilling from the foundation to 12 inches above the top of the pipe. All piping shall be protected from lateral displacement and possible damage resulting from impact or unbalanced loading during backfilling operations by being adequately bedded.

Most of the soils in the utility pipe zones consist of fine-grained silts and clays. These soils are not suitable as trench backfill. Granular soils near pits six and seven may be used as backfill.

Pipe foundation: shall consist of native soils if the soils are stable and undisturbed. Wherever the trench subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, the trench shall be excavated below the bottom of the pipe to such depth as may be necessary, and this additional excavation filled with compacted well-graded, granular soil (per 6.1.3), compacted to 95% of the standard proctor.

Pipe groove: shall be excavated in the pipe foundation to receive the bottom quadrant of the pipe so that the installed pipe will be true to line and grade. Bell holes shall be dug after the trench bottom has been graded Bell holes shall be excavated so that only the barrel of the pipe bears on the pipe foundation.

Pipe bedding: (from pipe foundation to 12 inches above top of pipe) shall be deposited and compacted in layers not to exceed 8 inches in uncompacted depth. Deposition and compaction of bedding materials shall be done simultaneously and uniformly on both sides of the pipe. All bedding materials shall be placed in the trench in such a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses.

Backfill for utility trenches located beneath roads are to be compacted to 96% of the standard proctor. In non-load bearing areas, trenches are to be compacted to 85% of the standard proctor (ASTM D 698).

6.1.6. Native Soil As Fill

The native soils consist mostly of sandy silt and clays. The clayey soils are not acceptable as fill. The sandy silts and silty sands may be used if compaction requirements can be met. It may be difficult to achieve compaction with these soils because they are moisture sensitive. Structural fill may also be used, and shall consist of well-graded granular material, as stated in section 6.1.3.

6.1.7. Drainage

Each building site shall be graded in such a manner that surface water will flow away from the buildings foundations. Natural drainage is generally from east to west.

6.2. Foundations

6.2.1. Installation and Bearing Material

Any existing topsoil is to be removed in the areas where footings are to be located. If structural fill is required, it is to be compacted to 98% of the standard proctor. Footings are to be placed at least 2' above the high groundwater elevation. Foundation excavations are to be inspected by a qualified soil engineer before placing concrete because of possible soil variation. The soils engineer should verify suitability of the soil and its preparation. All load bearing soils for building structures should be within ±2% of the optimum moisture content prior to placing foundations on them.

All organic material, soft areas, frozen material or other inappropriate structural material shall be removed from the footing zone and be replaced with structural fill.

6.2.2. Bearing Pressure
Spread footings bearing on the undisturbed natural soils or on compacted structural fill may be designed for an allowable net bearing pressure of 1500 pounds per square foot.

6.2.3. Settlement
According to the findings and conclusions of this report, the anticipated differential settlement will be less than ½ inch for footings designed as indicated herein.

6.2.4. Frost Depth
All exterior footings are to be at least 30 inches under the ground surface. This may require fill to be placed around buildings. Interior footings require 18 inches of cover.

6.2.5. Construction Observation
A qualified soil engineer shall periodically monitor installation of footings. Inspection of soil before placement of structural fill is required to detect any field conditions not encountered in the investigation, which would alter the recommendations of this report. All structural fill material shall be tested by the engineer for adequate compaction.

6.2.6. Foundation Drainage
Consideration must be given to subsurface drainage around foundations. According to the International Residential Code (IRC 2003), soils with poor drainage characteristics (soils below the IRC group I) require that a foundation drain be installed to allow water to drain away from the foundation.[5] Soils near depths of seven feet and below appear to be in group two, which would require foundation drains be installed. If foundation excavations expose soils at basement depths that differ from those found in the test pits, the necessity of a foundation drain may be reevaluated, if desired, by a qualified soils engineer.

6.3. Lateral Forces

6.3.1. Resistance for Footings
Wind and seismic forces, which cause lateral loads on foundations, are resisted by friction and passive earth pressures at the foundation ground interface. In the design of spread footings, the coefficient of friction for lateral sliding (μ) is 0.25 for sands, and the resistance of lateral sliding is 130 psf for clays and silts.[6]

6.3.2. Pressures on Foundation Walls
The following equivalent fluid weights are given for the design of sub-grade walls and retaining structures. "For relatively rigid walls, as when braced by floors, the design lateral load shall be increased. Basement walls extending not more than 8 feet below grade and supporting flexible floor systems are not considered as being relatively rigid walls."[7] The values listed assume the on site material is used as backfill and that the surface adjacent the wall is horizontal.

