

GeoStrata



Geotechnical Investigation

Micron Property – High Density Single Family, Commercial and Apartment Section

**Approximately 500 West and State Road 92
Lehi, Utah**

January 21, 2021

Prepared For:

D.R. Horton

**Attention: Scott Bishop and Dan Mitchell
12351 South Gateway Park Place
Draper, Utah 84020**

GeoStrata Job No. 589-100

**Office - 14425 South Center Point Way Bluffdale, Utah 84065
Phone (801) 501-0583 | info@geostata-llc.com**

Prepared for:

D. R. Horton
Attn: Scott Bishop and Dan Mitchell
12351 South Gateway Park Pl.
Draper, UT 84020

**Preliminary Geotechnical Investigation
Micron Property – High Density and Commercial Property 157-Acre Portion
Approximately 500 West and State Road 92
Lehi, Utah**

GeoStrata Job No. 589-100



Caleb R. Allred, P.E.
Project Geotechnical Engineer

J. Scott Seal, P.E.
Associate Principal

GeoStrata
14425 South Center Point Way
Bluffdale, UT 84065
(801) 501-0583

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1.0 EXECUTIVE SUMMARY

This report presents the preliminary findings of a geotechnical investigation conducted for 157-acres of the Micron Property at approximately 500 West and State Road 92, in Lehi and Draper, of Utah County. We understand that this section of the proposed development consists of high density residential and commercial development. The development will include different structures, consisting of townhouses, duplexes, apartments and office buildings. The development for this section will be constructed across 157 acres. We anticipate footing loads on the order of 3 to 5 kips per lineal foot and column loads of up to 70 kips. The purposes of this investigation were to assess the nature and engineering properties of the subsurface soils at the site and to provide recommendations for general site grading and the design and construction of foundations, slabs-on-grade, and exterior concrete flatwork. All recommendations and conclusions presented in this report are preliminary, due to the preliminary site development plan.

Based on the subsurface conditions encountered at the site, it is our opinion that the subject site is suitable for the proposed development provided that the recommendations contained in this report are incorporated into the design and construction of the project.

As a part of this investigation, subsurface soil conditions were explored by advancing 34 exploratory test pits depths ranging from 6 to 12 feet below the existing site grade. Based on the results of our field observations as well as on our review of applicable surficial geologic maps, the site is overlain partially by approximately ½ to 2 feet of topsoil covered a majority of the site. Underlying the topsoil or fill, we encountered deposits mapped by Biek (2005) as consisting of Historical to Pleistocene-aged material deposits. Groundwater was not encountered in any of the completed test pits for this section.

Due to the presence of dense granular soils (sands and gravels) and fine-grained soils with low potential for collapsible soil present at the proposed buildings elevations (between 2 to 8 feet below the existing ground surface), strip and spread footings can be placed entirely on non-collapsible undisturbed native soils. If soil at the foundation elevation appears to have a hydro-collapsible nature (pinholes, low natural density, etc.), collapse testing in the laboratory should be performed on a lot-by-lot basis to confirm that potential collapse will not adversely affect the proposed construction. Foundation elements should not be founded on collapsible soils, and if these soils are encountered, they should be over-excavated according to the results of lot-specific laboratory collapse testing. According to our preliminary soil collapse testing, structural fill depth below footings will be 0 to 24 inches. The site may then be brought back up to design grade using properly placed and compacted structural fill. Strip and spread footings should be a minimum of 20 and 30 inches wide, respectively. Exterior shallow footings and spread footings should be embedded at least 30 inches below final grade for frost protection and confinement. Interior strip shallow footings not susceptible to frost conditions should be embedded at least 18 inches for confinement. Conventional strip and spread footings founded on a native granular soil or on structural fill may be proportioned for a maximum net allowable bearing capacity of **1,900 pounds per square foot (psf)**.

Additional recommendations concerning other aspects of the proposed construction may be found in the body of this report.

IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT:

Do not rely on the executive summary. The executive summary omits a number of details, any one of which could be crucial. Read and refer to the report in full. Do not rely on this report if this report was prepared for a different client, different project, different purpose, different site, and/or before important events occurred at the site or adjacent to it. All recommendations in this report are confirmation dependent. A two-page document prepared by GBA explains these items with greater detail and can be found in Appendix D (Plates D-1 and D-2).

2.0 INTRODUCTION

2.1 PURPOSE AND SCOPE OF WORK

This report presents the results of a preliminary geotechnical investigation conducted for 157-acres of the Micron Property located at approximately 500 West and State Road 92 in Lehi and Draper, in Utah County, Utah. The purposes of this investigation were to assess the nature and engineering properties of the subsurface soils at the site and to provide recommendations for general site grading and the design and construction of foundations, slabs-on-grade, and exterior concrete flatwork.

The scope of work completed for this study included a site reconnaissance, subsurface exploration, soil sampling, laboratory testing, engineering analyses, and preparation of this report. Our services were performed in accordance with our proposal and signed authorization, dated November 18, 2020.

The recommendations contained in this report are subject to the limitations presented in the LIMITATIONS section of this report (Section 7.1).

2.2 PROJECT DESCRIPTION

Due to the size of the Micron Property project, we have divided the property into smaller sections for the purposes of our investigation. This preliminary geotechnical investigation is completed for High Density Single Family, Commercial and Apartments Section, which represents the southwestern-most 157-acres of the proposed building portions of the development. The property is located at approximately 500 West and State Road 92, in Lehi and Draper, Utah County, Utah (see Plate A-1, *Site Vicinity Map*). Plate A-2, *Site Section Map*, shows how we have divided up the buildable portions of the Micron property. This 157-acre portion of the Micron Property will be developed with high density residences and commercial office buildings. The resulting construction will include one- to three-story, wood-framed residences founded on conventional spread and strip footings and one- to two-story office buildings or apartment structures founded on conventional spread and strip footings. If larger structures are planned, then GeoStrata should be consulted and our recommendations should be updated if necessary. Each of these types of structures are anticipated to have basements or crawlspaces if feasible. We anticipate footing loads on the order of 3 to 5 kips per lineal foot and column loads of up to 70 kips. As stated before, if the anticipated footing loads exceed assumptions or the proposed construction is different than what we have assumed, please contact

GeoStrata with the updated information. The additional information may warrant additional soil subsurface investigations and engineering analysis. Our investigation for the development will be used to provide geotechnical design parameters for construction of buildings, parking areas, driveways, and associated landscaping and utilities.

3.0 METHOD OF STUDY

3.1 FIELD INVESTIGATION

As a part of this investigation, subsurface soil conditions were explored by advancing 34 exploratory test pits depths ranging from 6 to 12 feet below the existing site grade. The approximate locations of the explorations are shown on Plate A-3, *High Density Single Family, Commercial and Apartments Section Exploration Map*, in Appendix A. Exploration points were placed to provide optimum coverage of the site in the areas of the proposed residential or commercial development. Logs of the subsurface conditions, as encountered in the test pit explorations, were recorded at the time of excavation and advancement by a staff engineer currently employed at GeoStrata and are presented on Plates B-1 to B-34 in Appendix B. A *Soil Symbols and Description Key* used in the test pit logs is included as Plate B-35.

The test pits were excavated with a mini track mounted excavator. Both bulk and relatively undisturbed soil samples were obtained from the test pits. Relatively undisturbed soil samples were obtained from the test pit in the form of tube samples and block samples. All samples were transported to our laboratory for testing to evaluate engineering properties of the various earth materials observed. The soils were classified according to the *Unified Soil Classification System* (USCS) by the Geotechnical Engineer. Classifications for the individual soil units are shown on the attached Test Pit Logs, Plates B-1 to B-34 in Appendix B.

3.2 LABORATORY INVESTIGATION

Geotechnical laboratory tests were conducted on selected relatively undisturbed and bulk soil samples obtained during our field investigation. The laboratory testing program was designed to evaluate the engineering characteristics of onsite earth materials. Laboratory tests conducted during this investigation include:

- Grain Size Distribution Analysis (ASTM D422)
- Atterberg Limits (ASTM D4318)
- 1-D Collapse Consolidation Test (ASTM D2435)
- California Bearing Ratio Test (ASTM D1883)

The results of laboratory tests are presented on the Test Pit Logs in Appendix B (Plates B-1 to B-34), the test result plates presented in Appendix C (Plates C-2 to C-23) and in the *Summary of Laboratory Test Results* Table (Plate C-1).

3.3 ENGINEERING ANALYSIS

Engineering analyses were performed using soil data obtained from the laboratory test results and empirical correlations from material density, depositional characteristics and classification. Appropriate factors of safety were applied to the results consistent with industry standards and the accepted standard of care.

4.0 GENERALIZED SITE CONDITIONS

4.1 SURFACE CONDITIONS

At the time of our subsurface investigation in this 157-acre portion of the Micron Property, one structure existed on the site. This portion of the subject property was also occupied by storage ponds for the uphill drainages, and a well house. These ponds consisted of depressions excavated into the native grade and then earthen embankments surrounding the depressions. The only other site improvements consisted of utilities, gravel improved roadways, and fences constructed across the site. The site slopes towards the south (towards Utah Lake), having a maximum topographic relief of approximately 180 feet. The residential development known as Canyon View borders this property to the northwest and two schools border this property on the west, the southern border of this property is State Road 92. The remainder of property surrounding the 157-acre portion of the Micron Property is undeveloped land.

4.2 SUBSURFACE CONDITIONS

As previously mentioned, the subsurface soil conditions were explored at the subject property by advancing 34 exploratory test pits to depths ranging from 6 to 12 feet below the existing site grade (Test Pits MW-TP-17 to MW-TP-19, MW-TP-24 to MW-TP-54). Subsurface soil conditions were logged using the United Soils Classification System (USCS) at the time of the investigation and are included on the Test Pit Logs in Appendix B (Plates B-1 through B-34). The soil and moisture conditions encountered during our investigation are discussed below.

4.2.1 Soils

Based on the results of our field observations as well as on our review of applicable surficial geologic maps, the site is overlain partially by approximately ½ to 2 feet of topsoil. Underlying the topsoil or fill, we encountered deposits mapped by Biek (2005) as consisting of Historical to Pleistocene-aged material deposits. Descriptions of the soil units shown in the area are described below;

Qlsb - Lacustrine sand and silt (Upper Pleistocene) – Fine- to coarse-grained lacustrine sand and silt with minor gravel. These deposits are typically thick bedded and well sorted. This geologic soil unit was encountered in MW-TP-17, 18, 19, 24, 25, 26, 27, 28, 31, 32, 35, 36, 39, 40, 41, 42, 43, 47, 48, 49, 50, and 51. The soils were generally visually classified as a fine-grained Lean CLAY (CL) or Sandy SILT (ML), or a coarse-grained Silty SAND (SM) to Silty GRAVEL (GM) with varying amounts of silt, sand, and gravel. Some of the block samples obtained from the test pits contain pinhole texture and could be moisture sensitive. We are in the process of

completing laboratory test to assess this collapse hazard in order to provide recommendations for remediation.

Qafy - Younger undifferentiated alluvial-fan deposits (Holocene to Upper Pleistocene) – Poorly to moderately sorted, non-stratified, clay- to boulder-size sediment deposited principally by debris flows at the mouths of active drainages, are locally deeply incised; thickness unknown, but likely up to several tens of feet. This geologic soil unit was encountered in MW-TP-29, 30, 33, 34, 37, 38, 44, 45, 46, 52, 53, and 54. The soils were generally visually classified as a fine-grained Lean CLAY (CL) or Sandy SILT (ML), or a coarse-grained Silty SAND (SM) to Silty GRAVEL (GM) with varying amounts of silt, sand, and gravel.

Qf - Artificial fill (Historical) – Engineered fill larger areas of fill used to create new level building areas. Not encountered in our test pits advanced in this section but mapped as existing in this in this section.

Qaf₁ - Modern alluvial-fan deposits (Holocene) – Poorly to moderately sorted, non-stratified, clay- to boulder-size sediment deposited principally by debris flows at the mouths of active drainages. The closest test pit to this unit is MW-TP-17, and the near surface soil may contain some of the silty soil associated with this unit.

The stratification lines shown on the enclosed test pit represent the approximate boundary between soil types USCS classifications of the soils (Plates B-1 to B-34). The actual in-situ transition may be gradual. Due to the nature and depositional characteristics of the native soils, care should be taken in interpolating subsurface conditions between and beyond the exploration locations.

4.2.2 Groundwater

Groundwater was not encountered in any of the 34 test pits completed for this portion of the Micron Property. Seasonal fluctuations in precipitation, surface runoff from adjacent properties, or other on or offsite sources may increase moisture conditions. The observed groundwater conditions can change seasonally depending on the time of year and will impact the proposed construction. It is recommended that lowest floor slab elevation for each structure should be maintained a minimum of 3 feet above any observed groundwater conditions.

4.2.3 Collapsible Soils

Collapse (often referred to as “hydro-collapse”) is a phenomena whereby undisturbed soils exhibit volumetric strain and consolidation upon wetting under increased loading conditions. Collapsible soils can cause differential settling of structures and roadways. Collapsible soils do not necessarily preclude development and can be mitigated by over-excavating porous, potentially collapsible soils and replacing with engineered fill and by controlling surface drainage and runoff. For some structures that are particularly sensitive to differential settlement, or in areas where collapsible soils are identified at great depth, a deep foundation system should be considered.

Soils that have a potential to collapse under increased loading and moisture conditions are typically characterized by a pinhole structure and relatively low unit weights. In general, potentially collapsible soils are observed in fine-grained soils that include clay and silt, although collapsible soils may include sandy soils. Test results of the collapse test show negligible to low collapse potential. A table of the collapse test results, depth, and test pit number are provided below. This information is also contained in Plate C-8 to C-21.

Test Pit Number	Sample Depth	Collapse Potential
MW-TP-18	3.0	0.07
MW-TP-19	6.0	1.40
MW-TP-28	3.5	0.47
MW-TP-30	4.0	0.40
MW-TP-32	3.5	0.01
MW-TP-33	6.0	0.10
MW-TP-35	5.0	0.12
MW-TP-39	3.5	0.21
MW-TP-41	5.0	0.01
MW-TP-43	8.0	3.55
MW-TP-47	6.0	0.65
MW-TP-49	6.0	-0.29
MW-TP-52	4.0	-0.01
MW-TP-54	8.0	0.53

Based on these lab test results, it is anticipated that between 0 to 24 inches of structural fill may be required under some of the structures that extend into fine-grained soils with a pinhole

texture. With the 0 to 24 inches of structural fill under the footings the collapsible soils are not anticipated to present a significant risk to the foundation elements within the proposed development if the recommendations presented in this report are incorporated into the design and construction of the structures.

5.0 GEOLOGIC CONDITIONS

5.1 GEOLOGIC SETTING

The site is located at an elevation between 4,830 and 5,050 feet above mean sea level within the northern portion of Utah Valley. The Utah Valley is a deep, sediment-filled structural basin of Cenozoic age flanked by the Wasatch Range to the east and the Lake Mountains, East Tintic Mountains, and the West Hills to the West (Hintze, 1980). The Wasatch Range is the easternmost expression of pronounced Basin and Range extension in north-central Utah.

The near-surface geology of Utah Valley is dominated by sediments deposited within the last 30,000 years by Lake Bonneville (Scott and others, 1983). As the lake receded, streams began to incise large deltas formed at the mouths of major canyons along the Wasatch Range, and the eroded material was deposited in shallow lakes and marshes in the basin and in a series of recessional deltas and alluvial fans. Sediments toward the center of the valleys are predominately deep-water deposits of clay, silt and fine sand. However, these deep-water deposits are in places covered by a thin post-Bonneville alluvial cover. Surface soil units as mapped by Biek (2005) as consisted of Historical to Pleistocene-aged material deposits. Based on the soil and groundwater conditions encountered during our investigation, it is considered likely that each of our test pits were terminated in the mapped deposit.

5.2 FAULTING AND SEISMICITY

The site lies within the north-south trending belt of seismicity known as the Intermountain Seismic Belt (ISB) (Hecker, 1993). The ISB extends from northwestern Montana through southwestern Utah. An active fault is defined as a fault that has had activity within the Holocene (<11ka). Based on information provided by Geologic Hazards on the Utah Geologic Hazard Portal, faults associated with the Wasatch Fault Zone (WFZ) are present to the north and east of the subject property (see Plate A-5, *Fault and Fault Special Study Area Map*). No active faults or special study area are mapped through or immediately adjacent to the site (Black and others, 2003, and Constenius, et al., 2011). The closest fault according to Utah Geologic Hazard Portal is 1200 feet northeast of the site. The 157-acre portion of Micron Property is located approximately 5 miles east of the northern strand of the Provo section of the Wasatch Fault Zone. The Provo section is one of the longest sections of the Wasatch Fault Zone (Hecker, 1993) and is estimated to be approximately 43 miles long with a reported rupture length of 37 miles and a maximum potential to produce earthquakes up to magnitude (M_s) 7.5 to 7.7 (Black and others, 2003). The 157-acre portion of Micron Property is also located approximately 6 miles north of the mapped

Utah Lake Faults and Folds (ULFF). The ULFF consists of several northeast to northwest trending faults and folds located beneath Utah Lake and are reported to have been active in the past 15 ka (Black et al, 2003). However, since the ULFF is at the bottom of a large lake these faults are poorly understood – as such, the USGS does not include ULFF in their fault database for seismic hazard analysis. Analysis of the ground shaking hazard along the Wasatch Front suggests that the Wasatch Fault Zone is the single greatest contributor to the seismic hazard in the Salt Lake City region. Each of the faults listed above show evidence of Holocene-aged movement and is therefore considered active.

Spectral responses for the Risk-Targeted Maximum Considered Earthquake (MCE_R) are shown in the table below. These values generally correspond to a one percent probability of structure collapse in 50 years for a “firm rock” site. To account for site effects, site coefficients which vary with the magnitude of spectral acceleration are used. Based on our field exploration to 12 feet and our geologic review of the site, it is our opinion that this location is best described as a Site Class C. The spectral accelerations are calculated based on the site’s approximate latitude and longitude of 40.434° and -111.851° respectively and the Seismic Design Maps web-based application at <https://seismicmaps.org/>.

Description	Value
Site Class	C
S_s - MCE_R ground motion (period – 0.2s)	1.327
S_1 - MCE_R ground motion (period – 1.0s)	0.485
F_a - Site amplification factor at 1.0s	1.200
F_v - Site amplification factor at 1.0s	1.500
PGA - MCE_G peak ground acceleration	0.596
PGA_M – Site modified peak ground acceleration	0.715

It should be noted that our investigation did not include a site-specific ground motion hazard analysis and a Site Class C has been used to determine the seismic parameters presented above based on maximum depths explored of 12 feet and our geologic review. The seismic parameters presented herein may be used for design of the proposed structures provided that structural design allows for the ground motion hazard analysis exception in ASCE 7-16 Section 11.4.8. Alternatively, GeoStrata may be contacted to complete a ground motion hazard analysis in accordance with ASCE 7-16 Chapter 21.

5.3 LIQUEFACTION

Certain areas within the intermountain region possess a potential for liquefaction during seismic events. Liquefaction is a phenomenon whereby loose, saturated, granular soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits causing settlements of overlying layers after an earthquake as excess pore water pressures are dissipated. The primary factors affecting liquefaction potential of a soil deposit are: (1) level and duration of seismic ground motions; (2) soil type and consistency; and (3) depth to groundwater.

Based on our review of the *Liquefaction-Special Study Areas, Wasatch Front and nearby Area, Utah*, this portion of the Micron Property is located in an area currently designated as having a “Very Low to Low” liquefaction potential. “Low” liquefaction potential indicates that there is between a 5% to 10% probability of having an earthquake within a 100-year period that will be strong enough to cause liquefaction. “Very Low” liquefaction potential indicates that there is less than 5% probability of having an earthquake within a 100-year period that will be strong enough to cause liquefaction.

The near-surface soils observed within our test pits consisted of unsaturated soils. Groundwater was not observed in the test pits. A liquefaction analysis was beyond the scope of the project; however, if the owner or client wishes to have greater understanding of the liquefaction potential of the soils at greater depths, a liquefaction analysis should be completed at the site.

5.4 OTHER GEOLOGIC HAZARDS

According to the latest update to the Geologic Hazards on the web-based Utah Geologic Hazard Portal at <https://geology.utah.gov/apps/hazards/>, the 157-acre portion of Micron property is located just outside of special study areas for debris flows and slope stability. Maps of these hazards are included on Plates A-6 to A-7. Recommendations for development in these mapped hazards special study areas, should be addressed in geologic hazard report or reports. The results of these reports and findings may limit the development or require mitigation prior to the development of the site.

6.0 ENGINEERING ANALYSIS AND RECOMMENDATIONS

6.1 GENERAL CONCLUSIONS

Based on the subsurface conditions encountered at the site, it is our opinion that the subject site is suitable for the proposed construction provided that the recommendations contained in this report are complied with. This conclusion should be understood as preliminary, and the results of geologic hazard analysis could designate some portions of this development as hazardous or unbuildable.

The recommendations presented in this report are based on our understanding of the proposed project, the subsurface conditions observed during field exploration, the results of laboratory testing, and our engineering analyses. If subsurface conditions other than those described herein are encountered in conjunction with construction, and/or if design and layout changes are initiated, we must be informed so that the recommendations herein can be reviewed and revised as changes or conditions may require.

Based on our observations, the subject site is overlain by ½ to 2 feet of topsoil. Increased depth of topsoil may be encountered in the drainages or within the alluvial fan deposits. These soils would need to be over-excavated in all areas underlying footing elements, pavements and any other areas which would underlie structural elements of the new development.

As additional layers of undocumented fill soils may exist existing, particularly in the footprint of the existing roadways or batching plant. The owner and contractor should be aware that the possibility exists that thicker sections of undocumented fill than those reported in our test pits may exist.

6.2 EARTHWORK

Prior to the placement of foundations, general site grading is recommended to provide proper support for foundations, exterior concrete flatwork, concrete slabs-on-grade, and pavement sections. Site grading is also recommended to provide proper drainage and moisture control on the subject property and to aid in preventing differential movement in foundation soils as a result of variations in moisture conditions.

6.2.1 General Site Preparation and Grading

In areas beneath footings and concrete flat work, the highly organic topsoil (top 3 to 6 inches) should be stripped and stockpiled for use in landscape areas or disposal. Debris, vegetation, undocumented fill, roots, loose, soft or other deleterious materials should also be removed. If over-excavation is required, the excavation should extend a minimum of one foot laterally for every foot of depth of over-excavation. The exposed subgrade should be proof-rolled with heavy equipment to identify loose, soft or otherwise disturbed soils. If soft soils are observed, they should be stabilized in accordance with our recommendations in the Soft Soil Stabilization Section (Section 6.2.4); if loose soils are observed, they should be compacted as recommended in Section 6.2.5.

A GeoStrata representative should observe the site preparation and grading operations to assess that the recommendations presented in this report are complied with.

6.2.2 Excavation Stability

Based on Occupational Safety and Health Administration (OSHA) guidelines for excavation safety, trenches with vertical walls up to 5 feet in depth may be occupied, however, the presence of fill soils, loose soils, or wet soils may require that the walls be flattened to maintain safe working conditions. When the trench is deeper than 5 feet, we recommend a trench-shield or shoring be used as a protective system to workers in the trench. Based on our soil observations, laboratory testing, and OSHA guidelines, native soils at the site classify as Type C soils. Deeper excavations, if required, should be constructed with side slopes no steeper than one and one-half horizontal to one vertical (1.5H:1V). Wet conditions should be anticipated side slopes will likely need to be further flattened to maintain slope stability. Alternatively, shoring or trench boxes may be used to improve safe work conditions in trenches. The contractor is ultimately responsible for trench and site safety. Pertinent OSHA requirements should be met to provide a safe work environment. If site specific conditions arise that require engineering analysis in accordance with OSHA regulations, GeoStrata can respond and provide recommendations as needed.

We recommend that a GeoStrata representative be on-site during all excavations to assess the exposed soils in trench walls.

6.2.3 Soft Soil Stabilization

Based on observations during our field investigation, if near-surface soils become saturated soft or pumping soils may be exposed in excavations at the site. Once exposed, all subgrade surfaces beneath proposed structure, pavements, and flat work concrete should be proof rolled with heavy wheeled-construction equipment. If soft or pumping soils are encountered, these soils should be stabilized prior to construction of footings. Stabilization of the subgrade soils can be accomplished using a clean, coarse angular material worked into the soft subgrade. We recommend the material be greater than 2-inch diameter, but less than 6 inches. A locally available pit-run gravel may be suitable but should contain a high percentage of particles larger than 2 inches and have less than 7 percent fines (material passing the No. 200 sieve). A pit-run gravel may not be as effective as a coarse, angular material in stabilizing the soft soils and may require more material and greater effort. The stabilization material should be worked (pushed) into the soft subgrade soils until a firm relatively unyielding surface is established. Once a firm, relatively unyielding surface is achieved, the area may be brought to final design grade using structural fill.

