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August 03, 2020

Widefield Investment Group
#3 Widefield Blvd.
Colorado Springs, CO 80911

Gentlemen,

At your request, personnel of J&K Geologic Services, (J&K), reviewed the Subsurface Investigation (SSI) performed by RMG Engineers dated 6/19/2020 (Job # 174778) for Filing 9, The Glen at Widefield East. The purpose of our review was to compare the ground water table elevations encountered on lots 88 and 89 in the SSI referenced above with the elevations obtained in J&K Geological Services' Ground Water Table Study for Filings 9 & 11 dated 2/16/2019 for the suitability of basement construction on lots 87-90.

The piezometers for the study referenced above were installed as part of a monitoring program to verify ground water elevations in Filings #9 & #11 as approved by the Colorado Geological Survey, (CGS) and the comment letter dated April 16, 2016, (CGS Unique No. EP-16-0003 4), concerning the Preliminary Plat Plan for The Glen at Widefield East.

In the CGS comment letter for the above referenced development dated January 15, 2016, Ms. Jill Carlson, CEG, recommended "basements should not be allowed in areas where observed groundwater levels are shallower than 14 ft. below planned final grades...". As the groundwater measurements from the RMG report referenced above show on lots 88 and 89 this requirement has been surpassed. Although test borings were not placed on Lots 87 and 90 the subsurface conditions are most likely similar in nature for basement construction.

As in all other filings of The Glen at Widefield East, each individual lot is to be investigated by the lot owner's Geotechnical Engineer of Record for final foundation parameters and recommendations.

We trust this provides the information you requested. Should questions arise or if further information is needed, please contact J&K Geological Services at your convenience.

Respectfully submitted,

J&K GEOLOGIC SERVICES, LLC

James F. Frohbieter,
Professional Geologist/Owner
J&K Geological Services LLC

Architecture
Structural
Geotechnical

ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED

Materials Testing
Forensic
Civil/Planning

SUBSURFACE SOIL INVESTIGATION

Lots 1-12, 30-40, 55-70, 84-93, and 102-106
The Glen, Filing No. 9
El Paso County, Colorado

PREPARED FOR:

Windsor Ridge Homes
4164 Austin Bluffs Parkway, #361
Colorado Springs, CO 80918

JOB NO. 174778

June 19, 2020

Respectfully Submitted,
RMG – Rocky Mountain Group

Brian Griffith, E.I.
Geotechnical Staff Engineer

Reviewed by,
RMG – Rocky Mountain Group

COLORADO REGISTERED
ANTHONY P. MUNGER
6/24/20
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PROFESSIONAL ENGINEER

Tony Munger, P.E.
Geotechnical Project Manager

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GENERAL SITE AND PROJECT DESCRIPTION

Project Description

The site is located south and east of Colorado Springs, Colorado, north and west of the intersection of Marksheffel Road and Mesa Ridge Parkway. More specifically, the site is located along Bittercress Drive, Peachleaf Drive, Bee Balm Place, Bigtooth Maple Drive, Spring Glen Drive, and Golden Buffs Drive. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

The project is to consist of single-family residential construction on fifty-four lots at The Glen at Widefield subdivision, Filing No. 9. The structures are anticipated to be one to two-stories in height with multi-car garages. The homes may either be constructed with or without basements. RMG – Rocky Mountain Group was retained to explore the subsurface conditions at the site and develop geotechnical engineering recommendations for design and construction.

Existing Site Conditions

The site is presently developed as residential lots. Significant vegetation was not present due to overlot grading. The topography across the site is relatively flat.

FIELD INVESTIGATION AND LABORATORY TESTING

Drilling

The subsurface conditions on the site were investigated by drilling thirty exploratory test borings. The approximate locations of the test borings and Anticipated Foundation Recommendations are presented in Figure 2 and Figure 2A.

The test borings were advanced with a power-driven, continuous-flight auger drill rig to depths of about 20 feet below the existing ground surface. Samples were obtained in general accordance with ASTM D-1586 utilizing a 2-inch OD split-barrel sampler or in general accordance with ASTM D-3550 utilizing a 2½-inch OD modified California sampler. An Explanation of Test Boring Logs is presented in Figure 3. The Test Boring Logs are presented in Figures 4 through 18.

Laboratory Testing

The moisture content for the recovered samples was obtained in the laboratory. Grain-size analysis, Atterberg Limits, and Denver Swell/Consolidation tests were performed on selected samples for purposes of classification and to develop pertinent engineering properties. A Summary of Laboratory Test Results is presented in Figure 19. Soil Classification Data are presented in Figures 20 through 25. Swell/Consolidation Test Results are presented in Figures 26 through 33.

SUBSURFACE CONDITIONS

Subsurface Materials

The subsurface materials encountered in the test borings were classified using the Unified Soils Classification System (USCS) and the materials were grouped into the general categories of sandy clay fill, native silty to clayey sand, native sandy clay, silty to clayey sandstone, and sandy claystone.

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the logs are based upon the engineer's classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

Groundwater

Groundwater was observed in the test borings on four of the lots at depths ranging from 17 to 19 feet below the existing ground surface at the time of field exploration. When checked seven days subsequent to drilling, groundwater was measured at an approximate depth of 16 feet on Lot 89 and 17 feet on Lot 91. Follow-up groundwater checks were not performed on the remaining lots. Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels.

CONCLUSIONS AND RECOMMENDATIONS

The following discussion is based on the subsurface conditions encountered in the test borings and on the project characteristics previously described. If conditions are different from those described in this report or the project characteristics change, RMG should be retained to review our recommendations and adjust them, if necessary.

Geotechnical Considerations

Fill soils were encountered during our investigation. As of the issue date of this report, no documentation has been provided to RMG indicating that the fill was placed in a controlled manner, or that it was observed or tested during placement. Until such documentation is provided, the fill soils encountered on the site are considered non-engineered and are not suitable for support of foundation components. These unsuitable fill soils may be encountered in the excavations, even on lots where none are indicated on the test boring logs. Furthermore, any fill placed atop those unsuitable fill soils will also be considered unsuitable for support of foundation components, unless the new fill soils comprise one component of a foundation bearing enhancement system. This report does not include recommendations for design or construction of such a bearing enhancement system. If such recommendations are desired, contact personnel of RMG for more information.

Loose/soft soils were not encountered in the test borings. Expansive soils and/or bedrock were encountered in all thirty of the test borings. As with fill soils, loose/soft soils and/or expansive soils/bedrock may be encountered in the excavations, even on lots where none are indicated on the test boring logs. If encountered in the excavation, these materials will require additional compaction and/or

removal (overexcavation) and replacement as indicated under the **Overexcavation and Replacement** section of this report.

Foundation design recommendations, based on the field investigation and laboratory testing, are presented below. It must be understood that these recommendations should be verified after the excavation on each individual lot is completed.

Overexcavation and Replacement

Fill soils may be considered unsuitable for a variety of reasons. These include (but are not limited to) non-engineered fills, fill soils containing trash or debris, fill soils that appear to have been improperly selected, placed and/or compacted, etc. If unsuitable fill soils are encountered during the Open Excavation Observation, they will require removal (overexcavation) and replacement with compacted structural fill. As stated above, all fill soils encountered on the site are considered unsuitable, until documentation indicating that the fill was placed in a controlled manner is provided to RMG. The zone of overexcavation shall extend to the bottom of the unsuitable fill zone and shall extend at least that same distance beyond the building perimeter (or lateral extent of the fill, if encountered first).

If loose/soft soils are encountered during the Open Excavation Observation, they may require additional compaction to achieve the allowable bearing pressure indicated in this report. Fluctuations in material density may occur. In some cases, removal and recompaction of up to 2 feet of soil may be required. The removal and recompaction shall extend a minimum of 2 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings. The use of track-mounted excavation equipment, or other low ground pressure equipment, is recommended on loose soils to reduce the likelihood of loss of stability during excavation.

Recommendations for overexcavation of expansive soils and allowable bearing pressures are presented below:

- **Lots 1-3, 36-40, 84-93, and 102-106**

  <u>Spread Footing Foundations</u>

  The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of spread footing foundations. Mitigations for clay and/or claystone on these lots are as follows:

  - On lots where **Granular Structural Fill** is to be used:

    If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted granular structural fill to a depth which results in at least 3 feet of compacted structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

    For a spread footing foundation supported atop full-depth granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- On lots where **Moisture-Conditioned Structural Fill** is to be used:

  If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 3 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  Moisture-conditioned structural fill may only consist of native clay soils derived from excavations on lots included in this report.

  For a spread footing foundation supported atop moisture-conditioned, on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report, a maximum allowable bearing pressure of 2,400 psf with a 1,000 psf minimum dead load may be used for design.

Stiffened-Slab Foundations

The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of stiffened-slab foundations. If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 3 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

Structural fill placed below stiffened-slab foundations on these lots may consist of either:

Entirely of granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, or

Entirely of on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report.

For a stiffened-slab foundation supported atop structural fill, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- **Lots 4-12, 30-35, and 59-62**

Spread Footing Foundations

The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of spread footing foundations. Mitigations for clay and/or claystone on these lots are as follows:

- On lots where **Granular Structural Fill** is to be used:

  If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted granular structural fill to a depth which results in at least 3 feet of compacted structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  For a spread footing foundation supported atop full-depth granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- On lots where **Moisture-Conditioned Structural Fill** is to be used:

  If expansive soils are determined to be within 4 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 4 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 4 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  Moisture-conditioned structural fill may only consist of native clay soils derived from excavations on lots included in this report.

  For a spread footing foundation supported atop moisture-conditioned, on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report, a maximum allowable bearing pressure of 2,400 psf with a 1,000 psf minimum dead load may be used for design.

Stiffened-Slab Foundations

Overexcavation of clay soils and claystone bedrock is not anticipated for stiffened-slab foundations on these lots.

For a stiffened-slab foundation supported atop native soils/bedrock, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- **Lots 55-56 and 63-65**

Spread Footing Foundations

The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of spread footing foundations. Mitigations for clay and/or claystone on these lots are as follows:

- On lots where **Granular Structural Fill** is to be used:

  If expansive soils are determined to be within 4 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted granular structural fill to a depth which results in at least 4 feet of compacted structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 4 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  For a spread footing foundation supported atop full-depth granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- On lots where **Moisture-Conditioned Structural Fill** is to be used:

  If expansive soils are determined to be within 5 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 5 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 5 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  Moisture-conditioned structural fill may only consist of native clay soils derived from excavations on lots included in this report.

  For a spread footing foundation supported atop moisture-conditioned, on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report, a maximum allowable bearing pressure of 2,400 psf with a 1,000 psf minimum dead load may be used for design.

Stiffened-Slab Foundations

The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of stiffened-slab foundations. If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 3 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required.

The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

Structural fill placed below stiffened-slab foundations may consist of either:

Entirely granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, or

Entirely on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report.

For a stiffened-slab foundation supported atop structural fill, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- **Lots 57-58 and 66-70**

Spread Footing Foundations

The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of spread footing foundations. Mitigations for clay and/or claystone on these lots are as follows:

- On lots where **Granular Structural Fill** is to be used:

  If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted granular structural fill to a depth which results in at least 3 feet of compacted structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  For a spread footing foundation supported atop full-depth granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, a maximum allowable bearing pressure of 2,000 psf may be used for design.

- On lots where **Moisture-Conditioned Structural Fill** is to be used:

  If expansive soils are determined to be within 4 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 4 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 4 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

  Moisture-conditioned structural fill may only consist of native clay soils derived from excavations on lots included in this report.

For a spread footing foundation supported atop moisture-conditioned, on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report, a maximum allowable bearing pressure of 2,400 psf with a 1,000 psf minimum dead load may be used for design.

Stiffened-Slab Foundations

The clay soils and claystone bedrock encountered in the test borings on these lots appeared to have low to moderate swell potential and are not suitable for direct bearing of stiffened-slab foundations. If expansive soils are determined to be within 3 feet of foundation components or floor slabs, removal (overexcavation) and replacement with compacted, moisture-conditioned structural fill to a depth which results in at least 3 feet of compacted, moisture-conditioned structural fill below foundation components and floor slabs will be required. The zone of overexcavation shall extend at least 3 feet beyond the building perimeter, and at least that same distance beyond the perimeter of counterfort and "T" wall footings.

Structural fill placed below stiffened-slab foundations may consist of either:

Entirely granular, non-cohesive structural fill prepared in conformance to the **Granular Structural Fill** section of this report, or

Entirely on-site clay soils derived from excavations on lots included in this report that have been prepared in conformance to the **Moisture-Conditioned Structural Fill** section of this report.

For a stiffened-slab foundation supported atop structural fill, a maximum allowable bearing pressure of 2,000 psf may be used for design.

The bedrock at this site is firm to very hard and may require the use of specialized heavy-duty equipment to facilitate rock break-up and removal.

Foundation Recommendations

Stiffened Slab-on-Grade Foundations

A stiffened slab-on-grade foundation is suitable for the proposed residential structures. A total movement of 1 inch with a differential movement of ½ inch of a horizontal distance of 10 feet has been estimated. We have anticipated the deepest excavation cuts for stiffened slab construction will be approximately 2 to 3 feet below the existing ground surface.

Spread Footing Foundations

A spread footing foundation is suitable for the proposed residential structures. We have anticipated that the deepest excavation cuts for basement level construction will be approximately 6 to 8 feet below the existing ground surface.

All Foundations

Foundation designs should be prepared by a qualified Colorado Registered Professional Engineer using the recommendations presented in this report. This foundation system should be designed to span a minimum of 10 feet under the design loads. The bottoms of exterior foundations should be at least 30 inches below finished grade for frost protection.

Open Excavation Observations

During construction, foundation excavations should be observed by RMG prior to placing structural fill, forms, or concrete to verify the foundation bearing conditions for each structure. Based on the conditions observed in the foundation excavation, the recommendations made at the time of construction may vary from those contained herein. In the case of differences, the Open Excavation Observation report shall be considered to be the governing document. The recommendations presented herein are intended only as preliminary guidelines to be used for interpreting the subsurface soil conditions exposed in the excavation and determining the final recommendations for foundation construction.

Floor Slabs

For interior floor slabs not comprising an integral part of a stiffened slab foundation (such as garage or basement slabs), vertical slab movements on the order of one to three inches have been estimated for the subsurface conditions encountered. If movement and associated damage to floors and finishes cannot be tolerated, a structural floor system should be used. Floor slabs should be separated from structural components to allow for vertical movement.

Recommendations for exterior concrete slabs such as patios, driveways, and sidewalks are not included in this report.

Interior Partitions

Interior non-bearing partitions and other attached finishes do not require isolation from floor slabs that comprise a stiffened slab-on-grade foundation system.

Where basement construction with an isolated concrete slab floor is utilized, interior non-bearing partitions and attached furnishings (e.g., cabinets, shower stalls, etc.) on concrete slabs should be constructed with a void so that they do not transmit floor slab movement to the roof or overlying floor. A void of at least 1-1/2 inches is recommended beneath non-bearing partitions. The void may require reconstruction over the life of the structure to re-establish the void due to vertical slab movement.

Lateral Earth Pressures

Foundation and basement walls should be designed to resist lateral pressures. For non-expansive backfill materials, we recommend an equivalent fluid pressure of 40 pcf for design. For on-site moisture conditioned expansive backfill materials, we recommend an equivalent fluid pressure of 60 pcf for design.

The above lateral pressure applies to level, drained backfill conditions. Equivalent Fluid Pressures for sloping/undrained conditions should be determined on an individual basis.

Surface Grading and Drainage

The ground surface should be sloped from the building with a minimum gradient of 10 percent for the first 10 feet. This is equivalent to 12 inches of fall across this 10-foot zone. If a 10-foot zone is not possible on the upslope side of the structure, then a well-defined swale should be created a minimum 5 feet from the foundation and sloped parallel with the wall with a minimum slope of 2 percent to intercept the surface water and transport it around and away from the structure. Roof drains should extend across backfill zones and landscaped areas to a region that is graded to direct flow away from the structure. Owners should maintain the surface grading and drainage recommended in this report to help prevent water from being directed toward and/or ponding near the foundations.

Landscaping should be selected to reduce irrigation requirements. Plants used close to foundation walls should be limited to those with low moisture requirements and irrigated grass should not be located within 5 feet of the foundation. To help control weed growth, geotextiles should be used below landscaped areas adjacent to foundations. Impervious plastic membranes are not recommended.

Irrigation devices should not be placed within 5 feet of the foundation. Irrigation should be limited to the amount sufficient to maintain vegetation. Application of more water will increase the likelihood of slab and foundation movements.

The recommendations listed in this report are intended to address normal surface drainage conditions, assuming the presence of groundcover (established vegetation, paved surfaces, and/or structures) throughout the regions upslope from this structure. However, groundcover may not be present due to a variety of factors (ongoing construction/development, wildfires, etc.). During periods when groundcover is not present in the "upslope" regions, higher than normal surface drainage conditions may occur, resulting in perched water tables, excess runoff, flash floods, etc. In these cases, the surface drainage recommendations presented herein (even if properly maintained) may not mitigate all groundwater problems or moisture intrusion into the structure. We recommend that the site plan be prepared with consideration of increased runoff during periods when groundcover is not present on the upslope areas.

Perimeter Drain

A subsurface perimeter drain is recommended around portions of the structure which will have habitable or storage space located below the finished ground surface. This includes crawlspace areas but not the walkout trench, if applicable. A typical drain detail is presented in Figure 34.

A subsurface perimeter drain is designed to intercept some types of subsurface moisture and not others. Therefore, the drain could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement area.

Where main level slab-on-grade foundation systems (stiffened, monolithic, or isolated) are utilized, a subsurface perimeter drain will not be required around the foundation.

Overexcavation Drain

Depending on the conditions observed at the time of the excavation observation and/or overexcavation observation, a subsurface drain may also be recommended to help reduce the ponding of "free" water atop a soil layer of lower permeability. The guidelines listed below (in conjunction with the test boring

logs presented herein) may be used to determine an approximate percentage of the included lots where an overexcavation drain is likely to be recommended. However, the final overexcavation drain recommendations will be determined for each specific lot at the time of construction. The lot specific overexcavation drain recommendations may vary from the guidelines presented below, based on the actual conditions observed on that lot. In the case of differences, the Open Excavation Observation report shall be considered the governing document. The guidelines presented below are intended only as preliminary guidelines to be used for pre-construction estimating purposes, and are not to be taken as the final lot specific overexcavation drain recommendations.

- Where **Granular Structural Fill** is utilized, an overexcavation drain should be anticipated. The overexcavation drain is to be placed at the bottom of the overexcavated portion of the excavation (in this case 3 to 4 feet below the bottom of the foundation components) prior to backfilling.
- Where full-depth **Moisture-Conditioned Structural Fill** consisting of on-site expansive materials derived from the lots included in this report is utilized, an overexcavation drain is not anticipated to be required.

A typical drain detail is presented in Figure 35. It must be understood that the drain is designed to intercept some types of subsurface moisture and not others. Therefore, the drain could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement area.

Concrete

Type I/II cement is recommended for concrete in contact with the subsurface materials. Calcium chloride should be used with caution for soils with high sulfate contents. The concrete should not be placed on frozen ground. If placed during periods of cold temperatures, the concrete should be kept from freezing. This may require covering the concrete with insulated blankets and heating. Concrete work should be completed in accordance with the latest applicable guidelines and standards published by ACI.

Exterior Backfill

Backfill should be placed in loose lifts not exceeding 8 to 12 inches, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to 85 percent of the maximum dry density as determined by the Modified Proctor test, ASTM D-1557 on exterior sides of walls in landscaped areas. In areas where backfill supports pavement and concrete flatwork, the materials should be compacted to 92 percent of the maximum dry density.

Fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

The appropriate government/utility specifications should be used for fill placed in utility trenches. If material is imported for backfill, the material should be approved by the Geotechnical Engineer prior to hauling it to the site.

The backfill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement. Backfill should be compacted by mechanical means, and foundation walls should be braced during backfilling and compaction.

Structural Fill

Areas to receive structural fill should have topsoil, organic material, or debris removed. The upper 6 inches of the exposed surface soils should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698) or to a minimum of 92 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557) prior to placing structural fill.

Structural fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

Structural fill should be placed in loose lifts not exceeding 8 to 12 inches, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698) or to a minimum of 92 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557). The materials should be compacted by mechanical means.

Materials used for structural fill should be approved by the RMG prior to use. Structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

To verify the condition of the compacted soils, density tests should be performed during placement. The first density tests should be conducted when 24 inches of fill have been placed.

Moisture-Conditioned Structural Fill

Areas to receive moisture-conditioned expansive soils used as structural fill should have topsoil, organic material, or debris removed. The upper 6 inches of the exposed surface soils should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698) or to a minimum of 92 percent of the maximum dry density as determined by the Modified Proctor test (ASTM D-1557) prior to placing structural fill.

Moisture-conditioned structural fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

Moisture conditioned structural fill shall consist of a moisture-conditioned, on-site cohesive fill material. The fill material shall be moisture conditioned and replaced as follows:

- Fill shall be free of deleterious material and shall not contain rocks or cobbles greater than 6 inches in diameter.

- Claystone fill shall be thoroughly "pulverized" and shall not contain claystone chunks greater than 1 1/2 inches in diameter.

- When claystone is to be incorporated, the fill materials shall be processed in a stockpile **(processing these materials in the excavations will not be permitted)**. These stockpiled fill materials shall be moisture-conditioned to a minimum of 1 percent to 4 percent above optimum

moisture content (as determined by the Standard Proctor test, ASTM D-698), with an average of not less than 1 1/2 percent above optimum moisture content. These materials, once moisture conditioned and thoroughly mixed, should rest in the stockpile a minimum of 24 hours to ensure proper distribution of the moisture through the material. After resting, the materials should be re-wet and re-mixed to replace the surficial moisture lost to evaporation during the resting period. Fill materials not containing claystone do not require processing in a stockpile.