Design Lateral Soil Loads:
Inorganic silts and clayey silts........................45 psf/ft. of depth; 100 psf/ft. of depth for rigid walls
Inorganic clays of low to medium plasticity.......60 psf/ft. of depth; 100 psf/ft. of depth for rigid walls

5 International Residential Code 2003, Section R405
6 International Building Code 2000, Section 1805, Table 1804.2
7 International Building Code 2000, Section 1610, Table 1610.1

6.3.3. Seismic Conditions

Under seismic conditions, the equivalent fluid weight should be increased by 27 pcf in the active and at-rest conditions and decreased by 27 pcf in the passive condition.

6.3.4. Safety Factors

A factor of safety of 1.5 is required in all soil/structure interactive design.

6.4. Concrete Slabs on Grade

Concrete slabs may be placed on undisturbed native soils, or structural fills compacted to 98% density of the standard proctor values. Temperature steel reinforcement is recommended in slabs.

6.5. Seismic Information

6.5.1. Faulting

The Wasatch Fault lies about nine miles to the east. Surface rupture is not a hazard on the site, but ground shaking is a concern. International Building Code maximum earthquake ground motion for a 0.2 second spectral response acceleration is 120.7 and for a one second period is 66.3. The site class is "D" for a "stiff soil profile." The design spectral response acceleration is 80.47 for short periods and 66.3 for a one second period.[8]

6.5.2. Liquefaction

Anderson and others map the site as having a very low potential for liquefaction.[9] The very low potential has less than five percent probability for liquefaction in 100 years. Special precautions for liquefaction are not required.

6.5.3. Structures

Structures are to be designed for lateral loading as defined in the International Building Code. The site location has a design spectral response acceleration of 80.5 for short periods and 66.3 for a one second period. Lateral loading is to be the greater of seismic loads or wind loads.

6.6. Pavement Design and Construction

6.6.1. Sub-grade Preparation

All topsoil, or any soil containing organic materials, should be removed from locations where structural loads will be applied. To evaluate its stability, the sub-grade must be "proof rolled" with a loaded dump truck or tested with a nuclear density gauge. Any unstable soils shall be removed and replaced with structural fill according to Section 6.1.4. Any areas of fill or disturbed areas shall be compacted to 96% of the standard proctor. A qualified engineer should observe unsuitable sub-grade remediation.

6.6.2. Base Course

Eight inches of untreated base course is required for all roadways. The base course shall comply with a ¾-inch mix per UDOT Standard Specifications, Section 02721, "Untreated Base Course."

6.6.3. Surface Course

Three inches of asphalt concrete pavement is required for all roadway surfaces. This asphalt concrete pavement is to comply with UDOT Standard Specifications, Section 02741, and "Hot Mix Asphalt (HMA)."

6.6.4. Drainage Consideration

A storm drainage plan will be required to detain and convey storm water to protect the site and adjacent properties from flooding.

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[8] International Building Code 2000, Section 1615.

[9] Surface Rupture and Liquefaction Potential, Special Study Areas, Salt Lake County, Utah., Revised February 1997; Reference Anderson, Keaton, Spitzler, and Allen 1985, Liquefaction Potential Map for Salt Lake County.

LIMITATIONS AND PROFESSIONAL STATEMENT

This report has been prepared in accordance with generally accepted geologic and geotechnical engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the test holes excavated at the locations indicated on the site plan, laboratory results, data obtained from the U.S.G.S. Library, and previous reports and studies. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface soil or groundwater conditions are found to be significantly different than that which is described in this report, we should be notified so that we can re-evaluate recommendations.

We have correlated soil types and properties such as bearing pressure and equivalent fluid lateral pressure with U.S.G.S. surveys, the International Building Code, and surrounding investigations. Any assumptions made, based on these correlations, are conservative.