In large areas of soft subgrade soils, stabilization of the subgrade may not be practical using the method outlined above. In these areas it may be more economical to place a woven geotextile fabric against the soft soils covered by 18 inches of coarse, sub-rounded to rounded material over the woven geotextile. An inexpensive non-woven geotextile “filter” fabric should also be placed over the top of the coarse, sub-rounded to rounded fill prior to placing structural fill or pavement section soils to reduce infiltration of fines from above. The woven geotextile should be Mirafi RS280i or prior approved equivalent. The filter fabric should consist of a Mirafi 140N, or equivalent as approved by the Geotechnical Engineer.

We recommend that a GeoStrata representative be on-site to assess the exposed excavation soils and be allowed to review the excavation plans when they are prepared in order to evaluate their compatibility with these recommendations.

6.2.4 Structural Fill and Compaction

All fill placed for the support of structures, flatwork or pavements, should consist of structural fill. Onsite soils may be utilized for structural fill, although the contractor should be aware that due to the over-sized aggregates or the clayey composition of the native soils, it may be difficult if not impossible to maintain active and accurate proctor values for moisture conditioning and compaction. As such, the native soil onsite may need to be screened and well mixed prior to the

use of the native soils as structural fill for development. Onsite undocumented fill soils may likewise be used as structural fill. The contractor should have confidence that the anticipated method of compaction will be suitable for the type of structural fill used. All structural fill should be free of vegetation, debris or frozen material, and should contain no inert materials larger than **4 inches** in nominal diameter.

If an imported material will be used as structural fill, it should consist a relatively well-graded granular soil with a maximum of 50 percent passing the No. 4 sieve and a maximum fines content (minus No.200 mesh sieve) of 25 percent. Fill material portion finer than the No. 40 sieve should have a liquid limit (LL) less than 35 and a plasticity index (PI) less than 25. The table below provides our recommended gradation and Atterberg limits requirements for structural fill.

Grain Size	Percent Passing
4-inch	100
2-inch	85 to 100
No. 4	15 to 50
No. 200	< 25
Liquid Limit (LL)	<35
Plasticity Index (PI)	<25

All structural fill soils should be approved by the Geotechnical Engineer prior to placement. Earth materials not meeting the aforementioned criteria may be suitable for use as structural fill; however, such material should be evaluated on a case-by-case basis and should be approved by the Geotechnical Engineer prior to use. These requirements for structural fill meet the needs of the site; however, regulating entities including special service districts, cities etc. may require the use of a predefined structural fill for use in their utility corridors/trenches. The contractor should be aware of the special requirements of structural fill by these regulating entities.

GeoStrata observed that some of the native soils meet the requirements for A-1-a according to AASTHO soil classification system. A table of the laboratory tests and soil classification are provided below;

Sample Location	USCS Classification	AASTHO Classification	Can be used as onsite structural fill?
MW-TP-17	SM	A-2-4	Yes
MW-TP-24	GC	A-2-6	Yes
MW-TP-25	SP-SM	A-1-b	Yes
MW-TP-26	SM	A-2-4	Yes
MW-TP-29	SC	A-2-6	Yes
MW-TP-31	CL	A-6	No
MW-TP-32	CL	A-6	No
MW-TP-33	GP-GM	A-1-a	Yes
MW-TP-36	ML	A-2-4	No
MW-TP-36	ML	A-2-4	Yes
MW-TP-37	GP	A-1-a	Yes
MW-TP-39	CL	A-6	No
MW-TP-41	GC	A-6	Yes
MW-TP-42	SM	A-4	Yes
MW-TP-45	CL	A-6	No
MW-TP-46	GM	A-4	Yes
MW-TP-49	SC	A-6	Yes
MW-TP-51	CL	A-6	No
MW-TP-53	CL	A-6	No

All structural fill should be placed in maximum 10-inch loose lifts if compacted by small hand-operated compaction equipment, maximum 12-inch loose lifts if compacted by riding rollers or heavy-duty compaction equipment that is capable of efficiently compacting the entire thickness of the lift. We recommend that all structural fill be compacted on a horizontal plane, unless otherwise approved by the geotechnical engineer. Structural fill should be compacted to at least 95% of the maximum dry density, as determined by ASTM D-1557, for fill 5 feet or less in thickness. The required compaction should be increased to 98% for fills greater than 5 feet in thickness. The moisture content should be at or slightly above the optimum moisture content at the time of placement and compaction. Also, prior to placing any fill, the excavations should be observed by the geotechnical engineer to observe that any unsuitable materials or loose soils have been removed. In addition, proper grading should precede placement of fill, as described in the **General Site Preparation and Grading** subsection of this report (Section 6.2.1).

We understand that grading fills and structural fill will be placed up to 12 feet in total height. Fill soils placed for subgrade below exterior flat work and pavements, should be within 3% of the optimum moisture content when placed and compacted to at least 95% of the maximum dry density as determined by ASTM D-1557, for fills less than 6 feet in depth. Fill soils placed for subgrade below exterior flat work and pavements, should be within 3% of the optimum moisture content when placed and compacted to at least 95% of the maximum dry density as determined by ASTM D-1557, for fills more than 6 feet and less than 12 feet in depth. Contact Geostrata for recommendations for fill placement exceed 12 feet in depth. All utility trenches backfilled below the proposed structure, pavements, and flatwork concrete, should be backfilled with onsite soils or structural fill that is within 3% of the optimum moisture content when placed and compacted to at least 95% of the maximum dry density as determined by ASTM D-1557. All other trenches, in landscape areas, should be backfilled and compacted to at least 90% of the maximum dry density (ASTM D-1557).

The gradation, placement, moisture, and compaction recommendations contained in this section meet our minimum requirements but may not meet the requirements of other governing agencies such as city, county, or state entities. If their requirements exceed our recommendations, their specifications should override those presented in this report.

6.3 FOUNDATIONS

The foundations for the proposed structures may consist of conventional strip and/or spread footings. Strip and spread footings should be a minimum of 20 and 30 inches wide, respectively, and exterior shallow footings should be embedded at least 30 inches below final grade for frost protection and confinement. Interior shallow footings not susceptible to frost conditions should be embedded at least 18 inches for confinement.

6.3.1 Installation and Bearing Material

Due to the presence of dense granular soils (sands and gravels) and fine-grained soils with low potential for collapsible soil present at the proposed buildings elevations (between 2 to 8 feet below the existing ground surface), strip and spread footings can be placed entirely on non-collapsible undisturbed native soils. If soil at the foundation elevation appears to have a hydro-collapsible nature (pinholes, low natural density, etc.), collapse testing in the laboratory should be performed on a lot-by-lot basis to confirm that potential collapse will not adversely affect the proposed construction. Foundation elements should not be founded on collapsible soils, and if these soils are encountered, they should be over-excavated according to the results of lot-

specific laboratory collapse testing. According to our preliminary soil collapse testing, structural fill depth below footings will be 0 to 24 inches. The site may then be brought back up to design grade using properly placed and compacted structural fill. Structural fill should meet material recommendations and be placed and compacted as recommended in Section 6.2.4 of this report.

Foundation elements should not be founded on undocumented fill, and if these soils are encountered, they should be over-excavated until suitable, native soils are exposed. Foundation elements should not be founded on combination soils, and if these soils condition are encountered, they should be over-excavated a minimum of 1-foot. The site may then be brought back up to design grade using properly placed and compacted structural fill. Structural fill should meet material recommendations and be placed and compacted as recommended in Section 6.2.5 of this report.

All organic material, soft areas, frozen material or other inappropriate material shall be removed from the footing zone to a depth determined by the Geotechnical Engineer and be replaced with structural fill where over excavation is required.

6.3.2 Bearing Pressure

Conventional strip and spread footings founded on a native soil or on structural fill may be proportioned for a maximum net allowable bearing capacity of **1,900 pounds per square foot (psf)**. The recommended net allowable bearing pressure refers to the total dead load and can be increased by $\frac{1}{3}$ to include the sum of all loads including wind and seismic.

6.3.3 Settlement

Settlements of properly designed and constructed conventional footings, founded as described above, are anticipated to be less than 1 inch. Differential settlements should be on the order of half the total settlement over 30 feet.

6.3.4 Frost Depth

All exterior footings and spread footings are to be constructed at least 30 inches below the ground surface for frost protection and confinement. This includes walk-out areas and may require fill to be placed around buildings. Interior strip footings not susceptible to frost conditions should be embedded at least 18 inches for confinement. If foundations are constructed through the winter months, all soils on which footings will bear shall be protected from freezing.

6.3.5 Construction Observation

A geotechnical engineer shall periodically monitor excavations prior to installation of footings. Inspection of soil before placement of structural fill or concrete 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 under the direction of a geotechnical engineer for material and compaction requirements.

6.3.6 Foundation Drainage

As stated in Section 4.2.2 of this report, groundwater was not encountered in the test pits. IRC Section R405 *Foundation Drainage* recommends the construction of a foundation drain around any walls or portions thereof that retain earth and enclose spaces and floors below grade. Where a site is located in well-drained gravel or sand/gravel mixture soils, a dedicated drainage system is not required.

We recommend that the IRC Section R405 Foundation Drainage recommends be complied with. The foundation drain should consist of a 4-inch perforated pipe placed at or below the footing elevation. The pipe should be covered with at least 12 inches of free draining gravel (containing less than 5 percent passing the No. 4 sieve) and be graded to a free gravity outfall or to a pumped sump. A separator fabric, such as Mirafi 140N, should separate the free draining gravel and native soil (i.e. the separator fabric should be placed between the gravel and the native soils at the bottom of the gravel, the side of the gravel where the gravel does not lie against the concrete footing or foundation and at the top of the gravel). We recommend that the gravel extend up the foundation wall to within 2 feet of the final ground surface. As an alternative, the gravel extending up the foundation wall may be replaced with a prefabricated drain panel, such as Ecodrain-E. We recommend that the foundation drain construction be observed and documented in a subsequent observation letter.

As an added precaution the following moisture protection mitigation recommendation should be implemented to help reduce the risk from potential settlement from occurring. These items are summarized as follows:

- Moisture should not be allowed to infiltrate into the soils in the vicinity of the foundations. As such, design strategies to minimize ponding and infiltration near the home should be implemented.

- The ground surface within 10 feet of the entire perimeter of the building should slope a minimum of five percent away from the structure. Alternatively, a slope of 5% is acceptable if the water is conveyed to a concrete ditch that will convey the water to a point of discharge that is at least 10 feet from the structures.
- Roof runoff devices (rain gutters) should be installed to direct all runoff a minimum of 10 feet away from the structure and preferably day-lighted to the curb where it can be transferred to the storm drain system. Rain gutters discharging roof runoff adjacent to or within the near vicinity of the structure may result in excessive differential settlement.
- We recommend irrigation around foundations be minimized by selective landscaping and that irrigation valves be constructed at least 5 feet away from foundations.
- Jetting (injecting water beneath the surface) to compact backfill against foundation soils may result in excessive settlement beneath the building and is not allowed.
- Backfill against foundations walls should be placed and compacted in accordance with the Section 6.2.4.
- Any additional precautions which may become evident during construction.

6.4 CONCRETE SLAB-ON-GRADE CONSTRUCTION

Concrete slabs-on-grade should be constructed over at least 4 inches of compacted gravel. Disturbed native soils should be compacted to at least 95% of the maximum dry density as determined by ASTM D-1557 (modified proctor) prior to placement of gravel. The gravel should consist of road base or clean drain rock with a ¾-inch maximum particle size and no more than 12 percent fines passing the No. 200 mesh sieve. The gravel layer should be compacted to at least 95 percent of the maximum dry density of modified proctor or until tight and relatively unyielding if the material is non-proctorable. The maximum load on the floor slab should not exceed 100 psf; greater loads would require additional subgrade preparation and additional structural fill. All concrete slabs should be designed to minimize cracking as a result of shrinkage. Consideration should be given to reinforcing the slab with welded wire, re-bar, or fiber mesh.

6.5 EARTH PRESSURE AND LATERAL RESISTANCE

Lateral forces imposed upon conventional foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footing and the supporting subgrade. In determining the frictional resistance, a coefficient of friction of 0.41 should be used for native soils against concrete or 0.43 for structural fill against concrete.

Ultimate lateral earth pressures from native soil backfill acting against retaining walls and buried structures may be computed from the lateral pressure coefficients or equivalent fluid densities presented in the following table:

Condition	Lateral Pressure Coefficient	Equivalent Fluid Density (pounds per cubic foot)
Active ¹	0.29	34
At-rest ²	0.48	58
Passive ¹	11.62	1394
Seismic Active ³	0.32	38
Seismic Passive ⁴	-8.92	-1071

¹Based on Coulomb's equation

²Based on Jaky

³Based on Lew et al. (2010)

⁴Based on Mononobe-Okabe Equation

These coefficients and densities assume level, granular backfill with no buildup of hydrostatic pressures. The force of the water should be added to the presented values if hydrostatic pressures are anticipated. If sloping backfill is present, we recommend the geotechnical engineer be consulted to provide more accurate lateral pressure parameters once the design geometry is established.

Walls and structures allowed to rotate slightly should use the active condition. If the element is constrained against rotation, the at-rest condition should be used. These values should be used with an appropriate factor of safety against overturning and sliding. A value of 1.5 is typically used. Additionally, if passive resistance is calculated in conjunction with frictional resistance, the passive resistance should be reduced by ½.

For seismic analyses, the *active* and *passive* earth pressure coefficient provided in the table is based on Lew et al (2010) and Mononobe-Okabe respectively and only accounts for the dynamic horizontal thrust produced by ground motion. Hence, the resulting dynamic thrust pressure should be added to the static pressure to determine the total pressure on the wall. The pressure distribution of the dynamic horizontal thrust may be closely approximated as an inverted triangle with stress decreasing with depth and the resultant acting at a distance approximately 0.6 times the loaded height of the structure, measured upward from the bottom of the structure.

The coefficients shown assume a vertical wall face. Hydrostatic and surcharge loadings, if any, should be added. Over-compaction behind walls should be avoided. Resisting passive earth pressure from soils subject to frost or heave, or otherwise above prescribed minimum depths of embedment, should usually be neglected in design.

6.6 PAVEMENT SECTION

For pavement design, the following CBR laboratory test result was obtained:

Test Pit	Depth (ft)	Soil Type	CBR (%)
MW- TP-41	1.5	GC	10.9
MW- TP-41	2.0	CL	5.3

The test results indicate a low CBR value of 5.3. No traffic information was available at the time this report was prepared; therefore, GeoStrata has assumed traffic counts for the local and private roads and parking areas. We assumed that vehicle traffic along the local and private roadways will consist of approximately 1,500 passenger car trips per day, 2 small trucks per day, and 2 large trucks per day with a 20-year design life. Based on these assumptions, our analysis uses 51,000 ESAL's for for a 20-year design life of the pavement. We assumed that vehicle traffic along the collector and arterial roads will consist of approximately 1,275,000 ESAL's for a 20-year design life (approximately 25 times greater than private roads).

Based on these assumptions, our analysis uses 51,000 and 1,275,000 ESAL's for the traffic over the life of the pavement. Asphalt has been assumed to be a high stability plant mix or Superpave mix with a minimum CBR of 70. The untreated base course material (road base or UTBC) composed of crushed stone with a minimum CBR of 30. The table below presents equivalent recommended pavement sections based on the above assumptions. The City of Lehi minimum pavement sections may govern the pavement design.

Local and Private Roadways Pavement Sections

Pavement Materials	Recommended Minimum Thickness (in)		
	Pavement 1	Pavement 2	City Minimum
Asphaltic Concrete	3	3	3
Untreated Base Course	6	10	6
Granular Borrow/ Engineered Fill	8	0	12

Collector and Arterial Pavement Sections

Pavement Materials	Recommended Minimum Thickness (in)		
	Pavement 1	Pavement 2	City Minimum
Asphaltic Concrete	5	6	6.5
Untreated Base Course	8	8	6
Granular Borrow/ Engineered Fill	15	10	12

The pavement section thicknesses above assume that there is no mixing over time between the road base and the softer native layers below. In order to prevent mixing or fines migration, and thereby prolong the life of the pavement section, we recommend that the owner give consideration to placing a non-woven filter fabric between the native soils and the road base. We recommend that a Propex Geotex® NW-401, NW-601, or a GeoStrata-approved equivalent be used.

If traffic conditions vary significantly from our stated assumptions, GeoStrata should be contacted so we can modify our pavement design parameters accordingly. Specifically, if the traffic counts are significantly higher or lower, we should be contacted to review the pavement sections as necessary. The pavement sections thicknesses above assumes that the majority of construction traffic including cement trucks, cranes, loaded haulers, etc. has ceased. If a significant volume of construction traffic occurs after the pavement section has been constructed, the owner should anticipate maintenance or a decrease in the design life of the pavement area.

In our experience, in areas with heavy truck loads where trucks frequently turn around, backup, or load and unload, such as areas around dumpsters, pavements experience more distress. To prolong the life of the pavement in these areas, consideration should be given to using a Portland cement concrete (rigid) pavement in these areas. The table below presents our recommended rigid pavement section.

Rigid Pavement Section

Pavement Materials	Recommended Minimum Thickness (in)
	Rigid Pavement 1
Concrete	5
Untreated Base Course	6

Concrete should consist of a low slump, low water cement ratio mix with a minimum 28-day compressive strength of 4,000 psi. Base course should be compacted to at least 95% of the maximum dry density as determined by the ASTM D-1557.

The pavement sections discussed above meet our minimum recommendations for pavement design. It should be noted that more stringent pavement section requirements may be enforced by Lehi City, Utah County or other governing agency.

7.0 CLOSURE

7.1 LIMITATIONS

The recommendations contained in this report are based on our limited field exploration, laboratory testing, and understanding of the proposed construction. The subsurface data used in the preparation of this report were obtained from the explorations made for this investigation. It is possible that variations in the soil and groundwater conditions could exist between and beyond the points explored. The nature and extent of variations may not be evident until construction occurs. If any conditions are encountered at this site that are different from those described in this report, GeoStrata should be immediately notified so that we may make any necessary revisions to recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, GeoStrata should be notified.

This report was prepared in accordance with the generally accepted standard of practice at the time the report was written. No other warranty, expressed or implied, is made.

It is the Client's responsibility to see that all parties to the project including the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

7.2 ADDITIONAL SERVICES

The recommendations made in this report are based on the assumption that an adequate program of tests and observations will be made during construction. GeoStrata staff should be on site to verify compliance with these recommendations. These tests and observations should include, but not necessarily be limited to, the following:

- Observations and testing during site preparation, earthwork and structural fill placement.
- Observation of foundation soils to assess their suitability for footing placement.
- Observation of soft/loose soils over-excavation.
- Observation of temporary excavations and shoring.
- Consultation as may be required during construction.
- Quality control and observation of concrete placement.

We also recommend that project plans and specifications be reviewed by GeoStrata to verify compatibility with our conclusions and recommendations. Additional information concerning the scope and cost of these services can be obtained from our office.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding the report or wish to discuss additional services, please do not hesitate to contact us at your convenience at (801) 501-0583.

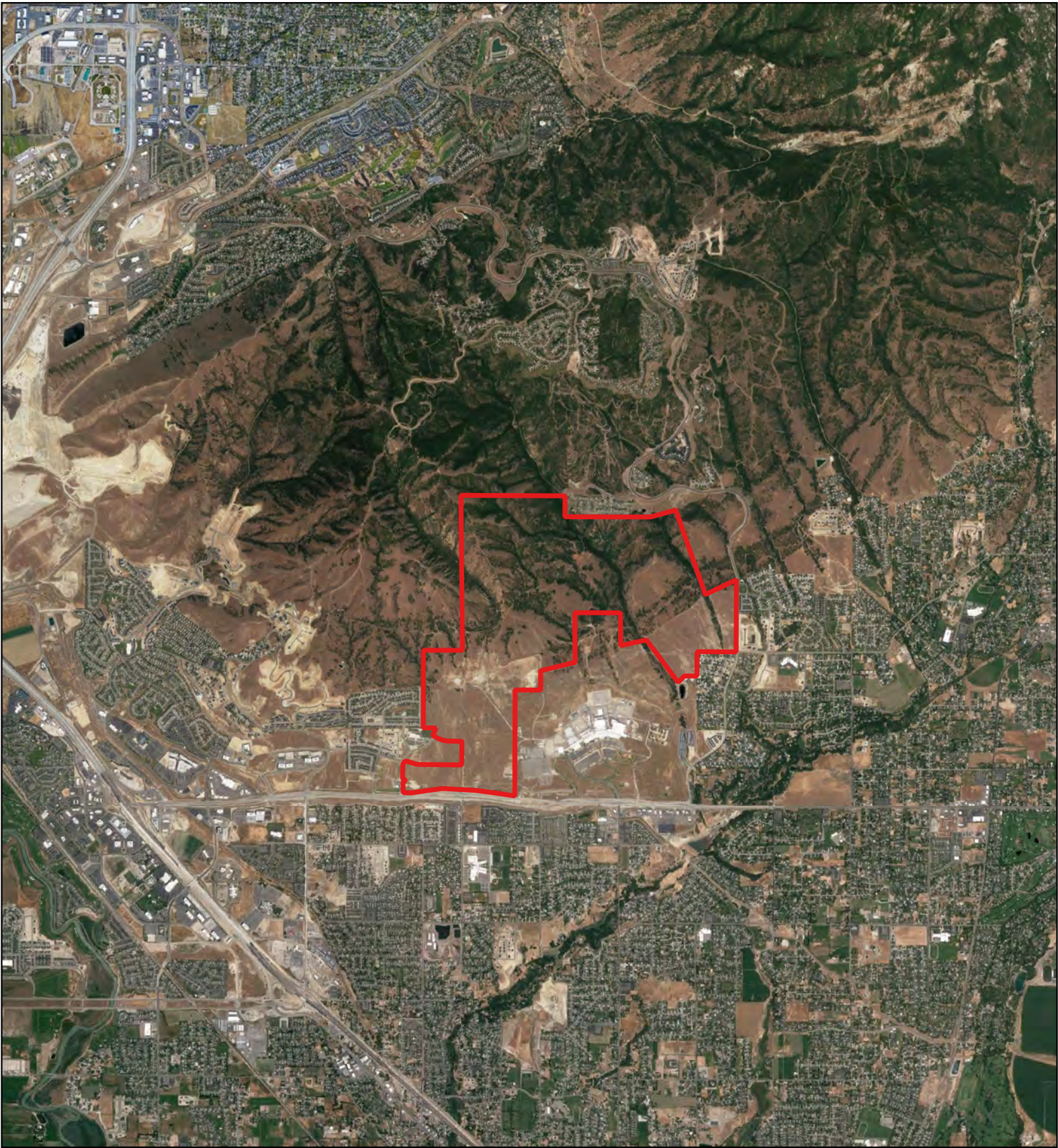
7.3 ACKNOWLEDGEMENTS

This project was made possible through the help of Dan Mitchell and Scott Bishop with D.R. Horton, they scheduled meetings with the landowners and worked on permits for land disturbance and scheduled a second trackhoe to dig the east side of the property test pits at the site. Dale Judd with JSI Ventures, LLC, the operator with the excavation company that completed the test pits on the west side of the property. Bryce Jackson, E.I.T., Nate Flores, Ashley Peay, and James Moore with GeoStrata all logged test pits and collected samples at the site. Jerry Olson and Jack Berry with Micron Technology, Inc met multiple times to discuss utility location. There are others with GeoStrata, D.R. Horton, and Micron Technology Inc. that made this project happen. Thank you.