- Fill materials shall be moisture-conditioned to a minimum of 1 percent to 4 percent above optimum moisture content (as determined by the Standard Proctor test, ASTM D-698), with an average of not less than 1 1/2 percent above optimum moisture content.

- The moisture-conditioned materials should be placed in maximum 6" compacted lifts. These materials should be compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698). Material not meeting the above requirements shall be reprocessed.

Materials used for moisture-conditioned structural fill should be approved by RMG prior to use. Moisture-conditioned structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

To verify the condition of the compacted soils, density tests should be performed during placement. The first density tests should be conducted when 24 inches of fill have been placed.

CLOSING

This report has been prepared for the exclusive purpose of providing geotechnical engineering information and recommendations for development described in this report. RMG should be retained to review the final construction documents prior to construction to verify our findings, conclusions and recommendations have been appropriately implemented.

This report has been prepared for the exclusive use by **Windsor Ridge Homes** for application as an aid in the design and construction of the proposed development in accordance with generally accepted geotechnical engineering practices. The analyses and recommendations in this report are based in part upon data obtained from test borings, site observations and the information presented in referenced reports. The nature and extent of variations may not become evident until construction. If variations then become evident, RMG should be retained to review the recommendations presented in this report considering the varied condition, and either verify or modify them in writing.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

The scope of services for this project does not include, either specifically or by implication, environmental assessment of the site or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions,

including but not limited to biological or toxicological issues, are beyond the scope of this report. If the Client desires investigation into the potential for such contamination or conditions, other studies should be undertaken.

If we can be of further assistance in discussing the contents of this report or analysis of the proposed development, from a geotechnical engineering point-of-view, please feel free to contact us.

FIGURES

NOT TO SCALE

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SITE VICINITY MAP

LOTS 1-12, 30-40, 55-70, 84-93, AND 102-106
THE GLEN, FILING NO. 9
EL PASO COUNTY, COLORADO
WINDSOR RIDGE HOMES

JOB No. 174778

FIG No. 1

DATE 6-19-2020

*NOTE, SOIL MITIGATIONS AND FOUNDATION RECOMMENDATIONS SHOWN IN THIS TABLE ARE BASED ON MATERIALS ENCOUNTERED IN THE PERTINENT TEST BORINGS. IF DIFFERING MATERIALS OR CONDITIONS ARE ENCOUNTERED I NTHE LOT-SPECIFIC EXCAVATIONS DURING CONSTRUCTION, THE RECOMMENDATIONS MAY VARY FROM THIS TABLE. IN THE CASE OF DIFFERENCES, THE RECOMMENDATIONS MADE AT THE TIME OF THE OPEN EXCAVATION OBSERVATION SHALL BE CONSIDERED AS THE GOVERNING RECOMMENDATIONS.

STIFFENED-SLAB CONSTRUCTION*

GRANULAR, NON-EXPANSIVE SOIL USED AS STRUCTURAL FILL

LOT #'S	OVERDIG FOR	DEPTH OF OVERDIG	WIDTH OF OVERDIG	BEARING CAPACITY	MINIMUM DEAD LOAD	OVERDIG DRAIN ANTIC.? (YES/NO)
1-3	FILL	FULL DEPTH OF FILL	SAME AS DEPTH	2,000 PSF	NONE	YES
	EXPANSIVE	3 FEET	3 FEET			
4-12	EXPANSIVE	NONE	NONE			
30-35	EXPANSIVE	NONE	NONE			
36-40	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
55-58	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
59-62	EXPANSIVE	NONE	NONE			
63-65	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
66-70	EXPANSIVE	3 FEET	3 FEET			
84-93	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
102-106	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			

MOISTURE-CONDTIONED CLAY SOIL USED AS STRUCTURAL FILL

LOT #'S	OVERDIG FOR	DEPTH OF OVERDIG	WIDTH OF OVERDIG	BEARING CAPACITY	MINIMUM DEAD LOAD	OVERDIG DRAIN ANTIC.? (YES/NO)
1-3	FILL	FULL DEPTH OF FILL	SAME AS DEPTH	2,000 PSF	NONE	NO
	EXPANSIVE	3 FEET	3 FEET			
4-12	EXPANSIVE	NONE	NONE			
30-35	EXPANSIVE	NONE	NONE			
36-40	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
55-58	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
59-62	EXPANSIVE	NONE	NONE			
63-65	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
66-70	EXPANSIVE	3 FEET	3 FEET			
84-93	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			
102-106	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET			

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LOTS 1-12, 30-40, 55-70, 84-93, AND 102-106 THE GLEN, FILING NO. 9 EL PASO COUNTY, COLORADO WINDSOR RIDGE HOMES

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DRAWN BY:	BG
CHECKED BY:	TM
ISSUED:	6-19-2020

ANTICIPATED FOUNDATION RECOMMENDATIONS - STIFFENED SLABS

SHEET No.
FIG-2

*NOTE, SOIL MITIGATIONS AND FOUNDATION RECOMMENDATIONS SHOWN IN THIS TABLE ARE BASED ON MATERIALS ENCOUNTERED IN THE PERTINENT TEST BORINGS. IF DIFFEREING MATERIALS OR CONDITIONS ARE ENCOUNTERED I NTHE LOT-SPECIFIC EXCAVATIONS DURING CONSTRUCTION, THE RECOMMENDATIONS MAY VARY FROM THIS TABLE. IN THE CASE OF DIFFERENCES, THE RECOMMENDATIONS MADE AT THE TIME OF THE OPEN EXCAVATION OBSERVATION SHALL BE CONSIDERED AS THE GOVERNING RECOMMENDATIONS.

SPREAD FOOTING CONSTRUCTION*

GRANULAR, NON-EXPANSIVE SOIL USED AS STRUCTURAL FILL							MOISTURE-CONDTIONED CLAY SOIL USED AS STRUCTURAL FILL						
LOT #'S	OVERDIG FOR	DEPTH OF OVERDIG	WIDTH OF OVERDIG	BEARING CAPACITY	MINIMUM DEAD LOAD	OVERDIG DRAIN ANTIC.? (YES/NO)	LOT #'S	OVERDIG FOR	DEPTH OF OVERDIG	WIDTH OF OVERDIG	BEARING CAPACITY	MINIMUM DEAD LOAD	OVERDIG DRAIN ANTIC.? (YES/NO)
1-3	FILL	FULL DEPTH OF FILL	SAME AS DEPTH	2,000 PSF	NONE	YES	1-3	FILL	FULL DEPTH OF FILL	SAME AS DEPTH	2,400 PSF	1,000 PSF	NO
	EXPANSIVE	3 FEET	3 FEET					EXPANSIVE	3 FEET	3 FEET			
4-12	EXPANSIVE	3 FEET	3 FEET				4-12	EXPANSIVE	4 FEET	4 FEET			
30-35	EXPANSIVE	3 FEET	3 FEET				30-35	EXPANSIVE	4 FEET	4 FEET			
36-40	FILL	FULL DEPTH OF FILL	SAME AS DEPTH				36-40	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET					EXPANSIVE	3 FEET	3 FEET			
55-56	FILL	FULL DEPTH OF FILL	SAME AS DEPTH				55-56	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	4 FEET	4 FEET					EXPANSIVE	5 FEET	5 FEET			
57-62	EXPANSIVE	3 FEET	3 FEET				57-62	EXPANSIVE	4 FEET	4 FEET			
63-65	FILL	FULL DEPTH OF FILL	SAME AS DEPTH				63-65	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	4 FEET	4 FEET					EXPANSIVE	5 FEET	5 FEET			
66-70	EXPANSIVE	3 FEET	3 FEET				66-70	EXPANSIVE	4 FEET	4 FEET			
84-93	FILL	FULL DEPTH OF FILL	SAME AS DEPTH				84-93	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET					EXPANSIVE	3 FEET	3 FEET			
102-106	FILL	FULL DEPTH OF FILL	SAME AS DEPTH				102-106	FILL	FULL DEPTH OF FILL	SAME AS DEPTH			
	EXPANSIVE	3 FEET	3 FEET					EXPANSIVE	3 FEET	3 FEET			

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ANTICIPATED FOUNDATION RECOMMENDATIONS - SPREAD FOOTINGS

SHEET No.
FIG-2A

SOILS DESCRIPTION

INTERBEDDED SANDSTONE AND SHALE/CLAYSTONE

CLAYEY SAND

CLAYSTONE

FILL: CLAY, SANDY

SANDSTONE

SANDY CLAY

SILTY SAND

SILTY TO CLAYEY SAND

UNLESS NOTED OTHERWISE, ALL LABORATORY
TESTS PRESENTED HEREIN WERE PERFORMED BY:
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2910 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, COLORADO

SYMBOLS AND NOTES

XX — STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).

XX — UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).

FREE WATER TABLE

DEPTH AT WHICH BORING CAVED

BULK — DISTURBED BULK SAMPLE

AUG — AUGER "CUTTINGS"

4.5 — WATER CONTENT (%)

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EXPLANATION OF TEST BORING LOGS

JOB No. 174778

FIGURE No. 3

DATE Jun/19/2020

LOT No.: **1**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	FILL: CLAY, SANDY, light brown, moist			
	CLAY, SANDY, light brown, very stiff, moist			
5			20	10.8
10			17	10.1
	CLAYSTONE, SANDY, light brown to brown, firm, moist			
15			44	12.9
	SANDSTONE, CLAYEY, brown to olive, very hard, moist			
20			50/6"	12.2

LOT No.: **3**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown, very stiff, moist			
5			21	8.3
	CLAYSTONE, SANDY, light brown and brown to olive with rust staining, medium hard to very hard, moist			
10			50/8"	14.7
15			50/5"	11.0
20			10/0"	6.5

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TEST BORING LOGS

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FIGURE No. 4

DATE Jun/19/2020

LOT No.: **5**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown, very stiff, moist			
5			21	7.2
	SAND, SILTY TO CLAYEY, light brown, medium dense, moist			
10			25	5.7
	CLAYSTONE, SANDY, brown to gray with rust staining, hard to very hard, moist			
15			50/6"	11.6
20			50/6"	13.4

LOT No.: **7**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown to brown with rust staining, very stiff, moist			
5			18	8.2
10			21	8.6
15			25	15.2
	CLAYSTONE, SANDY, brown to gray with rust staining, very hard, moist			
20			50/7"	11.4

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TEST BORING LOGS

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FIGURE No. 5

DATE Jun/19/2020

LOT No.: **9**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown, very stiff, moist			
5			20	7.6
10			25	8.2
	INTERBEDDED SANDSTONE AND CLAYSTONE, with gravel, brown to gray with rust staining, firm to hard, moist			
15			30	6.1
20			50/8"	12.8

LOT No.: **11**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown, very stiff, moist			
5			20	7.2
	CLAYSTONE, SANDY, light brown to brown with rust staining, medium hard to very hard, moist			
10			50/9"	9.9
15			50/7"	11.7
20			50/8"	11.7

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FIGURE No. 6

DATE Jun/19/2020

LOT No.: **30**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

CLAY, SANDY, light brown to brown, very stiff, moist

CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist

DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %
5	26	9.9
10	50/6"	11.7
15	50/6"	11.8
20	50/6"	12.3

LOT No.: **32**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

CLAYSTONE, SANDY, brown to olive with rust staining, medium hard to very hard, moist

DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %
5	50/10"	10.6
10	50/8"	11.4
15	50/4"	10.7
20	50/8"	15.3

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TEST BORING LOGS

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FIGURE No. 7

DATE Jun/19/2020

LOT No.: **34**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			50/6"	9.8
10			50/4"	11.3
15			50/8"	15.4
20			50/5"	13.6

LOT No.: **36**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

CLAYSTONE, SANDY, brown to gray and olive with rust staining, medium hard to very hard, moist

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			50/9"	10.2
10			50	11.9
15			50/7"	14.9
20			50/5"	12.6

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TEST BORING LOGS

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FIGURE No. 8

DATE Jun/19/2020

LOT No.: **38**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			18	10.4
10			21	10.5
15			26	14.0
20			50/8"	12.7

FILL: CLAY, SANDY, brown, moist

CLAY, SANDY, brown, very stiff, moist

CLAYSTONE, SANDY, brown with rust staining, hard, moist

LOT No.: **40**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			20	11.4
10			7	9.8
15			23	12.2
20			50/10"	14.6

CLAY, SANDY, light brown, medium stiff to very stiff, moist

CLAYSTONE, SANDY, light brown to brown with rust staining, hard, moist

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FIGURE No. 9

DATE Jun/19/2020

LOT No.: **55**
DATE DRILLED:
2/20/20
REMARKS:
NO GROUNDWATER ON
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	FILL: CLAY, SANDY, brown, stiff, moist			
5			13	7.0
	CLAY, SANDY, light brown to dark brown, very stiff to hard, moist			
10			48	11.4
15			30	10.8
20			20	11.7

LOT No.: **57**
DATE DRILLED:
2/20/20
REMARKS:
NO GROUNDWATER ON
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown to brown, very stiff, moist			
5			20	10.3
10			21	9.9
15			33	9.3
	CLAYSTONE, SANDY, light brown, medium hard, moist			
20			39	14.5

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 10

DATE Jun/19/2020

LOT No.: **59**
DATE DRILLED:
2/20/20
REMARKS:
NO GROUNDWATER ON
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, light brown, stiff to hard, moist			
5			18	8.6
10			33	7.8
	CLAYSTONE, SANDY, light brown, medium hard to hard, moist			
15			50/10"	11.7
20			50/8"	12.4

LOT No.: **61**
DATE DRILLED:
2/12/20
REMARKS:
NO GROUNDWATER ON
2/12/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAYSTONE, SANDY, brown to olive, medium hard to very hard, moist			
5			50/8"	12.9
10			50/10"	15.2
15			10/0"	10.8
20			50/4"	12.3

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 11

DATE Jun/19/2020

LOT No.: **63**
DATE DRILLED:
2/12/20
REMARKS:
NO GROUNDWATER ON
2/12/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAY, SANDY, brown, very stiff, moist			
5			32	7.3
	CLAYSTONE, SANDY, brown, hard to very hard, moist			
10			50/11"	11.6
15			50/6"	13.3
20			50/4"	13.2

LOT No.: **65**
DATE DRILLED:
2/12/20
REMARKS:
NO GROUNDWATER ON
2/12/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAYSTONE, SANDY, brown, very hard, moist			
5			50/6"	9.0
10			50/4"	8.9
15			50/7"	11.5
20			50/6"	11.1

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 12

DATE Jun/19/2020

LOT No.: **67**
DATE DRILLED:
2/12/20
REMARKS:
NO GROUNDWATER ON
2/12/20

CLAYSTONE, SANDY, brown, hard to very hard, moist

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			50/6"	8.8
10			50/5"	9.5
15			50/5"	11.3
20			50/6"	16.3

LOT No.: **69**
DATE DRILLED:
2/12/20
REMARKS:
NO GROUNDWATER ON
2/12/20

CLAYSTONE, SANDY, brown, medium hard to very hard, moist

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			47	12.2
10			50/6"	11.0
15			50/8"	14.5
20			50/7"	15.2

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 13

DATE Jun/19/2020

LOT No.: **70**
DATE DRILLED:
2/20/20
REMARKS:
NO GROUNDWATER ON
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	CLAYSTONE, SANDY, light brown, hard to very hard, moist			
5		■	50/5"	9.5
10		◢	50/6"	10.5
15		■	50/6"	12.5
20		■	50/6"	14.7

LOT No.: **84**
DATE DRILLED:
2/20/20
REMARKS:
NO GROUNDWATER ON
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
	SAND, SILTY, light brown, moist			
	CLAY, SANDY, light brown, very stiff, moist			
5		■	17	8.8
	CLAYSTONE, SANDY, light brown, medium hard to hard, moist			
10		◢	50/7"	11.2
15		■	50/9"	16.2
20		■	50/11"	13.8

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 14

DATE Jun/19/2020

LOT No.: **86**
DATE DRILLED:
2/20/20
REMARKS:
GROUNDWATER @ 18.0 '
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
SAND, SILTY, light brown, moist				
CLAY, SANDY, brown, medium stiff to stiff, moist to wet			16	6.1
5				
			11	16.7
10				
			7	24.9
15				
			6	
20				

LOT No.: **88**
DATE DRILLED:
2/20/20
REMARKS:
GROUNDWATER @ 18.0 '
2/20/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
SAND, CLAYEY, light brown, moist				
CLAY, SANDY, brown, stiff to very stiff, moist to wet			16	8.2
5				
			18	22.2
10				
			16	24.1
15				
			16	26.5
20				

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JOB No. 174778

FIGURE No. 15

DATE Jun/19/2020

LOT No.: **89**
DATE DRILLED:
1/29/20
REMARKS:
GROUNDWATER @ 16.0 '
2/5/20

FILL: CLAY, SANDY, brown, very stiff, moist

CLAY, SANDY, brown to dark brown, medium stiff to very stiff, moist to wet

DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %
5	21	15.1
10	20	18.1
15	13	23.1
20	8	23.1

LOT No.: **91**
DATE DRILLED:
1/29/20
REMARKS:
GROUNDWATER @ 17.0 '
2/5/20

FILL: CLAY, SANDY, brown with rust staining, very stiff, moist

CLAY, SANDY, light brown to dark brown, medium stiff to stiff, moist to wet

DEPTH (FT)	BLOWS PER FT.	WATER CONTENT %
5	35	9.5
10	7	15.0
15	6	29.0
20	10	24.9

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 16

DATE Jun/19/2020

LOT No.: **93**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			12	6.7
10			16	11.9
15			9	15.8
20			13	20.6

FILL: CLAY, SANDY, brown, moist

CLAY, SANDY, with gravel, light brown to brown, stiff, moist

LOT No.: **102**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			26	11.5
10			50/11"	15.0
15			50/5"	11.7
20			50/7"	12.8

CLAY, SANDY, brown, very stiff, moist

CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 17

DATE Jun/19/2020

LOT No.: **104**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			16	6.1
10			17	11.8
15			50/9"	11.1
20			50/6"	10.5

FILL: CLAY, SANDY, brown, moist

CLAY, SANDY, light brown, stiff to very stiff, moist

CLAYSTONE, SANDY, brown with rust staining, hard to very hard, moist

LOT No.: **106**
DATE DRILLED:
1/29/20
REMARKS:
NO GROUNDWATER ON
1/29/20

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			19	13.8
10			14	10.1
15			21	15.6
20			50	14.2

FILL: CLAY, SANDY, brown, very stiff, moist

CLAY, SANDY, light brown, stiff to very stiff, moist

CLAYSTONE, SANDY, brown with rust staining, hard, moist

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TEST BORING LOGS

JOB No. 174778

FIGURE No. 18

DATE Jun/19/2020

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	USCS Classification
1	4.0	10.8	91.7	37	22	0.0	84.0		- 2.5	CL
1	9.0	10.1								
1	14.0	12.9								
1	19.0	12.2								
3	4.0	8.3								
3	9.0	14.7				0.6	76.9			
3	14.0	11.0								
3	19.0	6.5								
5	4.0	7.2								
5	9.0	5.7				17.6	29.1			
5	14.0	11.6								
5	19.0	13.4								
7	4.0	8.2				0.0	81.2			
7	9.0	8.6								
7	14.0	15.2								
7	19.0	11.4								
9	4.0	7.6								
9	9.0	8.2								
9	14.0	6.1	133.7	26	10	31.5	22.5		- 1.8	SC
9	19.0	12.8								
11	4.0	7.2								
11	9.0	9.9	122.6	34	20		79.8		1.9	CL
11	14.0	11.7								
11	19.0	11.7								
30	4.0	9.9								
30	9.0	11.7	109.9	34	19	0.0	77.0		0.3	CL
30	14.0	11.8								
30	19.0	12.3								
32	4.0	10.6					81.6			
32	9.0	11.4								
32	14.0	10.7								
32	19.0	15.3								
34	4.0	9.8								
34	9.0	11.3		30	17	0.0	57.7			CL

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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 174778
FIGURE No. 19
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DATE Jun/19/2020

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	USCS Classification
34	14.0	15.4								
34	19.0	13.6								
36	4.0	10.2	121.4	30	16		62.1		- 0.1	CL
36	9.0	11.9								
36	14.0	14.9								
36	19.0	12.6								
38	4.0	10.4								
38	9.0	10.5					81.0			
38	14.0	14.0								
38	19.0	12.7								
40	4.0	11.4	100.5	38	23	0.0	88.8		- 1.3	CL
40	9.0	9.8								
40	14.0	12.2								
40	19.0	14.6								
55	4.0	7.0								
55	9.0	11.4	111.1	36	24	0.0	79.3		3.1	CL
55	14.0	10.8								
55	19.0	11.7								
57	4.0	10.3	93.3	30	15	0.0	72.6		- 6.4	CL
57	9.0	9.9								
57	14.0	9.3								
57	19.0	14.5								
59	4.0	8.6								
59	9.0	7.8				0.0	67.2			
59	14.0	11.7								
59	19.0	12.4								
61	4.0	12.9	112.2	35	19		73.1		- 0.5	CL
61	9.0	15.2								
61	14.0	10.8								
61	19.0	12.3								
63	4.0	7.3	92.0	36	20	1.7	66.8		- 2.0	CL
63	9.0	11.6								
63	14.0	13.3								
63	19.0	13.2								

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SUMMARY OF LABORATORY TEST RESULTS

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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	USCS Classification
65	4.0	9.0								
65	9.0	8.9	119.7	39	25		60.6		1.2	CL
65	14.0	11.5								
65	19.0	11.1								
67	4.0	8.8				3.2	53.6			
67	9.0	9.5								
67	14.0	11.3								
67	19.0	16.3								
69	4.0	12.2								
69	9.0	11.0	122.1	36	21	0.0	75.2		1.9	CL
69	14.0	14.5								
69	19.0	15.2								
70	4.0	9.5		35	22	1.7	59.8			CL
70	9.0	10.5								
70	14.0	12.5								
70	19.0	14.7								
84	4.0	8.8								
84	9.0	11.2	110.8	33	21	9.3	60.3		0.8	CL
84	14.0	16.2								
84	19.0	13.8								
86	4.0	6.1		26	9	0.0	65.0			CL
86	9.0	16.7								
86	14.0	24.9								
88	4.0	8.2								
88	9.0	22.2								
88	14.0	24.1				2.2	69.1			
88	19.0	26.5								
89	4.0	15.1								
89	9.0	18.1	111.3	40	25	0.0	94.2		0.0	CL
89	14.0	23.1								
89	19.0	23.1								
91	4.0	9.5	129.7	34	20	0.0	72.3		1.2	CL
91	9.0	15.0								
91	14.0	29.0								