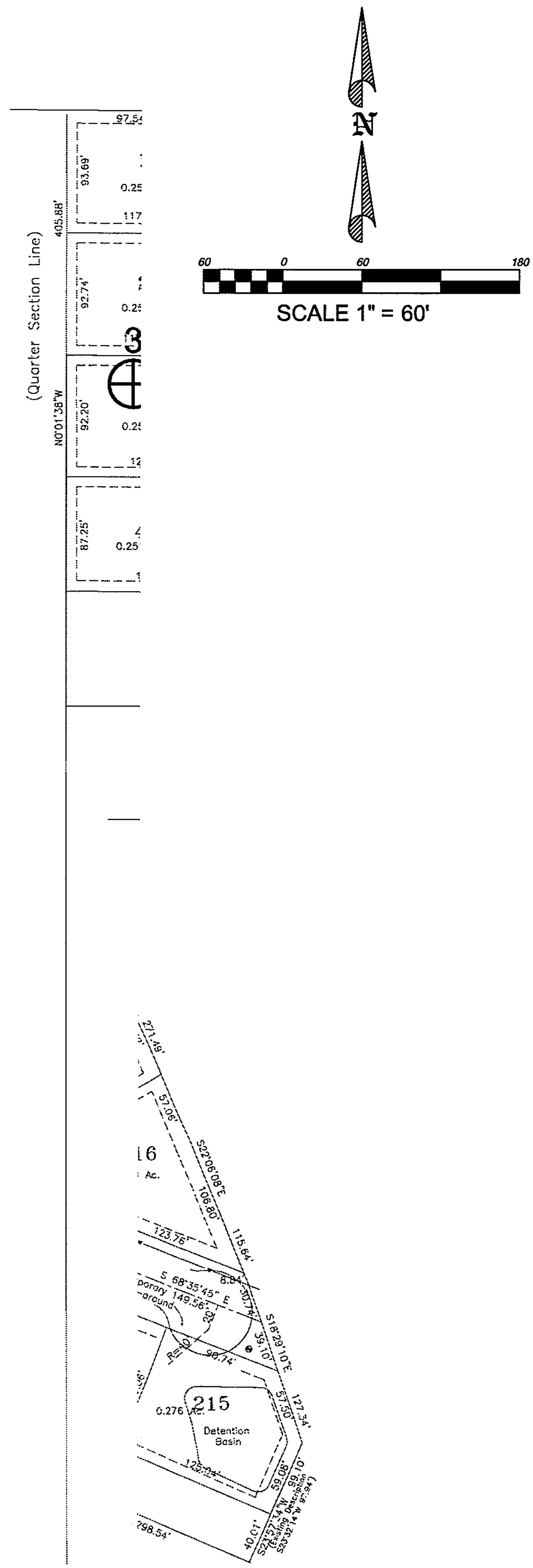
We appreciate the opportunity of providing this service for you. If you have any questions concerning this report or require additional information or services feel free to contact us.

Report prepared by:
WILDING ENGINEERING, INC.

David P. Wilding, P. E.
President

REGISTERED PROFESSIONAL ENGINEER
#157932
DAVID PRESTON WILDING
8-17-04
STATE OF UTAH

APPENDIX



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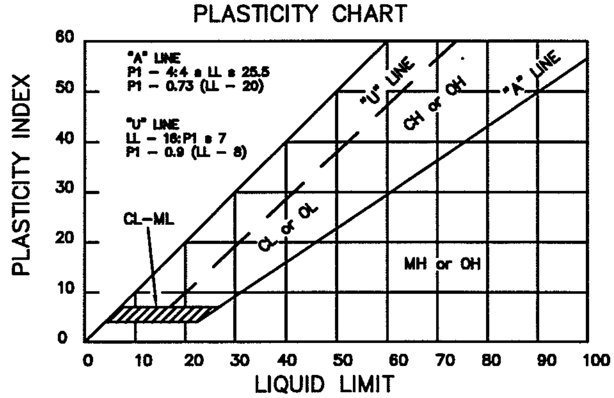
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified for engineering purposes by the United Soil Classification System. Gram-sized analyses and Atterberg Limits tests often are performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. Graphic symbols are used on boring logs presented on this report. For a more detailed description of the system, see "Standard Pratice for Description and Identification of Soils (Visual-Manual Procedure)" ASTM Designation: 2488-84 and "Standard Test Method for Classification of Soils for Engineering Purposes" ASTM Designation: 2487-85.

MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS Less than 50% passes No. 200 sieve	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No, 200 sieve)			GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, OR SAND -GRAVEL-COBBLE MIXTURES
					GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, OR SAND-GRAVEL-COBBLE MIXTURES
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Lines plot below "A" line & hatched zone on plasticity chart		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			Lines plot above "A" line & hatched zone on plasticity chart		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (50% or more of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 sieve)			SW	WELL GRADED SANDS, GRAVELLY SANDS
					SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Lines plot below "A" line & hatched zone on plasticity chart		SM	SILTY SANDS, SAND-SILT MIXTURES
			Lines plot above "A" line & hatched zone on plasticity chart		SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS Limited plot below "A" line & hatched zone on plasticity chart	SILTS OF LOW PLASTICITY (Liquid limit less than 50)			ML	INORGANIC SILTS, CLAYEY SILTS OF LOW TO MEDIUM PLASTICITY
		SILTS OF HIGH PLASTICITY (Liquid limit 50 or more)			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS, ELASTIC SILTS
	CLAYS Limited plot above "A" line & hatched zone on plasticity chart	CLAYS OF LOW PLASTICITY (Liquid limit less than 50)			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, AND SILTY CLAYS
		CLAYS OF HIGH PLASTICITY (Liquid limit 50 or more)			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS, SANDY CLAYS OF HIGH PLASTICITY
	ORGANIC SILTS AND CLAYS	ORGANIC SILTS AND CLAYS OF LOW PLASTICITY (Liquid limit less than 50)			OL	ORGANIC SILTS AND CLAYS OF LOW TO MEDIUM PLASTICITY, SANDY ORGANIC SILTS AND CLAYS
		ORGANIC SILTS AND CLAYS OF HIGH PLASTICITY (Liquid limit 50 or more)			OH	ORGANIC SILTS AND CLAYS OF HIGH PLASTICITY, SANDY ORGANIC SILTS AND CLAYS
ORGANIC SOILS		PRIMARILY ORGANIC MATTER (dark in color and organic odor)			PT	PEAT

NOTE: Coarse-grained soils with between 5% and 12% passing thru No. 200 sieve and fine-grained soils with limit plotting in the hatched zone on the plasticity chart have dual classifications.

PLASTICITY CHART



DEFINITION OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Boulders	Above 12 in.
Cobbles	12 in. to 3 in.
Gravel	3 in. to No. 4 sieve
Coarse Gravel	3 in. to 3/4 in.
Fine Gravel	3/4 in. to No. 4 sieve
Sand	No. 4 to No. 200 sieve
Coarse sand	No. 4 to No. 10 sieve
Medium sand	No. 10 to No. 40 sieve
Fine sand	No. 40 to No. 200 sieve
Fines(silt and clay)	Less than No. 200 sieve

DATE 8/4/04

PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

LOG OF TEST PIT NO. 1

HOLE LOCATION NEAR LOT 11
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
		X					ML	DRY	TAN SANDY SILT
5		X					CL	DRY	BROWN SILTY CLAY
10							ML	MOIST	TAN SANDY SILT
15									
20									
25									

GROUND WATER

DEPTH	HOUR	DATE
N/A		

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
D – 3 1/4" O.D. 2.42" I.D. TUBE SAMPLE

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DRAPER, UTAH 84020
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DATE 8/4/04

PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

LOG OF TEST PIT NO. 2

HOLE LOCATION NEAR LOT 15
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
5							ML	DRY SOME MOISTURE	TAN SANDY SILT
10							CL	SOME MOISTURE	BROWN SILTY CLAY
		X					ML	MOIST	LIGHT GRAY CLAYEY SILT
15									
20									
25									

GROUND WATER

	DEPTH	HOUR	DATE
▽	N/A		
▼			

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
D – 3 1/4" O.D. 2.42" I.D. TUBE SAMPLE

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PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

LOG OF TEST PIT NO. 3

HOLE LOCATION NEAR LOT 3
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
5							ML	DRY SOME MOISTURE	TAN SANDY SILT
10							CL	SOME MOISTURE	BROWN SILTY CLAY
							ML	MOIST	GRAY/TAN CLAYEY SILT
15									
20									
25									

GROUND WATER

DEPTH	HOUR	DATE
N/A		

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
D – 3 1/4" O.D. 2.42" I.D. TUBE SAMPLE

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PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

LOG OF TEST PIT NO. 4

HOLE LOCATION NEAR LOT 9
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
5							ML	DRY	TAN SANDY SILT
10							GM	DRY	GRAVEL WITH BROWN SANDY SILT MATRIX
							ML	DRY	GRAY/TAN CLAYEY SILT
15									
20									
25									

GROUND WATER

DEPTH	HOUR	DATE
N/A		

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
D – 3 1/4" O.D. 2.42" I.D. TUBE SAMPLE

WILDING ENGINEERING, INC
12411 SOUTH FORT STREET
DRAPER, UTAH 84020
(801)553-8112

DATE 8/4/04

PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

LOG OF TEST PIT NO. 5

HOLE LOCATION NEAR LOT 209
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
		X					ML	DRY	TAN SANDY SILT WITH SOME GRAVEL
							SM	DRY	BROWN SILTY SAND
5							ML	DRY	BROWN CLAYEY SILT
10							ML	SOME MOISTURE	GRAY/TAN CLAYEY SILT
15									
20									
25									