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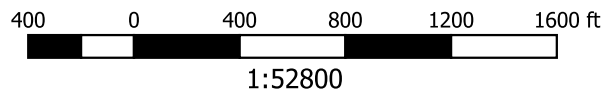
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APPENDIX A



Legend

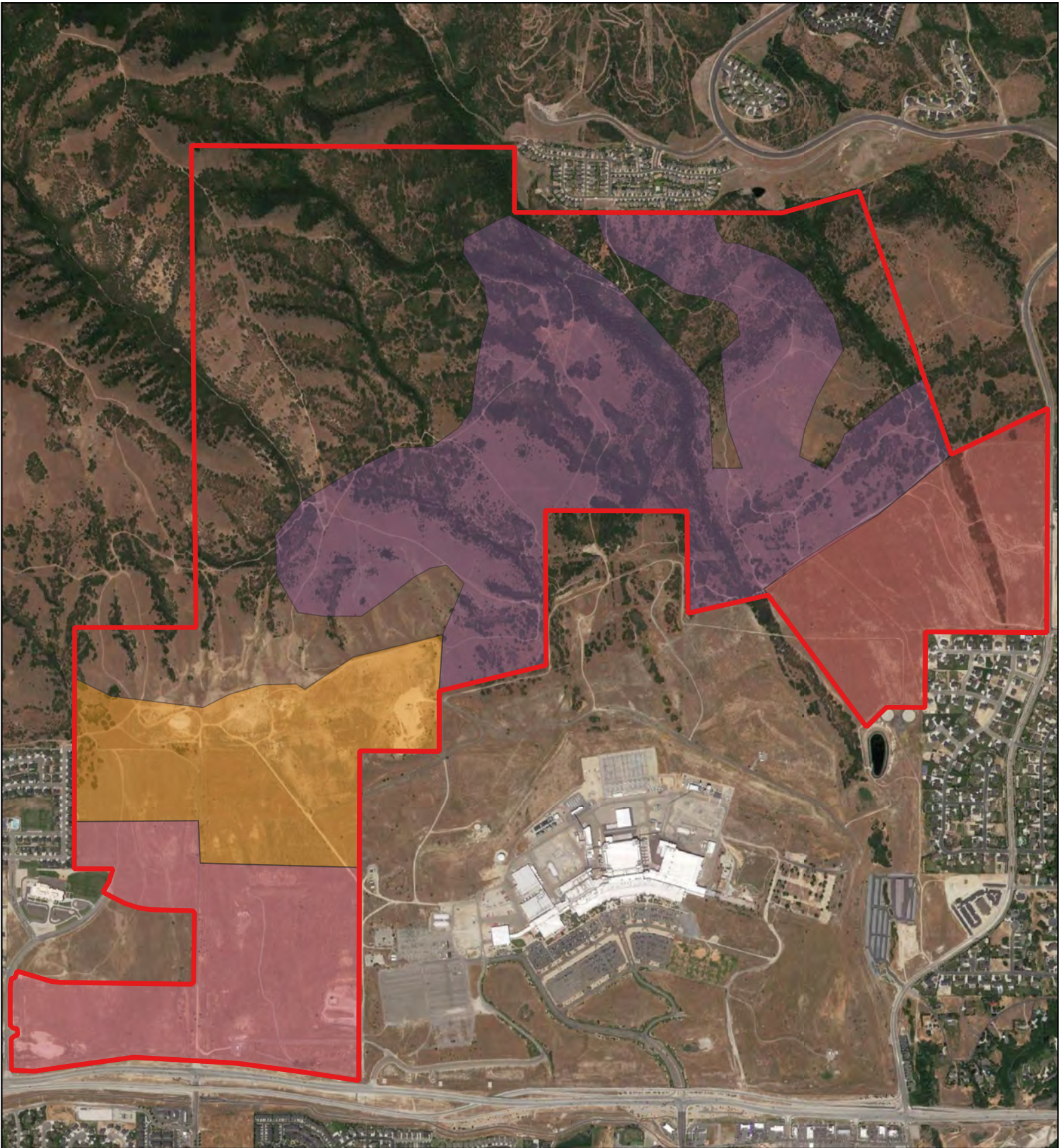
 Boundaries



D.R. Horton
Mircon Property
Lehi/Draper, Utah
Project Number

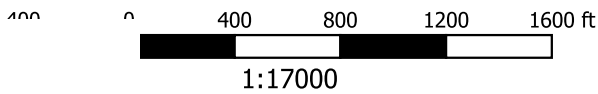
Site Vicinity Map

Plate
A-1



Legend

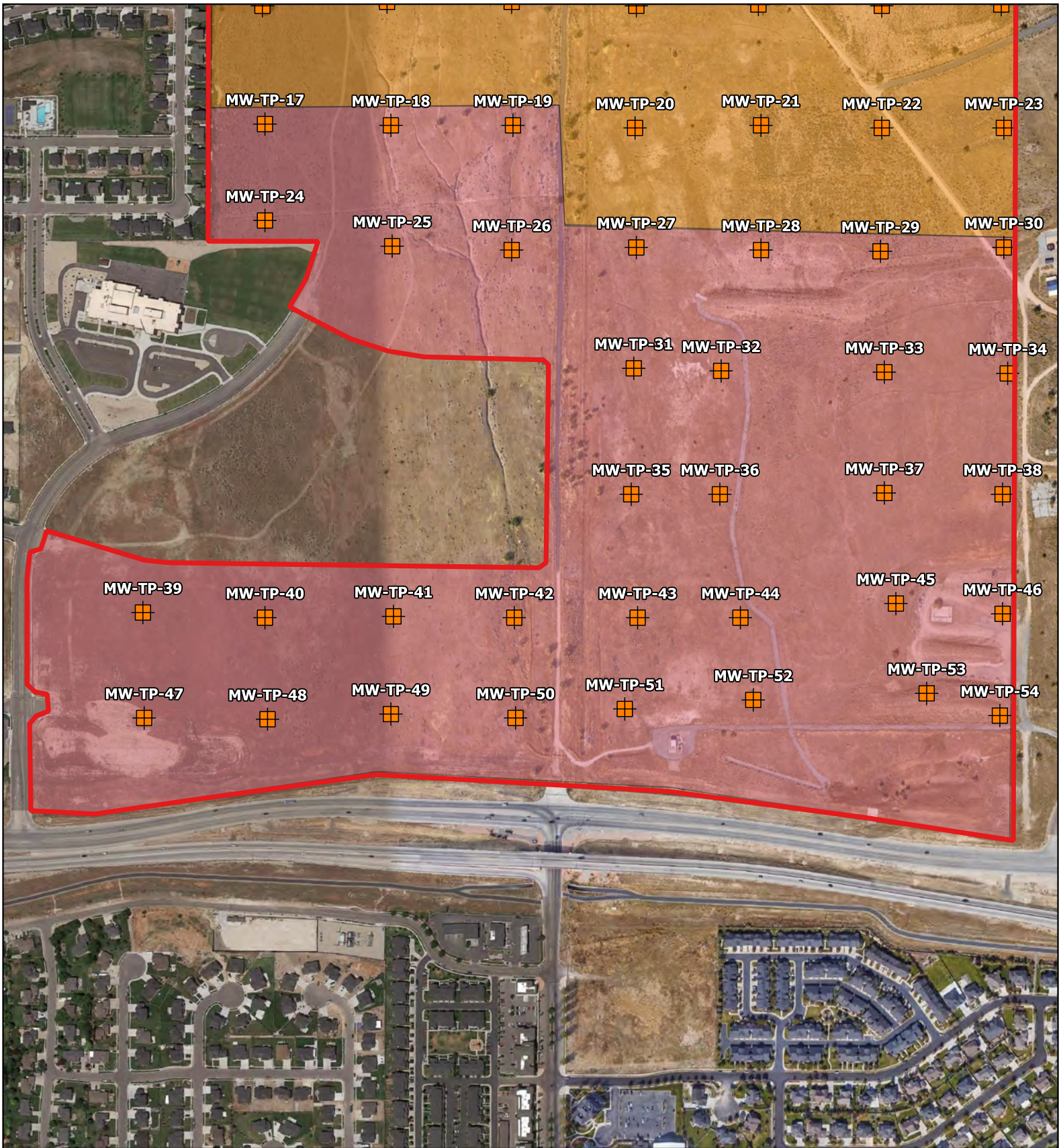
- Mircon Property Boundaries
- High Density Single Family, Commercial, and Apartments
- Lehi Emerald Single Family and Single Family
- Highland Emerald Single Family
- Mountain Single Family



D.R. Horton
 Mircon Property
 Lehi/Draper, Utah
 Project Number

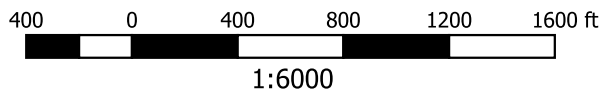
Site Section Map

**Plate
 A-2**



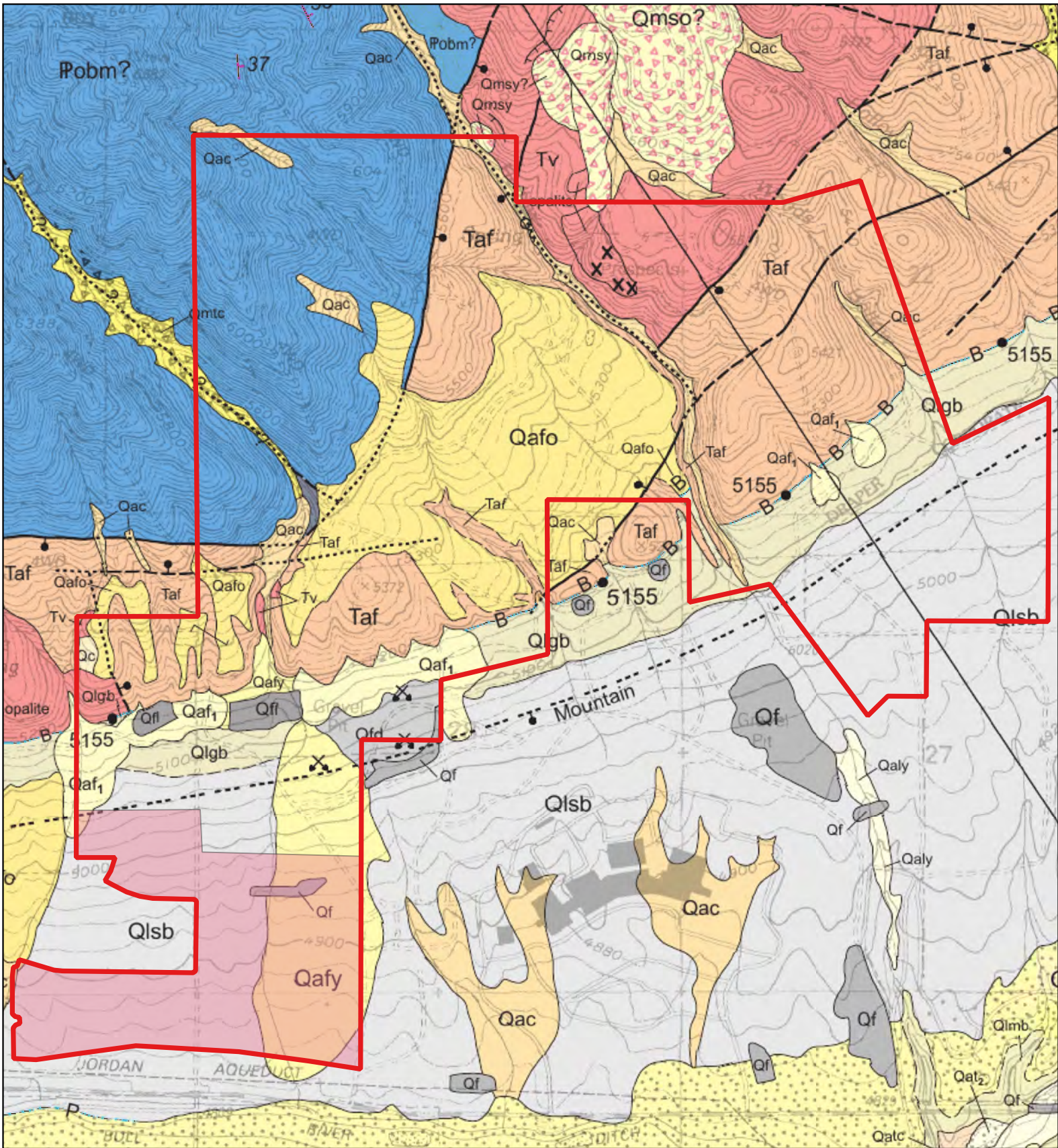
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- Mircon Property Boundaries
- Approximate Test Pit Location
- High Density Single Family, Commercial, and Apartments
- Lehi Emerald Single Family and Single Family



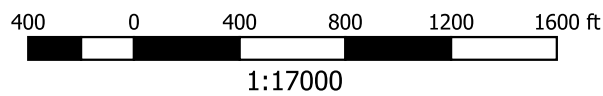
D.R. Horton
 Mircon Property
 Lehi/Draper, Utah
**High Density Single Family, Commercial, and
 Apartment Section Exploration Map**

**Plate
 A-3**



Legend

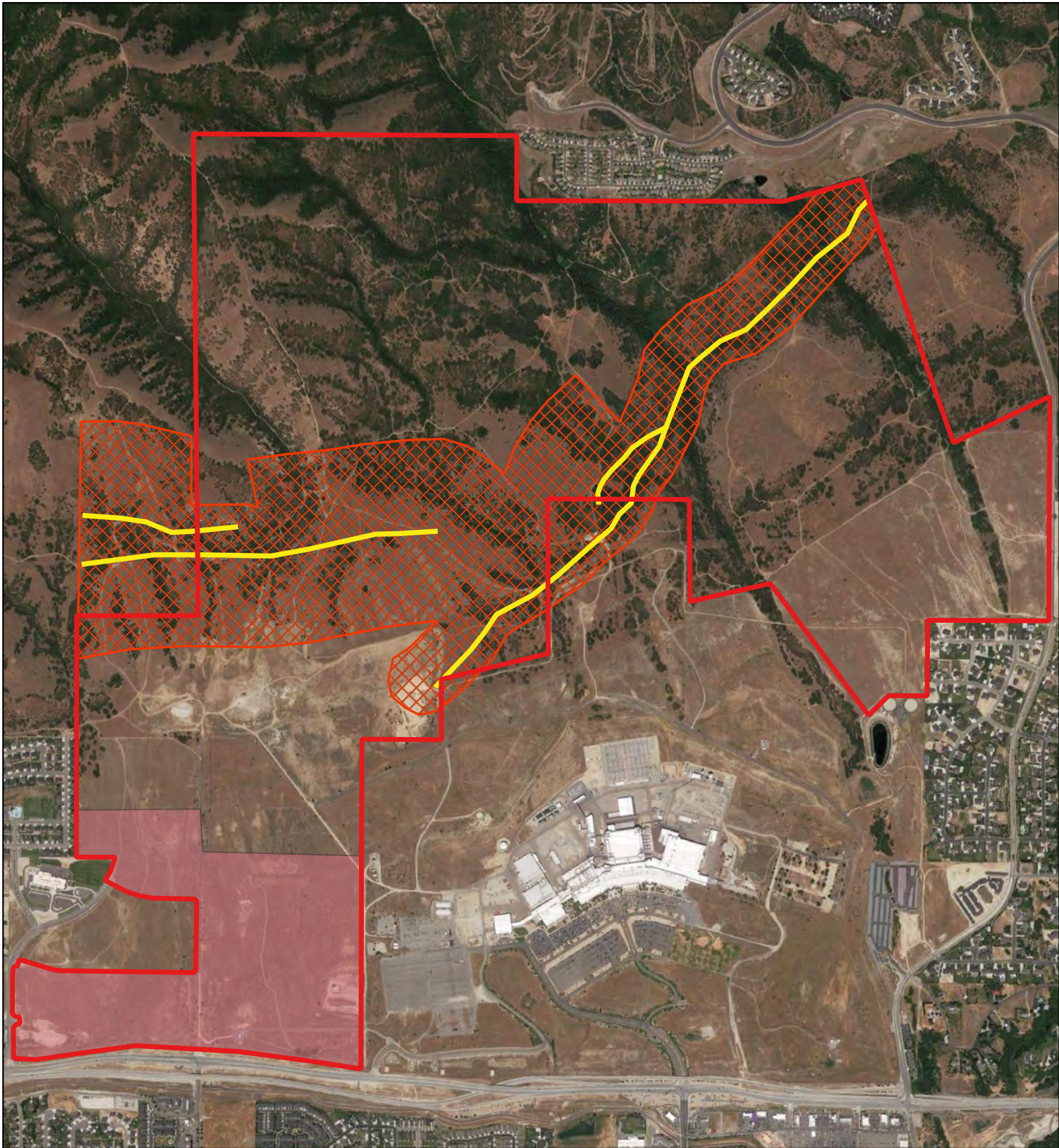
- Mircon Property Boundaries
- High Density Single Family, Commercial, and Apartments



D.R. Horton
 Mircon Property
 Lehi/Draper, Utah
 Project Number 589-100

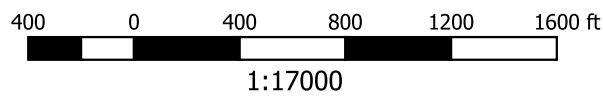
**Plate
 A-4**

Site Geology Map



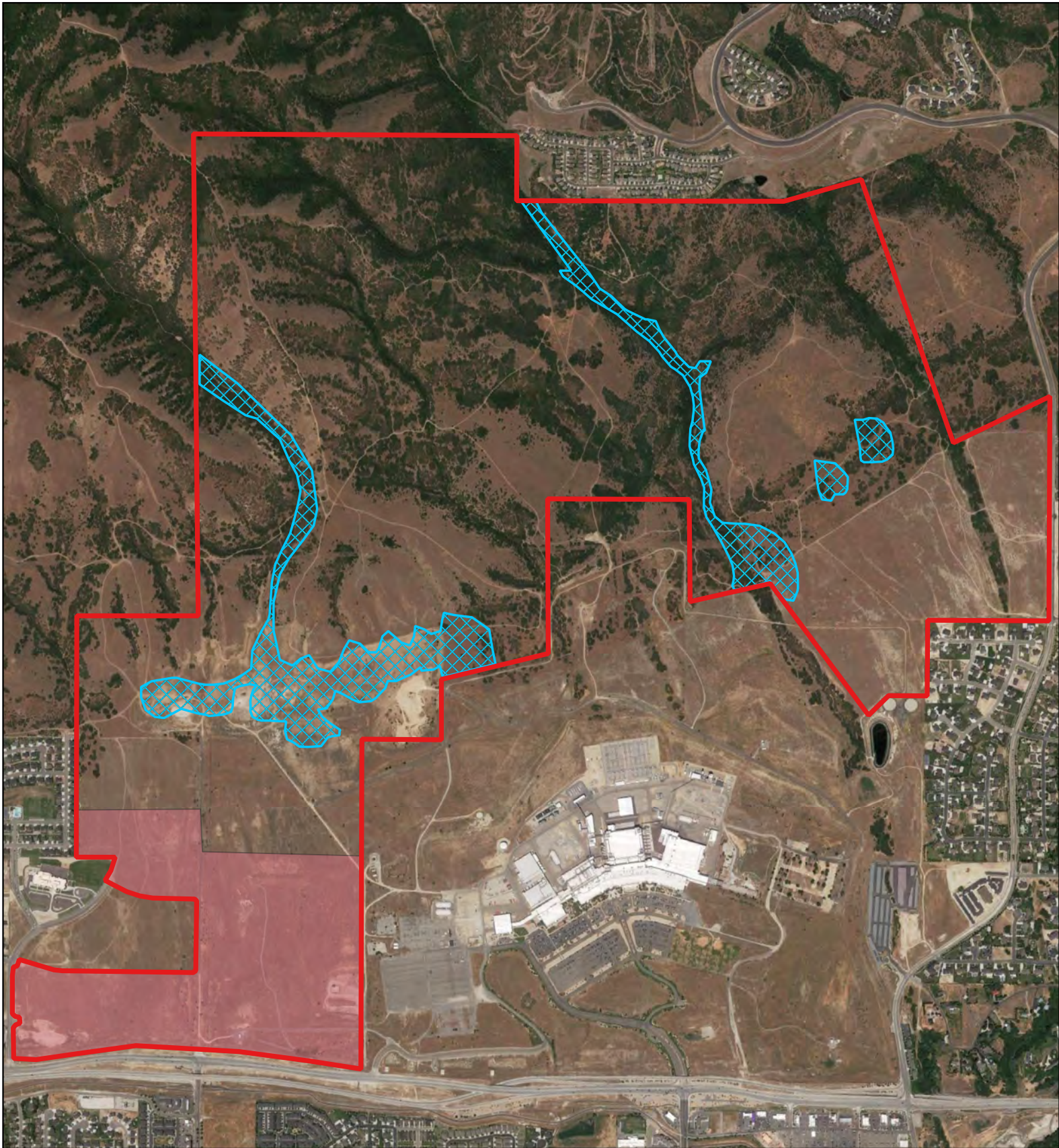
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- Mircon Property Boundaries
- High Density Single Family, Commercial, and Apartments
- Approximate Faults
- Fault Special Study Area



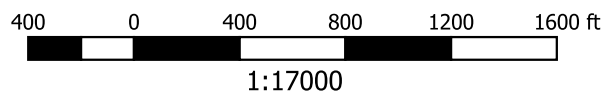
D.R. Horton
 Mircon Property
 Lehi/Draper, Utah
 Project Number 589-100
Faults and Fault Special Study Area Map

**Plate
 A-5**



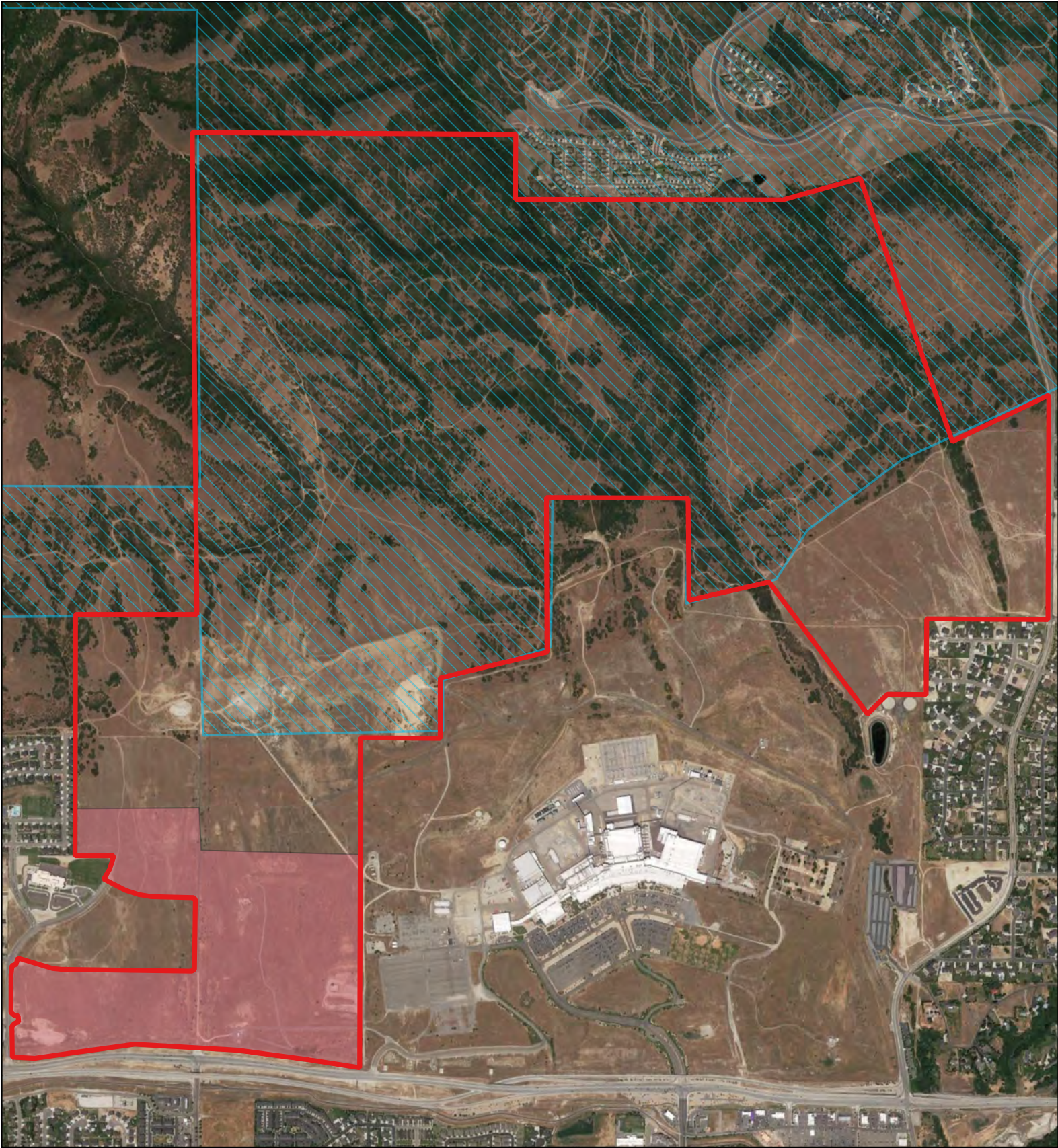
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- Mircon Property Boundaries
- High Density Single Family, Commercial, and Apartments
- Debris Flow Study Areas



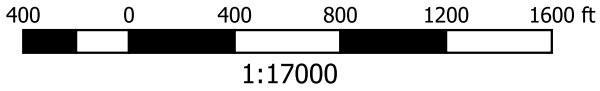
D.R. Horton
 Mircon Property
 Lehi/Draper, Utah
 Project Number 589-100
Debris Flow Special Study Area Map

**Plate
 A-6**



Legend

- Mircon Property Boundaries
- Slope Stability Special Study Area
- High Density Single Family, Commercial, and Apartments