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FIGURE No. 19
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Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	FHA Expansion Pressure (psf)	% Swell/ Collapse	USCS Classification
91	19.0	24.9								
93	4.0	6.7								
93	9.0	11.9					73.9			
93	14.0	15.8								
93	19.0	20.6								
102	4.0	11.5		39	20	0.5	76.5			CL
102	9.0	15.0								
102	14.0	11.7								
102	19.0	12.8								
104	4.0	6.1								
104	9.0	11.8				4.4	81.4			
104	14.0	11.1								
104	19.0	10.5								
106	4.0	13.8	118.8	36	22	0.0	75.6		0.3	CL
106	9.0	10.1								
106	14.0	15.6								
106	19.0	14.2								

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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 174778
FIGURE No. 19

DATE Jun/19/2020

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	1	4.0	**LEAN CLAY with SAND(CL)**	37	15	22
⧓	3	9.0				
▲	5	9.0				
★	7	4.0				
⊙	9	14.0	**CLAYEY SAND with GRAVEL(SC)**	26	16	10

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	1	4.0	0.0	16.0	84.0	
⧓	3	9.0	0.6	22.6	76.9	
▲	5	9.0	17.6	53.3	29.1	
★	7	4.0	0.0	18.8	81.2	
⊙	9	14.0	31.5	46.1	22.5	

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SOIL CLASSIFICATION DATA

JOB No. 174778

FIGURE No. 20

DATE Jun/19/2020

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	11	9.0	**LEAN CLAY with SAND(CL)**	34	14	20
⧗	30	9.0	**LEAN CLAY with SAND(CL)**	34	15	19
▲	32	4.0				
★	34	9.0	**SANDY LEAN CLAY(CL)**	30	13	17
⊙	36	4.0	**SANDY LEAN CLAY(CL)**	30	14	16

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	11	9.0			79.8	
⧗	30	9.0	0.0	23.0	77.0	
▲	32	4.0			81.6	
★	34	9.0	0.0	42.3	57.7	
⊙	36	4.0			62.1	

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SOIL CLASSIFICATION DATA

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FIGURE No. 21

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	38	9.0				
⧗	40	4.0	LEAN CLAY(CL)	38	15	23
▲	55	9.0	LEAN CLAY with SAND(CL)	36	12	24
★	57	4.0	LEAN CLAY with SAND(CL)	30	15	15
⊙	59	9.0				

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	38	9.0			81.0	
⧗	40	4.0	0.0	11.2	88.8	
▲	55	9.0	0.0	20.7	79.3	
★	57	4.0	0.0	27.4	72.6	
⊙	59	9.0	0.0	32.8	67.2	

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SOIL CLASSIFICATION DATA

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FIGURE No. 22

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	61	4.0	**LEAN CLAY with SAND(CL)**	35	16	19
⧗	63	4.0	**SANDY LEAN CLAY(CL)**	36	16	20
▲	65	9.0	**SANDY LEAN CLAY(CL)**	39	14	25
★	67	4.0				
⊙	69	9.0	**LEAN CLAY with SAND(CL)**	36	15	21

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	61	4.0			73.1	
⧗	63	4.0	1.7	31.4	66.8	
▲	65	9.0			60.6	
★	67	4.0	3.2	43.1	53.6	
⊙	69	9.0	0.0	24.8	75.2	

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SOIL CLASSIFICATION DATA

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FIGURE No. 23

DATE Jun/19/2020

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	70	4.0	**SANDY LEAN CLAY(CL)**	35	13	22
⧗	84	9.0	**SANDY LEAN CLAY(CL)**	33	12	21
▲	86	4.0	**SANDY LEAN CLAY(CL)**	26	17	9
★	88	14.0				
⊙	89	9.0	**LEAN CLAY(CL)**	40	15	25

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	70	4.0	1.7	38.5	59.8	
⧗	84	9.0	9.3	30.4	60.3	
▲	86	4.0	0.0	35.0	65.0	
★	88	14.0	2.2	28.7	69.1	
⊙	89	9.0	0.0	5.8	94.2	

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FIGURE No. 24

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	**91**	**4.0**	**LEAN CLAY with SAND(CL)**	**34**	**14**	**20**
⧗	**93**	**9.0**				
▲	**102**	**4.0**	**LEAN CLAY with SAND(CL)**	**39**	**19**	**20**
★	**104**	**9.0**				
⊙	**106**	**4.0**	**LEAN CLAY with SAND(CL)**	**36**	**14**	**22**

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	**91**	**4.0**	**0.0**	**27.7**	**72.3**	
⧗	**93**	**9.0**			**73.9**	
▲	**102**	**4.0**	**0.5**	**23.1**	**76.5**	
★	**104**	**9.0**	**4.4**	**14.2**	**81.4**	
⊙	**106**	**4.0**	**0.0**	**24.4**	**75.6**	

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SOIL CLASSIFICATION DATA

JOB No. 174778

FIGURE No. 25

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **1 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **91.7 PCF**
NATURAL MOISTURE CONTENT: **10.8%**
PERCENT SWELL/COMPRESSION: **- 2.5**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **9 @ 14 FT**
NATURAL DRY UNIT WEIGHT: **133.7 PCF**
NATURAL MOISTURE CONTENT: **6.1%**
PERCENT SWELL/COMPRESSION: **- 1.8**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 26

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **11 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **122.6 PCF**
NATURAL MOISTURE CONTENT: **9.9%**
PERCENT SWELL/COMPRESSION: **1.9**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **30 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **109.9 PCF**
NATURAL MOISTURE CONTENT: **11.7%**
PERCENT SWELL/COMPRESSION: **0.3**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 27

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **36 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **121.4 PCF**
NATURAL MOISTURE CONTENT: **10.2%**
PERCENT SWELL/COMPRESSION: **- 0.1**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **40 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **100.5 PCF**
NATURAL MOISTURE CONTENT: **11.4%**
PERCENT SWELL/COMPRESSION: **- 1.3**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 28

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **55 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **111.1 PCF**
NATURAL MOISTURE CONTENT: **11.4%**
PERCENT SWELL/COMPRESSION: **3.1**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **57 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **93.3 PCF**
NATURAL MOISTURE CONTENT: **10.3%**
PERCENT SWELL/COMPRESSION: **- 6.4**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 29

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **61 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **112.2 PCF**
NATURAL MOISTURE CONTENT: **12.9%**
PERCENT SWELL/COMPRESSION: **- 0.5**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **63 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **92.0 PCF**
NATURAL MOISTURE CONTENT: **7.3%**
PERCENT SWELL/COMPRESSION: **- 2.0**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 30

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **65 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **119.7 PCF**
NATURAL MOISTURE CONTENT: **8.9%**
PERCENT SWELL/COMPRESSION: **1.2**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **69 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **122.1 PCF**
NATURAL MOISTURE CONTENT: **11.0%**
PERCENT SWELL/COMPRESSION: **1.9**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 31

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAYSTONE, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **84 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **110.8 PCF**
NATURAL MOISTURE CONTENT: **11.2%**
PERCENT SWELL/COMPRESSION: **0.8**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **89 @ 9 FT**
NATURAL DRY UNIT WEIGHT: **111.3 PCF**
NATURAL MOISTURE CONTENT: **18.1%**
PERCENT SWELL/COMPRESSION: **0.0**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 32

DATE Jun/19/2020

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **FILL: CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **91 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **129.7 PCF**
NATURAL MOISTURE CONTENT: **9.5%**
PERCENT SWELL/COMPRESSION: **1.2**

PROJECT: **The Glen, Filing No. 9, El Paso County, Colorado**
SAMPLE DESCRIPTION: **FILL: CLAY, SANDY**
NOTE: SAMPLE WAS INUNDATED WITH WATER AT 1,000 PSF

SAMPLE LOCATION: **106 @ 4 FT**
NATURAL DRY UNIT WEIGHT: **118.8 PCF**
NATURAL MOISTURE CONTENT: **13.8%**
PERCENT SWELL/COMPRESSION: **0.3**

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SWELL/CONSOLIDATION TEST RESULTS

JOB No. 174778

FIGURE No. 33

DATE Jun/19/2020

GENERAL NOTES:

1. BOTTOM OF DRAIN PIPE SHALL BE AT OR BELOW BOTTOM OF FOOTING AT ALL LOCATIONS
2. ALL DRAIN PIPE SHALL BE PERFORATED PLASTIC, WITH THE EXCEPTION OF THE DISCHARGE PORTION WHICH SHALL BE SOLID, NON-PERFORATED PIPE.
3. DRAIN PIPE SHALL HAVE POSITIVE FALL THROUGHOUT.
4. DRAIN PIPE SHALL BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. IF A GRAVITY OUTFALL CANNOT BE ACHIEVED, THEN A SUMP PIT AND PUMP SHALL BE USED. THE OUTFALL SHOULD EXTEND PAST BACKFILL ZONES AND DISCHARGE TO A LOCATION THAT IS GRADED TO DIRECT WATER OFF-SITE.
5. ALL DRAIN COMPONENTS SHALL BE RATED/APPROVED BY THE MANUFACTURER FOR THE INSTALLED DEPTH AND APPLICATION
6. DRAIN SYSTEM, INCLUDING THE OUTFALL OF THE DRAIN, SHALL BE OBSERVED BY QUALIFIED PERSONNEL PRIOR TO BACKFILLING TO VERIFY INSTALLATION.
7. A VERTICAL SEGMENT OF PERFORATED DRAIN PIPE, CAPPED AT THE TOP, SHALL EXTEND TO FINISH GRADE WITHIN ALL WINDOW WELLS.

ARCHITECTS RMG ENGINEERS
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Northern Office:
Greeley / Evans, CO 80620
(970) 330-1071

PERIMETER DRAIN

FIG No. 34

GENERAL NOTES:

1. ALL DRAIN PIPE SHALL BE PERFORATED PLASTIC, WITH THE EXCEPTION OF THE DISCHARGE PORTION WHICH SHALL BE SOLID, NON-PERFORATED PIPE.

2. DRAIN PIPE SHALL HAVE POSITIVE FALL THROUGHOUT.

3. DRAIN PIPE SHALL BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. IF A GRAVITY OUTFALL CANNOT BE ACHIEVED, THEN A SUMP PIT AND PUMP SHALL BE USED. THE OUTFALL SHOULD EXTEND PAST BACKFILL ZONES AND DISCHARGE TO A LOCATION THAT IS GRADED TO DIRECT WATER OFF-SITE.

4. ALL DRAIN COMPONENTS SHALL BE RATED/APPROVED BY THE MANUFACTURER FOR THE INSTALLED DEPTH AND APPLICATION

5. DRAIN SYSTEM, INCLUDING THE OUTFALL OF THE DRAIN, SHALL BE OBSERVED BY QUALIFIED PERSONNEL PRIOR TO BACKFILLING TO VERIFY INSTALLATION.

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Northern Office:
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(970) 330-1071

OVEREXCAVATION DRAIN

FIG No. 35

J&K Geological Services
18291 Smokey Pine Rd
Peyton, Colorado 80831
(719) 499-5431

February 6, 2019

Widefield Investment Group
#3 Widefield Blvd.
Colorado Springs, CO 80911

Gentlemen,

At your request, personnel of J&K Geologic Services, (J&K), installed a total of 6 piezometers in The Glen at Widefield East on December 1, 2017, as discussed in our letter dated January 1, 2018, (J&K Job # 171201). Reference the attached Piezometer Location Plan, (Fig. #1).

The piezometers were installed as part of a monitoring program to verify ground water elevations in Filings #9 & #11 as approved by the Colorado Geological Survey, (CGS) and the comment letter dated April 16, 2016, (CGS Unique No. EP-16-0003 4), concerning the Preliminary Plat Plan for The Glen at Widefield East.

The piezometer borings were advanced to a depth at least 10 ft. below the depth groundwater was encountered during the drilling process. A 2 inch diameter slotted pipe was installed in the boring and was backfilled with washed sand. The upper 3 ft. of the boring was backfilled with Vol-Clay powder to seal the piezometer from outside water sources.

The groundwater levels were measured once a month from December 2017 through December 2018. An electronic Ken-Tech brand water level indicator was used to measure the depth to the groundwater.

In the CGS comment letter for the above referenced development dated January 15, 2016, Ms. Jill Carlson, CEG, recommended "basements should not be allowed in areas where observed groundwater levels are shallower than 14 ft. below planned final grades...". As the groundwater measurements show this requirement has been surpassed in all areas of the development that were of concern for shallow groundwater.

As in all other filings of The Glen at Widefield East, each individual lot is to be investigated by the lot owner's Geotechnical Engineer of Record for final foundation parameters and recommendations.

We trust this provides the information you requested. Should questions arise or if further information is needed, please contact J&K Geological Services at your convenience.

Respectfully submitted,

J&K GEOLOGIC SERVICES, LLC

James F. Frohbieter,
Professional Geologist

JFF/ksf

Piezometer Location Map & Legend

P1 - Piezometer Location

The Glen at Widefield East

Filing Map

Prepared For:
Widefield Investment Group
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(719) 392-0194

Prepared By:
NASS DESIGN ASSOCIATES
LAND PLANNING • LANDSCAPE ARCHITECTURE
111 S. Tejon Suite 312
Colorado Springs, CO 80903
(719) 473-2406

PREPARATION: 08-08-16
REVISION:

Sheet 1 of 1

NOTICE TO ARCHITECT/CONTRACTOR/ENGINEER:
THE DETAILS SHOWN ON THIS DEVELOPMENT PLAN ARE FOR PLANNING PURPOSES ONLY. DO NOT USE THIS PLAN SET FOR PRODUCT SPECS, ENGINEERING DETAILS, OR CONSTRUCTION PURPOSES.
A PRE-CONSTRUCTION MEETING MUST BE SCHEDULED TO REVIEW ALL APPROVALS AND DESIGN CRITERIA PRIOR TO STARTING ANY SITE WORK.

GROUND WATER MEASUREMENTS: THE GLEN AT WIDEFIELD EAST
DECEMBER 2017 THROUGH DECEMBER 2018

Piezometer #*	**P-1**	**P-2**	**P-3**	**P-4**	**P-5**	**P-6**
Elevation (ft.)	5678.82	5681.36	5692.34	5684.37	5680.36	5687.60
Depth to water below current ground surface	Depth to water	Depth to water	Depth to water	Depth to water	Depth to water	Depth to water
December 12/05/2017	26'1''	29'6''	37'2''	34' 10"	31'10''	20'2''
January 01/25/2018	25'0''	29'0"	36'2"	32'0"	29'10"	20'8"
February 02/26/2018	25'1"	28'10"	36'0"	31'10"	30'0"	21'8"
March 03/22/2018	26'10"	28'9"	36'3"	31'10"	30'1"	21'4"
April 04/26/18	27'1"	28'11"	36'1"	32'0"	30'4"	21'7"
May 5/31/2018	28'0"	28'11"	37'0"	32'4"	30'0"	21'0"
June 06/21/2018	30'0"	29'8"	38'6"	32'0"	30'2"	20'6"
July 07/23/2018	30'9"	29'4"	38'3"	32'7"	30'9"	19'6"
August 08/14/2018	31'1"	30'10"	38'9"	32'4"	31'2"	18'4"
September 09/19/2018	30'10"	30'9"	38'9"	33'2"	31'2"	18'9"
October 10/24/2018	30'8"	30'7"	38'4"	32'6"	31'0"	18'6"
November 11/29/2018	30'8"	30'8"	38'3"	32'3"	31'3"	18'6"
December 12/14/2018	30'4"	30'0"	38'0"	32'4"	31'3"	18'5"

*Piezometers installed 12/01/2017

PRELIMINARY
SUBSURFACE SOIL INVESTIGATION
THE GLEN AT WIDEFIELD, FILING #7
WIDEFIELD, COLORADO

Prepared For:

Glen Investment Group No. VIII
3 Widefield Boulevard
Colorado Springs CO 80911

Respectfully submitted,

SOIL TESTING AND ENGINEERING INC

Larry W. Chisman, Principal

Reviewed By:

Francis Magnussen, P.E.

LWC/mss

STE Report 060933

April 16, 2007

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INTRODUCTION

This report presents the results of our preliminary subsurface soil investigation, to determine the subsurface conditions for The Glen @ Widefield, Filing #7. Borings and test pits from our initial subsurface soil investigation for The Glen @ Widefield, Filing 6, Job No. 051021, that pertain to this filing were also utilized to evaluate subsurface conditions.

The following reports were reviewed and data from these reports were utilized for the completion of this report:

- Lincoln Devores "Geotechnical Report for Sunrise Ridge Subdivision, Phase 2, Western Portion", El Paso County, Colorado. Job No 70380, dated February 24, 1989.
- Geotechnical Consultants Inc. report "Reconnaissance Geology and Surface soils 735 acre area Widefield Area, El Paso County, Colorado". Job No 2245 dated October 31, 1986.
- STE's Report, "Preliminary Subsurface Soil Investigation Sunrise Ridge Phase II, Colorado Springs, Colorado", Job No 80415 dated June 10, 1998.
- STE Report, "Preliminary Subsurface Soil Investigation Marksheffel and Peaceful Valley Road for Widefield School District", Job No 90235 dated May 5, 1999.
- STE Report, "Preliminary Subsurface Soil Investigation Filings 1&2 The Glen at Widefield, Colorado", Job No 90356, dated June 30, 1999.
- STE Report, "Preliminary Subsurface Soil Investigation Proposed Future Elementary School Site in the Central Portion of Filings 1&2 the Glen at Widefield, Colorado", Job No 90989, October 20, 1999.
- STE Report, "Mesa Ridge Parkway, The Glen", Job No 00620, dated October 11, 2000.
- STE Report, "The Glen at Widefield", Job No 01149, dated April 19, 2001.
- Kleinfelders Report-Geotechnical Investigation, "Proposed Mesa Ridge Parkway, Settlement and Preload Analysis, Fountain, Colorado", Job No 65-1532-003 dated May 1, 2001.
- In addition, STE's daily notes and density test results as well as our experience gained in the development of Filing Nos. 1, 2, 3, 4 and 5 for The Glen at Widefield were considered for this letter.
- STE Report, "Preliminary Subsurface Soil Investigation, FMIC Ditch Relocation, Job No. 01149, dated April 19, 2001.
- STE Report, Preliminary Subsurface Soil Investigation, Filing #4, The Glen at Widefield, Widefield, Colorado, Job No. 01969, dated February 7, 2002.
- STE Preliminary Subsurface Soil Investigation, Filing #5, The Glen at Widefield, Widefield, Colorado, Job No. 040721, dated October 11, 2004.
- STE Preliminary Subsurface Soil Investigation, Filing #6, The Glen at Widefield, Widefield, Colorado, Job No. 060938, dated March 21, 2006.

INTRODUCTION
CONT'D

- STE Preliminary Subsurface Soil Investigation, Filing #6, The Glen at Widefield, Widefield, Colorado, Job No. 051021, dated November 21, 2005.

This investigation was completed to better define subsurface conditions for estimating costs for the development phase.

Information provided at the time of writing this report, our preliminary findings, along with suggestions and recommendations for development and construction are included in the body of the report.

The borings are spaced at varying intervals. The soil profile represented by the boring logs is an interpretation of the anticipated profile. However, the soils are erratic and variations in the thicknesses of Soil Types 1, 2, 3 and 5 are anticipated.

During the subsurface investigation for Filing No. 6, borings and test pits were completed along the western boundary of this filing. Test borings from STE report, Job No. 051021 are included in this report (Reference Figures A through Z). Test pits and trenches completed along the eastern boundary of Filing No. 6 were used to provide a preliminary delineation between the stable and unstable areas in this filing. Additional borings were completed during this investigation to better define this boundary. It will be further discussed in the body of this report.

Thirty two borings were completed initially to verify soil conditions across the site. The information obtained from borings along the western boundary of Filing No. 7 from STE Job No. 051021 was also utilized to identify areas that required additional investigation. Thirty additional borings were completed to better define groundwater conditions and areas of unstable soil.

A high pressure gas line and associated easement runs from south to north in the central portion of this filing. A second high pressure gas line and easement is located along the eastern boundary of the site. The two easements intersect in the north central area. It is our understanding the south central portion of the gas line will be abandoned and located in the dedicated easement west of Marksheffel Road.

A forced main sanitary sewer line is also present across the southern and southeastern portion of the site. It is our understanding this utility will be moved to the easement adjacent to Mesa Ridge Parkway.

If these utilities are moved separately from the development phase of this filing, a representative of STE is to periodically monitor the trenches during the removal process. The visual observation of the trenches will be utilized to better define the depths of soil types across the site.

If fill is required to raise trenches to the proposed grades for development, a testing program will be required.

This report addresses the soil conditions only and does not address any environmental concerns.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

LOCATION:

The site is generally located to the west of Marksheffel Road and extends to the south, north and west of the intersection of Peaceful Valley Road and Marksheffel Road, southeast of metropolitan Colorado Springs, Colorado. The site, designated as Filing No. 7, is located to the west of Marksheffel Road. A proposed school site is located between Marksheffel Road and the eastern boundary of this filing in the northeastern portion. The approximate location of the site is shown on the enclosed Site Location Plan (Figure 1).

SITE DESCRIPTION:

Filing No. 7 is generally located on a hill that runs north to south across the property. The highest elevation is in the southern portion of the site.

The slopes around the highest elevation slope in all directions. A saddle is present in the higher elevations between the southern and northern portions of the property.

The highest elevation of the northern area is located at the northeastern boundary corner between the school site and this filing. The surface from the northeast corner generally slopes to the west and south.