GROUND WATER

DEPTH	HOUR	DATE
N/A		

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
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PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

LOG OF TEST PIT NO. 6

HOLE LOCATION NEAR LOT 217
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
5		X					GW	DRY	6" MINUS GRAVEL WITH A BROWN SILTY SAND MATRIX
10		X					SM	DRY	BROWN SILTY SAND
15									
20									
25									

GROUND WATER

DEPTH	HOUR	DATE
N/A		

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
D – 3 1/4" O.D. 2.42" I.D. TUBE SAMPLE

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DATE 8/4/04

LOG OF TEST PIT NO. 7

PROJECT SCENIC COVE SUBDIVISION

PROJECT LOCATION 11800 S. 4350 W., RIVERTON, UT

HOLE LOCATION NEAR LOT 205
RIG TYPE BACKHOE
BORING TYPE OPEN PIT EXCAVATION
SURFACE ELEVATION 4700 (Estimated from USGS Quad map)
FIELD ENGINEER RUSSELL WILDING

DEPTH IN FEET	GRAPHICAL LOG	SAMPLE	SAMPLE TYPE	BLOWS/FOOT 140 LB, 30" FREE FALL DROP HAMMER	DRY DENSITY LBS PER CUBIC FOOT	MOISTURE CONTENT PERCENT OF DRY WEIGHT	UNIFIED SOIL CLASSIFICATION	REMARKS	VISUAL CLASSIFICATION
0							OL	DRY	DARK BROWN SANDY SILT TOPSOIL
							GW	DRY	6" MINUS GRAVEL WITH A BROWN SILTY SAND MATRIX
5							SM	DRY	BROWN SILTY SAND
		X					ML	DRY	DARK BROWN CLAYEY SILT
10							ML	SOME MOISTURE	LIGHT TAN CLAYEY SILT
15									
20									
25									

GROUND WATER

	DEPTH	HOUR	DATE
▽	N/A		
▼			

SAMPLE TYPE

A – AUGER CUTTINGS
S – 2" O.D. 1.38" ID TUBE SAMPLE
U – 3" O.D. 2.42" I.D. TUBE SAMPLE
T – 3" O.D. THIN WALLED SHELBY TUBE
D – 3 1/4" O.D. 2.42" I.D. TUBE SAMPLE

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RECORD SHEET FOR CONDUCTING SOIL PERCOLATION TESTS

NAME OF PROJECT FOR DEVELOPMENT: SCENIC COVE SUBDIVISION DATE OF TEST: 8-9-04

LOCATION OF PROPERTY: 11800 South 4350 West, Riverton, Utah

NAME OF PERSON PERFORMING TEST: David Wilding

PERCOLATION TEST #: 1 DEPTH OF TEST: 4' 6"

PERIOD OF TIME HOLE WAS SATURATED: 4 HRS.	TIME INTERVAL USED FOR MEASURING WATER DROP: 30 MIN.	HOLE WIDTH OR DIAMETER: 12"
TOTAL DEPTH OF HOLE: 12"	PERIOD OF TIME SOIL PERMITTED TO SWELL: 16 HRS.	DEPTH OF WATER TABLE: UNDETERMINED

SUCCESSIVE PERCOLATION TESTS	INITIAL DEPTH TO WATER	BEGINNING TIME	FINAL DEPTH TO WATER	ENDING TIME	DISTANCE WATER DROPPED IN INCHES	ELAPSED TIME IN MINUTES	PERC RATE IN MINUTES/ INCH
1	3 11/16	10:15 a.m.	6	10:45	2 5/16	30	13.0
2	5 1/4	10:45	6 5/8	11:15	1 3/8	30	21.8
3	4 1/2	11:15	5 7/8	11:45	1 3/8	30	21.8
4							
5							
6							
7							
8							

FINAL STABILIZED PERCOLATION RATE: **21.8** minutes/inch

DESCRIPTIVE LOG OF SOIL EXPLORATION HOLE

THICKNESS OF EACH STRATUM	DESCRIPTION AND TEXTURE OF EACH STRATUM	USDA CLASSIFICATION
6"	Dark brown sandy silt topsoil	OL
5.5'	Tan sandy silt	ML
3'	Brown clay	CL
3'	Tan sandy silt	ML