D.R. Horton
 Mircon Property
 Lehi/Draper, Utah
 Project Number 589-100

Slope Special Study Area Map

**Plate
 A-7**

APPENDIX B

DATE STARTED: 12/2/20 COMPLETED: 12/2/20 BACKFILLED: 12/2/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-17 Sheet 1 of 1									
										LOCATION NORTHING 4,476,957.00 EASTING 4,476,957.00 ELEVATION 5,040-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH METERS FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	0 0 TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty SAND with gravel - medium dense, moist, dark brown SM 1 5 2 3 10 SM Sandy SILT with gravel - stiff, moist, light brown 4 Bottom of Test Pit @ 12 Feet						4.1	25.6	NP	NP	●		



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate
B - 1

DATE STARTED: 12/2/20 COMPLETED: 12/2/20 BACKFILLED: 12/2/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-18 Sheet 1 of 1									
										LOCATION NORTHING 4,476,959.00 EASTING 4,476,959.00 ELEVATION 5,024-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION											
	0	0				CL TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Lean CLAY with sand - stiff, moist, dark brown -light brown, with iron staining SP Poorly Graded SAND with gravel - medium dense, moist, light brown, subrounded gravel up to 3 inches in diameter Bottom of Test Pit @ 12 Feet	86.7	20.1	85.1		●						



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate

B - 2

DATE STARTED: 12/2/20 COMPLETED: 12/2/20 BACKFILLED: 12/2/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-19 Sheet 1 of 1									
										LOCATION NORTHING 4,476,956.00 EASTING 4,476,956.00 ELEVATION 5,018-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION											
	0	0				SM	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Silty SAND with gravel - dense, moist, light brown, gravels and cobbles up to 6 inches in diameter										
	1					ML	Sandy SILT - stiff, moist, tan	88.6	8.1	65.1	●						
	2					SM	Silty SAND with gravel - dense, moist, tan, gravels and cobbles up to 6 inches in diameter										
	3	10					Bottom of Test Pit @ 12 Feet										
	4																



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate
B - 3

DATE STARTED: 12/2/20 COMPLETED: 12/2/20 BACKFILLED: 12/2/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-24 Sheet 1 of 1							
										LOCATION NORTHING 4,476,845.80 EASTING 4,476,845.80 ELEVATION 5,001-ft					
										MATERIAL DESCRIPTION					
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
												Plastic Limit	Moisture Content	Liquid Limit	
	0	0				ML						10	30	40	
						GC		3.8	13.5	27	12		50	60	
	1					SP							70	80	
	2												90		
	3	10													
	4														
							Bottom of Test Pit @ 12 Feet								



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate
B - 4

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-25 Sheet 1 of 1									
										LOCATION NORTHING 4,476,814.00 EASTING 4,476,814.00 ELEVATION 4,986-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH METERS FEET SAMPLES WATER LEVEL GRAPHICAL LOG UNIFIED SOIL CLASSIFICATION	0 1 5 2 3 10 4	SP-SM	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Poorly Graded SAND with silt - medium dense, moist, light brown				5.0	8.9	NP	NP ●	Bottom of Test Pit @ 11 Feet						

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SAMPLE TYPE

- GRAB SAMPLE
- 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Plate
B - 5

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-26 Sheet 1 of 1									
										LOCATION NORTHING 4,476,810.20 EASTING 4,476,810.20 ELEVATION 4,975-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Plastic Limit Moisture Content Liquid Limit -----●----- 10 20 30 40 50 60 70 80 90	
DEPTH METERS FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index								
0				GM ML	3.3	27.9			●								
1																	
5																	
2																	
3																	
10																	
4																	
Bottom of Test Pit @ 8 Feet																	



- SAMPLE TYPE**
- GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
- MEASURED
 - ESTIMATED

NOTES:

Plate
B - 6

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-27 Sheet 1 of 1											
										LOCATION NORTHING 4,476,814.00 EASTING 4,476,814.00 ELEVATION 4,965-ft								Moisture Content and Atterberg Limits			
										MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION															
	0	0				SM	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Silty SAND with gravel - dense, moist, light brown, gravels and cobbles up to 6 inches in diameter														
	1					SP	Poorly Graded SAND with gravel - medium dense, moist, light brown														
	2					SM	Silty SAND with gravel - dense, moist, light brown, gravels and cobbles up to 6 inches in diameter														
	3	10				SP	Poorly Graded SAND with gravel - medium dense, moist, light brown														
	4				Bottom of Test Pit @ 12 Feet																



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 7

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-28 Sheet 1 of 1											
										LOCATION NORTHING 4,476,812.40 EASTING 4,476,812.40 ELEVATION 4,958-ft								Moisture Content and Atterberg Limits			
										MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION															
	0	0				CL-ML SM	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Sandy Silty CLAY - stiff, moist, tan		107.0	6.8	79.2	25	18								
	1																				
	5																				
	2																				
	3	10																			
	4						Bottom of Test Pit @ 12 Feet														



SAMPLE TYPE

- GRAB SAMPLE
- 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Plate

B - 8

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-29 Sheet 1 of 1									
										LOCATION NORTHING 4,476,807.40 EASTING 4,476,807.40 ELEVATION 4,961-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Plastic Limit Moisture Content Liquid Limit 	
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index						
	0	0				ML TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Sandy SILT with gravel - stiff, moist, brown											
	1				SC Clayey SAND with gravel - medium dense, moist, tan		4.7	31.3	30	15							
	2																
	3	10															
	4					Bottom of Test Pit @ 12 Feet											



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 9

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-30 Sheet 1 of 1									
										LOCATION NORTHING 4,476,814.60 EASTING 4,476,814.60 ELEVATION 4,963-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION											
	0	0				TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Sandy SILT with gravel - stiff, moist, dark brown Lean CLAY - stiff, moist, dark brown	126.6	14.2	92.5	35	15						
	1				- some white mottling - some iron staining												
	2																
	3	10				Bottom of Test Pit @ 10 Feet											
	4																



SAMPLE TYPE	
	- GRAB SAMPLE
	- 2.5" O.D. THIN-WALLED HAND SAMPLER
WATER LEVEL	
	- MEASURED
	- ESTIMATED

NOTES:

Plate

B - 10

DATE		STARTED: 12/3/20	D.R. Horton Micron Property Lehi, Utah Project Number 589-100	GeoStrata Rep: B.J. Rig Type: Trackhoe			TEST PIT NO: MW-TP-31 Sheet 1 of 1			
		COMPLETED: 12/3/20								
		BACKFILLED: 12/3/20								
DEPTH		LOCATION		Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits	
METERS	FEET	NORTHING	EASTING						ELEVATION	Plastic Limit
		SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION				
0	0			[Hatched]	CL	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Lean CLAY - stiff, moist, dark brown				10 20 30 40 50 60 70 80 90
1				[Hatched]	CL	Sandy Lean CLAY with gravel - stiff, moist, dark brown				●
2				[Hatched]	CL	Poorly Graded SAND with gravel - medium dense, moist, brown				
3	10			[Dotted]	SP	Bottom of Test Pit @ 12 Feet				
4										



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

**Plate
B - 11**

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-32 Sheet 1 of 1									
										LOCATION NORTHING 4,476,666.00 EASTING 4,476,666.00 ELEVATION 4,929-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Plastic Limit Moisture Content Liquid Limit 	
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index						
	0	0				ML TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Sandy SILT - stiff, moist, dark brown											
	1					CL Lean CLAY with gravel - stiff, moist, brown	98.9	11.1	95.9	35	14						
	5					CL Sandy Lean CLAY with gravel - stiff, moist, brown, some iron staining											
	2																
	3	10				SP Poorly Graded SAND with gravel - medium dense, moist, brown											
	4					Bottom of Test Pit @ 12 Feet											



SAMPLE TYPE - GRAB SAMPLE - 2.5" O.D. THIN-WALLED HAND SAMPLER	
WATER LEVEL - MEASURED - ESTIMATED	

NOTES:

Plate
B - 12

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-33 Sheet 1 of 1									
										LOCATION NORTHING 4,476,667.00 EASTING 4,476,667.00 ELEVATION 4,923-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH METERS FEET SAMPLES WATER LEVEL GRAPHICAL LOG UNIFIED SOIL CLASSIFICATION	0 1 5 2 3 4	0 10	CL GP-GM	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Lean CLAY with sand - stiff, moist, light brown ----- Poorly Graded GRAVEL with silt and sand - medium dense, moist, tan ----- Bottom of Test Pit @ 12 Feet		90.0 10.6 86.7 1.0 2.0	10.6 2.0	86.7 2.0	10.6 2.0	10.6 2.0	10.6 2.0						



SAMPLE TYPE	
☐	- GRAB SAMPLE
☒	- 2.5" O.D. THIN-WALLED HAND SAMPLER
WATER LEVEL	
▼	- MEASURED
▽	- ESTIMATED

NOTES:

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-34 Sheet 1 of 1									
										LOCATION NORTHING 4,476,662.00 EASTING 4,476,662.00 ELEVATION 4,928-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Plastic Limit Moisture Content Liquid Limit 	
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index						
	0	0			SM	TOPSOIL - Lean CLAY with sand and gravel - dark brown, moist, organics throughout Silty SAND - dense, moist, brown		7.4			●						
	1				CL	Lean CLAY with sand - stiff, moist, tan, sand was observed to be fine-grained, some iron staining											
	2																
	3	10															
	4					Bottom of Test Pit @ 12 Feet											



- SAMPLE TYPE**
- GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
- MEASURED
 - ESTIMATED

NOTES:

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-35 Sheet 1 of 1									
										LOCATION NORTHING 4,476,519.00 EASTING 4,476,519.00 ELEVATION 4,898-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	96.1	10.9	77.5	●							
0	0	0			ML	TOPSOIL - Silty SAND with gravel - dark brown, moist, organics throughout Sandy SILT - stiff, moist, tan											
1																	
5					SP	Poorly Graded SAND with gravel - medium dense, moist, dark brown, subrounded gravel up to 3 inches in diameter											
2																	
3	10																
4																	
						Bottom of Test Pit @ 12 Feet											



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 15

2020 LOG OF TEST PIT - PLATE (B) - 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 1/18/21

DATE		STARTED: 12/3/20		COMPLETED: 12/3/20		BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-36 Sheet 1 of 1				
DEPTH		LOCATION												Moisture Content and Atterberg Limits						
METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Plastic Limit	Moisture Content	Liquid Limit	
0	0					TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Gravelly SILT with sand -stiff, moist, dark brown						13.9	6.7	40.8						
					ML															
1					SM	Silty SAND - dense, moist, light brown, pinholes throughout														
2					CL	Sandy Lean CLAY - stiff, moist, light brown, iron staining														
3					ML	Sandy SILT - stiff, moist, light brown, iron staining														
4	10					Bottom of Test Pit @ 12 Feet						7.0	53.7							



- SAMPLE TYPE**
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

**Plate
B - 16**

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-37 Sheet 1 of 1							
										LOCATION NORTHING 4,476,523.00 EASTING 4,476,523.00 ELEVATION 4,892-ft					
										MATERIAL DESCRIPTION					
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
												Plastic Limit	Moisture Content	Liquid Limit	
	0	0			SM	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty SAND with gravel - medium dense, moist, dark brown						10	30	40	
	1				SM	-tan									
	2				GP	Poorly Graded GRAVEL with sand - medium dense, moist, tan	1.0	1.4			●				
	3	10				-becomes more sandy, smaller gravel up to 1/2 inches									
	4					Bottom of Test Pit @ 12 Feet									



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate
B - 17

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-38 Sheet 1 of 1									
										LOCATION NORTHING 4,476,523.00 EASTING 4,476,523.00 ELEVATION 4,893-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Plastic Limit Moisture Content Liquid Limit 	
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index						
	0	0				SM											
	1				TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty SAND with gravel - medium dense, moist, dark brown	SP											
	5																
	2																
	3	10															
	4																



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 18

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-39 Sheet 1 of 1											
										LOCATION NORTHING 4,476,375.00 EASTING 4,476,375.00 ELEVATION 4,877-ft								Moisture Content and Atterberg Limits			
										MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION															
	0	0			[Pattern]		TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout														
	1				[Pattern]	CL	Lean CLAY - stiff, moist, light brown -tan, iron staining				7.4	97.6		●							
	5				[Pattern]						95.5	8.0	93.2	●							
	2																				
	3	10																			
	4						Bottom of Test Pit @ 12 Feet														



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-40 Sheet 1 of 1							
										LOCATION NORTHING 4,476,377.00 EASTING 4,476,377.00 ELEVATION 4,875-ft					
										MATERIAL DESCRIPTION					
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
	0	0				CL-ML						Plastic Limit Moisture Content Liquid Limit 	10 20 30 40 50 60 70 80 90		
	1														
	5														
	2														
	3	10													
	4														
					Bottom of Test Pit @ 12 Feet										

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SAMPLE TYPE

- GRAB SAMPLE
- 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Plate
B - 20

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-41 Sheet 1 of 1											
										LOCATION NORTHING 4,476,373.00 EASTING 4,476,373.00 ELEVATION 4,873-ft								Moisture Content and Atterberg Limits			
										MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Clayey GRAVEL with sand - dense, moist, dark brown		6.7	40.8	32	13	10 20 30 40 50 60 70 80 90								
					GC	Sandy Lean CLAY - medium dense, moist, light brown -lighter tan brown															
					CL								Poorly Graded SAND with gravel - medium dense, moist, tan								
						SP	Bottom of Test Pit @ 12 Feet														



SAMPLE TYPE	
□	- GRAB SAMPLE
▣	- 2.5" O.D. THIN-WALLED HAND SAMPLER
WATER LEVEL	
▼	- MEASURED
▽	- ESTIMATED

NOTES:

DATE		STARTED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100			GeoStrata Rep: B.J.		TEST PIT NO:				
		COMPLETED: 12/3/20							Rig Type: Trackhoe		MW-TP-42		
		BACKFILLED: 12/3/20									Sheet 1 of 1		
DEPTH		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG						UNIFIED SOIL CLASSIFICATION	NORTHING 4,476,373.00 EASTING 4,476,373.00 ELEVATION 4,869-ft		
		MATERIAL DESCRIPTION									10 20 30 40 50 60 70 80 90		
0	0			SM	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout								
					Silty SAND with gravel - medium dense, moist, dark brown								
1													
5													
2					-smaller gravel 1/2 inches in diameter			5.9	42.9	22	4 ● H		
3	10												
4					Bottom of Test Pit @ 12 Feet								



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

DATE STARTED: 12/3/20 COMPLETED: 12/3/20 BACKFILLED: 12/3/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-43 Sheet 1 of 1															
														LOCATION NORTHING 4,476,370.00 EASTING 4,476,370.00 ELEVATION 4,865-ft								Moisture Content and Atterberg Limits			
														MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION																			
	0	0				ML	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Sandy SILT with gravel - stiff, moist, brown																		
	1					SP	Silty SAND with gravel - medium dense, moist, light brown																		
	2					ML	Sandy SILT - hard, moist, light brown				86.8	7.1	68.9	●											
	3	10					Bottom of Test Pit @ 12 Feet																		
	4																								



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 23

DATE STARTED: 12/4/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-44 Sheet 1 of 1									
										LOCATION NORTHING 4,476,377.00 EASTING 4,476,377.00 ELEVATION 4,866-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Plastic Limit Moisture Content Liquid Limit -----●----- 10 20 30 40 50 60 70 80 90	
DEPTH METERS FEET SAMPLES WATER LEVEL GRAPHICAL LOG UNIFIED SOIL CLASSIFICATION	0 1 2 3 4	0 1 2 3 4	ML SM	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Sandy SILT - stiff, moist, dark brown, pinholes throughout ----- Silty SAND - medium dense, moist, light tan, pinholes throughout ----- Bottom of Test Pit @ 12 Feet				Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index					



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate
B - 24

DATE STARTED: 12/4/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-45 Sheet 1 of 1									
										LOCATION NORTHING 4,476,386.00 EASTING 4,476,386.00 ELEVATION 4,865-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION											
	0	0			[Hatched Box]	CL	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Sandy Lean CLAY - stiff, moist, brown	6.0	68.6	27	10	● —					
	1				[Dotted Box]	SM	Silty SAND with gravel - medium dense, moist, dark brown										
	2				[Dotted Box]	SP	Poorly Graded SAND with gravel - medium dense, moist, tan, subrounded gravel										
	3	10															
	4						Bottom of Test Pit @ 12 Feet										



SAMPLE TYPE □ - GRAB SAMPLE ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER
WATER LEVEL ▼ - MEASURED ▽ - ESTIMATED

NOTES:

Plate
B - 25

DATE	STARTED: 12/4/20	D.R. Horton Micron Property Lehi, Utah Project Number 589-100	GeoStrata Rep: B.J.				TEST PIT NO: MW-TP-46				
	COMPLETED: 12/4/20		Rig Type: Trackhoe				Sheet 1 of 1				
	BACKFILLED: 12/4/20										
DEPTH		LOCATION		Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
METERS	FEET	SAMPLES	WATER LEVEL						GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Plastic Limit Moisture Content Liquid Limit -----●----- 10 20 30 40 50 60 70 80 90
0	0								MATERIAL DESCRIPTION		
									TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty GRAVEL with sand - very dense, moist, dark brown		
1						6.0	40.9	●			
5											
2											
3	10										
4									Bottom of Test Pit @ 12 Feet		



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

DATE STARTED: 12/4/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-47 Sheet 1 of 1											
														LOCATION NORTHING 4,476,246.00 EASTING 4,476,246.00 ELEVATION 4,859-ft							
														MATERIAL DESCRIPTION							
DEPTH METERS FEET		SAMPLES WATER LEVEL GRAPHICAL LOG UNIFIED SOIL CLASSIFICATION	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Lean CLAY - Stiff, moist, dark brown, pinholes				Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
0 1 5 2 3 4												Plastic Limit Moisture Content Liquid Limit -----●----- 10 20 30 40 50 60 70 80 90									
0 1 5 2 3 4		CL	Bottom of Test Pit @ 12 Feet				95.0	9.3	93.1												



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

2020 LOG OF TEST PIT - PLATE (B) - 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 1/18/21

DATE		STARTED: 12/4/20		COMPLETED: 12/4/20		BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100			GeoStrata Rep: B.J. Rig Type: Trackhoe			TEST PIT NO: MW-TP-48 Sheet 1 of 1								
DEPTH		METERS		FEET		SAMPLES		WATER LEVEL		GRAPHICAL LOG		UNIFIED SOIL CLASSIFICATION		LOCATION NORTHING 4,476,254.00 EASTING 4,476,254.00 ELEVATION 4,846-ft			Moisture Content and Atterberg Limits					
														MATERIAL DESCRIPTION TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty SAND with gravel - medium dense, moist, dark brown			Dry Density (pcf) Moisture Content % Percent minus 200 Liquid Limit Plasticity Index			Plastic Limit Moisture Content Liquid Limit -----●----- 10 20 30 40 50 60 70 80 90		
0		0										SP										
1																						
5														-color change to light brown								
2																						
3		10																				
4														Bottom of Test Pit @ 12 Feet								



SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 28

DATE STARTED: 12/4/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe		TEST PIT NO: MW-TP-49 Sheet 1 of 1									
										LOCATION NORTHING 4,476,257.00 EASTING 4,476,257.00 ELEVATION 4,852-ft						Moisture Content and Atterberg Limits	
										MATERIAL DESCRIPTION						Dry Density (pcf)	Moisture Content %
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION											
	0	0			[Hatched Box]	SC	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Clayey SAND - dense, moist, light brown, small organics, iron staining		6.4	46.0	30	14	●				
	1				[Hatched Box]	CL	Lean CLAY - hard, moist, dark brown		105.0	15.7	95.6		●				
	2				[Hatched Box]												
	3	10			[Hatched Box]												
	4				[Hatched Box]		Bottom of Test Pit @ 12 Feet										



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Plate
B - 29

DATE		STARTED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100		GeoStrata Rep: B.J.			TEST PIT NO:						
		COMPLETED: 12/4/20				Rig Type: Trackhoe			MW-TP-50						
		BACKFILLED: 12/4/20							Sheet 1 of 1						
DEPTH		LOCATION						Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	NORTHING 4,476,254.00 EASTING 4,476,254.00 ELEVATION 4,848-ft MATERIAL DESCRIPTION							Plastic Limit	Moisture Content	Liquid Limit
0	0					TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty SAND with gravel - medium dense, moist, light brown									
1					SM	Silty SAND - dense, moist, light brown									
5						Bottom of Test Pit @ 12 Feet									
2															
3	10														
4															

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SAMPLE TYPE
 - GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Plate
B - 30

DATE STARTED: 12/4/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-51 Sheet 1 of 1											
														LOCATION NORTHING 4,476,265.00 EASTING 4,476,265.00 ELEVATION 4,849-ft							
														MATERIAL DESCRIPTION							
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
												Plastic Limit	Moisture Content	Liquid Limit							
0	0	0			CL	CL						10	30	40							
					SM	SM		9.9	87.0	32	14	50	60	70							
1																					
5																					
2																					
3																					
10																					
4																					
						Bottom of Test Pit @ 12 Feet															



SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

DATE	STARTED: 12/4/20	D.R. Horton Micron Property Lehi, Utah Project Number 589-100	GeoStrata Rep: B.J.				TEST PIT NO: MW-TP-52													
	COMPLETED: 12/4/20		Rig Type: Trackhoe				Sheet 1 of 1													
	BACKFILLED: 12/4/20																			
DEPTH		LOCATION						Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits							
METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION							Plastic Limit	Moisture Content	Liquid Limit					
0	0			[Hatched Pattern]	CL	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Lean CLAY - stiff, moist, dark brown						102	30	40	50	60	70	80	90	
1				[Hatched Pattern]		- iron staining						104.4	14.7	93.1						
5				[Dotted Pattern]	SM	Silty SAND - medium dense, moist, gray														
2						Bottom of Test Pit @ 12 Feet														
3	10																			
4																				



- SAMPLE TYPE**
- GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
- MEASURED
 - ESTIMATED

NOTES:

DATE STARTED: 12/4/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-53 Sheet 1 of 1											
										LOCATION NORTHING 4,476,263.00 EASTING 4,476,263.00 ELEVATION 4,844-ft								Moisture Content and Atterberg Limits			
										MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION															
	0	0				SM	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Silty SAND with gravel - medium dense, moist, dark brown														
	1					CL	Gravelly Lean CLAY with sand - stiff, moist, dark brown				7.0	56.9	27	11	●						
	5					SP	Poorly Graded SAND with gravel - medium dense, moist, tan, subrounded gravel														
	2						Bottom of Test Pit @ 8 Feet														
	3	10																			
	4																				



SAMPLE TYPE

- GRAB SAMPLE
 - 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
 - ESTIMATED

NOTES:

Plate

B - 33

DATE STARTED: 12/3/20 COMPLETED: 12/4/20 BACKFILLED: 12/4/20		D.R. Horton Micron Property Lehi, Utah Project Number 589-100				GeoStrata Rep: B.J. Rig Type: Trackhoe				TEST PIT NO: MW-TP-54 Sheet 1 of 1											
										LOCATION NORTHING 4,476,268.00 EASTING 4,476,268.00 ELEVATION 4,852-ft								Moisture Content and Atterberg Limits			
										MATERIAL DESCRIPTION								Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit
DEPTH	METERS	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	TOPSOIL - Sandy SILT with gravel - dark brown, moist, organics throughout Lean CLAY - stiff, moist, light brown				86.7	13.6	88.6	●							
	0	0			CL																
	1																				
	5																				
	2																				
	3	10																			
	4						Bottom of Test Pit @ 12 Feet														

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SAMPLE TYPE

- GRAB SAMPLE
- 2.5" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Plate
B - 34

Unified Soil Classification Per ASTM D 2488

Primary Divisions		Group Symbol	Group Name		
COARSE-GRAINED SOILS more than 50% retained on the No. 200 Sieve	GRAVEL More than half of the coarse fraction is larger than the #4 sieve	Clean Gravel	GW Well Graded GRAVEL GP Poorly Graded GRAVEL		
		Gravel with Dual Classifications	GW-GM Well Graded GRAVEL with silt GP-GM Poorly Graded GRAVEL with silt		
			GW-GC Well Graded GRAVEL with clay GP-GC Poorly Graded GRAVEL with clay		
			GM Silty GRAVEL GC Clayey GRAVEL		
			GC-GM Silty, Clayey GRAVEL		
		Gravel with Fines	SW Well Graded SAND SP Poorly Graded SAND		
		SAND More than half of the coarse fraction is smaller than the #4 sieve	Clean Sand	SW Well Graded SAND SP Poorly Graded SAND	
			Sand with Dual Classifications	SW-SM Well Graded SAND with silt SP-SM Poorly Graded SAND with silt	
				SW-SC Well Graded SAND with clay SP-SC Well Graded SAND with clay	
				SM Silty SAND SC Clayey SAND	
	SC-SM Silty, Clayey SAND				
	Sand with Fines		CL Lean CLAY ML SILT CL-ML Silty CLAY		
	FINE-GRAINED SOILS 50% or more passes No. 200 Sieve		SILTY & CLAY less than 50%	Inorganic	OL Organic CLAY or Organic SILT
				Organic	CH Fat CLAY MH Elastic SILT
			SILTY & CLAY LL 50% or more	Inorganic	OH Organic CLAY or Organic SILT
				Organic	PT Peat
		Highly Organic Soils			