An abandoned irrigation ditch system parallels the slope in the northern portion. Shallow ditches are present at various locations on the site. A partially open trench is present in the southeastern portion of

the site. This may be in the utility easement adjacent to the eastern boundary.

The eastern and southern slopes are generally mild and uniform. The central portion of the western slopes, contain some drainage features that generally slope to the south and west.

The western boundary is adjacent to a seasonally active drainage feature. The western boundary is delineated on Figure 2 utilizing data obtained from this investigation and STE Job No. 060938.

The eastern boundary will be the western edge of the high pressure gas line easement.

The easement parallels Marksheffel Road in the southeastern portion. It separates the school property and this filing in the central and northern portions.

The southern boundary is the utility easement located on the north side of Mesa Ridge Parkway.

The northern boundary is adjacent to an open field presently used for grazing.

Minor debris fill is scattered across the site at various locations. Minor piles of residential fill, is present on the surface. Concrete associated with the abandoned irrigation ditches is present in a few areas.

The site is generally covered with grasses and weeds. A few elm and cottonwood trees are present in small areas.

PROJECT DESCRIPTION: This investigation will be utilized to aid in the proposed planning phase and development phase for future residential construction.

Proposed residential models for this subdivision have been designed for other filings of this subdivision. The structures generally consist of one or two-story wood framed structures utilizing a combination of basement, crawlspace, and slab-on-grade type construction.

The building loads are anticipated to range from light to moderate.

GENERAL SUBSURFACE CONDITIONS

SOIL TYPES:

Generally, four native soil types are present over the bedrock. Soil types from previous subsurface investigation were compared for classification and testing. The soils encountered are as follows:

- Type 1 – silty to sandy clay
- Type 2 – sandy clay
- Type 3 – sandy gravel with sandy clay lenses
- Type 5 – silty to clayey sand with sandy clay lenses
- Type 4 – lensatic sandy claystone and clayey sandstone

Clayier portions of the five types are moisture sensitive and will change in volume with increases in moisture content. Soil types 1, 2, 3 and 4 classify as a low plastic silty to sandy clay (CL) and Soil Type 5 classifies as a low plastic clayey sand (SC).

The clays encountered in all soil types have low to moderate to high expansion potentials when they were remolded.

Soil Type 1 consists of a silty to sandy clay and overlays the majority of the ground surface on the higher portions of the site. The thickness of this soil type varies considerably across the site. Due to the environment of deposition in which Soil Type 1 was deposited, the soil profile contains lenses and pockets of silty to clayey sand.

Soil Type 1 is generally a metastable soil that has a low to high potential for collapse when weight and water are added. Swell/consolidation test results from this filing indicate one sample has a low expansion potential of 0.7% volume increase. The majority of the samples collapsed ranging from 1.0% to 8%. This range is from low to very high potential for collapse.

Expansion potential of remolded samples of Type 1 ranged from 795 psf to 1704 psf. This is in the low to moderate to moderate to high expansion range.

Soil Type 2 is also a sandy clay soil and is somewhat similar to Soil Type 1 when tested in the laboratory. This soil type is also somewhat erratic containing varying percentages of coarse grained sands and also contains lenses of silty to clayey sands. This soil type is generally located below Soil Type 1 across this filing.

The soil is generally expansive with a low to moderate moisture increase. Settlement type movements can occur under heavy loads. With a high to saturated moisture content, Soil Type 2 is generally a weak, unstable soil prone to settlement type movements. Due to the

low permeability of this soil, settlement generally occurs over long periods of time.

The major differences between Soil Type 1 and 2 is the environment of deposition. Soil Type 2 was deposited in a wetter environment which allowed for the formation of a more structured soil profile.

Soil Type 3 is a silty to clayey sand and gravel soil. It contains lenses of sandy clay. The majority of the sand and gravel in this deposit appears to be derived from the local sandstone outcroppings. The particles are generally angular, indicating the source for the sand and gravel was relatively close.

Limited amounts of Type 3 were encountered during this investigation. The majority was encountered in the lower elevation along the western portion of the site. This soil type was found at various locations over the bedrock across this site. In previous filings, where groundwater was present over the bedrock in the more permeable lenses, groundwater elevations generally raised immediately during the drilling process. This rise indicates the source of the groundwater is uphill to the north of this site creating a hydrostatic head resulting in the rapid rise in the water elevation in the borings. The water elevation changes were not as extreme in this investigation.

Where water is not present over the bedrock, the lenses of sandy clay in this deposit can be moisture sensitive resulting in settlement type movements in the lighter weight portions. Where these lenses have been exposed to water and consolidation, the clays can have expansion pressures ranging from low to moderate depending on the sand/clay content.

Soil Type 5 was encountered in two borings on the southern end of the site. Based on auger cuttings and limited samples recovered the soil is somewhat lensatic. It is generally silty to clayey sand with sandy clay lenses.

Soil Type 4 is a lensatic claystone and sandstone material belonging to the Pierre Shale formation. The expansion potential ranges from low to high depending on the sand/clay content. Due to the highly fractured nature and high density of the bedrock, undisturbed samples could not be procured for swell/consolidation testing.

Depths to the bedrock vary significantly across the site. Reference the attached "Boring Logs" (Figure Nos. 4 through 34 and Figures A through Z). The initial borings were spaced approximately 400 feet apart. Borings were added at closer spacing where considerable differences in the soil profile were evident during the drilling program.

As such, variations in the bedrock surface are anticipated. The bedrock on the hill is relatively shallow. However, the depth to bedrock deepens considerably on the western and southern slopes.

As discussed in previous reports for The Glen at Widefield, Paleo Channels are present across the entire site. The sides of these channels can be mildly to steeply sloping from the top edge of the channel to the bottom. Many of the channels have very steep to near vertical sidewalls. This type of near vertical sidewalls on the channels has been encountered in previous filings.

MANMADE FILL: Small piles of debris fill are present across the site. The household trash on this portion of The Glen at Widefield is considerably less than that present on other filings.

Concrete debris associated with abandoned irrigation gates is present in the lower portion of the site.

An irrigation channel is located in the northern portion of the site. Several small ditches are also located across the site. These shallow swales appear to be relatively free of debris.

The access road to this area from Marksheffel Road and the sanitary sewer pump station at the southwest corner appears to be cut in most areas. However, it appears some fill was utilized in portions of the western end to construct the access roadway.

All debris fill is unsuitable for use as overlot or structural fill. Due to the relatively small quantities, it should be removed from the site.

The fills associated with abandoned irrigation channels is most likely derived from existing soils at the time of their construction. Subsequent to stripping, the fill can be evaluated for use in the overlot grading process.

Pockets of old fill may be scattered across the site. If fill is encountered during the grading process, it will be addressed at that time.

All debris (i.e. pipe, concrete etc.) associated with the removal of existing gas or sanitary sewer lines are to be removed from the site.

GROUNDWATER: Groundwater was apparent in the majority of the borings along the western boundary, either at the time of drilling or after the drilling program. The borings were measured subsequent to each phase of the

drilling program to determine groundwater elevations. Groundwater was also present in Test Borings 6, 8, 10 and 15 near the gas line easement.

Water bearing pockets and/or lenses were present in Soil Types 2, 3 and 4. Soil Type 5 has lenses of clean to silty sand. However, water was not evident in either boring where it was encountered. The water bearing soils are generally silty to clayey sand and are founded above a non-permeable material that creates perched water tables in the soil profile. The groundwater and perched water elevations will fluctuate with seasonal variations in precipitation and irrigation practices in the area.

The majority of Soil Type 3 was encountered in the western, lower portion of the site where the depth to the bedrock increased. This soil type was generally located at, or near the interface of the bedrock. Where groundwater at the lower elevation was present in this soil type the groundwater elevation raised immediately when the water bearing strata was encountered.

Soil Type 4 is a lensatic shale and also contains water bearing lenses. Groundwater was not generally apparent in the bedrock during the drilling program. However, water was present in subsequent measurements as indicated on the Test Boring Logs.

Since the majority of the soils are expansive, an overexcavation replacement scheme should be used to calculate separation between the bottom of the overexcavation and the groundwater. A six foot separation between the bottom of the overexcavation and the groundwater is generally recommended.

The depth to groundwater varies across the site. If seepage or evidence of groundwater is present in individual excavations, more comprehensive drain systems may be warranted (i.e. curtain drains, capillary breaks etc.).

Groundwater was not apparent to depths drilled on the eastern portion of the site and the higher elevations of the western and northern portions. The majority of the groundwater was present along the western boundary and the lower west central portion of the site.

Groundwater was encountered in Test Borings 6, 8, 10 and 15. These borings are generally in lower areas of the site and overlot fill is anticipated to raise the existing grades.

Again, groundwater is a permanent feature of the site. It will fluctuate with seasonal variations in precipitation and irrigation practices.

Construction of homes and roadways along with irrigation of landscaped areas will tend to raise subsurface water tables.

CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION:

The discussion in this section is based upon the review of previous reports, conditions encountered in the test borings completed in this filing and on the anticipated building characteristics previously described. Representatives of STE should review grading plans, development plans etc. to ensure they will be appropriate for site conditions.

DEVELOPMENT PLANNING:

As discussed above, the soils in this subdivision are erratic and range from collapsible to unstable to expansive. The majority of the geologic hazards discussed in this report can be addressed during the development phase to reduce potential problems during the home construction process. Concerns not addressed during the initial phases will be addressed on a lot by lot basis (i.e. overexcavation/replacement for expansive material).

Soil Type 1 is generally metastable and will tend to consolidate and/or collapse when weight and water are added. This material is generally located on the slopes on the site and is present over Types 2, 3 and 4. The depth ranges from shallow where bedrock is at or near the surface to 15 to 20 feet below the present ground surface in Paleo channels.

This material is light weight and contains air holes throughout the profile. These materials are subject to settlement and collapse type

movements with additional weight and water intrusion. They have a low permeability. As such, surface water does not easily permeate through the soil profile of the slopes. In the lower portion of the site they have eroded and/or collapsed.

Soil Type 1 is interbedded with both sandy clay and silty to clayey sand lenses. As discussed in reports for previous filings in this subdivision, the overexcavation and recompaction of this material is generally the most accepted method for addressing the collapse potential of the material.

Based on information available, the overexcavation/replacement scheme recommended for Soil Type 1 can be completed satisfactorily during the grading process. If unstable soil is encountered during the overexcavation process it will be evaluated and recommendations will be provided.

Soil Type 2 is generally a sandy clay. Interbedded lenses of both sandy clay and silty to clayey sand are present in this soil deposit. As discussed in the "Groundwater" section of this report, a portion of the sandier lenses may contain perched water tables above the main groundwater elevation.

Soil Type 2 was encountered in all of the borings in the lower portions of the site and in a portion of the borings on the upper elevations. This material generally has an expansion potential in the moderate to high expansion range with low to moderate moisture content increases.

This material, with a high to saturated moisture content, is unstable. As indicated on the boring logs, the auger could be pushed through the unstable soil with very little resistance.

Soil Type 3 is also lensatic. Sandy clay lenses were present in the sand and gravel deposits over the bedrock. Generally, the bedrock on the higher portions of the site is relatively shallow and Soil Type 3 was less apparent.

In the lower portions of the site, the cleaner portions of this deposit were generally saturated with a high permeability allowing the flow of groundwater. This soil type was not as evident on this filing as previous filings.

The clayier portions can have a low to moderate expansion potential with low to moderate moisture contents. Pockets of highly expansive material may be encountered during the development and/or

construction phases, as has been our experience with other filings in this subdivision.

Soil Type 5 was apparent in Test Borings 34 and 35 only. These borings are in the southern portion of the site. The material is generally silty to clayey sand with sandy clay lenses. Due to the depth of the material, it should not be a factor in the cut and fill areas of this subdivision.

Soil Type 4 is a lensatic, very highly weathered to formational claystone and sandstone belonging to the Pierre Shale. The expansion potential in this formation ranges from low to moderate to high. The laboratory testing indicates the clayier lenses are in the moderate to high expansion range. Where samples have a higher percentage of sands and silts the expansion potential is in the low to moderate expansion potential.

Very dense sandstone lenses were encountered in portions of the bedrock profile. These lenses ranged from thin to in excess of 12 inches. Based on the subsurface investigation in this filing and information obtained from previous filings, the thickness of the very dense lenses will increase with depth. The density of the bedrock also increases with depth. This report addresses only the bedrock

encountered to depths indicated on the boring logs. If cuts are planned below the elevations indicated on the drill logs, additional drilling will be warranted.

Mixing the soils may reduce the expansion potential. However, where moderately to highly expansive material is utilized exclusively, overexcavation/replacement schemes will be required for construction of homes.

The initial overexcavation/replacement of collapsible soils during the development phase would include the removal of the material, moisture conditioning and proper compaction as overlot fill. Reference the "Overlot and Structural Fill" section of this report for fill specifications. Unstable material was encountered in the lower western and southwestern portions of the site. During the initial subsurface investigation for Filing 6 backhoe pits were completed to better define the boundary between the unstable and stable portions of the original Filing 6 boundary.

During the subsurface investigation for this filing, the results of the test pits and initial borings completed were utilized to determine the location of additional borings. The western no build line on Figure 2 indicates the boundary between relatively deep unstable soils and shallow

unstable soils. Based on information available, the depth to unstable soil is generally a minimum 14 feet below the present ground surface east of the line.

A roadway is planned at the western boundary of this filing. It is our understanding; underground utilities will be placed to the east of the roadway. Structures, roadways and utilities are not to be planned to the west of the no build line.

The metastable soil (Type 1) in the roadway area is to be removed and replaced in a controlled manner. Available information suggests the overexcavation should not encounter unstable conditions. If, however, unstable soil is encountered some type of stabilization will be required. Recommendations to address unstable soil will be provided, if encountered. Stabilization generally consists of the intrusion of granitic shotrock into the soil to bridge the unstable areas beneath the roadway. The size of the shotrock will be determined by a representative of STE. The quantity of work required to stabilize the affected area will also be determined in the field.

WESTERN ROADWAY BOUNDARY:

As previously discussed, soft to very soft, saturated and unstable materials were encountered on the western and southwestern portions

of the site during the subsurface investigation. The western boundary line assumes the roadway is 60 feet in width. The line indicated on Figure 2 represents either the western edge of the roadway or the crown of the embankment parallel with the edge of the road. Portions of the western roadway embankment may be partially over unstable soil. Some settlement of embankment fills may occur over time. The affected slopes will be monitored by STE on an annual basis until it is determined that the effects of slope movement are negligible. A report will be prepared subsequent to each field inspection.

Based on information available, there will be a minimum 14 feet separation between the present ground surface and unstable material. Fill should be utilized to construct the roadway in lieu of cuts where shallow groundwater is present. Cuts would tend to reduce the separation between the surface and unstable material.

As previously discussed, if unstable small pockets are encountered, they will require stabilization to bridge the soft areas. This has worked well in other filings of this subdivision.

Since a roadway is planned along the western boundary, the foundations to the east of the roadway will not require setbacks from the line shown on the map.

The western roadway may require some additional maintenance, due to its geologic setting.

Further investigation will be required in the two areas in the western portion of the site marked potentially unstable. During the development phase mitigation techniques will be provided if unstable soils are present.

Roadway embankments on either side are to be maintained so that water does not collect or pond on the slopes or at the toe of the slope. Collected surface water at the top of the slopes should be directed into non-erosive channels or conduit and discharged into an area of positive drainage away from the toe of the slope.

UTILITY TRENCHES: Due to the erratic nature of the groundwater conditions, utility trenches may encounter groundwater and flowing material at various locations across the site. All trenches will require sufficient sloping, shoring and bracing to provide safe working conditions. The contractor is responsible for providing the proper shoring and bracing to ensure adequate safety.

If water is encountered in the utility trenches, some type of dewatering will be required. The contractor is responsible for selecting and utilizing

An overexcavation/replacement scheme will include the removal of a minimum of three feet of the expansive material from beneath the building footprint and replacement with an approved structural fill. The zone of overexcavation is to extend a minimum three feet laterally beyond the foundation components.

OVERLOT AND STRUCTURAL FILL:

During the development phase of this project, the on-site material will be utilized in the cut and fill operations. Due to moisture content of on-site soil and soil makeup, watering both the cut and fill areas will help moisture condition the material. Surfactants may be required to aid in the moisture conditioning of silty clay.

All fill placed across the site during the development phase is to be compacted in lifts not to exceed 6 inches after compaction, while maintaining a minimum of 95% of its maximum Proctor dry density, ASTM D-698. The soil is to be placed at approximately ±2% of its Proctor optimum moisture content.

As discussed earlier, Soil Type 1 is both weight and moisture sensitive and will consolidate and/or collapse with the addition of loads, and/or moisture. In previous filings in this subdivision, Soil Type 1 was removed, moisture conditioned and compacted during the overlot fill phase.

Due to the erratic nature of the subsurface topography and groundwater elevations, conditions may become apparent during the grading process that would warrant the installation of "canyon drains, interceptor drains etc." The type of drain system required will be determined prior to continuing with the overlot fill placement. Collected groundwater is to be directed away from affected areas and discharged appropriately. This issue will be addressed during the grading phase, if encountered.

DESIGN PARAMETERS: Based on information available to date, the majority of the foundation excavations will be founded in moderately to highly expansive soil requiring an overexcavation/replacement scheme. Shallow foundation systems utilized in conjunction with an overexcavation/replacement scheme may be proportioned on the basis of a maximum allowable bearing capacities ranging from 2000 psf to 2600 psf. The final bearing capacity will be determined on a lot-by-lot basis at the time of the open excavation observation. Foundations are to be provided with a minimum of 30 inches of cover for frost protection. Foundation walls should be designed to span a minimum of 12 feet under the design loads to provide for foundation rigidity and account for anomalies in the soil profile.

The on-site native soils and structural fill can be taken to have the following equivalent hydrostatic fluid pressures:

Soil Type	Equivalent Fluid Pressure		
	Active (pcf)	Passive (pcf)	At Rest (pcf)
Select granular fill	38	291	56
1, 2, 4 and Overlot fill	59	138	71
3 and 5	48	238	70

The above values assume level backfill conditions and may require modifications for the effects of surcharge loads, sloping backfill, etc. The design parameters provided must be verified by observation of the foundation excavation.

BACKFILL: Where overexcavation/replacement schemes are warranted due to highly expansive soils, walls retaining in excess of four feet of backfill should be backfilled with granular, non-expansive materials. However, the clay may be used in the upper 18 inches of landscaped areas to create a relatively impermeable cap.

If low to moderately expansive soil is utilized in the backfill process against walls greater than four feet in height, the potential for lateral movement of foundation components will be significantly increased. To reduce the expansion potential, the low to moderately expansive soils can be placed at a minimum of 2% to 4% over optimum moisture content as determined by Standard Proctor, ASTM D-698. Surface drainage and grading is critical, and must be maintained over the life of the structure. Highly expansive soil is not to be used against walls retaining in excess of four feet of backfill.

FLOOR SLABS:

Since expansive soil is present on this site, movement of floor slabs-on-grade is probable. The magnitude of this movement is unpredictable. Concentrating slab loads cannot control the movement. The only positive solution, in our opinion, would be to utilize structural floors with an air space between the expansive soils and floor system. Economic constraints may prevent the use of structural floors. Therefore, if floor slabs-on-grade are utilized in conjunction with an overexcavation replacement scheme, the following recommendations are made:

- Slabs must be separated from all structural and non-structural portions of the building in such a manner that they do not transmit floor slab movement to the roof or overlying floor.

- Stairways and doorways must be designed to accommodate slab movement. Sheetrock and pre-hung doors must not rest on stairway stringers or the slab.

- Columns, pipes, plumbing and utilities penetrating the slab must be isolated from the slab to provide for slab movement.

- Water lines and gas lines connected to water heaters and/or furnaces resting on the slab must be constructed with flexibility to allow for slab movement. Heater ducts must be provided with collapsible connections between the furnace and ductwork.

- Backfill placed below floor slabs should be granular material and is to be compacted to a minimum of 90% of its maximum modified Proctor dry density, ASTM D-698.

The above recommendations are considered prudent and should be followed in order to mitigate the effects of floor slab movement. They do not, however, guarantee that movement will not occur in the event that the subsoils increase in moisture content.

CONCRETE TYPE: All concrete in contact with the soil should be made using a Type II cement for sulfate resistance. Calcium chloride must not be added to a

Type II cement. Foundation forms should remain in place for an appropriate length of time in accordance with ACI (American Concrete Institute) recommendations in the ACI Manual of Standard Practice, Part 2.

In accordance with the International Building Code and good construction practices, concrete must not be placed on frozen ground.

SURFACE DRAINAGE AND GRADING:

The ground surface within 10 feet of the building must be sloped away from the building with a minimum gradient of 5%. This is equivalent to six inches of fall across this 10-foot zone. Two-percent slope would be appropriate in paved areas. Where this is not possible, a well-defined swale should be constructed to intercept the surface water and carry it quickly and safely around and away from the building. Plastic should not be utilized beneath decorative rock or bark, etc. A breathable filter fabric should be utilized in lieu of plastic membranes.

Decorative edging, sidewalks and other flatwork should be planned and constructed so that they do not restrict rapid surface flows away from the foundation region.

Roof downspouts should be extended across all backfill zones and discharged into an area of positive drainage away from the structure.

Decorative edging, sidewalks and other flatwork should be planned and constructed so that they do not restrict rapid surface flows away from the foundation region.

Roof downspouts should be extended across all backfill zones and discharged into an area of positive drainage away from the structure.

No sod, grass, shrubs, flowers, trees, or other vegetation requiring water should be placed within five feet of the foundation or within any backfill zone. Sprinklers must not discharge water within five feet of the foundation or within any backfill zone.

In addition, control of drainage and grading is a critical factor in the future performance of the proposed structures. Cut and fill operations should utilize the natural contours of the site as much as possible.

SUBSURFACE DRAINAGE:

At a minimum, a subsurface perimeter drain will be required around each foundation system. If seepage or evidence of groundwater is

present in the excavation a more comprehensive drain system would be warranted (i.e. curtain drains, capillary breaks, etc.).