Exploration Log Key

Sample Symbols	Ground Water Symbol	
Auger Cuttings		Measured Groundwater Elevation
		Estimated Groundwater Elevation
California Sampler		Relative Density
		SPT N (blows/ft)
Rock Core		Very Loose 0 to 4
		Loose 5 to 10
		Med. Dense 11 to 30
Bag or Block Sample		Dense 31 to 50
		Very Dense >51
Modified California Sampler		Consistency
		SPT N (blows/ft)
		Very Soft 0 to 1
No Recovery		Soft 2 to 4
		Med. Stiff 5 to 8
		Stiff 9 to 15
Split Spoon		Very Stiff 16 to 30
		Hard 31 to 60 Very Hard >61
Shelby Tube		Modifiers
		Description Percentage
Dames and More Sampler		Trace less than 5
		Some 5 to 12 With more than 12



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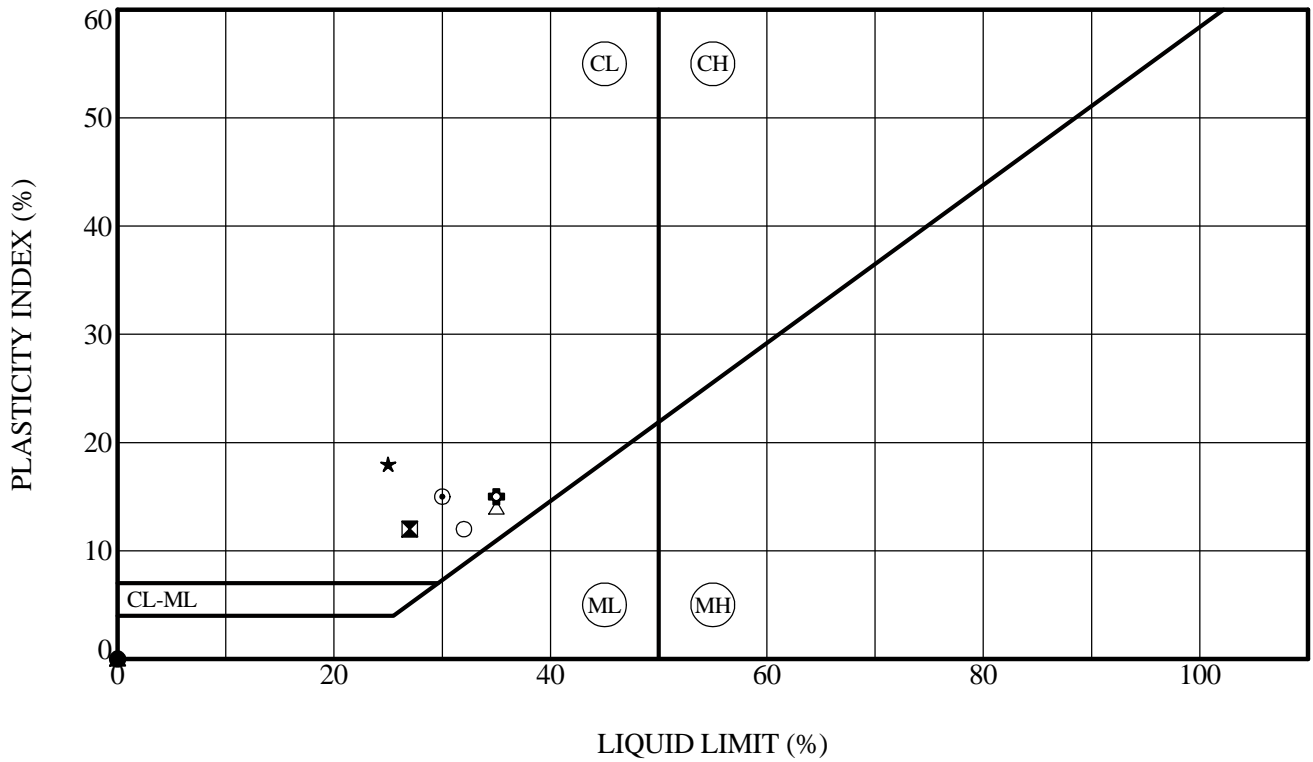
Soil Symbols and Description Key

D.R. Horton
Micron Property
Lehi/Draper, Utah
Project Number: 589-100

Plate B-35

APPENDIX C

Test Pit No.	Sample Depth (feet)	USCS Soil Classification	Natural Moisture Content (%)	Natural Dry Density (pcf)	Optimum Moisture Content (%)	Maximum Dry Density (pcf)	Gradation			Atterberg		Collapse (%)	CBR (%)
							Gravel (%)	Sand (%)	Fines (%)	LL	PI		
MW-TP-17	4	SM	4.1				35.6	38.8	25.6	NP	NP		
MW-TP-18	3	CL	20.1	86.7					85.1			0.07	
MW-TP-19	6	ML	8.1	88.6					65.1			1.4	
MW-TP-24	3.5	GC	3.8	3.8			51.9	34.6	13.5	27	12		
MW-TP-25	11	SP-SM	5				6.7	84.4	8.9	NP	NP		
MW-TP-26	3	GM	3.3				2.3	69.8	27.9				
MW-TP-28	3.5	CL-ML	6.8	107					79.2	25	18	0.47	
MW-TP-29	2	SC	4.7				23.4	45.3	31.3	30	15		
MW-TP-30	4	CL	14.2	126.6					92.5	35	15	0.4	
MW-TP-31	2	CL	10.9				0.1	4.9	95.0	32	12		
MW-TP-32	3.5	CL	11.1	98.9			1.3	2.8	95.9	35	14	0.01	
MW-TP-33	6	CL	10.6	90					86.7			0.1	
MW-TP-33	10.5	GP-GM	1				74.5	23.5	2.0				
MW-TP-34	4.5	SM	7.4										
MW-TP-35	5	ML	10.9	96.1					77.5			0.12	
MW-TP-36	1	ML	13.9										
MW-TP-36	1.5	ML	6.7				36.0	23.2	40.8				
MW-TP-36	10	ML	7				6.0	40.3	53.7				
MW-TP-37	6	GP	1				81.6	17.0	1.4				
MW-TP-39	2	CL	7.4				0.0	2.4	97.6				
MW-TP-39	3.5	CL	8	95.5					93.2			0.21	
MW-TP-41	1.5	GC	6.7		10.9	121.1	28.7	20.8	40.8	32	13		11.6
MW-TP-41	5	CL	5.5	88.6					53.1			0.01	
MW-TP-42	6	SM	5.9				12.6	44.5	42.9	22	4		
MW-TP-43	8	ML	7.1	86.8					68.9			3.55	
MW-TP-45	2	CL	6		11.7	112	13.3	18.1	68.6	27	10		5.3
MW-TP-46	3.5	GM	6				31.6	27.5	40.9				
MW-TP-47	6	CL	9.3	95					93.1			0.65	
MW-TP-49	2	SC	6.4				3.3	50.7	46.0	30	14		
MW-TP-49	6	CL	15.7	105					95.6				
MW-TP-51	2	CL	9.9				1.0	12.0	87.0	32	14		
MW-TP-52	4	CL	14.7	104.4					93.1				
MW-TP-53	2	CL	7				26.3	16.8	56.9	27	11		
MW-TP-54	8	CL	13.6	86.7					88.6			0.53	



Sample Location	Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
● MW-TP-17	4.0	NP	NP	NP	25.6	Silty SAND with gravel
⊠ MW-TP-24	3.5	27	15	12	13.5	Clayey GRAVEL with sand
▲ MW-TP-25	11.0	NP	NP	NP	8.9	Poorly Graded SAND with silt
★ MW-TP-28	3.5	25	7	18	79.2	Sandy Silty CLAY
⊙ MW-TP-29	2.0	30	15	15	31.3	Clayey SAND with gravel
⊕ MW-TP-30	4.0	35	20	15	92.5	Lean CLAY
○ MW-TP-31	2.0	32	20	12	95.0	Lean CLAY
△ MW-TP-32	3.5	35	21	14	95.9	Lean CLAY

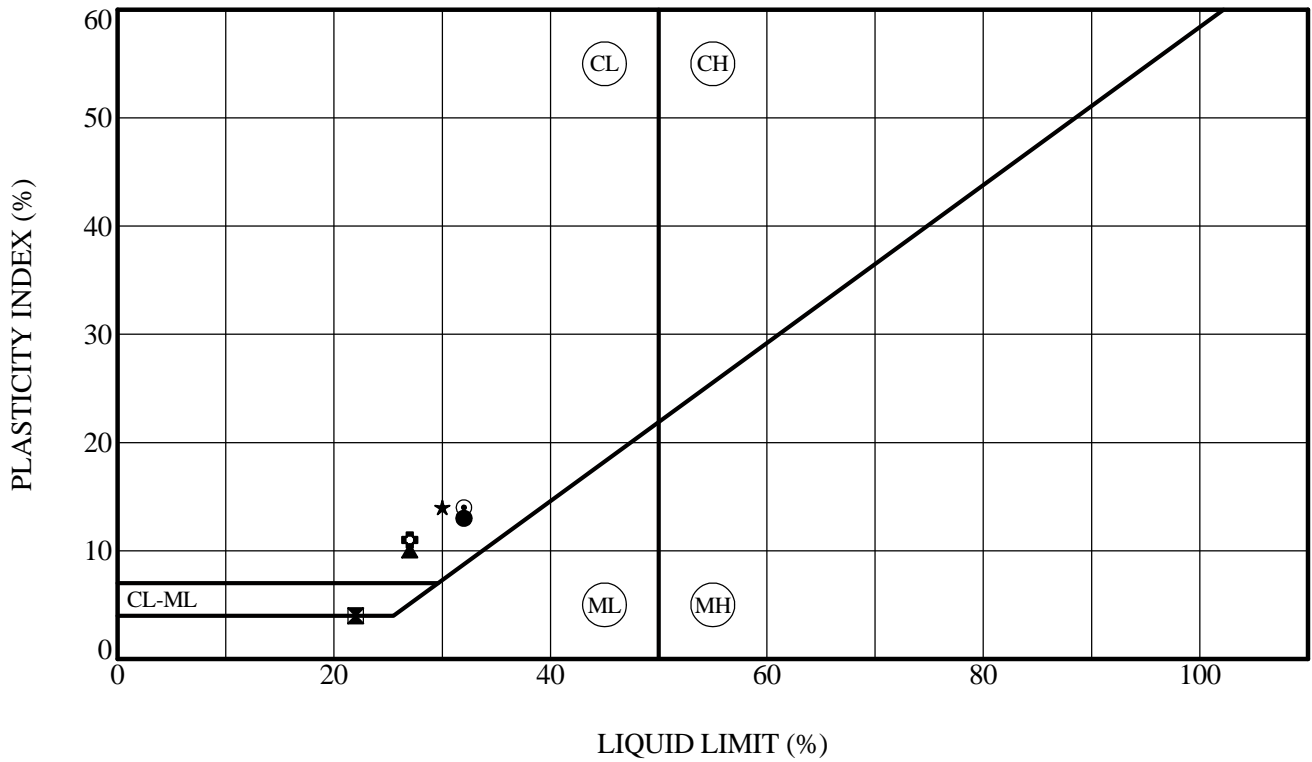
C_ATTBERG 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 1/18/21

ATTERBERG LIMITS' RESULTS - ASTM D 4318



D.R. Horton
 Micron Property
 Lehi, Utah
 Project Number: 589-100

Plate
C - 2



Sample Location	Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
● MW-TP-41	1.5	32	19	13	40.8	Clayey GRAVEL with sand
■ MW-TP-42	6.0	22	18	4	42.9	Silty SAND
▲ MW-TP-45	2.0	27	17	10	68.6	Sandy Lean CLAY
★ MW-TP-49	2.0	30	16	14	46.0	Clayey SAND
◎ MW-TP-51	2.0	32	18	14	87.0	Lean CLAY
⊕ MW-TP-53	2.0	27	16	11	56.9	Gravelly Lean CLAY with sand

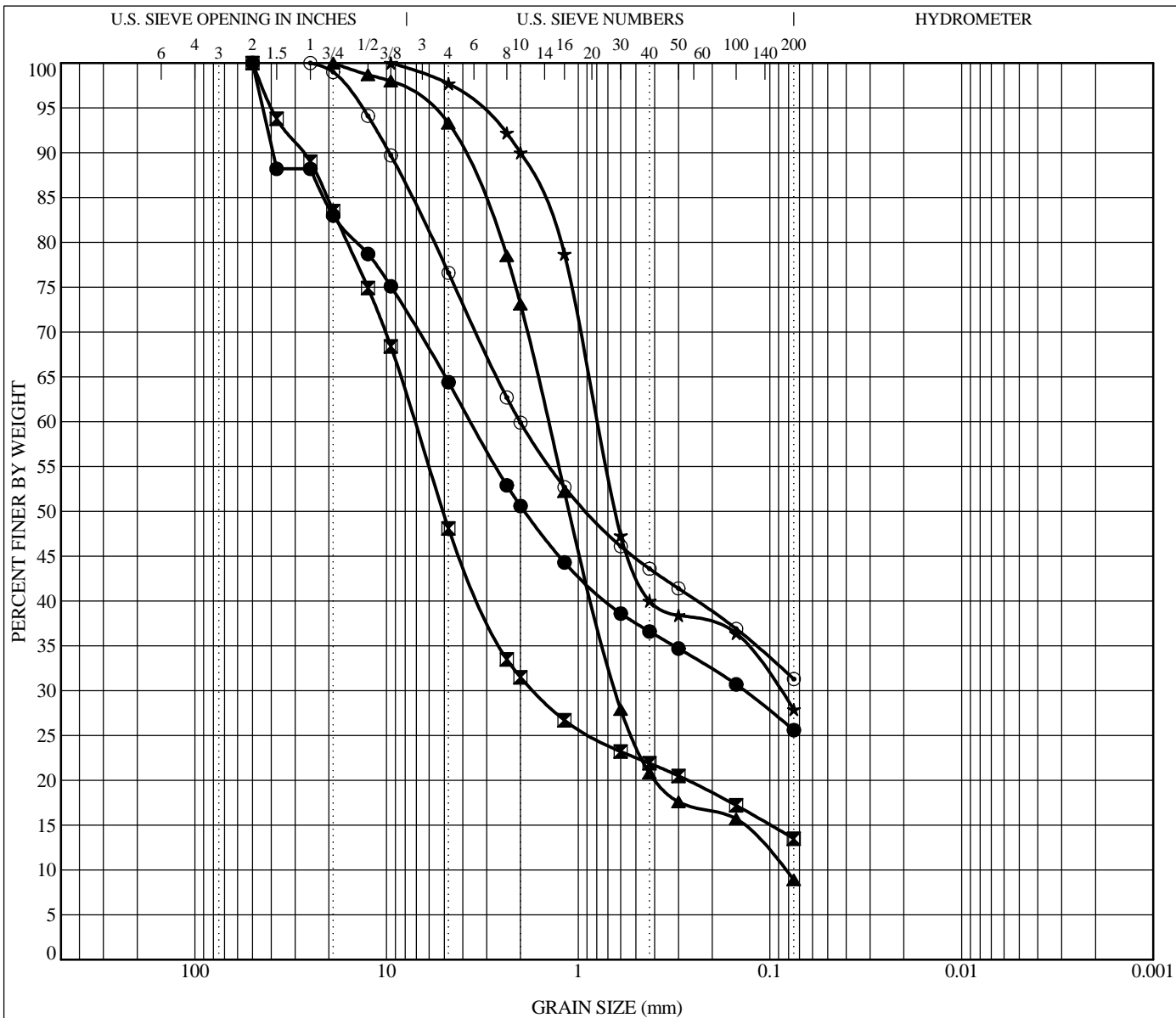
ATTERBERG LIMITS' RESULTS - ASTM D 4318



D.R. Horton
 Micron Property
 Lehi, Utah
 Project Number: 589-100

Plate

C - 3



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

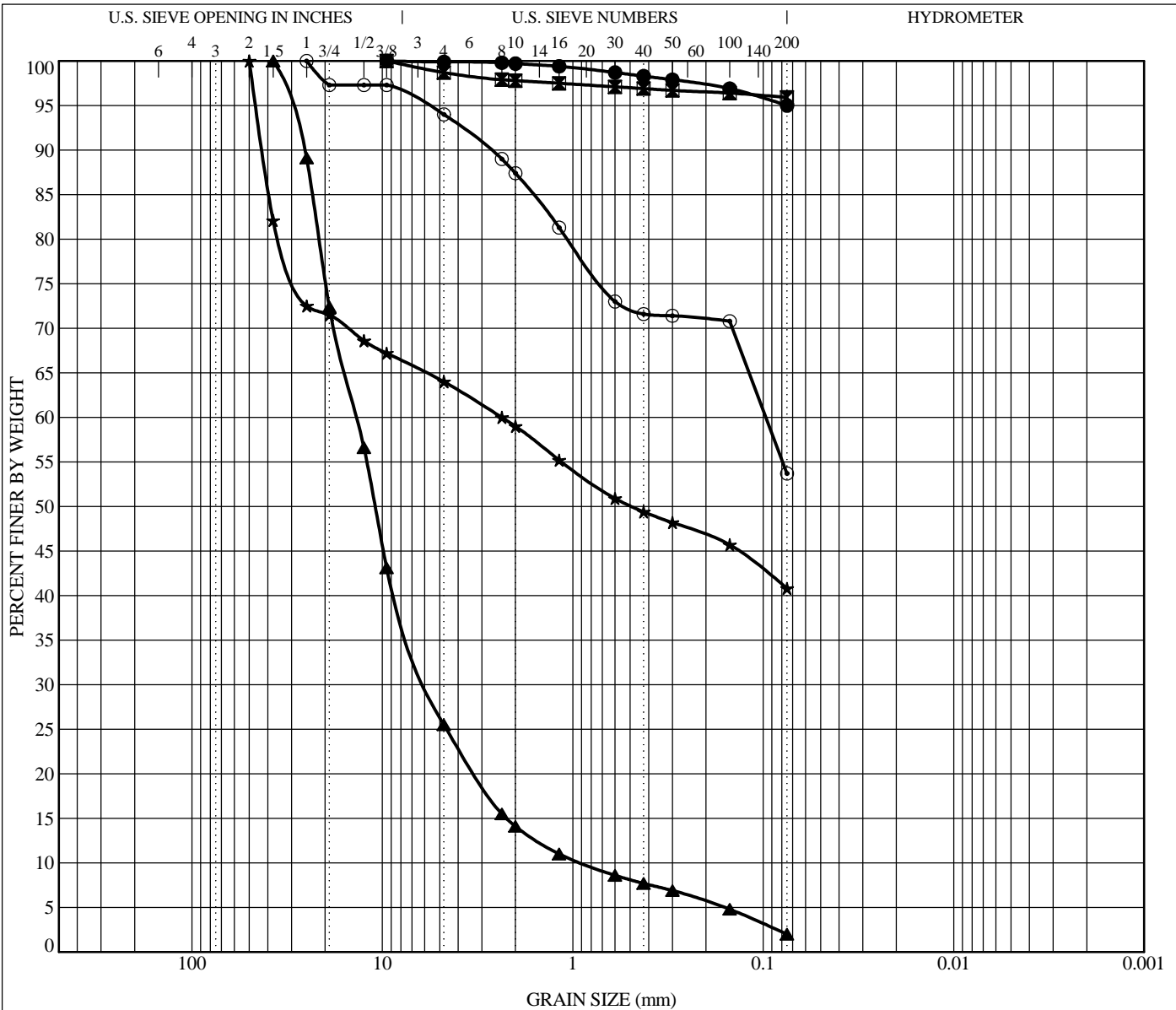
Sample Location	Depth	Classification					LL	PL	PI	Cc	Cu
● MW-TP-17	4.0	Silty SAND with gravel					NP	NP	NP		
☒ MW-TP-24	3.5	Clayey GRAVEL with sand					27	15	12		
▲ MW-TP-25	11.0	Poorly Graded SAND with silt					NP	NP	NP	3.36	17.13
★ MW-TP-26	3.0										
⊙ MW-TP-29	2.0	Clayey SAND with gravel					30	15	15		
Sample Location	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● MW-TP-17	4.0	50	3.635	0.136		35.6	38.8	25.6			
☒ MW-TP-24	3.5	50	7.131	1.696		51.9	34.6	13.5			
▲ MW-TP-25	11.0	19	1.437	0.636	0.084	6.7	84.4	8.9			
★ MW-TP-26	3.0	9.5	0.789	0.089		2.3	69.8	27.9			
⊙ MW-TP-29	2.0	25	2.012			23.4	45.3	31.3			

GRAIN SIZE DISTRIBUTION - ASTM D422



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 Micron Property
 Lehi, Utah
 Project Number: 589-100

Plate
C - 4



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

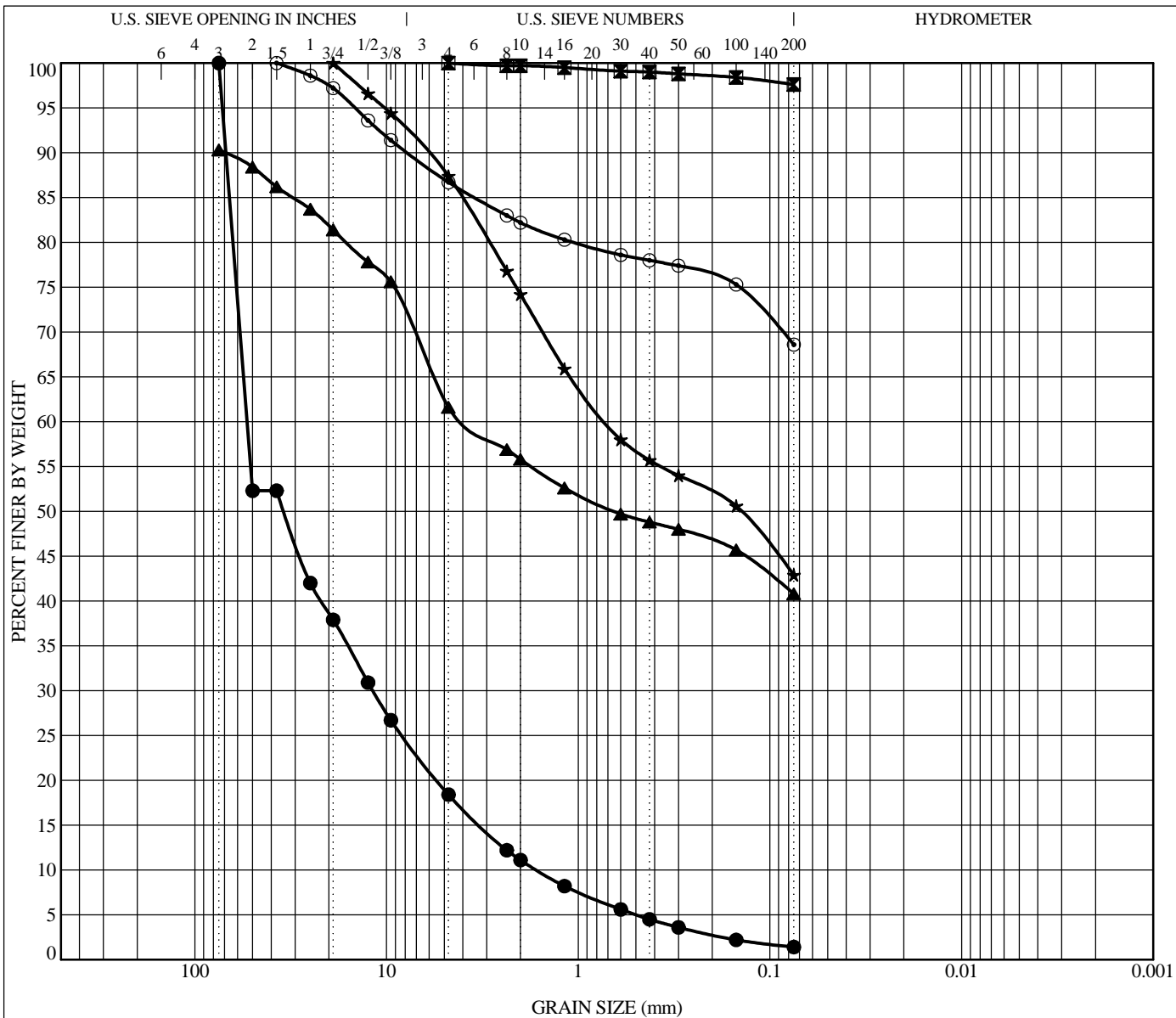
Sample Location	Depth	Classification				LL	PL	PI	Cc	Cu
● MW-TP-31	2.0	Lean CLAY				32	20	12		
☒ MW-TP-32	3.5	Lean CLAY				35	21	14		
▲ MW-TP-33	10.5	Poorly Graded GRAVEL with silt and sand							2.64	15.37
★ MW-TP-36	1.5	Gravelly SILT with sand								
⊙ MW-TP-36	10.0	Sandy SILT								
Sample Location	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
● MW-TP-31	2.0	9.5				0.1	4.9	95.0		
☒ MW-TP-32	3.5	9.5				1.3	2.8	95.9		
▲ MW-TP-33	10.5	37.5	13.679	5.671	0.89	74.5	23.5	2.0		
★ MW-TP-36	1.5	50	2.36			36.0	23.2	40.8		
⊙ MW-TP-36	10.0	25	0.097			6.0	40.3	53.7		