OPEN EXCAVATION OBSERVATIONS:

The foundation excavation for each house is to be observed prior to setting forms or pouring concrete in order to verify that adequate bearing materials are present and that no unsuitable materials exist.

CLOSING:

This filing is located in a very complex geologic environment. Some differences in soil and groundwater conditions can be anticipated during the development and construction phases.

Our investigation consisted of random sampling a heterogeneous material. As a result, subsurface soil conditions encountered during development and construction may differ somewhat from the conditions described in this report.

Construction and design personnel should be made familiar with the contents herein. Prior to any site work, a meeting is to be held to familiarize all involved with the overlot grading with existing site conditions and proposed cut and fill operations. If discrepancies are noted during construction, Soil Testing and Engineering Inc. should be notified so that construction problems may be avoided.

This report has been prepared in accordance with generally accepted engineering standards of care for the time and region. No other guarantees or warranties are either expressed or implied.

We trust this report provides you with the information you require. Should questions arise or further information is needed, please contact Soil Testing and Engineering Inc. at your convenience.

Soil Testing and Engineering Inc. appreciates the opportunity to provide you with the engineering services you require.

GEOLOGY

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 8 miles west of the site is a major structure known as the Front Range Fault System. This fault system along with the Rampart Range Fault to the north marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. Bedrock in the area of the site tends to be dipping in an easterly direction. The bedrock in this area is sedimentary in nature and is Cretaceous aged.

The bedrock encountered in the subsurface investigation for this site is the Pierre Shale Formation (KP). Overlying the Pierre Shale are Quaternary aged layers of colluvial, alluvial, residual and eolian soils.

Three mappable units were identified on this site.

Qes – Holocene aged loess with eolian silty to clayey fine grained sand. These metastable soils may consolidate with the introduction of weight and moisture.

Qp – Piney Creek Alluvium – Holocene aged alluvial material – grey to brown firmly compacted silts, clays and sand, contains sand and gravel lenses at the bottom of the deposit. Slope stability is medium to poor. Vertical cuts are stable when dry, but become unstable when wetted.

Kp – Pierre Shale – Cretaceous aged marine shale which contains interbedded lenses of sandstone and claystone shale. Bentonite beds are encountered throughout the formation. Foundation stability is poor. Expansive pressures range from low to very big depending on sand/clay content.

The Reconnaissance Map of Colorado Springs and Vicinity by Scott and Wobus (1973), The Geologic Map of Colorado Springs/Castle Rock area, Front Range Urban Corridor, Colorado by Trimble and Machette (1979) and The Reconnaissance Geology and Surface Soils 735 acres, Widefield Area, El Paso County Co, by Geotechnical Consultants, Inc. (GCI Job No. 2245, dated October 31, 1986) were used in evaluating the site. The test borings by STE were also used to evaluate the site and are included with this report (Figure Nos. 4 - 60 and Figures A – N).

OVERLOT GRADING

This portion of the report is intended to provide specifications to establish the procedures for preparing areas to be filled, including stripping and grubbing, stabilization of soft soils, and placing and compacting fill soils to the lines and grades shown on the grading plans.

- A meeting is to be held on site prior to any stripping, grubbing or fill placement. Representatives from the owner, general contractor, earth moving contractor and STE are to be present at the meeting to familiarize all parties with the proposed project.

- The owner will establish the project boundaries. Responsibilities of all cut and fill elevations necessary for proper location and execution of the work is the responsibility of the owner. He will retain an engineer to establish vertical and horizontal control for the grading work and to determine the final rough grade of the fill.

- In accordance with generally accepted construction practices, the contractor will be solely and completely responsible for conditions on the job site including safety of all personnel and property during the performance of the work. This requirement will apply continuously and not be limited to normal working hours.

- The responsibility of the soil engineer, if hired to do so, is to conduct construction review of the contractor's performance and does not include review of the adequacy of the contractor's safety measures on or near the construction site.

- Soil Testing and Engineering Inc. shall be retained by the owner to observe and test the earthwork in accordance with specifications provided. Adequate observations and testing will be provided to meet construction specifications. It shall be the responsibility of the contractor and owner to assist personnel of Soil Testing and Engineering Inc. to keep apprised of work schedules, changes in conditions or design and new information and data as it becomes available so that we may evaluate any changes. In the event that any unusual conditions not covered by these specifications are encountered during the grading operation, Soil Testing and Engineering Inc shall be contacted for further recommendations.

- If, in the opinion of the representative of Soil Testing and Engineering Inc., substandard conditions are encountered, such as questionable or unsuitable soil conditions, unacceptable moisture content, inadequate compaction or adverse weather, etc., the representative may stop construction until the conditions are remedied, corrected or may recommend rejection of this work. The presence of the representative from Soil Testing and Engineering Inc. shall not relieve the contractor from its duty to place all fill material to the specified degree of compaction, and to complete all work in accordance with specifications.

- All soils used for fill must be approved by a representative of Soil Testing and Engineering Inc.

OVERLOT GRADING
CONT'D

- When the slope of the natural ground receiving fill exceeds 20% (5' horizontal to 1' vertical), the original ground shall be stepped or benched. Benches shall be cut to a firm, competent soil condition. The lower bench shall be at least 10 feet wide or 1½ times the compaction equipment width, whichever is greater. The bottom toe shall be sloped back into the hillside a gradient not less than 2%. All benches shall be at least 6 feet wide. All horizontal portions of each bench shall be compacted prior to receiving fill.

- All natural ground to receive fill must be properly scarified, watered and compacted prior to placing fill.

- Soil Testing and Engineering Inc. shall take an adequate number of density tests to determine if the fill satisfies project specifications. Density test results and daily notes will be provided periodically during the development process. Any failing tests or areas which do not satisfy project specifications will be reworked and retested to the satisfaction of the representative of Soil Testing and Engineering Inc.

- In areas where water is within 4 feet of the proposed fill, static compaction equipment shall be utilized. Vibrating sheepsfoot or smooth drum rollers are not to be used in areas above water until a minimum of 6 feet of compacted material is in place.

- The contractor is solely responsible for the design, maintenance and operation of any required dewatering system. The contractor shall perform such independent investigation as he deems necessary to satisfy himself as to the subsurface groundwater conditions and unstable soil conditions to be encountered throughout the construction.

- No fill shall be placed, spread or rolled while it is frozen, thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until a representative of Soil Testing and Engineering Inc. indicates that the moisture content and density of the previously placed fill are as specified. Fill surfaces may be scarified and recompacted after rainfall if necessary, to obtain proper moisture density relation.

GENERAL SITE WORK

This section of the report is intended to provide recommendations and to establish general procedures for the excavation for the proposed structure.

- The owner or contractor will establish the project boundaries including all cut and fill elevations. Execution of the work is the responsibility of the owner. He will retain qualified personnel to establish horizontal and vertical control for the excavation and will determine the final elevations for the structural fill.

- In accordance with generally accepted construction practices, the contractor will be solely responsible for conditions on the job site including supervision of all personnel and property during the performance of the work. This requirement will apply continuously and not be limited to normal working hours.

- The responsibility of the soil engineer, if hired to do so, is to observe the open excavation and provide final soil parameters for the proposed foundation design and does not include review of the adequacy of the contractor's safety measures in or near the construction site.

- Soil Testing and Engineering Inc. shall be retained by the owner to observe and test any structural fill in accordance with the specifications provided. Adequate observations and testing will be provided to meet construction specifications.

- All soils used for structural fill must be approved by a representative of Soil Testing and Engineering Inc.

- Where structural fill is required, Soil Testing and Engineering Inc. shall take an adequate number of density tests to determine if the structural fill satisfies project specifications. Density test results will be provided subsequent to any fill placement. Any failing tests or areas which do not satisfy project specifications will be reworked and retested to the satisfaction of the representative of Soil Testing and Engineering Inc.

- Utility trenches must be properly shored or sloped in accordance with local, state, federal or OSHA guidelines or regulations. The contractor is responsible for providing proper shoring and/or sloping to provide adequate safety.

FIELD EXPLORATION PROGRAM

1. The field investigation on this site consisted of drilling 62 test borings as shown on the enclosed Test Boring Location Diagram (Figure 2). Test borings completed on the eastern side of the original Filing No. 6 were in or near the western boundary of Filing No. 7. They are included in this report on Figures A – Z. Test borings were advanced by means of a power-driven, continuous auger drill to depths ranging from 20 feet to 40 feet below the present ground surface. The information from the test pits completed on the original eastern boundary of Filing No. 6 were utilized to determine soil conditions along the western boundary of Filing No. 7.

2. Samples were obtained using the Standard Penetration Test, ASTM D-1586, utilizing a two-inch, split spoon and California sampler.

3. Bulk sampling methods were also utilized.

LABORATORY TESTING PROGRAM

1. Moisture content, ASTM D-2216 was obtained in the laboratory for all recovered samples.

2. A grain size analysis, ASTM D-2487, and determination of the Atterberg Limits, ASTM D-4318, were performed on visually grouped samples in order to classify the soil in accordance with the Unified Soils Classification System. Utilizing this method, Soil Types 1, 2, 3 and 4 classified as low plasticity sandy clay (CL). Soil Type 5 classified as a clayey sand (SC).

3. Swell tests were performed in order to determine the expansive characteristics of remolded samples of all soil types.

4. Swell-consolidation results were also performed on five samples (reference Figure Nos. 40 - 44). Swell consolidation results from report Job No. 060938 are also included (Reference Figures 45 - 50).

SITE LOCATION PLAN

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DRAWN	DATE	CHECKED	DATE
mss		LWC	

STE

SOIL TESTING & ENGINEERING INC.

JOB No. 060933

FIG No. 1

15 STANDARD PENETRATION TEST -- ASTM C-1586. PRODUCED BY DRIVING A STANDARD 2" O.D. SPLIT SPOON SAMPLER INTO THE SOIL BY DROPPING A 140 lb HAMMER ONTO THE SPOON. THE NUMBER INDICATES THE NUMBER OF HAMMER DROPS REQUIRED TO DRIVE THE SPOON 12" INTO THE SOIL PROFILE.

15 STANDARD PENETRATION TEST -- ASTM C-1586. PRODUCED BY DRIVING A CALIFORNIA 2" O.D. SPLIT SPOON SAMPLER INTO THE SOIL BY DROPPING A 140 lb HAMMER 30" ONTO THE SPOON. THE NUMBER INDICATES THE NUMBER OF HAMMER DROPS REQUIRED TO DRIVE THE SPOON 12" INTO THE SOIL PROFILE.

1 SOIL TYPE NUMBER DESIGNATION IN REPORT

12.6 MOISTURE CONTENT OF SAMPLE

1/08/07 WATER LEVEL AND DATE MEASURED

SYMBOLS AND NOTES

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FIG No. 3

TEST BORING NO. 1
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN		33	6.9	1
5			29	8.1	2
	CLAY, SANDY, VERY STIFF, LOW MOISTURE, BROWN				
10			50/3"	8.2	2/4
	LENSATIC; WEATHERED CLAYSTONE TO SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST				
15			50/5"	11.3	4
20			50/9"	15.7	4
25					
30					
35					
40					

TEST BORING NO. 2
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24.5 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN		20	7.8	1
5			31	9.7	1
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO BROWN TO RUST				
10			50/8"	11.6	4
15			50/6"	10.0	4
20			50/5"	12.9	4
25			50/3"	11.4	4
30					
35					
40					

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FIG No.
4

TEST BORING NO. 3
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 19.7 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, BROWN		14	8.1	1
5			26	8.6	1
	CLAY, SANDY, HARD LOW MOISTURE, LIGHT BROWN				
10			33	7.4	2
	LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW TO MODERATE MOISTURE, GREEN TO RUST				
15			30	15.1	4
20			50/6"	13.4	4
25					
30					
35					
40					

TEST BORING NO. 4
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, BROWN		16	7.2	1
5			50/11"	9.2	1/4
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST				
10			50/7"	10.4	4
15			50/5"	17.1	4
20			50/4"	9.9	4
25			50/5"	11.2	4
30					
35					
40					

TEST BORING LOGS

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FIG No. 5

TEST BORING NO. 5
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 19.9 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			31	12.1	4
			31	13.3	4
5					
10			38	14.0	4
15			50/7"	13.7	4
20			50/5"	12.1	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED, CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

TEST BORING NO. 6
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER:
WATER AT 24 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			7	15.9	1
			37	18.6	2
5					
10			29	16.4	2
15			23	12.9	4
20			31	18.4	4
25			50/7"	13.5	4
30					
35					
40					

CLAY, SANDY, FIRM, MODERATE MOISTURE, LIGHT BROWN

CLAY, SANDY, HARD TO STIFF, MODERATE TO LOW MOISTURE, BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED, CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

10/6/06

TEST BORING LOGS

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FIG No. 6

TEST BORING NO. 7
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			20	9.2	1
5			27	7.1	3
10			50/7"	9.9	4
15			50/5"	9.9	4
20			50/8"	16.8	4
25					
30					
35					
40					

CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; SANDY CLAY AND CLAYEY SAND AND GRAVEL, VERY STIFF, LOW MOISTURE, GREEN TO RUST

LENSATIC, WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO DARK GREEN TO RUST

TEST BORING NO. 8
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER:
WATER AT 18.8 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			23	14.7	2
5			17	13.1	2
10			14	11.9	2
15			26	16.5	2/4
20			50/8"	15.5	4
25					
30					
35					
40					

CLAY, SANDY, VERY STIFF TO STIFF, MODERATE TO LOW MOISTURE, BROWN TO DARK GREEN TO LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

10/6/06

TEST BORING LOGS

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FIG No. 7

TEST BORING NO. 9
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 19 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			17	12.5	1
5			16	7.6	1
10			45	11.5	3
15			50/3"	11.7	4
20			50/5"	12.6	4
25					
30					
35					
40					

CLAY, SANDY, VERY STIFF TO STIFF, MODERATE TO LOW MOISTURE, BROWN TO GREEN

LENSATIC; SANDY CLAY AND CLAYEY SAND AND GRAVEL, HARD, LOW MOISTURE, BROWN

LENSATIC, CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST TO BROWN

TEST BORING NO. 10
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER:
WATER AT 20 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			44	14.0	1/4
5			50/9"	13.9	4
10			50/6"	12.8	4
15			50/5"	11.9	4
20			50/7"	16.2	4
25					
30					
35					
40					

10/6/06

CLAY, SANDY, VERY STIFF, MODERATE MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST

TEST BORING LOGS

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FIG No. 8

TEST BORING NO. 11
DATE DRILLED: 9/27/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24.8 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY				
			48	13.3	4
5			50/11"	12.7	4
10			50/11"	15.8	4
15			50/4"	13.0	4
20			50/5"	11.9	4
25			20 / BOUNCE	8.0	4
30					
35					
40					

TEST BORING NO. 12
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 23.7 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN				
			20	12.0	1/2
5	CLAY, SANDY, HARD, LOW MOISTURE, BROWN TO GREEN		35	12.3	2
10	CLAY, SANDY, FIRM, MODERATE MOISTURE, LIGHT GREEN		10	15.7	1
15	LENSATIC; SANDY CLAY AND CLAYEY SAND AND GRAVEL, VERY STIFF, LOW MOISTURE, GREEN TO RUST		24	13.4	3
20	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY		38	15.3	4
25			50/7"	10.8	4
30					
35					
40					

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FIG No. 9

TEST BORING NO. 13
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 23.9 FT. DRY

LENSATIC; RESIDUAL TO HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			18	11.1	4
			30	7.3	4
5					
			50/10"	13.5	4
10					
			50/7"	11.7	4
15					
			50/7"	12.4	4
20					
			50/7"	12.2	4
25					
30					
35					
40					

TEST BORING NO. 14
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 19.8 FT. DRY

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, BROWN TO GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			26	9.0	4
			25	15.1	4
5					
			50/9"	13.0	4
10					
			50/7"	13.4	4
15					
			50/6"	10.6	4
20					
25					
30					
35					
40					

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FIG No. 10

TEST BORING NO. 15
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER:
WATER AT 23 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO VERY STIFF, MODERATE TO LOW MOISTURE, BROWN TO GREEN TO LIGHT BROWN				
			16	16.6	1
5			25	12.1	1
10			15	12.1	1
	CLAY, SANDY, STIFF, MODERATE MOISTURE, LIGHT BROWN				
15			15	14.8	2
	LENSATIC; HIGHLY WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST				
20			50	13.8	4
	▼ 10/6/06				
25			50/6"	13.0	4
30					
35					
40					

TEST BORING NO. 16
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, BROWN TO LIGHT BROWN				
			11	8.3	1
5			20	10.8	1
10			25	11.8	1
15			39	10.9	1
20	LENSATIC; HIGHLY WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST		35	9.0	1/4
25			50/5"	10.2	4
30					
35					
40					

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FIG No. 11

TEST BORING NO. 17
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO VERY STIFF, MODERATE TO LOW MOISTURE, LIGHT BROWN TO BROWN				
			11	12.1	1
5			19	9.5	1
10	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY		50/8"	12.7	1/4
15			50/5"	11.0	4
20			50/4"	9.7	4
25			50/3"	9.3	4
30					
35					
40					

TEST BORING NO. 18
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM TO STIFF, HIGH TO LOW MOISTURE, BROWN TO GREEN				
			6	20.3	2
5			17	9.4	2
10	LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST		37	11.3	4
15			50/7"	11.2	4
20			50/3"	8.9	4
25			20/BOUNCE	8.9	4
30					
35					
40					

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FIG No. 12

TEST BORING NO. 19
DATE DRILLED: 10/4/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 23.8 FT. DRY

CLAY, SANDY, STIFF
LOW MOISTURE,
LIGHT BROWN

LENSATIC; RESIDUAL TO HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, MODERATE TO LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			19	12.6	4
5			23	14.3	4
10			50/8"	12.2	4
15			50/5"	9.2	4
20			50/5"	10.0	4
25			50/3"	9.2	4
30					
35					
40					

TEST BORING NO. 20
DATE DRILLED: 10/5/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24.3 FT. DRY

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, LIGHT BROWN TO GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			37	9.3	4
5			44	12.2	4
10			50/9"	10.9	4
15			50/8"	11.3	4
20			50/8"	11.1	4
25			50/5"	8.7	4
30					
35					
40					

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FIG No. 13

TEST BORING NO. 21
DATE DRILLED: 10/5/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 34 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			10	7.7	1
5			8	8.7	1
10			27	8.6	2
15			21	8.3	2
20			14	10.9	2
25			20	10.1	4
30			50/7"	11.6	4
35			50/3"	13.3	4
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY, VERY STIFF TO STIFF, LOW MOISTURE, LIGHT BROWN TO GREEN TO RUST

LENSATIC; RESIDUAL TO HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST

TEST BORING NO. 22
DATE DRILLED: 10/5/06

REMARKS: 10/6/06
MEASURED
FOR WATER: 24.1 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			19	9.2	4
5			33	10.4	4
10			50/6"	7.5	4
15			50/9"	12.6	4
20			50/5"	9.0	4
25			50/5"	8.4	4
30					
35					
40					

LENSATIC; RESIDUAL TO HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST

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FIG No. 14

TEST BORING NO. 23
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 24.3 FT. DRY

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			14	6.6	1
5			29	12.2	4
10			50/7"	12.1	4
15			20 BOUNCE	4.2	4
20			50/3"	9.0	4
25			50/3"	11.3	4
30					
35					
40					

TEST BORING NO. 24
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 24.3 FT. DRY

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			31	9.2	4
5			50/6"	9.8	4
10			50/5"	11.9	4
15			50/9"	13.2	4
20			50/4"	9.8	4
25			20 BOUNCE	7.5	4
30					
35					
40					

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FIG No. 15

TEST BORING NO. 25
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 29.3 FT. DRY

LENSATIC; RESIDUAL TO HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			23	13.3	4
5			36	11.6	4
10			50/9"	9.6	4
15			50/7"	11.7	4
20			50/5"	9.4	4
25			50/4"	9.1	4
30			50/4"	9.2	4
35					
40					

TEST BORING NO. 26
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 24.3 FT. DRY

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			50/7"	10.0	4
5			50/7"	9.2	4
10			50/8"	13.9	4
15			50/6"	11.4	4
20			50/4"	9.5	4
25			50/3"	9.8	4
30					
35					
40					

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FIG No. 16

TEST BORING NO. 27
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 30 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM TO STIFF, LOW MOISTURE, LIGHT BROWN				
			10	3.1	1
5			11	4.7	1
10			13	7.7	1
15			12	8.2	1
	CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN				
20			6	9.6	2
	LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST				
25			29	14.5	4
30			50/9"	15.0	4
35					
40					

TEST BORING NO. 28
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 24.5 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN TO RUST				
			16	6.0	1
5			15	5.9	1
10	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, LOW MOISTURE, GREEN TO RUST		50/7"	11.0	4
15			50/5"	10.7	4
20			50/6"	10.8	4
25			50/4"	8.7	4
30					
35					
40					

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JOB No. 060933
FIG No. 17

TEST BORING NO. 29
DATE DRILLED: 10/11/06

REMARKS: 10/13/06
MEASURED
FOR WATER: 24.5 FT. DRY

LENSATIC; RESIDUAL TO HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, LIGHT BROWN TO GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			22	8.4	4
5			29	13.2	4
10			50/11"	12.6	4
15			50/7"	10.2	4
20			50/6"	10.2	4
25			50/5"	10.8	4
30					
35					
40					

TEST BORING NO. 30
DATE DRILLED: 10/13/06

REMARKS: 10/25/06
MEASURED
FOR WATER: 30 FT. DRY

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, LIGHT BROWN TO GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			14	5.8	1
5			43	8.6	4
10			50/6"	11.4	4
15			50/9"	12.6	4
20			50/3"	10.5	4
25			20 / BOUNCE	7.5	4
30			50/3"	7.6	4
35					
40					

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JOB No. 060933
FIG No. 18

TEST BORING NO. 31
DATE DRILLED: 10/11/06

REMARKS: 10/25/06
MEASURED
FOR WATER: 30 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO FIRM, LOW MOISTURE, LIGHT BROWN TO BROWN				
			11	5.6	1
5			10	2.4	1
10			5	9.9	1
	CLAY, SANDY, VERY STIFF TO STIFF, LOW MOISTURE, LIGHT BROWN TO BROWN				
15			23	7.4	2
20			11	9.6	2
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST				
25			50/10"	13.9	4
30			50/8"	11.9	4
35					
40					

TEST BORING NO. 32
DATE DRILLED: 10/11/06

REMARKS: 10/25/06
MEASURED
FOR WATER: 29.6 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN				
			13	7.9	1
5			12	6.6	1
10	CLAY, SANDY, VERY STIFF, LIGHT BROWN		33	7.6	2
15			25	7.8	2
20			24	6.7	2
25	LENSATIC; CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST		50/4"	7.3	4
30			50/3"	8.9	4
35					
40					

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JOB No. 060933
FIG No. 19

TEST BORING NO. 33
DATE DRILLED: 10/11/06

REMARKS: 10/25/06
MEASURED
FOR WATER: 19.5 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM TO STIFF, LOW MOISTURE, LIGHT BROWN		7	6.1	1
5			12	6.6	1/4
	LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST				
10			50	9.4	4
15			50/8"	9.8	4
20			50/6"	12.0	4
25					
30					
35					
40					

TEST BORING NO. 34
DATE DRILLED: 10/11/06

REMARKS: 10/25/06
MEASURED
FOR WATER: 34.7 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, TO VERY STIFF, LOW MOISTURE, LIGHT BROWN		14	9.1	1
5			16	7.7	1
10			20	9.2	1
	CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN				
15			29	7.9	2
20			18	7.9	2
25			22	7.4	2
	SAND, SILTY TO CLAYEY, MEDIUM DENSE, LOW MOISTURE, LIGHT BROWN				
30			26	9.3	5
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE DENSE, LOW MOISTURE, GREEN TO RUST				
35			50/7"	14.2	4
40					

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JOB No. 060933
FIG No. 20

TEST BORING NO. 35
DATE DRILLED: 10/11/06

REMARKS: 10/25/06
MEASURED
FOR WATER: 35 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN				
			13	9.2	1
5			13	10.0	1
	CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, LIGHT BROWN TO RUST TO BROWN				
10			13	9.6	2
15			20	6.6	2
20			29	7.0	2
	SAND, SILTY TO CLAYEY, MEDIUM DENSE, LIGHT BROWN				
25			27	9.9	5
30			23	4.0	5
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST				
35			50/6"	12.5	4
40					

TEST BORING NO. 36
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: WATER AT 22 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO FIRM, LOW MOISTURE, LIGHT BROWN				
			12	6.4	1
5			8	5.9	1
10	CLAY, SANDY, FIRM, MODERATE MOISTURE, BROWN TO GREEN		6	11.8	1/2
15	LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST		26	14.1	2/4
20	11/20/06		50	14.9	4
25			50/10"	13.4	4
30					
35					
40					

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JOB No. 060933

FIG No. 21

TEST BORING NO. 37
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 33.9 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SILTY TO SANDY, STIFF TO VERY STIFF, LOW MOISTURE, LIGHT BROWN				
			13	8.2	1
5			15	9.5	1
10			22	9.6	1
	CLAY, SILTY TO SANDY WITH CLAYEY SAND LENSES, VERY STIFF, LOW MOISTURE, BROWN TO LIGHT BROWN				
15			26	5.8	2
20			27	8.1	2
25			25	7.4	2
	LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST				
30			20	15.0	4
35			50/6"	12.7	4
40					

TEST BORING NO. 38
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 24.3 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF LOW MOISTURE, LIGHT BROWN				
			12	5.6	1
5			12	10.4	1
10	CLAY, SANDY, FIRM, MODERATE MOISTURE, LIGHT BROWN TO BROWN		6	16.0	2
15			7	12.5	2
20	LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST		37	14.4	4
25			50/9"	15.7	4
30					
35					
40					

TEST BORING LOGS

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JOB No. 060933
FIG No. 22

TEST BORING NO. 39
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: WATER AT 20.8 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN				
			6	9.3	1
5			7	8.0	1
	CLAY, SANDY, FIRM TO VERY SOFT, LOW TO SATURATED MOISTURE CONTENT, LIGHT BROWN TO BROWN				
10			7	8.9	2
15			6	17.0	2
20	11/20/06		4	26.1	2
25	PUSHED AUGER WITH VERY LITTLE RESISTANCE FROM 25 FT. TO 38 FT.		3	25.9	2
30					
35	LENSATIC; HIGHLY WEATHERED CLAYSTONE AND SANDSTONE, HARD, LOW MOISTURE, GREEN TO RUST				
40			43	19.0	4

TEST BORING NO. 40
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: WATER AT 26.3 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN				
			13	7.6	1
5			13	9.0	1
	CLAY, SANDY, STIFF TO FIRM, LOW TO HIGH MOISTURE, BROWN				
10			13	12.2	2
15			11	17.2	2
20			7	17.3	2
25	11/20/06		7	21.8	2
	LENSATIC; HIGHLY WEATHERED CLAYSTONE AND SANDSTONE, HARD, GREEN TO RUST				
30			49	15.6	4
35					
40					

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JOB No. 060933
FIG No. 23

TEST BORING NO. 41
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 23.9 FT. DRY

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			50/10"	9.8	4
5			50/11"	10.6	4
10			50	13.2	4
15			50/9"	12.2	4
20			50/6"	12.0	4
25			50/3"	10.3	4
30					
35					
40					

TEST BORING NO. 42
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 24 FT. DRY

CLAY, SANDY WITH SCATTERED SANDSTONE CHIPS, STIFF, LOW TO MODERATE MOISTURE, GREEN TO BROWN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN T RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			11	9.3	2
5			23	9.8	2
10			14	12.1	2
15			15	13.9	2
20			50/10"	13.5	4
25			50/8"	12.8	4
30					
35					
40					

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JOB No. 060933
FIG No. 24

TEST BORING NO. 43
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 18.7 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM TO STIFF, LOW TO MODERATE MOISTURE, LIGHT BROWN TO BROWN				
			8	9.7	2
5			7	16.3	2
10			7	18.6	2
15			11	15.4	2
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST				
20			50/8"	13.2	4
25					
30					
35					
40					

TEST BORING NO. 44
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 23.6 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, LIGHT BROWN TO BROWN				
			11	9.2	1
5			18	10.8	1
	CLAY, SANDY WITH SCATTERED SANDSTONE CHIPS, HARD, LOW MOISTURE, BROWN TO GREEN TO RUST				
10			38	10.1	2
15			32	8.1	2
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE LOW MOISTURE, LIGHT BROWN TO GREEN TO RUST				
20			50/11"	9.9	2/4
25			50/4"	10.1	4
30					
35					
40					

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JOB No. 060933
FIG No. 25

TEST BORING NO. 45
DATE DRILLED: 11/9/06

REMARKS: 11/20/06
MEASURED
FOR WATER: 23.9 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
		■	22	9.6	2
		■	19	10.9	2
5					
		■	50	13.2	2/4
10					
		■	50/7"	11.7	4
15					
		■	50/10"	14.1	4
20					
		■	50/3"	10.2	4
25					
30					
35					
40					

CLAY, SANDY, VERY DENSE WITH SCATTERED SANDSTONE CHIPS, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

TEST BORING NO. 46
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: 24 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
		■	10	8.2	1
		■	10	9.1	1
5					
		■	16	9.2	2
10					
		■	27	12.1	2/4
15					
		■	50/10"	15.2	4
20					
		■	50/10"	15.2	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

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JOB No. 060933
FIG No. 26

TEST BORING NO. 47
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: 23.9 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			42	11.1	4
5			50/11"	11.7	4
10			50/8"	13.3	4
15			45	14.6	4
20			50/6"	16.0	4
25			50/9"	16.9	4
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO DARK GREEN

TEST BORING NO. 48
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: 18.8 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			17	8.3	1
5			29	8.5	1
					2
10			42	10.4	2
15			50/11"	13.9	4
20			50/5"	11.7	4
25					
30					
35					
40					

CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY, HARD, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST

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JOB No. 060933
FIG No. 27

TEST BORING NO. 49
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: 19 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			7	7.8	1
5			8	8.8	2
10			9	9.8	2
15			15	15.5	4
20			50/9"	13.4	4
25					
30					
35					
40					

CLAY, SANDY, FIRM
LOW MOISTURE,
LIGHT BROWN

CLAY, SANDY, FIRM TO
STIFF, LOW MOISTURE,
BROWN TO LIGHT BROWN

LENSATIC; RESIDUAL
CLAYS AND SANDS
DERIVED FROM
WEATHERING OF THE
BEDROCK, STIFF, LOW
MOISTURE, GREEN TO RUST

LENSATIC; WEATHERED
CLAYSTONE AND SANDSTONE,
DENSE, LOW MOISTURE,
GREEN TO RUST

TEST BORING NO. 50
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: WATER AT 15.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			9	17.6	2
5			9	16.9	2
10			8	15.5	2
15			9	23.0	2
20			5	24.6	2
25					
30			BULK	14.4	4
35					
40					

CLAY, SANDY, STIFF TO
VERY SOFT, MODERATE
TO SATURATED
MOISTURE CONTENT,
BROWN TO GREEN

12/18/06
12/18/06

NOTE: AUGER PUSHED
FROM 20 FT. TO 25 FT.
WITH VERY LITTLE
RESISTANCE

LENSATIC; WEATHERED
CLAYSTONE AND SANDSTONE,
HARD, MODERATE MOISTURE,
GREEN TO RUST

TEST BORING LOGS

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JOB No.
060933
FIG No.
28

TEST BORING NO. 51
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED FOR
WATER: CAVED TO
14.8 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW TO MODERATE MOISTURE, GREEN		13	8.5	2
5			9	11.7	2
10	LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST		23	14.6	4
15			32	15.3	4
20			50/9"	16.1	4
25					
30					
35					
40					

TEST BORING NO. 52
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: WATER AT 11.7 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW TO MODERATE MOISTURE, LIGHT BROWN TO GREEN		11	9.5	2
5			13	10.5	2
10	LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, DARK GREEN TO RUST ▼ 12/18/06		36	17.6	4
15			50/7"	11.8	4
20					
25					
30					
35					
40					

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JOB No. 060933
FIG No. 29

TEST BORING NO. 53
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED FOR
WATER: 19 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					2
			23	6.9	4
5			43	8.1	
10			50/8"	11.8	4
15			50/7"	11.6	4
20			50/6"	10.6	4
25					
30					
35					
40					

CLAY, SANDY, STIFF,
LOW MOISTURE, BROWN

LENSATIC; WEATHERED
CLAYSTONE AND SANDSTONE,
HARD TO DENSE, LOW
MOISTURE, GREEN
TO RUST

TEST BORING NO. 54
DATE DRILLED: 12/13/06

REMARKS: 12/18/06
MEASURED
FOR WATER: CAVED
TO 11.4 FT. MUDDY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			9	8.4	1
5			9	7.2 / 17.0	2
10			10	13.8	2
15			8	19.9	2
20					2
25			BULK	17.7	4
30					
35					
40					

CLAY, SANDY, STIFF,
LOW MOISTURE, BROWN

CLAY, SANDY, STIFF TO
VERY SOFT, MODERATE
TO SATURATED MOISTURE
CONTENT, BROWN TO GREEN

▼ 12/18/06

NOTE: AUGER PUSHED
FROM 15 FT. TO 22 FT.
WITH VERY LITTLE
RESISTANCE

▼ 12/13/06

LENSATIC; HIGHLY
WEATHERED CLAYSTONE
AND SANDSTONE, HARD,
MODERATE MOISTURE,
GREEN TO RUST

TEST BORING LOGS

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JOB No.
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FIG No.
30

TEST BORING NO. 55
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED FOR
WATER: 19.4 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, DARK BROWN TO RUST				
		■	50/9"	7.9	4
5		■	50/6"	8.6	4
10		■	50/5"	11.8	4
15		■	50/5"	12.2	4
20		■	50/3"	9.9	4
25					
30					
35					
40					

TEST BORING NO. 56
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED
FOR WATER:
WATER AT 22.6 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM TO STIFF, LOW MOISTURE, TAN TO LIGHT BROWN				1
		■	9	7.0	1
5		■	9	7.4	1
10		■	8	8.8	1
	CLAY, SANDY, FIRM TO STIFF, MODERATE TO SATURATED MOISTURE CONTENT, BROWN				
15		■	16	14.8	2
20		■	7	15.6	2
	▼ 1/04/07				
25		■	6	26.0	2
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE CONTENT, DARK GREEN TO RUST				4
30		■	50/8"	15.6	4
35					
40					

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FIG No. 31

TEST BORING NO. 57
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED FOR
WATER: 19.0 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			17	8.3	1
5			20	8.2	1
10			50/9"	10.6	4
15			50/7"	11.1	4
20			50/4"	10.3	4
25					
30					
35					
40					

CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, DARK BROWN TO RUST

TEST BORING NO. 58
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED
FOR WATER:
WATER AT 24.0 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			5	5.5	1
5			9	6.1	1
10			6	8.9	2
15			4	9.2	2
20			27	14.6	4
25			50/10"	13.4	4
30					
35					
40					

CLAY, SILTY TO SANDY FIRM TO STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY, VERY SOFT TO FIRM, MODERATE MOISTURE, LIGHT BROWN TO BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, MODERATE MOISTURE, DARK BROWN TO RUST ▼ 1/04/07

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JOB No.
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FIG No.
32

TEST BORING NO. 59
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED
FOR WATER:
WATER AT 23.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			19	5.2	1
5			13	7.9	1
10			8	14.3	2
15			9	17.8	2
20			16	19.5	2
25			9	24.6	2
30			50/12"	21.6	4
35					
40					

CLAY, VERY SILTY TO SANDY, STIFF TO VERY STIFF, LOW MOISTURE, TAN TO LIGHT BROWN

CLAY, SANDY, FIRM TO STIFF, MODERATE TO SATURATED MOISTURE CONTENT, LIGHT BROWN TO BROWN

1/04/07

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, HARD, MODERATE TO HIGH MOISTURE, BROWN TO RUST

TEST BORING NO. 60
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED
FOR WATER:
WATER AT 16.6 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					2
			7	8.1	2
5			4	12.2	2
10			3	12.2	2
15			6	21.5	2
20			5	27.4	2
25			4	27.9	2
30			9	24.5	2
35			50/12"	17.6	4
40					

CLAY, SANDY, VERY SOFT TO STIFF, MODERATE TO SATURATED MOISTURE CONTENT, LIGHT BROWN TO BROWN

1/04/07

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, HARD, MODERATE MOISTURE, BROWN TO GREEN

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JOB No. 060933
FIG No. 33

TEST BORING NO. 61
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED FOR
WATER: 19.2 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN			12	6.0	1
			15	5.8	1
5					
LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW TO MODERATE MOISTURE, DARK GREEN TO BROWN TO RUST					
10			50/8"	11.6	4
15			50/8"	14.0	4
20			50/7"	13.6	4
25					
30					
35					
40					

TEST BORING NO. 62
DATE DRILLED: 12/27/06

REMARKS: 1/04/07
MEASURED
FOR WATER:
WATER AT 17.4 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN			9	6.5	1
			10	5.8	1
5					
CLAY, SANDY, FIRM, MODERATE TO HIGH MOISTURE, DARK BROWN TO BROWN					
10			6	14.1	2
15			6	22.4	2
▼ 1/04/07					
20			6	22.6	2
25			7	24.2	2
LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, HIGH MOISTURE,DARK BROWN TO RUST					
30			50/11"	18.6	4
35					
40					

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FIG No. 34

TEST BORING NO. 209
DATE DRILLED: 11/21/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER AT 12 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 12 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					2
			12	13.0	2
5			8	14.7	2
10			5	28.6	2
15			30	19.0	4
20			50/6"	10.4	4
25					
30					
35					
40					

CLAY, SANDY WITH SAND LENSES, SOFT TO VERY SOFT, HIGH TO SATURATED MOISTURE CONTENT, DARK BROWN TO BROWN TO GREEN TO RUST

▼ 12/23/05
1/10/06

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST

TEST BORING NO. 210
DATE DRILLED: 11/21/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER AT 11.75 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 11.17 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			25	16.0	2
5			22	15.8	2
10			12	23.9	2
15			14	23.2	3
20			50/11"	17.4	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY WITH SAND LENSES, SOFT TO VERY SOFT, MODERATE TO SATURATED MOISTURE CONTENT, DARK BROWN TO BROWN TO GREEN TO RUST

▼ 11/21/05
▼ 12/23/05

CLAY, WITH FINE TO COARSE GRAINED SAND LENSES, STIFF, HIGH MOISTURE CONTENT, GREEN TO RUST

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST

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JOB No.
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(from 051021)
FIG No.
A

TEST BORING NO. 211
DATE DRILLED: 11/21/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER AT 13 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 12.25 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			17	6.4	1
			26	7.2	1
5					
10			22	18.2	2
15			10	26.3	3
20			24	19.4	3
25			50/6"	14.7	4
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY WITH SAND LENSES, VERY STIFF, SATURATED MOISTURE CONTENT, DARK BROWN TO BROWN TO GREEN TO RUST

▼ 12/23/05
1/10/06

CLAY, WITH FINE TO COARSE GRAINED SAND LENSES, STIFF TO VERY STIFF, HIGH MOISTURE CONTENT, GREEN TO RUST

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, LOW TO MODERATE MOISTURE, GREEN TO RUST

TEST BORING NO. 221
DATE DRILLED: 12/14/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER @ 9.75 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 9.75 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			32	22.4	2
5			8	17.2	2
10			3	10.0	2
15			7	31.6	2
20			24	22.0	2/4
25			50/5"	17.9	4
30					
35					
40					

CLAY, SANDY, VERY STIFF TO VERY SOFT, HIGH TO SATURATED MOISTURE CONTENT, GREEN TO DARK BROWN

▼ 12/14/05

▼ 12/23/05
1/10/06

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, HARD TO DENSE, MODERATE TO LOW MOISTURE, GREEN TO BUFF TO RUST

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JOB No.
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(FROM 051021)
FIG No.
B

TEST BORING NO. 222
DATE DRILLED: 12/14/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER @ 14.00 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 13.33 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN				
			26	8.1	1
5			21	8.0	1
	CLAY, SANDY, STIFF, HIGH MOISTURE, GREEN				
10			17	25.0	2
	▼ 12/23/05 / 1/10/06				
15	LENSATIC; HIGHLY WEATHERED, CLAYSTONE SANDSTONE, HARD TO DENSE, MODERATE TO LOW MOISTURE, GREEN TO RUST		37	17.2	2/4
20			50/5"	13.0	4
25					
30					
35					
40					

TEST BORING NO. 223
DATE DRILLED: 12/28/05

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 13.67 FT.
1/14/06 MEASURED FOR WATER:
WATER AT13.67 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM, LOW TO MODERATE MOISTURE, LIGHT BROWN TO BROWN				
			11	12.0	2
5			8	11.7	2
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST				
10			50/9"	16.6	4
	▼ 1/10/06 / 1/14/06				
15			50/9"	13.6	4
20			50/5"	12.3	4
25					
30					
35					
40					

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JOB No.
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(FROM 051021)
FIG No.
C

TEST BORING NO. 231
DATE DRILLED: 12/14/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER AT 13 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 8.75 FT.

CLAY, SANDY, VERY STIFF TO STIFF, HIGH TO SATURATED MOISTURE CONTENT, DARK BROWN TO BROWN TO GREEN

1/10/06

12/23/05

12/14/05

LENSATIC; SANDY CLAY AND CLAYEY SAND AND GRAVEL, STIFF, SATURATED MOISTURE CONTENT, GREEN TO RUST

SANDSTONE, VERY DENSE, LOW MOISTURE, BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			26	18.0	2
			17	23.7	2
5					
			23	24.5	2
10					
			16	14.9	2
15					
			13	22.1	3
20					
			25	14.4	4
25					
30					
35					
40					

TEST BORING NO. 232
DATE DRILLED: 12/14/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER AT 13 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 13 FT.

CLAY, SANDY WITH SILTY SAND LENSES, STIFF, MODERATE TO HIGH MOISTURE, GREEN

12/23/05
1/10/06

LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, MODERATE TO LOW MOISTURE, GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			29	16.9	2
			16	19.2	2
5					
			14	19.8	2
10					
			26	18.8	4
15					
			50/7"	16.5	4
20					
25					
30					
35					
40					

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JOB No.
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(FROM 051021)
FIG No.
D

TEST BORING NO. 233
DATE DRILLED: 12/14/05

REMARKS: 12/23/05
MEASURED FOR WATER:
WATER AT 17.33 FT.
1/10/06 MEASURED FOR WATER:
WATER AT 16.17 FT.

CLAY, SANDY, FIRM,
LOW MOISTURE,
LIGHT BROWN

LENSATIC; CLAYSTONE AND
SANDSTONE, HARD TO
DENSE, LOW MOISTURE,
LIGHT BROWN TO BROWN
TO GREEN

1/10/06
12/23/05

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			50/11"	14.1	4
5			46	11.8	4
10			50/6"	13.9	4
15			50/5"	13.9	4
20			50/4"	12.2	4
25					
30					
35					
40					

TEST BORING NO. 242
DATE DRILLED: 1/4/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 6.5 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 6.5 FT.

CLAY, SANDY, VERY
STIFF TO VERY SOFT,
MODERATE TO SATURATED
MOISTURE CONTENT,
BROWN TO
GREEN TO RUST

1/10/06
1/14/06

NOTE: AUGER PUSHED
FROM 9 FT. TO 15 FT.
WITH VERY LITTLE
RESISTANCE

LENSATIC; WEATHERED
CLAYSTONE AND SANDSTONE,
HARD TO DENSE,
LOW MOISTURE,
GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			30	15.7	2
5			9	24.6	2
10			5	32.7	2
15					2
20			50/8"	16.8	4
25					
30					
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
E

TEST BORING NO. 243
DATE DRILLED: 1/4/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 15.75 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 15.75 FT.

CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN

1/4/06

CLAY, SANDY, HARD TO VERY STIFF, LOW TO HIGH MOISTURE, BROWN TO GREEN

1/10/06
1/14/06

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, HARD TO DENSE, MODERATE TO LOW MOISTURE, GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			37	9.4	2
5			31	15.2	2
10			25	19.1	2
15			22	22.4	2
20			39	20.6	2/4
25			50/4"	14.3	4
30					
35					
40					

TEST BORING NO. 251
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 5.67 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 5.92 FT.

CLAY, SANDY, VERY STIFF TO STIFF, HIGH TO SATURATED MOISTURE CONTENT, DARK GREEN TO BROWN TO DARK BROWN

1/10/06
1/14/06

1/5/06

SAND AND GRAVEL WITH SANDY CLAY LENSES, VERY STIFF, SATURATED MOISTURE CONTENT, RUST TO GREEN

LENSATIC; HIGHLY WEATHERED CLAYSTONE, SANDSTONE, HARD MODERATE MOISTURE, GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			16	17.6	2
5			10	21.0	2
10			10	25.0	2
15			9	29.3	2
20			18	18.2	3
25			50	16.2	2
30					
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
F

TEST BORING NO. 252
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 10.75 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 10.08 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			20	10.8	3
5			36	12.8	4
10			50/8"	14.1	4
15			50/5"	11.9	4
20			50/5"	11.8	4
25					
30					
35					
40					

CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN

SAND, CLAYEY, VERY STIFF, LOW MOISTURE, GREEN TO RUST

1/10/06
1/14/06

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

1/5/06

TEST BORING NO. 253
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 16.75 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 16.75 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			15	7.6	1
5			27	8.8	1
10			36	17.4	4
15			50/9"	13.0	4
20			50/2"	10.1	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

1/10/06
1/14/06

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JOB No.
060933
(FROM 051021)
FIG No.
G

TEST BORING NO. 261
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 10 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 7.67 FT.

CLAY, SANDY, VERY SOFT, SATURATED MOISTURE CONTENT, BROWN TO GREEN

1/14/06

1/5/06
1/10/06

NOTE: AUGER PUSHED FROM 5 FT. TO 17 FT. WITH VERY LITTLE RESISTANCE

SAND AND GRAVEL WITH SANDY CLAY LENSES, STIFF, SATURATED MOISTURE CONTENT, GREEN TO RUST

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE, SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			3	22.0	2
5			2	24.0	2
10					2
15					2
20			14	31.5	3
25			50/6"	16.7	4
30					
35					
40					

TEST BORING NO. 262
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 19 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 19 FT.

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

CLAY AND SAND LENSES, VERY STIFF, LOW MOISTURE, GREEN TO RUST

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

1/10/06
1/14/06

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			23	8.5	1
5			23	9.1	3
10			50/8"	2.5	4
15			50/6"	12.5	4
20			50/6"	16.9	4
25					
30					
35					
40					

TEST BORING LOGS

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STE
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JOB No.
060933
(FROM 051021)
FIG No.
II

TEST BORING NO. 269
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 7.33 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 7.92 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			25	14.5	2
			8	26.2	2
5					
			ROD SETTLED UNDER ITS OWN WEIGHT		
10				29.5	2
15					2
20			12	14.7	3
25			50/6"	18.1	4
30					
35					
40					

CLAY, SANDY, STIFF TO VERY STIFF, MODERATE TO SATURATED MOISTURE CONTENT, DARK BROWN TO DARK GREEN

▼ 1/5/06
1/10/06

NOTE: AUGER PUSHED FROM 10 FT. TO 18 FT. WITH VERY LITTLE RESISTANCE

SANDY CLAY WITH SAND AND GRAVEL LENSES, STIFF, SATURATED MOISTURE CONTENT, BROWN

LENSATIC; CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST

TEST BORING NO. 270
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
WATER AT 15.17 FT.
1/14/06 MEASURED FOR WATER:
WATER AT 15.83 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			21	3.8	3
5			20	11.7	4
10			32	14.7	4
15			50/8"	14.0	4
20			50/8"	8.4	4
25					
30					
35					
40					

CLAY, SANDY, FIRM LOW MOISTURE, LIGHT BROWN

SANDY, CLAY WITH SAND AND GRAVEL LENSES, STIFF, SATURATED MOISTURE CONTENT, BROWN

▼ 1/10/06
1/14/06

LENSATIC, VERY HIGHLY WEATHERED CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
I

TEST BORING NO. 271
DATE DRILLED: 1/5/06

REMARKS: 1/10/06
MEASURED FOR WATER:
19.25 FT. DRY
1/14/06 MEASURED FOR WATER:
19.25 FT DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			12	10.6	1
5			18	9.3	1
10			50/10"	6.8	4
15			50/8"	13.7	4
20			50/5"	13.7	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC, WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO BROWN TO RUST TO BLUE GRAY

TEST BORING NO. 279
DATE DRILLED: 1/18/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 7.8 FT.
2/2/06 WATER AT 8 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			21	16.3	2
5			18	17.3	2
10			6	29.8	2
15			NO RECOVERY		2
20			16	14.8	3
25			50/5"	17.4	4
30					
35					
40					

CLAY, SANDY, VERY STIFF TO FIRM, MODERATE TO SATURATED MOISTURE CONTENT, DARK BROWN TO GREEN TO BROWN

1/18/06
2/2/06

SAND AND GRAVEL WITH SANDY CLAY LENSES, STIFF, SATURATED MOISTURE CONTENT, GREEN TO RUST

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE, HARD TO DENSE, MODERATE MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
J

TEST BORING NO. 280
DATE DRILLED: 1/18/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 11.5 FT.
2/2/06 WATER AT 11.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			18	12.9	1
5			14	17.2	2
10			8	14.6	2
15			50/8"	13.5	4
20			50/6"	12.1	4
25					
30					
35					
40					

CLAY, SANDY, BROWN, VERY STIFF, MODERATE MOISTURE, BROWN

CLAY, SANDY WITH CLAYEY SAND LENSES, STIFF TO FIRM, MODERATE MOISTURE, BROWN TO GREEN TO RUST

▼ 1/27/06
2/2/06

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

TEST BORING NO. 281
DATE DRILLED: 1/18/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 12.4 FT.
2/2/06 WATER AT 12.4 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			13	11.6	1
5			17	17.8	2
10			6	22.7	2
15			9	25.8	2
20			50/11"	14.2	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW TO MODERATE MOISTURE, LIGHT BROWN

CLAY, SANDY, STIFF, MODERATE TO SATURATED MOISTURE CONTENT, LIGHT BROWN TO BROWN

▼ 1/27/06
2/2/06

LENSATIC; WEATHERED CLAYSTONE, SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
K

TEST BORING NO. 282
DATE DRILLED: 1/8/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 14.4 FT.
2/2/06 WATER AT 16.4 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			17	9.7	1
5			41	7.9	1
10			50/8"	8.3	4
15			50/6"	13.6	4
20			50/4"	12.0	4
25					
30					
35					
40					

CLAY, SANDY, STIFF TO HARD, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST TO BROWN

1/27/06

2/2/06

TEST BORING NO. 292
DATE DRILLED: 1/19/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 11 FT.
2/2/06 WATER AT 10.9 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			21	10.8	1
5			26	12.9	2
10			3	26.3	2
15					2
20					3
25			50/6"	13.7	3/4
30			50/8"	16.3	4
35					
40					

CLAY, SANDY, VERY, STIFF, LOW MOISTURE, BROWN

CLAY, SANDY, VERY STIFF TO VERY SOFT, MODERATE TO SATURATED MOISTURE CONTENT, GREEN TO BROWN

1/19/06

2/2/06

NOTE: AUGER PUSHED FROM 10 FT. TO 18 FT. WITH VERY LITTLE RESISTANCE

SAND AND GRAVEL WITH SANDY CLAY LENSES, VERY STIFF, SATURATED MOISTURE CONTENT, GREEN TO RUST

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE MODERATE MOISTURE, GREEN TO RUST TO BLUE GRAY

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JOB No.
060933
(FROM 051021)
FIG No.
L

TEST BORING NO. 293
DATE DRILLED: 1/19/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 12.8 FT.
2/2/06 WATER AT 12.7 FT.

CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

1/27/06
2/2/06

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			20	7.8	1
5			43	13.7	4
10			36	16.4	4
15			50/11"	13.7	1
20			50/8"	15.1	1
25					
30					
35					
40					

TEST BORING NO. 294
DATE DRILLED: 1/19/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 17.7 FT.
2/2/06 WATER AT 17 FT.

CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST

1/27/06
2/2/06

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			50/10"	8.1	1/4
5			50/8"	7.8	4
10			50/10"	9.6	4
15			50/8"	13.4	4
20			50/8"	12.1	4
25					
30					
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
M

TEST BORING NO. 304
DATE DRILLED: 1/25/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 10.5 FT.
2/2/06 WATER AT 10.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, FIRM, LOW TO MODERATE MOISTURE, DARK BROWN TO LIGHT BROWN		7	11.2	1
5	1/25/06		8	19.5	1
	CLAY, SANDY, SOFT SATURATED MOISTURE CONTENT, BROWN 1/27/06 2/2/06				
10			4	24.2	2
	SAND AND GRAVEL WITH SANDY CLAY LENSES, STIFF, SATURATED MOISTURE CONTENT, BROWN				
15			7	25.2	3
	CLAY, SANDY, STIFF, SATURATED MOISTURE CONTENT, BROWN AND GREEN				
20			14	29.2	2
	LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW TO MODERATE MOISTURE, GREEN TO RUST				
25			50/4"	7.8	4
30			50/7"	19.1	4
35					
40					

TEST BORING NO. 305
DATE DRILLED: 1/19/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 18.9 FT.
2/2/06 WATER AT 18.9 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW TO MODERATE MOISTURE, LIGHT BROWN TO GREEN		10	7.5	1
5			11	9.5	1
10			11	15.1	1
	CLAY, SANDY, STIFF HIGH MOISTURE, GREEN TO RUST				
15			11	18.0	2
	SAND AND GRAVEL WITH SANDY CLAY LENSES, STIFF SATURATED MOISTURE CONTENT, GREEN TO BROWN 1/27/06 2/2/06				
20			9	23.9	3
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE MODERATE MOISTURE, GREEN TO RUST				
25			50/9"	15.6	4
30					
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
N

TEST BORING NO. 315
DATE DRILLED: 1/25/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 10.5 FT.
2/2/06 WATER AT 10.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			12	25.2	1
5			5	6.7	1
10			9	13.6	2
15			8	27.5	2
20			7	29.8	2
25			21	15.6	3
30			50/6"	15.9	4
35					
40					

CLAY, SANDY, STIFF TO FIRM, HIGH TO LOW MOISTURE, BROWN TO LIGHT BROWN

CLAY, SANDY, STIFF, HIGH TO SATURATED MOISTURE CONTENT, BROWN TO GREEN TO RUST

1/25/06

1/27/06
2/2/06

SAND AND GRAVEL WITH SANDY CLAY LENSES, SATURATED MOISTURE CONTENT, BROWN

LENSATIC; VERY HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, HIGH TO LOW MOISTURE, GREEN TO RUST TO GRAY

TEST BORING NO. 316
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
1/27/06 20 FT. DRY
2/2/06 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			15	6.5	1
5			19	9.1	1
10			19	10.2	2
15			13	11.3	2
20			50/8"	13.9	4
25					
30					
35					
40					

CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY WITH CLAYEY SAND LENSES, STIFF TO VERY STIFF, LOW MOISTURE, BROWN

LENSATIC, WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST

TEST BORING LOGS

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JOB No.
060933
(FROM 051021)
FIG No.
0

TEST BORING NO. 317
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
1/27/06 20 FT. DRY
2/2/06 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			50/5"	9.8	4
5			50	13.6	4
10			50/9"	8.0	4
15			50/6"	12.4	4
20			50/4"	10.6	4
25					
30					
35					
40					

CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

TEST BORING NO. 326
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 11.7 FT.
2/2/06 WATER AT 11.7 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			11	8.9	1
5			17	7.8	1
10			50	16.5	4
15			50/9"	19.7	4
20			50/6"	15.0	4
25					
30					
35					
40					

CLAY, SANDY, STIFF TO VERY STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

1/27/06
2/2/06
1/26/06

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JOB No.
060933
(FROM 051021)
FIG No.
P

TEST BORING NO. 327
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
1/27/06 20 FT. DRY
2/2/06 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			24	7.5	1
5			50/10"	11.3	4
10			50/11"	13.5	4
15			50/9"	13.9	4
20			50/5"	12.3	4
25					
30					
35					
40					

CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

TEST BORING NO. 335
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 10.7 FT.
2/2/06 WATER AT 10.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			16	18.1	2
5			5	15.9	2
10					2
15					2
20					2
25			6	28.2	3
30			50/6"	16.7	4
35					
40					

CLAY, SANDY, STIFF TO VERY SOFT, HIGH TO SATURATED MOISTURE CONTENT, DARK BROWN TO BROWN

2/2/06
2/2/06

NOTE: AUGER PUSHED FROM 5 FT. TO 22 FT. WITH VERY LITTLE RESISTANCE

SAND AND GRAVEL WITH SANDY CLAY LENSES, FIRM, SATURATED MOISTURE CONTENT, BROWN

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, HARD TO DENSE, HIGH TO LOW MOISTURE CONTENT, GREEN TO RUST TO GRAY

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JOB No.
060933
(FROM 051021)
FIG No.
Q

TEST BORING NO. 336
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
1/27/06 WATER AT 18.2 FT.
2/2/06 WATER AT 18.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			50/11"	7.6	4
5			50	14.3	4
10			50/6"	17.0	4
15			50/7"	14.6	4
20			50/5"	12.4	4
25					
30					
35					
40					

CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST

▼ 1/27/06
2/2/06

TEST BORING NO. 337
DATE DRILLED: 1/26/06

REMARKS: MEASURED FOR WATER:
2/2/06 20 FT. DRY
2/21/06 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			10	9.3	1
5			46	11.7	4
10			50/10"	13.8	4
15			50/8"	13.6	4
20			50/9"	15.6	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
R

TEST BORING NO. 346
DATE DRILLED: 1/27/06

REMARKS: MEASURED FOR WATER:
2/2/06 WATER AT 14.3 FT.
2/21/06 WATER AT 12.9 FT.

CLAY, SANDY, VERY STIFF TO VERY SOFT, HIGH TO SATURATED MOISTURE CONTENT, DARK BROWN TO GREEN TO RUST

1/27/06

2/21/06

2/2/06

SAND AND GRAVEL WITH SANDY CLAY LENSES, STIFF, SATURATED MOISTURE CONTENT, BROWN TO GREEN TO RUST

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GRAY TO GREEN TO RUST

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			18	17.4	2
5			10	21.6	2
10			3	32.6	2
15			9	21.6	3
20			13	33.1	3
25			11	19.4	3
30			50/5"	17.8	4
35					
40					

TEST BORING NO. 347
DATE DRILLED: 1/27/06

REMARKS: MEASURED FOR WATER:
2/2/06 WATER AT 12 FT.
2/21/06 WATER AT 11.6 FT.

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

CLAY, SANDY, VERY STIFF, GREEN TO RUST

2/21/06

2/2/06

LENSATIC; HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			10	8.2	1
5			17	13.6	2
10			41	14.0	4
15			50/11"	13.5	4
20			50/6"	13.0	4
25					
30					
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
S

TEST BORING NO. 348
DATE DRILLED: 1/27/06

REMARKS: MEASURED FOR WATER:
2/2/06 20 FT. DRY
2/21/06 20 FT. DRY

CLAY, SANDY, FIRM
LOW MOISTURE,
LIGHT BROWN

LENSATIC; HIGHLY
WEATHERED TO
FORMATIONAL CLAYSTONE
AND SANDSTONE WITH
VERY DENSE SATURATED
LENSES, HARD TO DENSE,
LOW MOISTURE, GREEN
TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			33	10.3	4
5			50/10"	13.1	4
10			50/6"	15.1	4
15			50/6"	13.6	4
20			50/4"	11.4	4
25					
30					
35					
40					

TEST BORING NO. 349
DATE DRILLED: 1/27/06

REMARKS: MEASURED FOR WATER.
2/2/06 20 FT. DRY
2/21/06 20 FT. DRY

CLAY, SANDY, HARD,
LOW MOISTURE,
LIGHT BROWN

LENSATIC, HIGHLY
WEATHERED TO
FORMATIONAL CLAYSTONE
AND SANDSTONE WITH
VERY DENSE SATURATED
LENSES, HARD TO DENSE,
LOW MOISTURE, GREEN
TO RUST TO BLUE GRAY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			36	15.0	1
5			50/10"	13.0	4
10			50/11"	16.6	4
15			50/6"	12.6	4
20			50/4"	8.2	4
25					
30					
35					
40					

TEST BORING LOGS

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SOIL TESTING & ENGINEERING INC.

JOB No.
060933
(FROM 051021)
FIG No.
T

TEST BORING NO. 359
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER:
2/2/06 WATER AT 13.3 FT.
2/21/06 WATER AT 13 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			17	8.5	1
5			23	16.5	2
10			4	23.3	2
15					2
20					2
25			23	16.9	3
30			50/9"	20.2	4
35					
40					

CLAY, SANDY, VERY STIFF, LOW MOISTURE, BROWN

CLAY, SANDY, VERY STIFF TO VERY SOFT, HIGH TO SATURATED MOISTURE CONTENT, BROWN

2/21/06
2/2/06
2/1/06

NOTE: AUGER PUSHED FROM 10 FT. TO 22 FT. WITH VERY LITTLE RESISTANCE

SAND AND GRAVEL WITH SANDY CLAY LENSES, VERY STIFF, SATURATED MOISTURE CONTENT, BROWN TO GREEN

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST TO BLUE GRAY

TEST BORING NO. 360
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER
2/2/06 WATER AT 17.2 FT.
2/21/06 WATER AT 17.2 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			13	10.5	1
5			12	9.5	1
10			50/11"	16.2	4
15			50	11.4	4
20			50/9"	15.6	4
25					
30					
35					
40					

CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN

LENSATIC; HIGHLY WEATHERED TO WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, LOW MOISTURE, GREEN TO RUST

2/2/06
2/21/06

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JOB No.
060933
(FROM 051021)
FIG No.
U

TEST BORING NO. 361
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER:
2/2/06 20 FT. DRY
2/21/06 20 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
					1
			30	9.1	4
5			50/10"	11.8	4
10			50/8"	13.6	4
15			50/8"	12.2	4
20			50/5"	9.7	4
25					
30					
35					
40					

CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN

LENSATIC; VERY HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE WITH VERY DENSE SANDSTONE LENSES, VERY STIFF TO DENSE, LOW MOISTURE, GREEN TO RUST TO BLUE GRAY

TEST BORING NO. 369
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER:
2/2/06 WATER AT 17.5 FT.
2/21/06 WATER AT 17.5 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			9	17.4	1
5			10	9.1	1
10			7	13.8	2
15			5	22.9	2
20					2
25					2
30					2
35			19	12.1	3
40			5/5"	18.4	4

CLAY, SANDY, STIFF, MODERATE TO LOW MOISTURE, LIGHT BROWN TO GREEN

NOTE: AUGER PUSHED 15 FT. TO 32 FT. WITH VERY LITTLE RESISTANCE

2/2/06
2/21/06

2/1/06

SAND AND GRAVEL WITH SANDY CLAY LENSES, SATURATED MOISTURE CONTENT, GREEN TO BROWN

LENSATIC; WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
V

TEST BORING NO. 370
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER:
2/2/06 24.5 FT. DRY
2/21/06 24.5 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE	
			18	5.1	1	CLAY, SANDY, VERY STIFF, LOW MOISTURE, LIGHT BROWN
5			24	2.4	1	
10			14	10.6	2	CLAY, SANDY, STIFF, LOW MOISTURE, GREEN TO BROWN TO RUST
15			10	12.5	2	
20			15	14.1	2	
25			50/10"	15.5	4	LENSATIC, WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, GREEN TO RUST
30						
35						
40						

TEST BORING NO. 380
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER:
2/2/06 WATER AT 15.2 FT.
2/21/06 FILLED TO 3.3 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE	
			6	10.6	1	CLAY, SANDY, FIRM, LOW MOISTURE, LIGHT BROWN
5			8	15.2	2	CLAY, SANDY WITH CLAYEY SAND LENSES, FIRM TO VERY SOFT, MODERATE TO SATURATED MOISTURE CONTENT, BROWN
10			4	17.2	2	
15					2	2/1/06
20					2	NOTE: AUGER PUSHED 9 FT. TO 30.5 FT. WITH VERY LITTLE RESISTANCE
25					2	
30					2	SAND AND GRAVEL WITH SANDY CLAY LENSES, SOFT SATURATED MOISTURE CONTENT, BROWN
					3	
35			11	23.6	4	33 FT. TO 37 FT. RESIDUAL CLAY WEATHERED FROM THE CLAYSTONE
40			50/5"	18.7	4	37 FT. LENSATIC HIGHLY WEATHERED TO FORMATIONAL CLAYSTONE AND SANDSTONE, VERY STIFF TO DENSE, MODERATE MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
W

TEST BORING NO. 381
DATE DRILLED: 2/2/06

REMARKS: MEASURED FOR WATER:
2/21/06 WATER AT 26.6 FT.
2/24/06 WATER AT 26.6 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN				
			10	6.6	1
5			12	6.9	1
10			11	7.2	1
	CLAY, SANDY, FIRM TO STIFF, MODERATE TO HIGH MOISTURE, BROWN				
15			5	11.1	2
20			6	17.9	2
25			11	21.9	2
	2/21/06 2/24/06				
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, BROWN TO GREEN				
30			50/9"	15.2	4
35					
40					

TEST BORING NO. 390
DATE DRILLED: 2/2/06

REMARKS: MEASURED FOR WATER:
2/21/06 WATER AT 19 FT.
2/24/06 WATER AT 19 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN				
			14	6.3	1
5			9	8.5	1
10	CLAY, SANDY, FIRM TO VERY SOFT, MODERATE TO SATURATED MOISTURE CONTENT, BROWN		8	12.2	2
15	NOTE: AUGER PUSHED 15 FT. TO 25 FT. WITH VERY LITTLE RESISTANCE		4	21.5	2
	2/21/06 2/24/06				
20					2
25					2
	LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, HARD TO DENSE, MODERATE MOISTURE, GREEN TO RUST				
30			50/8"	19.3	4
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
X

TEST BORING NO. 391
DATE DRILLED: 2/2/06

REMARKS: MEASURED FOR WATER:
2/21/06 CAVED TO 22 FT. DRY
2/24/06 22 FT. DRY

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF, LOW MOISTURE, LIGHT BROWN		16	5.5	1
5			16	6.0	1
	CLAY, SANDY, VERY STIFF TO STIFF, LOW TO HIGH MOISTURE, BROWN TO GREEN				
10			18	9.8	2
15			12	18.5	2
20			21	15.0	2
25			10	26.0	2
	LENSATIC; CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST				
30			50/6"	19.7	4
35					
40					

TEST BORING NO. 400
DATE DRILLED: 2/2/06

REMARKS: MEASURED FOR WATER:
2/21/06 WATER AT 21 FT.
2/24/06 WATER AT 21 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
	CLAY, SANDY, STIFF LOW MOISTURE, LIGHT BROWN		13	7.1	1
5			11	7.0	1
	CLAY, SANDY, FIRM TO VERY STIFF, HIGH TO SATURATED MOISTURE CONTENT, BROWN				
10			7	15.5	2
15	NOTE: AUGER PUSHED FROM 15 FT. TO 23 FT. WITH VERY LITTLE RESISTANCE		5	22.3	2
20	2/21/06 2/24/06				2
25	LENSATIC, WEATHERED CLAYSTONE AND SANDSTONE, DENSE, LOW MOISTURE, DARK BROWN		50/10"	16.5	4
30					
35					
40					

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JOB No.
060933
(FROM 051021)
FIG No.
Y

TEST BORING NO. 403
DATE DRILLED: 2/1/06

REMARKS: MEASURED FOR WATER:
2/2/06 WATER AT 12.8 FT.
2/21/06 WATER AT 12.8 FT.