GRAIN SIZE DISTRIBUTION - ASTM D422



D.R. Horton
 Micron Property
 Lehi, Utah
 Project Number: 589-100

Plate
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
● MW-TP-37	6.0	Poorly Graded GRAVEL with sand				1.59	32.60
☒ MW-TP-39	2.0	Lean CLAY					
▲ MW-TP-41	1.5	Clayey GRAVEL with sand	32	19	13		
★ MW-TP-42	6.0	Silty SAND	22	18	4		
⊙ MW-TP-45	2.0	Sandy Lean CLAY	27	17	10		

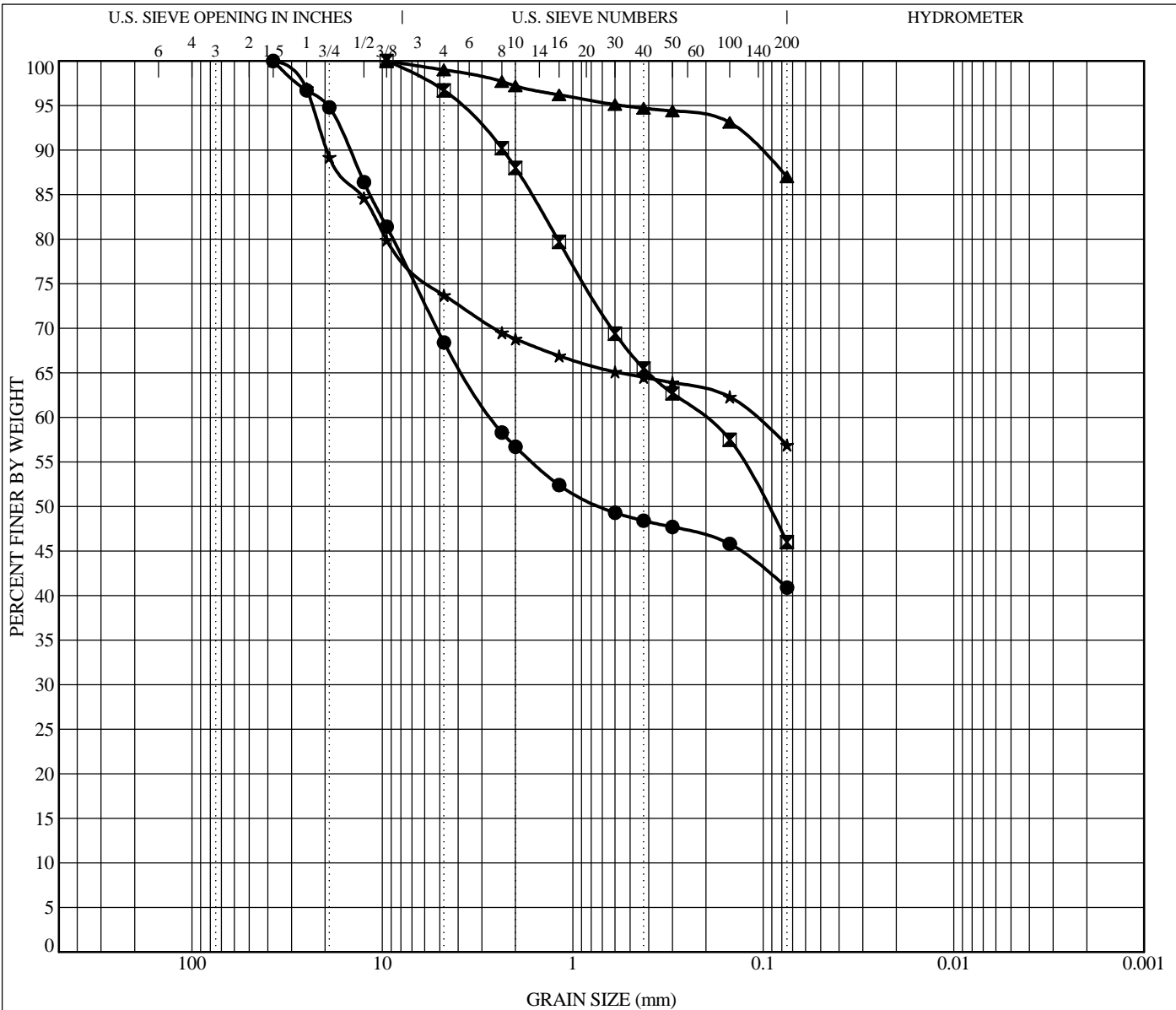
Sample Location	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● MW-TP-37	6.0	75	53.382	11.786	1.637	81.6	17.0	1.4	
☒ MW-TP-39	2.0	4.75				0.0	2.4	97.6	
▲ MW-TP-41	1.5	75	3.744			28.7	20.8	40.8	
★ MW-TP-42	6.0	19	0.712			12.6	44.5	42.9	
⊙ MW-TP-45	2.0	37.5				13.3	18.1	68.6	

GRAIN SIZE DISTRIBUTION - ASTM D422



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Plate
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
● MW-TP-46	3.5	Silty GRAVEL with sand					
☒ MW-TP-49	2.0	Clayey SAND	30	16	14		
▲ MW-TP-51	2.0	Lean CLAY	32	18	14		
★ MW-TP-53	2.0	Gravelly Lean CLAY with sand	27	16	11		

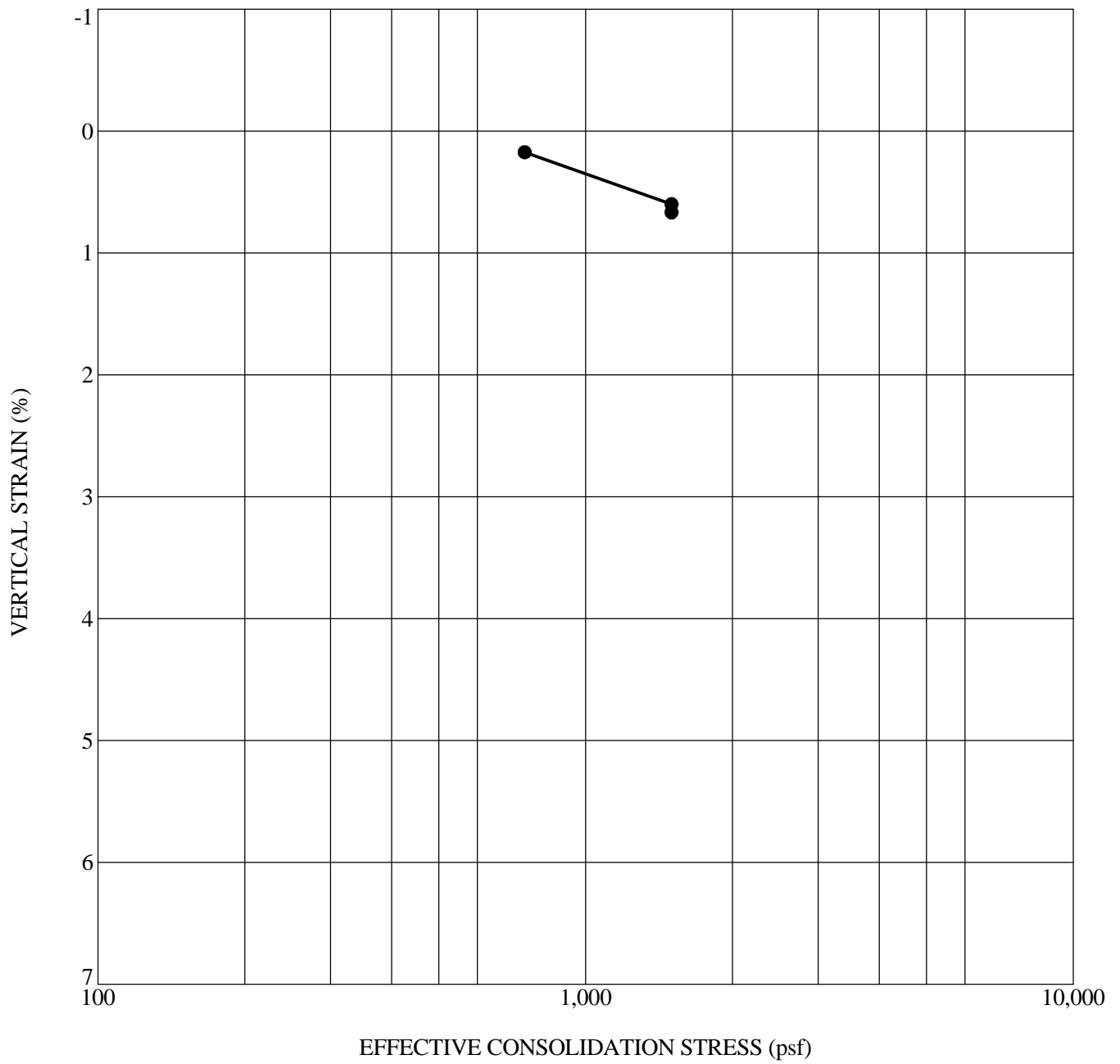
Sample Location	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● MW-TP-46	3.5	37.5	2.655			31.6	27.5	40.9	
☒ MW-TP-49	2.0	9.5	0.209			3.3	50.7	46.0	
▲ MW-TP-51	2.0	9.5				1.0	12.0	87.0	
★ MW-TP-53	2.0	37.5	0.112			26.3	16.8	56.9	

GRAIN SIZE DISTRIBUTION - ASTM D422

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Project Number: 589-100

Plate
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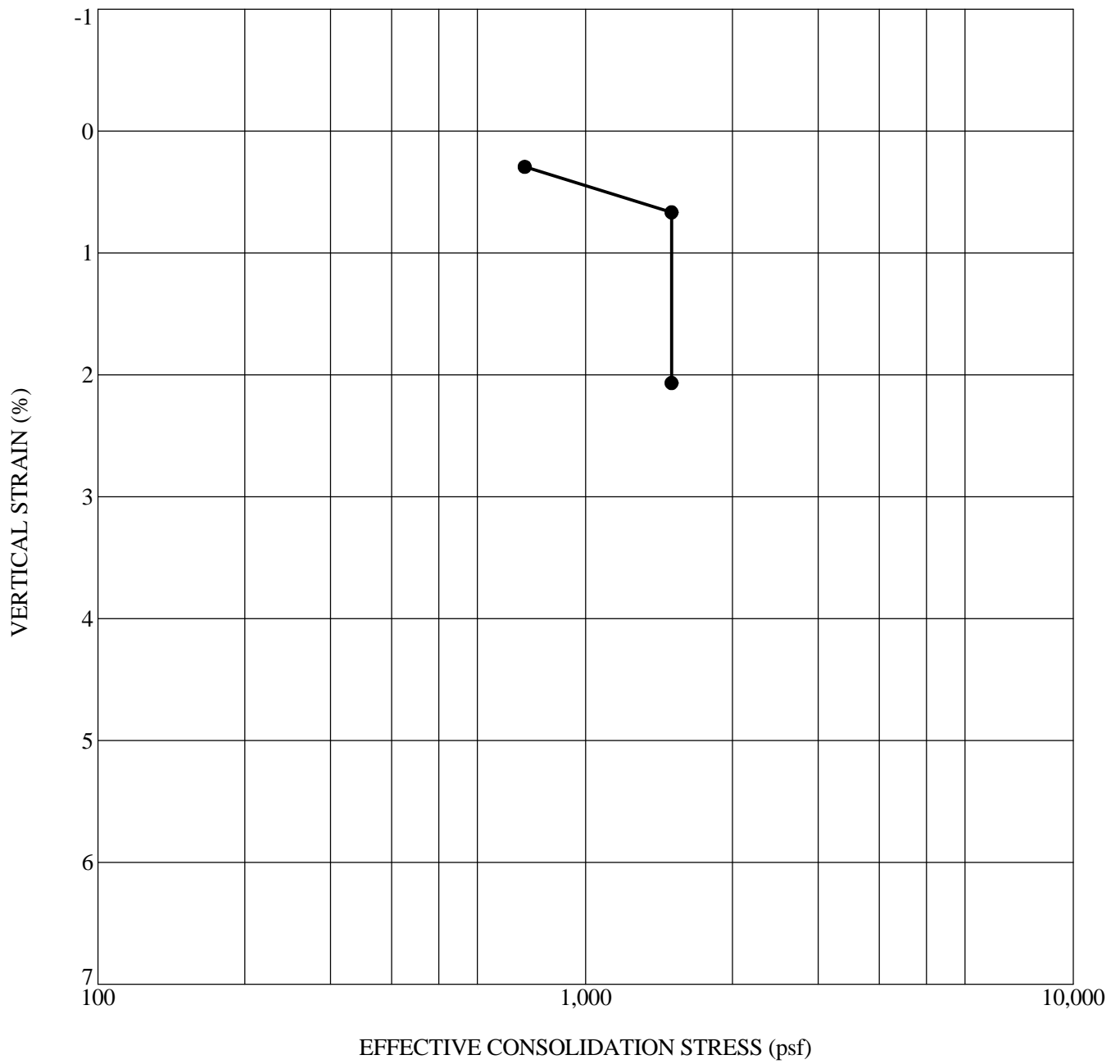
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-18	3.0	Lean CLAY with sand	87	20				1500		0.07



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

D.R. Horton
 Micron Property
 Lehi, Utah
 Project Number: 589-100

Plate
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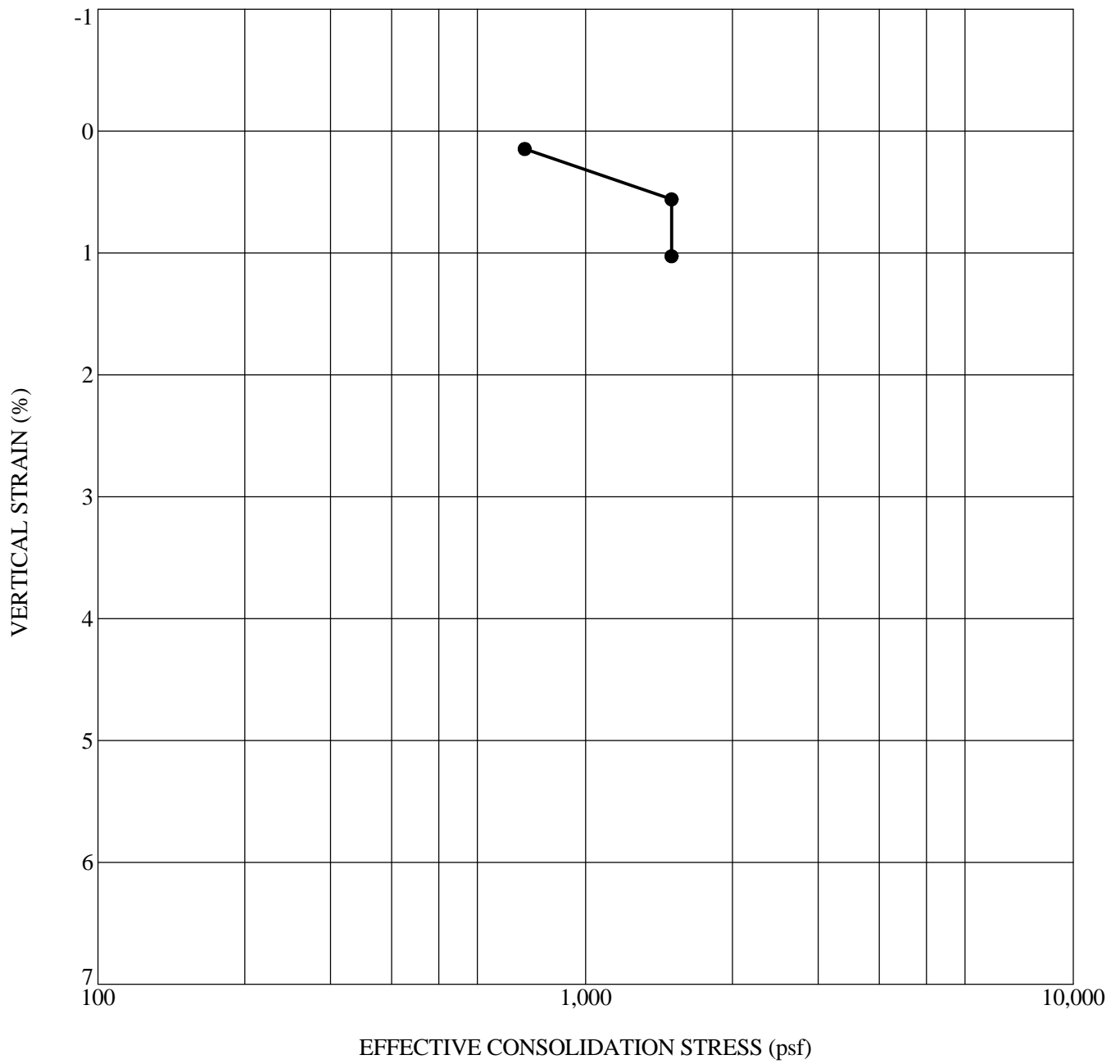
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-19	6.0	Sandy SILT	89	8				1500		1.40



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

D.R. Horton
 Micron Property
 Lehi, Utah
 Project Number: 589-100

Plate
C - 9



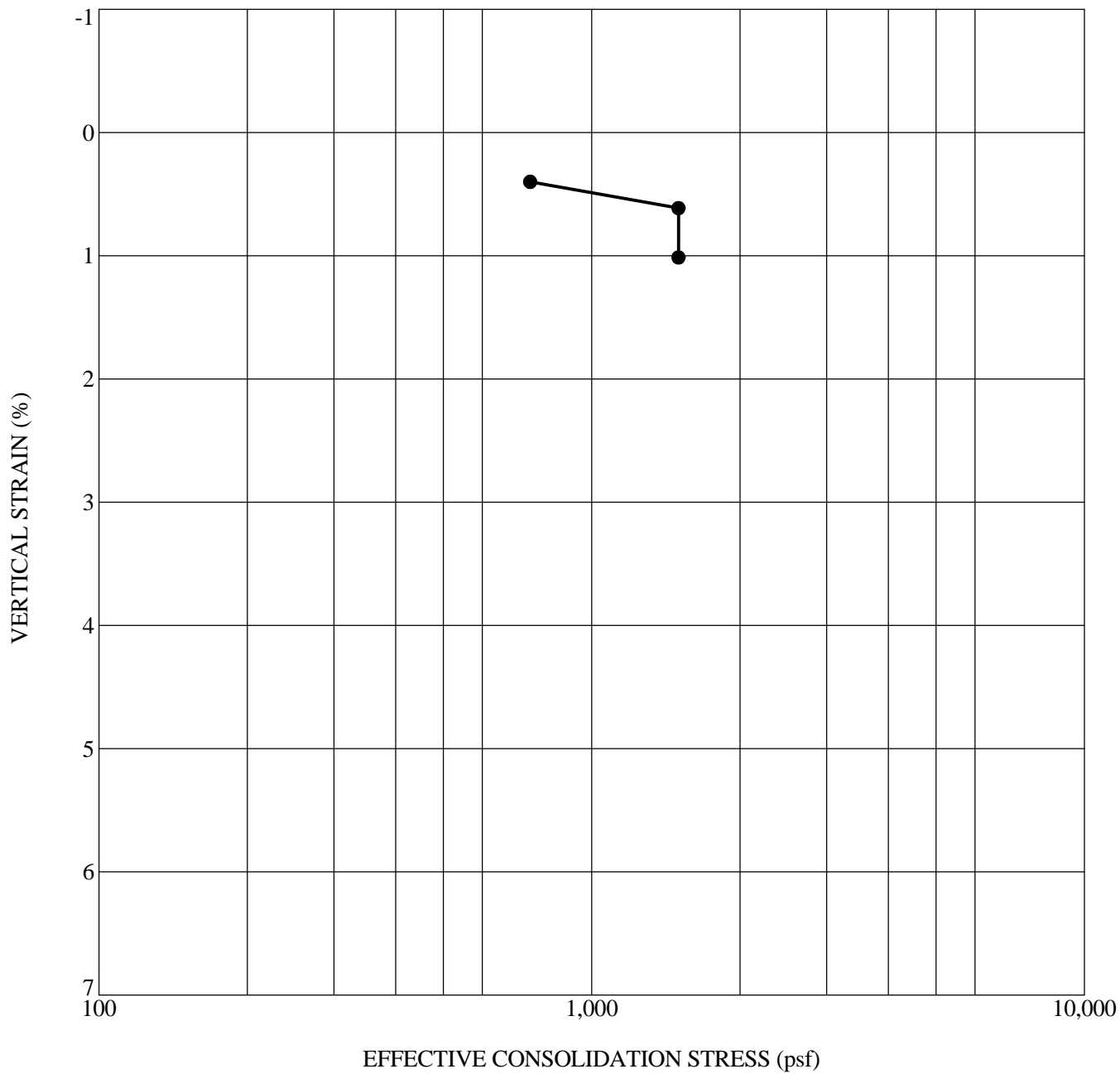
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-28	3.5	Sandy Silty CLAY	107	7				1500		0.47



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

D.R. Horton
 Micron Property
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 Project Number: 589-100

Plate
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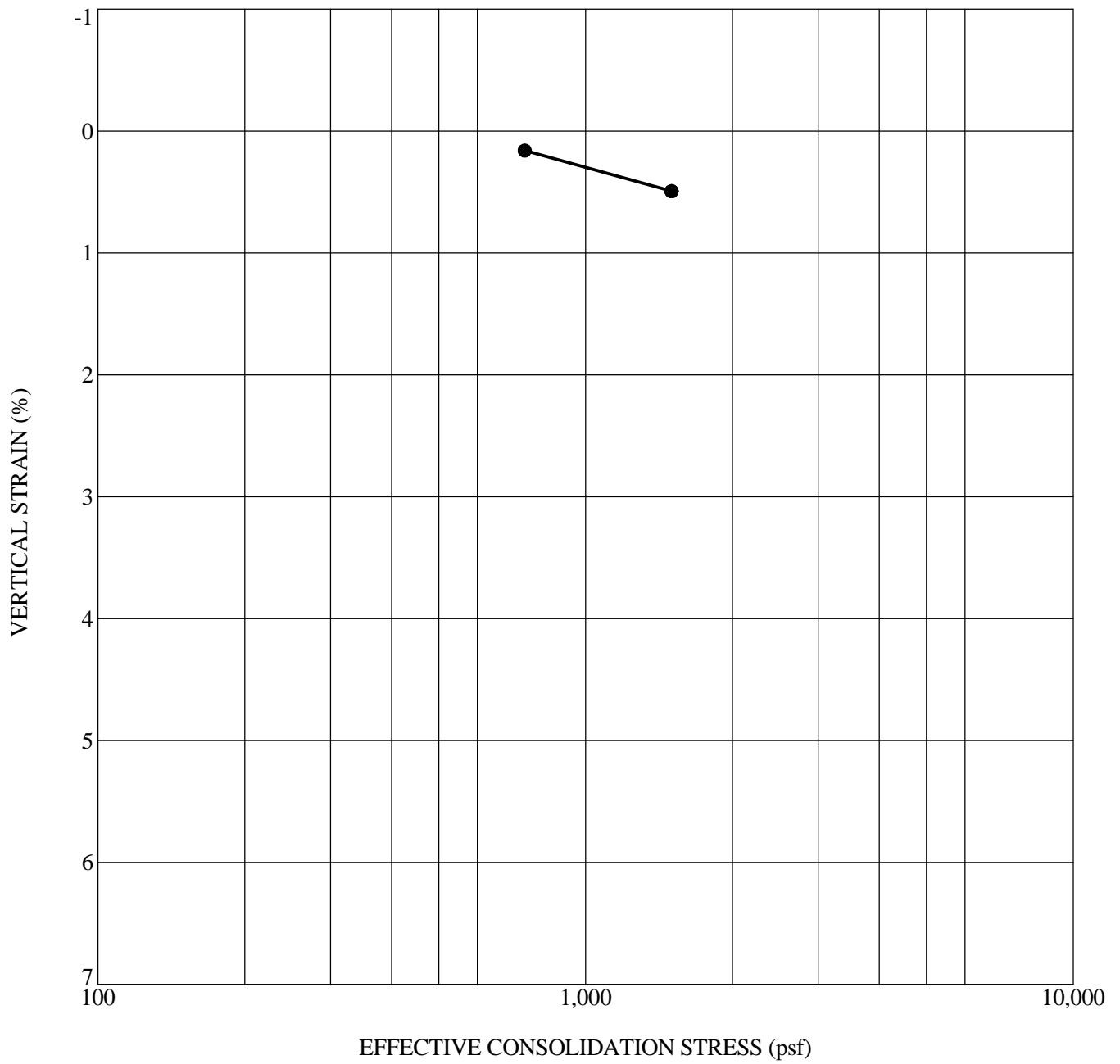
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-30	4.0	Lean CLAY	103	24				1500		0.40



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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Plate
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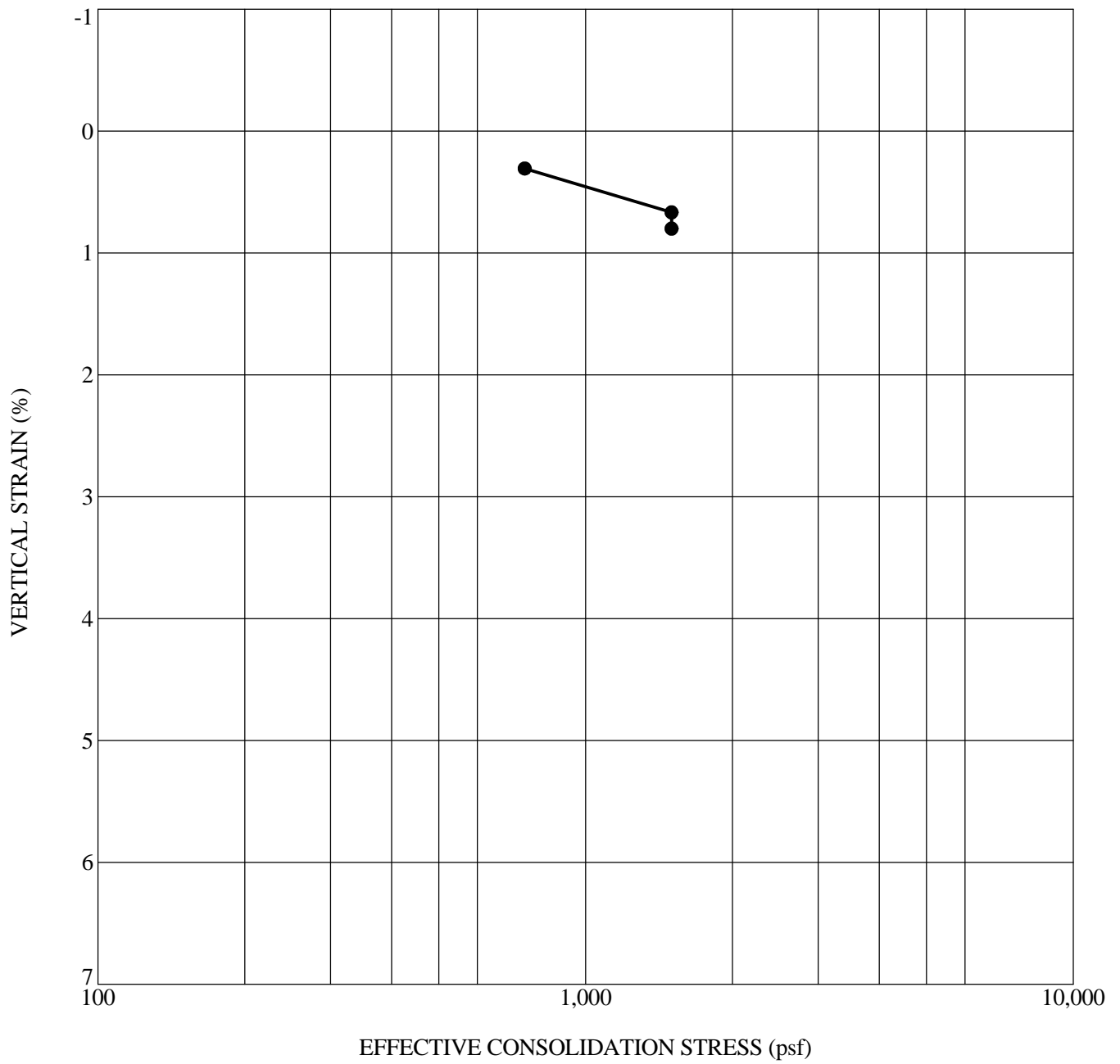
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-32	3.5	Lean CLAY	99	10				1500		0.01



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

D.R. Horton
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Plate
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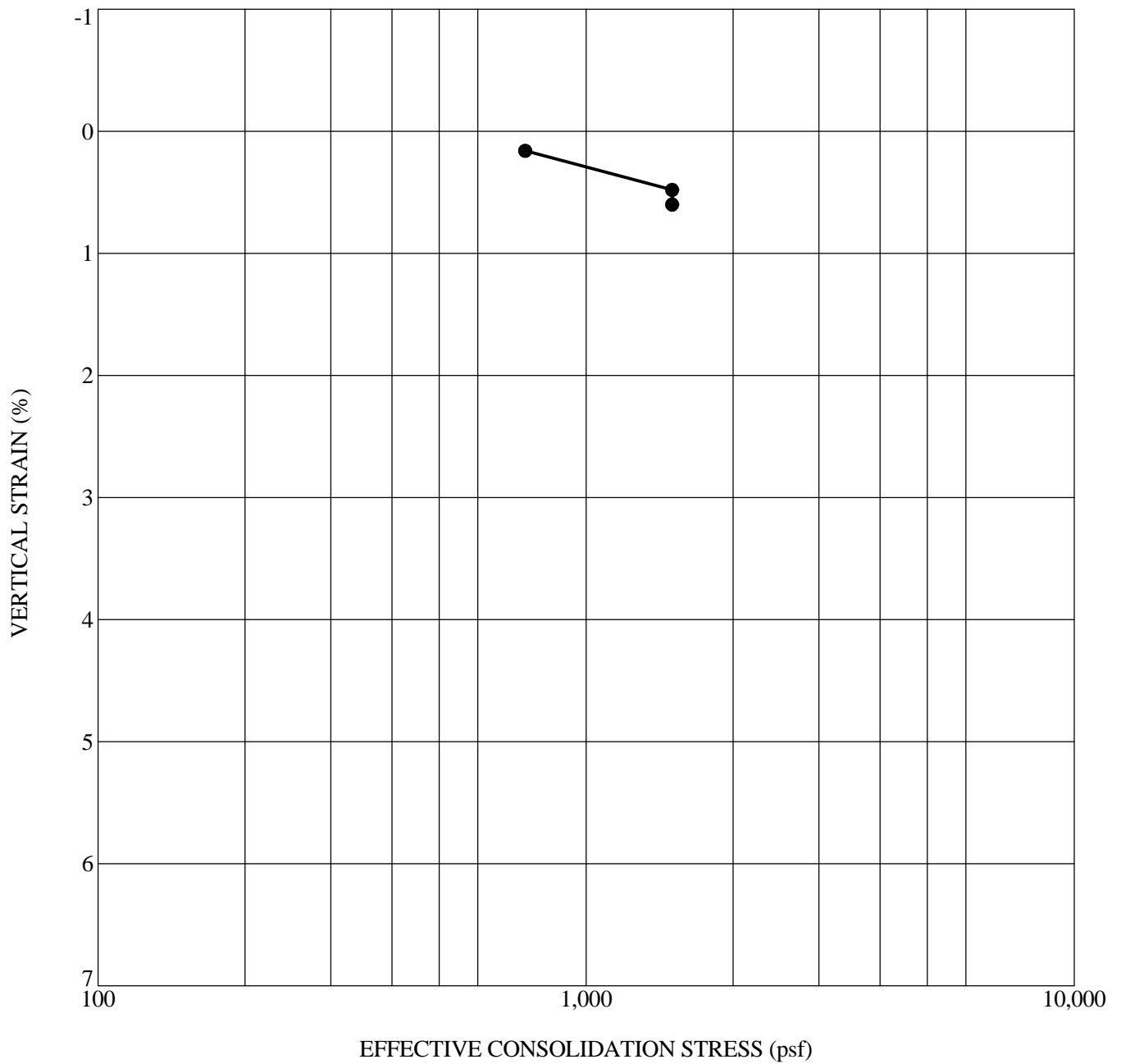
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-33	6.0	Lean CLAY with sand	90	11				1500		0.10



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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Plate
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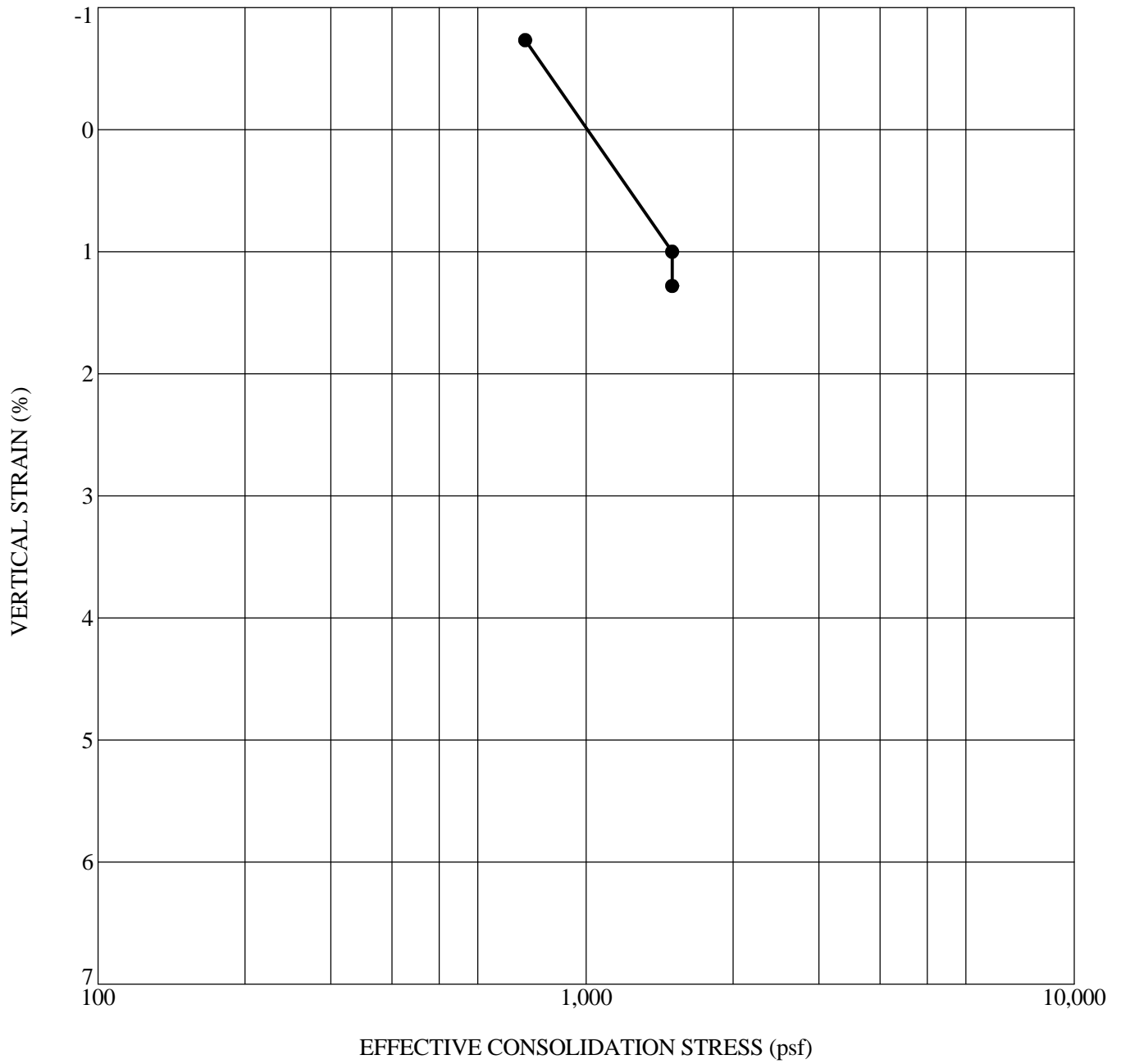
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-35	5.0	Sandy SILT	96	11				1500		0.12



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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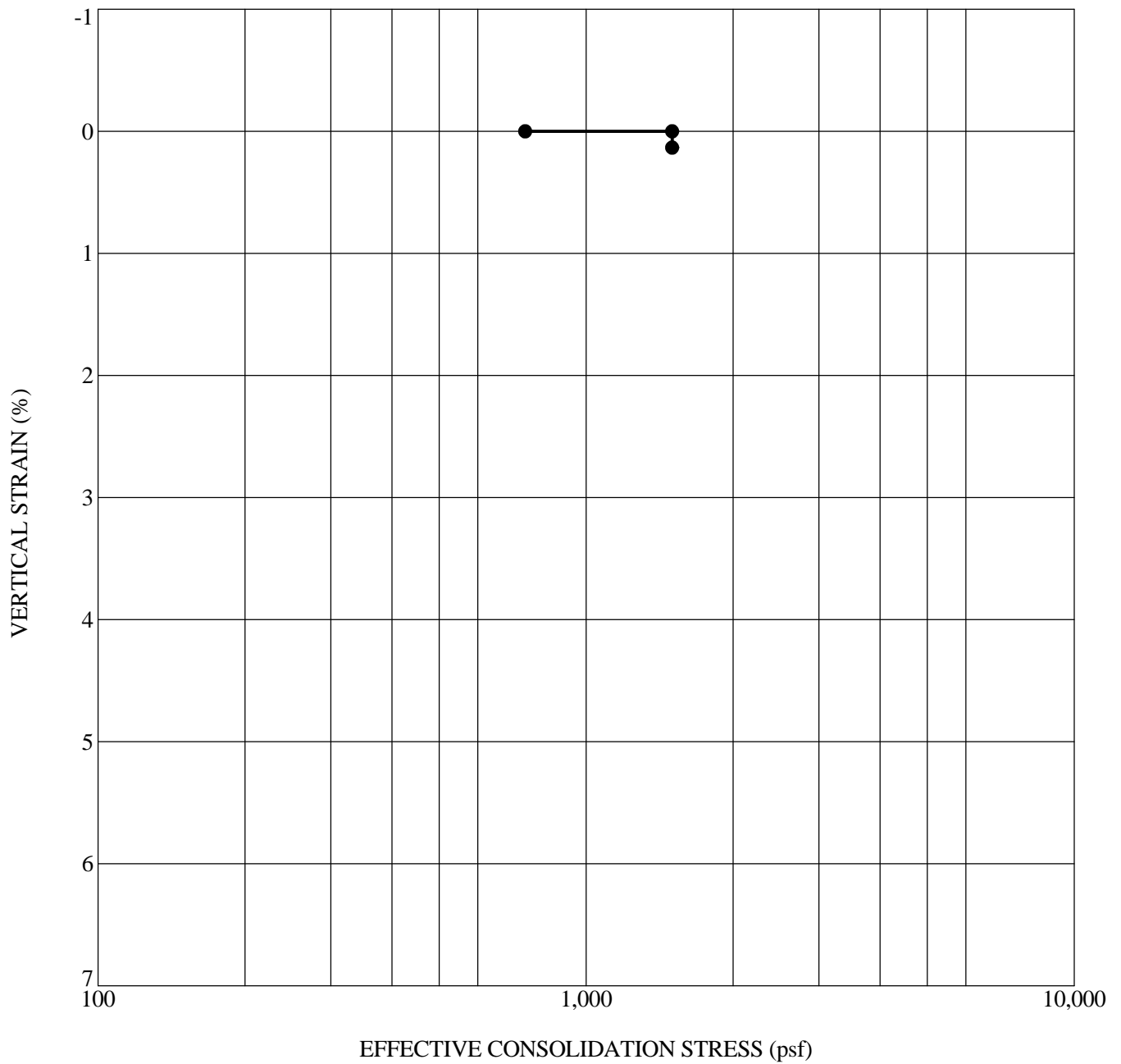
Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-39	3.5	Lean CLAY	96	8				1500		0.21



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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Plate
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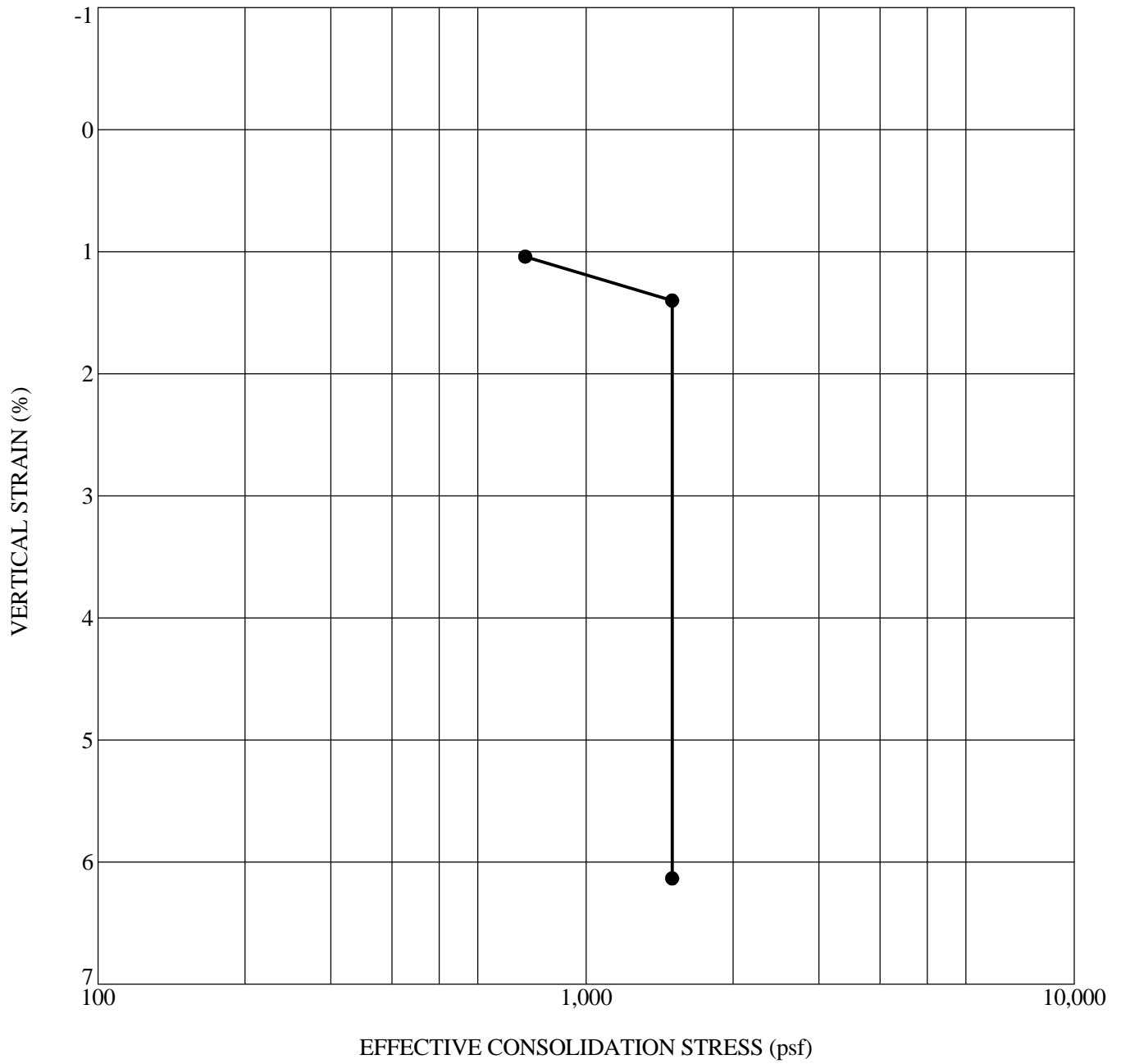
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-41	5.0	Sandy Lean CLAY	89	5				1500		0.01



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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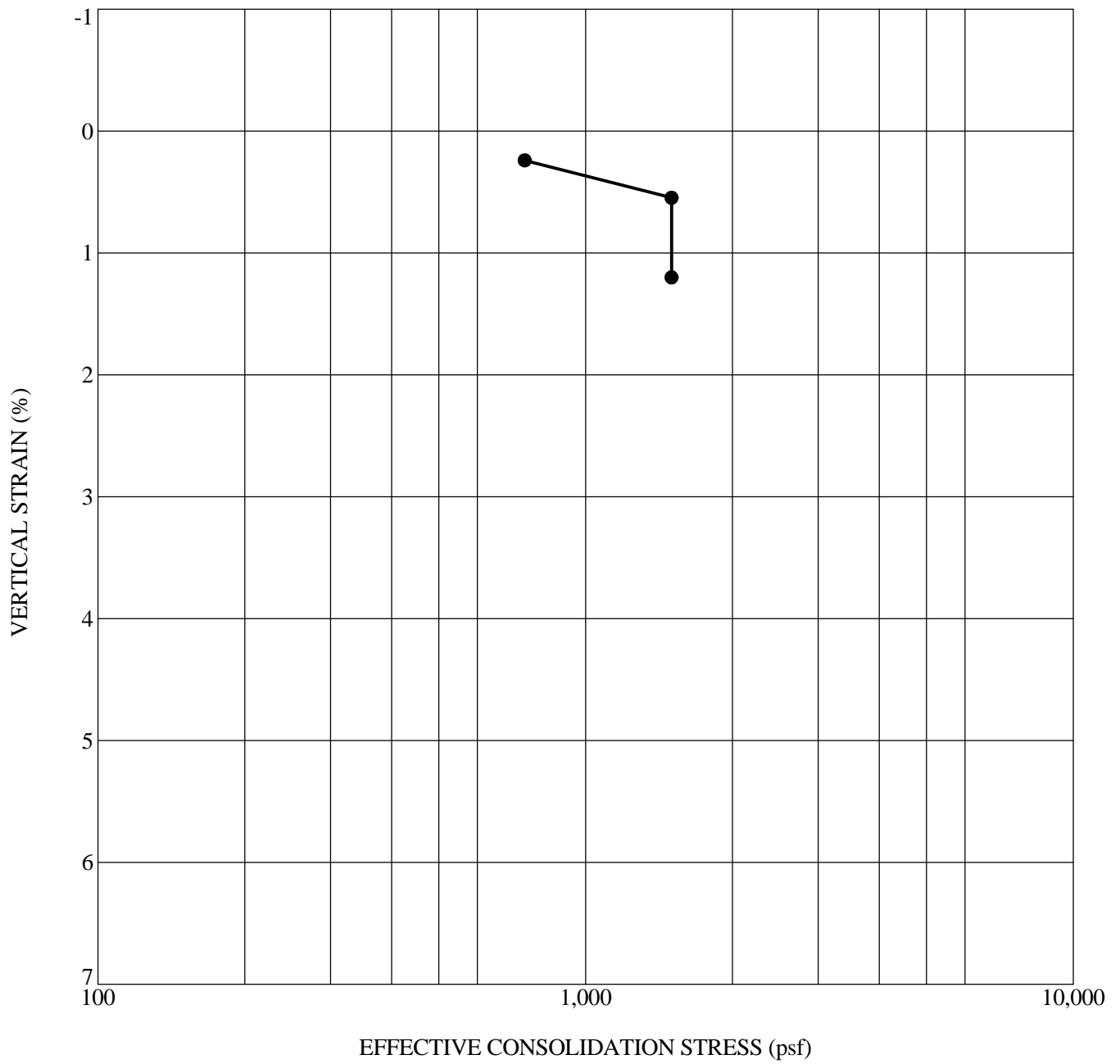
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-43	8.0	Sandy SILT	87	7				1500		3.55

1-D CONSOLIDATION/SWELL/COLLAPSE TEST



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Plate
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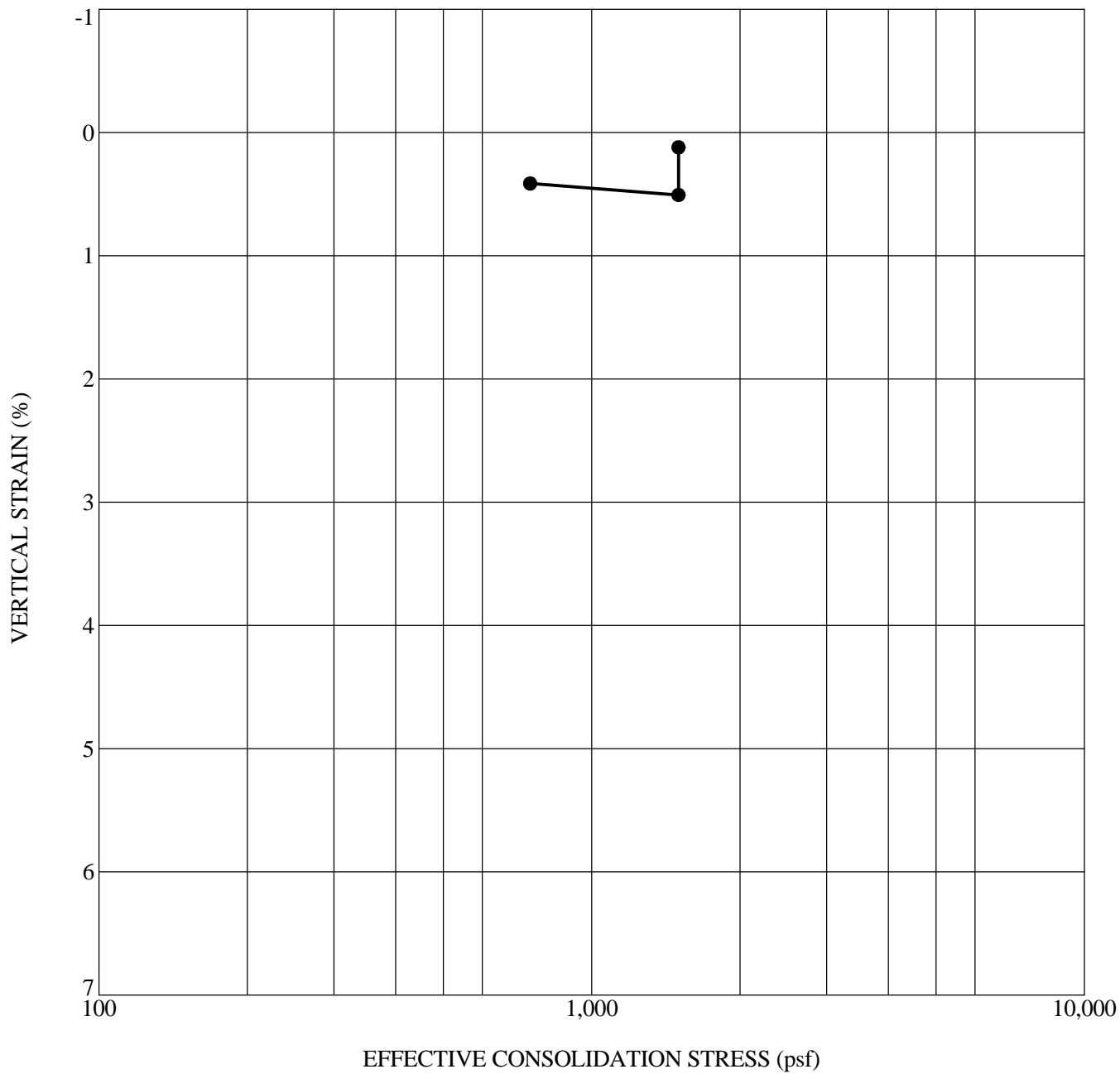
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-47	6.0	Lean CLAY	95	9				1500		0.65



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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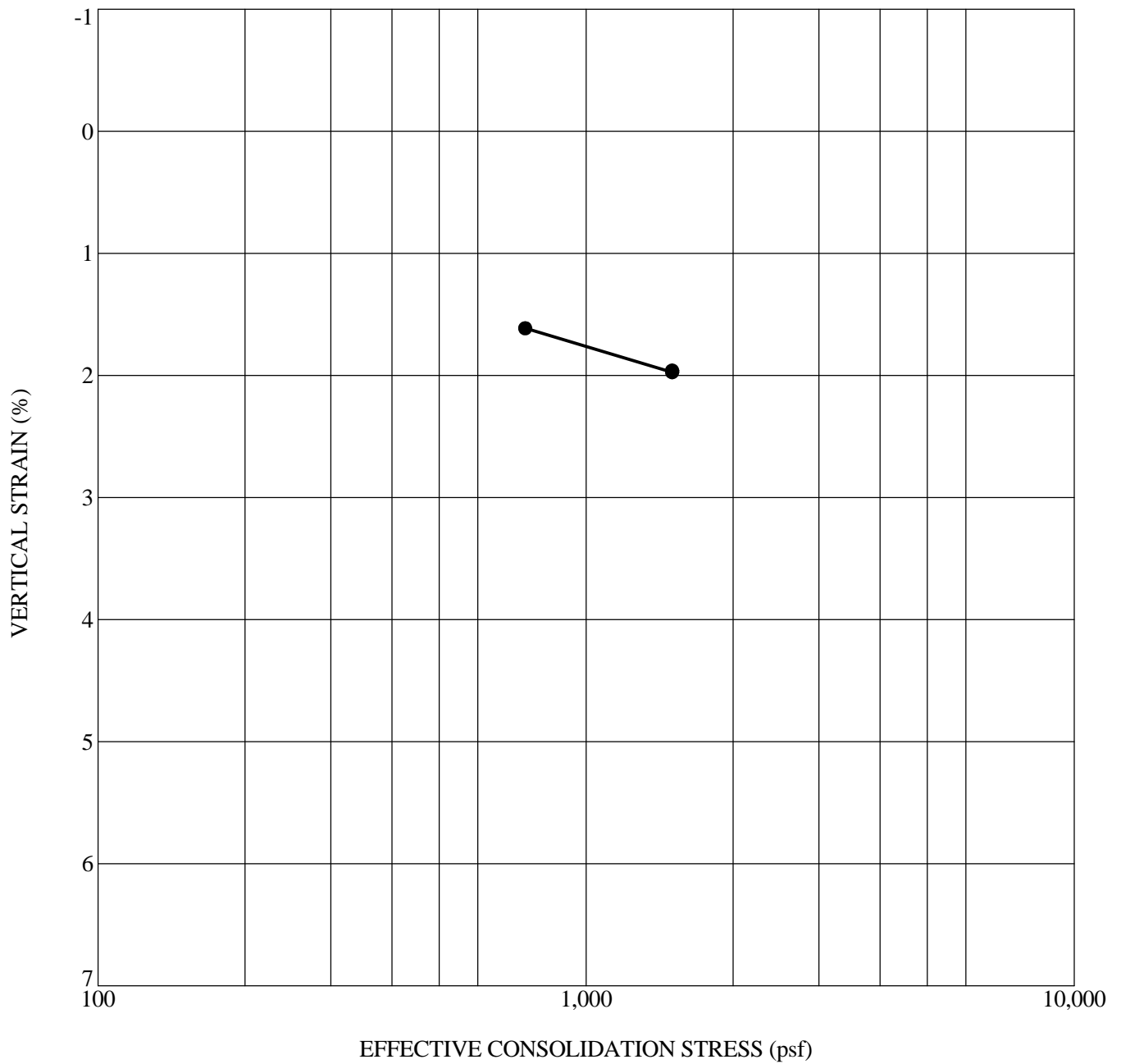
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-49	6.0	Lean CLAY	105	16				1500	0.29	



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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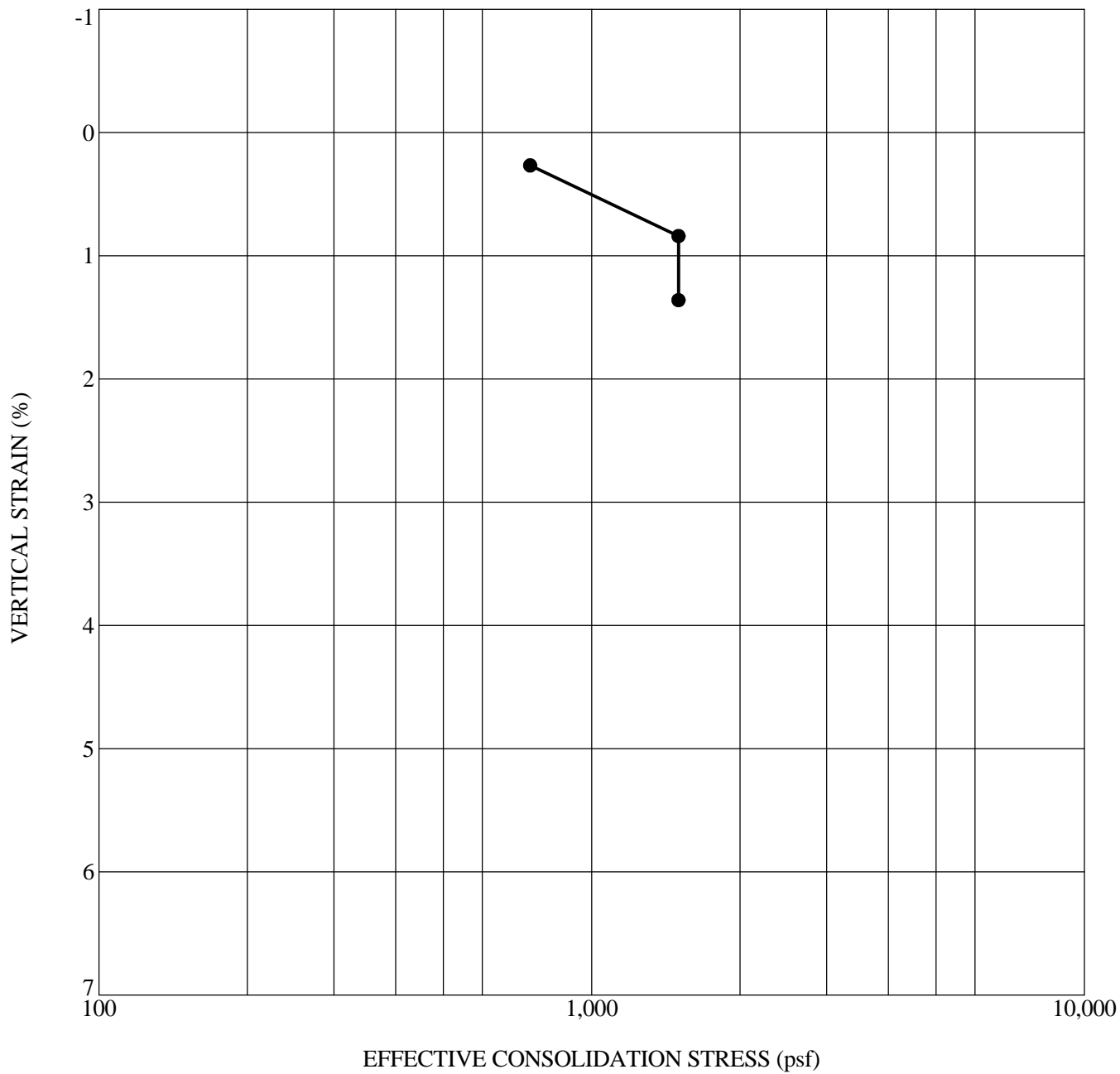
Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-52	4.0	Lean CLAY	104	15				1500	0.01	



1-D CONSOLIDATION/SWELL/COLLAPSE TEST

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Sample Location	Depth (ft)	Classification	γ_a (pcf)	MC (%)	C'_c	C'_r	OCR	Inundation Load (psf)	Swell (%)	Collapse (%)
● MW-TP-54	8.0	Lean CLAY	87	14				1500		0.53

1-D CONSOLIDATION/SWELL/COLLAPSE TEST



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Plate
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Source of Material MW-TP-41 1.5 ft.
 Material Description Clayey GRAVEL with sand
 Test Method ASTM D698 Method C

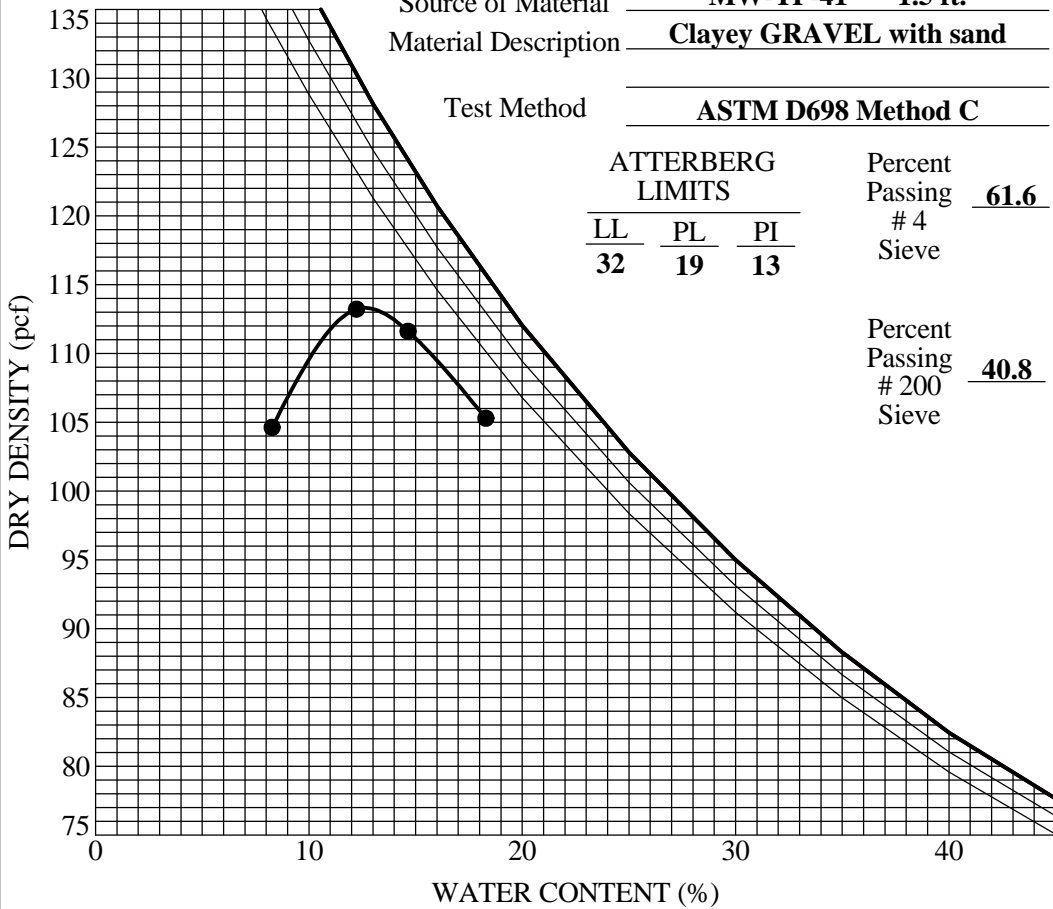
TEST RESULTS

Maximum Dry Density 114.8 (pcf)
 Optimum Water Content 12.9 (%)
 Percent Rock 19.0 (%)
 Corrected Maximum Dry Density 121.1 (pcf)
 Corrected Optimum Water Content 10.9 (%)

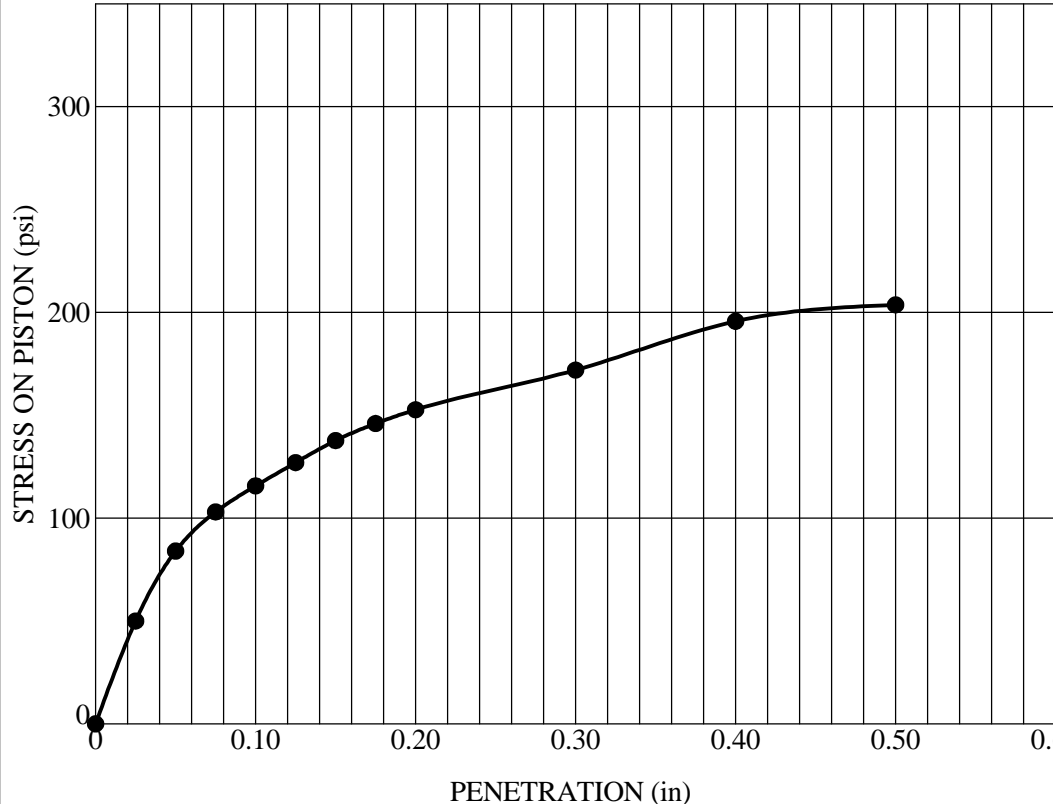
ATTEBERG LIMITS

LL	PL	PI
32	19	13

 Percent Passing #4 Sieve 61.6
 Percent Passing #200 Sieve 40.8



Curves of 100% Saturation for Specific Gravity Equal to:
2.60, 2.70, 2.80



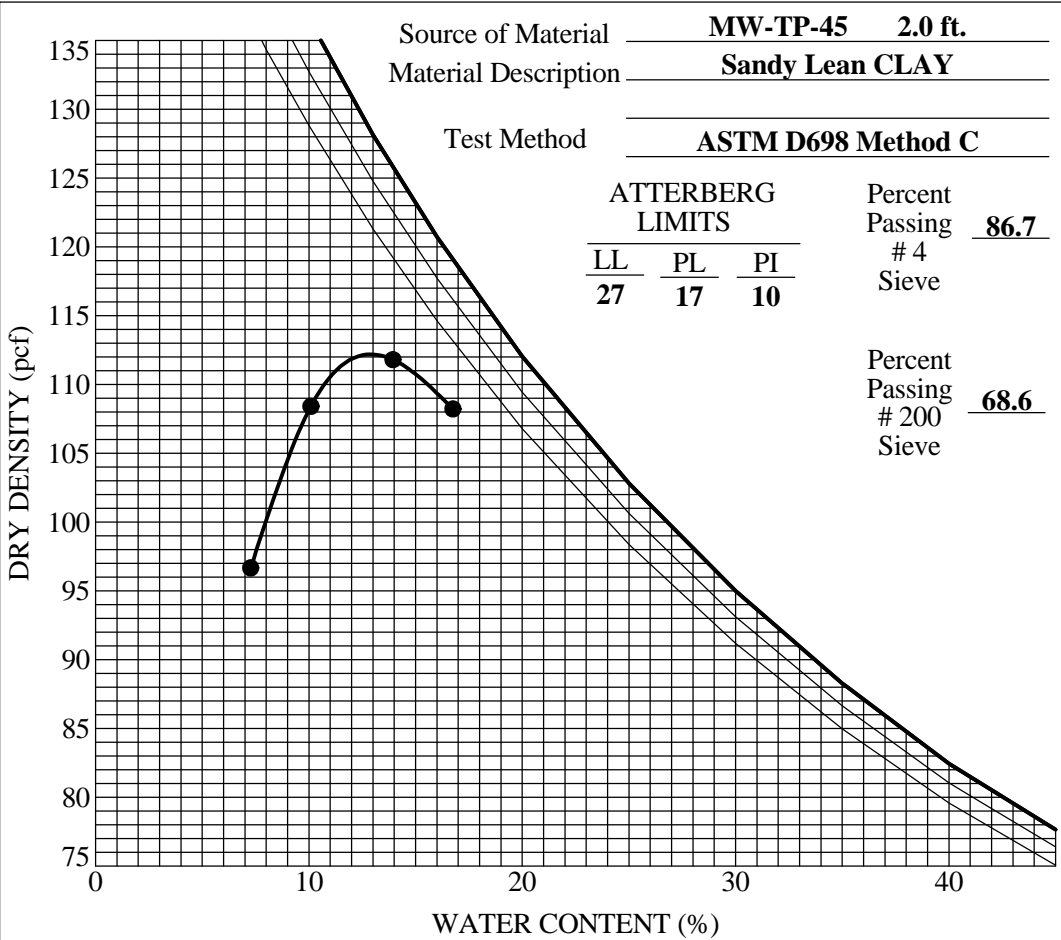
Dry Density 114.8 (pcf)
 Relative Compaction 100 (%)
 Surcharge 51 (psf)
 % Standard CBR 11.60
 Swell 0.81 (%)

COMPACTION AND CBR TEST

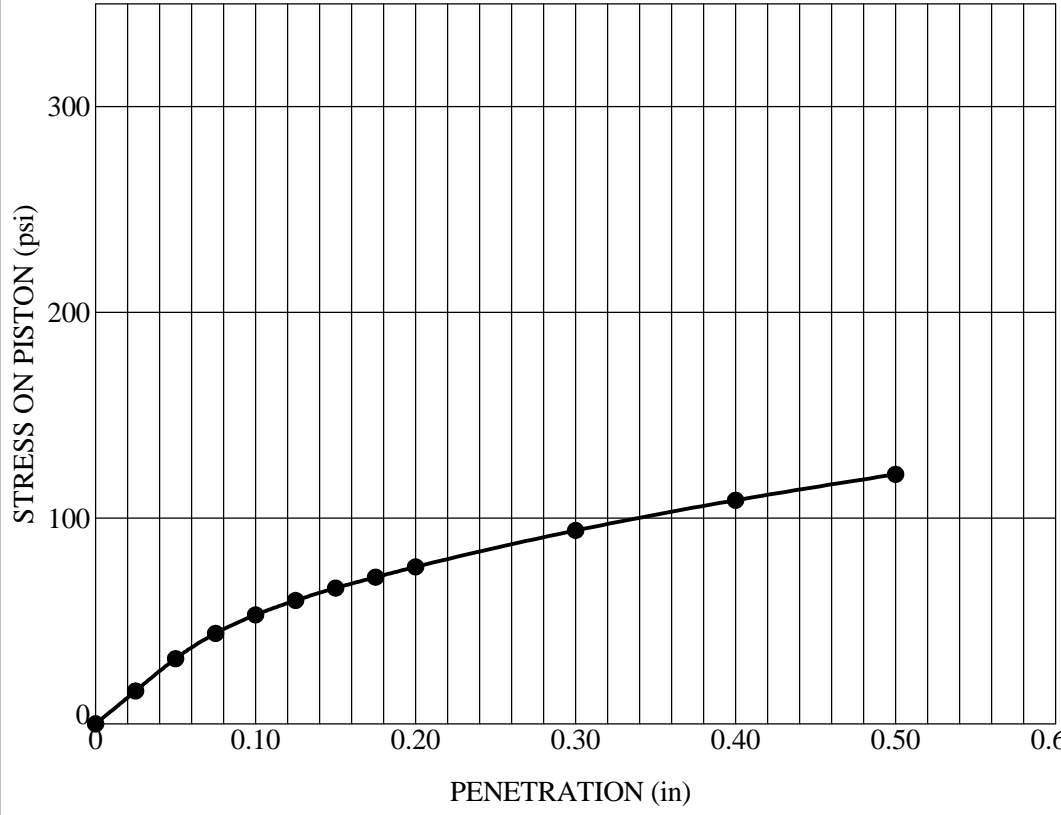


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TEST RESULTS	
Maximum Dry Density	<u>112.0 (pcf)</u>
Optimum Water Content	<u>11.7 (%)</u>
Percent Rock	_____ (%)
Corrected Maximum Dry Density	_____ (pcf)
Corrected Optimum Water Content	_____ (%)
Curves of 100% Saturation for Specific Gravity Equal to:	
<u>2.60, 2.70, 2.80</u>	



Dry Density	<u>113.0 (pcf)</u>
Relative Compaction	<u>101 (%)</u>
Surcharge	<u>51 (psf)</u>
% Standard CBR	<u>5.30</u>
Swell	<u>0.52 (%)</u>

COMPACTION AND CBR TEST



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APPENDIX D

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared solely for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on *this report* if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*



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Important Information about this Geotechnical Engineering Report

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responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. *Accordingly, proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists.*



Telephone: 301/565-2733

e-mail: info@geoprofessional.org www.geoprofessional.org

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Important Information about this Geotechnical Engineering Report

D.R. Horton
Micron Properties
Lehi/Draper, Utah
Project Number: 589-100

Plate
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