DEPTH (ft)	SYMBOL	SAMPLES	BLOWS per foot	WATER CONTENT %	SOIL TYPE
			12	9.1	2
5			6	11.9	2
10			3	26.0	2
15					2
20					2
25					3
30			50/11"	18.7	4
35					
40					

CLAY, SANDY, STIFF TO VERY SOFT, MODERATE TO SATURATED MOISTURE CONTENT, BROWN TO GREEN TO RUST

2/2/06
2/21/06
2/1/06

NOTE: AUGER PUSHED FROM 9 FT. TO 25 FT. WITH VERY LITTLE RESISTANCE

SAND AND GRAVEL WITH SANDY CLAY LENSES, STIFF, SATURATED MOISTURE CONTENT, GREEN TO RUST

LENSATIC; WEATHERED CLAYSTONE AND SANDSTONE, DENSE, MODERATE MOISTURE, GREEN TO RUST

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JOB No.
060933
(FROM 051021)
FIG No.
Z

CLIENT: NEW GENERATION HOMES	SOIL TYPE NO: 1
PROJECT: THE GLEN AT WIDEFIELD, FILING #7	UNIFIED CLASSIFICATION: CL

SIEVE SIZE	% PASSING
1½"	
1"	
3/4"	
1/2"	
3/8"	
# 4	100
# 10	99.6
# 20	99.2
# 40	98.9
# 100	95.9
# 200	74.3

MIXED SWELL		BORING 16 @ 9 FT.
8.1	% MOISTURE AT START	7.3
19.5	% MOISTURE AT FINISH	22.8
11.4	% MOISTURE INCREASE	15.5
0.60	% VOLUME CHANGE	0.28
105.1	pcf INITIAL DRY DENSITY	101.1
1704	psf SWELL	795

ATTERBERG LIMITS

LIQUID LIMIT: 32
PLASTIC LIMIT: 15
P. I.: 17

LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
MSS		LWC	

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SOIL TESTING & ENGINEERING INC.

JOB No. 060933

FIG No. 35

CLIENT: NEW GENERATION HOMES	SOIL TYPE NO: 2
PROJECT: THE GLEN AT WIDEFIELD, FILING #7	UNIFIED CLASSIFICATION: CL

SIEVE SIZE	% PASSING
1½"	
1"	
3/4"	
1/2"	
3/8"	100.0
# 4	99.4
# 10	98.7
# 20	97.8
# 40	97.1
# 100	88.9
# 200	70.7

MIXED SWELL		BORING 6 @ 4 FT.
8.5	% MOISTURE AT START	13.8
18.8	% MOISTURE AT FINISH	25.7
10.3	% MOISTURE INCREASE	11.9
0.61	% VOLUME CHANGE	0.68
106.5	pcf INITIAL DRY DENSITY	96.8
1360	psf SWELL	1931

ATTERBERG LIMITS

LIQUID LIMIT: 32
PLASTIC LIMIT: 15
P. I.: 17

LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
MSS		LWC	

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JOB No. 060933

FIG No. 36

CLIENT: NEW GENERATION HOMES	SOIL TYPE NO: 3
PROJECT: THE GLEN AT WIDEFIELD, FILING #7	UNIFIED CLASSIFICATION: CL

SIEVE SIZE	% PASSING
1½"	
1"	
3/4"	
1/2"	100.0
3/8"	98.7
#4	96.5
#10	93.1
#20	90.1
#40	88.3
#100	73.0
#200	55.0

SWELL

11.1	% MOISTURE AT START
17.2	% MOISTURE AT FINISH
6.1	% MOISTURE INCREASE
0.51	% VOLUME CHANGE
113.0	pcf INITIAL DRY DENSITY
1448	psf SWELL

ATTERBERG LIMITS

LIQUID LIMIT:	31
PLASTIC LIMIT:	17
P. I.:	14

LABORATORY TEST RESULTS

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MSS		LWC	

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JOB No. 060933

FIG No. 37

CLIENT: NEW GENERATION HOMES	SOIL TYPE NO: 4
PROJECT: *THE GLEN AT WIDEFIELD, FILING #7*	UNIFIED CLASSIFICATION: CL

SIEVE SIZE	% PASSING
1½"	
1"	
3/4"	
1/2"	
3/8"	
#4	100.0
#10	99.6
#20	99.0
#40	98.2
#100	90.4
#200	75.1

SWELL

11.1	% MOISTURE AT START
22.2	% MOISTURE AT FINISH
11.1	% MOISTURE INCREASE
0.91	% VOLUME CHANGE
108.9	pcf INITIAL DRY DENSITY
2029	psf SWELL

ATTERBERG LIMITS

LIQUID LIMIT:	37
PLASTIC LIMIT:	17
P. I.:	20

LABORATORY TEST RESULTS

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JOB No. 060933

FIG No. 38

CLIENT: NEW GENERATION HOMES	SOIL TYPE NO: 5
PROJECT: THE GLEN AT WIDEFIELD, FILING #7	UNIFIED CLASSIFICATION: SC

SIEVE SIZE	% PASSING
1½"	-------
1"	-------
3/4"	100.0
1/2"	98.8
3/8"	96.7
#4	93.5
#10	84.8
#20	77.7
#40	66.8
#100	44.9
#200	33.0

SWELL

% MOISTURE AT START

% MOISTURE AT FINISH

% MOISTURE INCREASE

% VOLUME CHANGE

pcf INITIAL DRY DENSITY

psf SWELL

ATTERBERG LIMITS

LIQUID LIMIT: 24
PLASTIC LIMIT: 14
P. I.: 10

LABORATORY TEST RESULTS

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JOB No. 060933

FIG No. 39

CLIENT: NEW GENERATION HOMES	JOB NO: 060933
PROJECT: THE GLEN AT WIDEFIELD, FILING 7	DATE: 10/9/06
BORING NO. 3 DEPTH: 4 FT. SOIL TYPE: 1	TEST BY: JF

SWELL-CONSOLIDATION TEST

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JOB No. 060933

FIG No. 40

CLIENT: NEW GENERATION HOMES	JOB NO: 060933
PROJECT: THE GLEN AT WIDEFIELD, FILING 7	DATE: 10/11/06
BORING NO. 6 DEPTH: 4 FT. SOIL TYPE: 2	TEST BY: JF

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FIG No. 41

CLIENT: NEW GENERATION HOMES	JOB NO: 060933
PROJECT: THE GLEN AT WIDEFIELD, FILING 7	DATE: 10/11/06
BORING NO. 16 DEPTH: 14 FT. SOIL TYPE: 1	TEST BY: JF

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FIG No. 42

CLIENT: NEW GENERATION HOMES	JOB NO: 060933
PROJECT: THE GLEN AT WIDEFIELD, FILING 7	DATE: 10/18/06
BORING NO. 21 DEPTH: 14 FT. SOIL TYPE: 1	TEST BY: JF

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FIG No. 43

CLIENT: NEW GENERATION HOMES	JOB NO: 060933
PROJECT: THE GLEN AT WIDEFIELD, FILING 7	DATE: 10/18/06
BORING NO. 27 DEPTH: 14 FT. SOIL TYPE: 1	TEST BY: JF

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FIG No. 44

CLIENT: GLEN INVESTMENT GROUP NO. VIII	JOB NO: 051021
PROJECT: THE GLEN AT WIDEFIELD, FILING 6	DATE: 12/07/05
BORING NO: 211 DEPTH: 2 FT. SOIL TYPE: 1 (SERIES 1)	TEST BY: JF

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JOB No. 060933 (FROM 051021)

FIG No. 45

CLIENT: GLEN INVESTMENT GROUP NO. VIII	JOB NO: 051021
PROJECT: THE GLEN AT WIDEFIELD, FILING 6	DATE: 12/19/05
BORING NO: 222 DEPTH: 4 FT. SOIL TYPE: 1 (SERIES 3)	TEST BY: JF

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JOB No.
060933
(FROM 051021)
FIG No.
46

CLIENT: GLEN INVESTMENT GROUP NO. VIII	JOB NO: 051021
PROJECT: THE GLEN AT WIDEFIELD, FILING 6	DATE: 2/17/06
BORING NO: 282 DEPTH: 4 FT. SOIL TYPE: 1 (SERIES 1)	TEST BY: JF

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JOB No. 060933 (FROM 051021) FIG No. 47

CLIENT: GLEN INVESTMENT GROUP NO. VIII	JOB NO: 051021
PROJECT: THE GLEN AT WIDEFIELD, FILING 6	DATE: 2/10/06
BORING NO: 316 DEPTH: 4 FT. SOIL TYPE: 1 (SERIES 3)	TEST BY: JF

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JOB No. 060933 (FROM 051021)
FIG No. 48

CLIENT: GLEN INVESTMENT GROUP NO. VIII	JOB NO: 051021
PROJECT: THE GLEN AT WIDEFIELD, FILING 6	DATE: 2/10/06
BORING NO: 360 DEPTH: 4 FT. SOIL TYPE: 1 (SERIES 3)	TEST BY: JF

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JOB No.
060933
(FROM 051021)
FIG No.
49

CLIENT: GLEN INVESTMENT GROUP NO. VIII	JOB NO: 051021
PROJECT: THE GLEN AT WIDEFIELD, FILING 6	DATE: 2/23/06
BORING NO: 280 DEPTH: 4 FT. SOIL TYPE: 2 (SERIES 3)	TEST BY: JF

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JOB No. 060933 (FROM 051021)
FIG No. 50

5690
5680
5690
5700
5710
5720
5730
5740
5680
5690
5700
5710
5720
5730
5740
5740

E1/4 COR.
SEC.21/SEC.22
NO-BUILD LINE
NO-BUILD LINE
6729
TB 210
6730
TB 211
400
TB_1
401
TB_2
6741
TB 222
6740
TB 221
6751
TB 232
6752
TB 233
402
TB_3
403
TB_4
6761
TB 242
6762
TB 243
21981
tb-47
21980
tb-46
21982
tb-48
6770
TB 251
6771
TB 252
6772
TB 253
404
TB_5
405
TB_6
21983
tb-49
6780
TB 261
6781
TB 262
406
TB_7
407
TB_8
6789
TB 270
408
409
5680
5670
5690
5700
5710
5720

N 89°51'21" E – 834.04'
N 89°51'21" E – 1094
N72°44'36"W
755.68'
N00°41'38"W
568.90'
N00°08'39"W
420.35'
N12°05'03"W
1.22
SCHOOL DISTRICT #3
TRANSPORTATION PARCEL
10.000 ACRES
TRANSPORTI
PA
S 89°51'21" W – 978.59'
POB
SCHOOL
PARCEL
GAS LOCATION
POST
N07°21'14" W = 657.24'
695.93'
N01°16'12"W
LOCATION OF
PROPOSED CIG
EASEMENT
SCHOOL PARCEL
48.498 ACRES
275.60'
N04°49'29"W
N 89°59'54" W – 614.07'
GAS UNDERGROUND EASEMENT
5720
5710
5700
5690
5680

.00'
POB
ARCEL
SS
MH
S15°12'30"W
435.91'
24.8'
11.4'
PP
5680
L45.36'
MARKSHEFFEL ROAD

EN AT WIDEFIELD
UBD FIL #5A
5740
5730
5720
5710

NO-BUILD LINE
NO-BUILD LINE
6798 TB 279
6799 TB 280
6800 TB 281
6801 TB 282
6813 TB 294
6812 TB 293
22004 tb-43
21984 tb-50
6823 TB 304
6824 TB 305
21985 tb-51
21986 tb-52
21987 tb-53
22002 tb-41
6834 TB 315
6835 TB 316
6845 TB 326
6846 TB 327
22001 tb-40
21988 tb-54
6856 TB 336
6857 TB 337
6868 TB 348
6867 TB 347
6869 TB 349
6879 TB 359
6880 TB 360
6881 TB 361
5660
5670
5680
5690

GASLINE
N09°44'14"W
359.82'
EXCEPTION NO. XXXXXXXX
N27°13'25"W
357.33'
N90°00'00"W
620.41'
MARKSHEFFEL ROAD
N32°54'08"W
194.86'
GAS LOCATION POST
N24°22'46"W
258.84'
N06°04'00"W
202.77'
S06°04'00"E
63.06'
GAS MKR
410 TB_11
412 TB_13
413 TB_14
415 TB_16
417 TB_18
418 TB_19
421 TB_22
422 TB_23
424
425 TB_26
22005 tb-41
22006 tb-43
22003 tb-42
3-1/4 ACAP
5680
5690
5700
5710

CROWN OF SLOPE FOR WESTERN BOUNDARY

POTENTIALLY UNSTABLE AREA – SPECIAL CONSTRUCTION PRACTICES MAY BE REQUIRED

TE TEST BORES

PINNACLE LAND SURVEYING COMPANY, INC.
925 W. CUCHARRAS ST., C.S., CO 634-0751

PARCEL #6
P.O. Box 1107
Golden, CO 80402
Reception No. 201022124
Tax I.D. #55280-00-001
NO-BUILD LINE
5650
5660
5670
6889
TB 369
6890
TB 370
21990
tb-56
6898
TB 380
22000
tb-39
21992
tb-58
6899
TB 381
21999
tb-38
6908
TB 390
21994
tb-60
21995
tb-61
6918
TB 400
21997
tb-36
21996
tb-62
SUB. EXEMP. PLAT
RECP. NO. 2005098403
Mesa R

AND W
THE G
SUBDI
Located in
NE1/4
GAS MKR
GAS MKR
GAS MKR
21995 tb-57
8503 cp-3
426 TB_27
427 TB_28
428 TB_29
429 TB_30
21993 tb-59
430 TB_31
431 TB_32
6909 TB_391
432 TB_33
433 TB_34
434 TB_35
21998 tb-37
R/C 7228
R/C 14611
S23°58'30"W 209.62'
S29°40'09"W 524.61'
S35°52'58"W 307.48'
S19°29'44"W 208.61'
5690
5700
5710
5680
5670
N
0 50 100 200 400
SCALE: 1" = 200'
idge Joint Venture LLC

E TEST BORES
VESTERN BOUNDARY
LEN AT WIDEFIELD
VISION FILING NO.7

n the SE1/4 of SECTION 21, SW1/4 of SECTION 22,
of SECTION 27, and the NW1/4 of SECTION 28
T15S, R65W of the 6TH P.M.
COUNTY OF EL PASO, STATE OF COLORADO

TEST BORE LOCATION MAP	JOB NO. 060933
COPYRIGHT 2007, SOIL TESTING & ENGINEERING INC.	FIG NO. 2

STE TEST BORES – THE GLEN AT WIDEFIELD FILING NO. 7

DRAWN BY: MWW	CHECKED BY: JWT	DATE: 04/01/07
JOB NO.: 05010000	DWG: 05010000WORK.DWG	SHEET 1 OF 1

Hepworth-Pawlak Geotechnical, Inc.
10302 South Progress Way
Parker, Colorado 80134
Phone: 303-841-7119
Fax: 303-841-7556
www.hpgeotech.com

March 22, 2016 Job No. 215292A

The Glen Investment Company
3 Widefield Boulevard
Colorado Springs, Colorado 80911

Subject: Measured Water Levels at the Glen at Widefield East, Filing 12

References: Geotechnical Report Created by HP Geotech, Job No. 215292A, Dated November 4, 2015

Sheet RG-2 of the Rough Grading Plan Created by Kiowa Engineering Corporation, Project No. 14044, Dated December 16, 2015.

Gentlemen:

At your request, the information in the following table has been compiled from information provided in the referenced geotechnical report, and the referenced rough grading plan.

Lot Number	Boring	Groundwater Elevation	Finished Grade Elevation	Proposed Basement Elevation	Separation from Groundwater (feet)
522/523	HP B-1	5656	5685	5677	21
498	HP B-2	5655	5678	5670	15
564/565	HP B-3	(dry)	5691	5683	*2
270/271	HP B-4	(dry)	5697	5689	*2
(omitted)	HP B-5	(omitted)	(omitted)	(omitted)	(omitted)
493	HP B-6	(dry)	5673	5665	*2
*1	HP B-7	5651	5668	5660	9
543/544	HP B-8	5653	5678	5670	17
515	HP B-9	5658	5689	5681	23
441/442	HP B-10	5658	5691	5683	25

*1: Boring was drilled in sediment basin
*2: No groundwater recorded

Though the proposed separation from groundwater appears adequate based on the water levels encountered in out investigation, significantly shallower groundwater is known to have been present in the past as indicated in subsurface investigations conducted by STE in 1998 and 1999.

Due to the historically high groundwater levels in this area, basements are not recommended in this area unless a longer groundwater level monitoring program can substantiate the lower groundwater levels based on a period of at least one year.

Please feel free to call with any questions.

Sincerely,

HEPWORTH-PAWLAK GEOTECHNICAL, Inc.

Arben Kalaveshi, P.E.

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PRELIMINARY GEOTECHNICAL INVESTIGATION
FOR PROPOSED DEVELOPMENT
THE GLEN AT WIDEFIELD
FILING NO. 7
WIDEFIELD, COLORADO

JOB NUMBER: 215292A

NOVEMBER 4, 2015

PREPARED FOR:
MR. J. RYAN WATSON
WIDEFIELD INVESTMENT GROUP
3 WIDEFIELD BOULEVARD
COLORADO SPRINGS, COLORADO 80911

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TABLE 1 SUMMARY OF LABORATORY TEST RESULTS

PURPOSE AND SCOPE OF STUDY

This report presents the findings of our preliminary geotechnical engineering study for the proposed residential development located at The Glen at Widefield, Filing No. 7. The site location is shown on Figure 1. The study was conducted to evaluate the potential influence of the site geology on the proposed development and to develop preliminary geotechnical engineering recommendations. The study was conducted in accordance with our agreement for professional engineering services to Widefield Investment Group dated September 9, 2015. Site specific geotechnical investigations should be conducted at each lot and within proposed roadways to determine the appropriate foundation type and construction considerations of each individual residence planned.

A review of prior geotechnical investigations conducted by Soil testing and Engineering, Inc. has been conducted. The following reports have been reviewed:

1. Preliminary Subsurface Soil Investigation, Sunrise Ridge, Phase II, Colorado Springs, Colorado, Job Number 80415, and Dated June 10, 1998
2. Preliminary Subsurface Soil Investigation, Marksheffel Road and Peaceful Valley Road, Job Number 90235, and Dated May 5, 1999
3. Preliminary Subsurface Soil Investigation, The Glen at Widefield, Filing 7, Widefield, Colorado, Job Number 060933, and dated April 16, 2007.

Additionally, the mapped geology shown in the following map was consulted:

1. Scott, G.R., Taylor, R.B., Epis, R.C., and Wobus, R.A., 1976, Geologic map of the Pueblo 1 degree x 2 degrees quadrangle, south-central Colorado: U.S. Geological Survey, Miscellaneous Field Studies Map MF-775, scale 1:187,500

In addition to the review of the available information listed above, a field exploration program consisting of a site reconnaissance and nine borings was conducted to obtain general information on subsurface conditions. Samples from the borings were tested in the laboratory to determine their engineering characteristics. The previous reports, along with the results of our geologic observations, field exploration, and laboratory testing were analyzed to develop a report on the potential geologic hazards and preliminary geotechnical recommendations. This report summarizes the data obtained during the study and presents our conclusions and preliminary recommendations.

PROPOSED DEVELOPMENT

We understand that this project is part of a larger proposed residential development to be located in the vicinity west of Marksheffel near the intersection with Peaceful Valley Road in El Paso County, Colorado. The scope of this study is limited to the area bound by Marksheffel Road to the east, The Fountain Corporate Boundary to the North (the northern border of Section 22, Township 15 South, Range 65 West), and the rerouted gas line easement to the west and south. This portion of the project has an area of about 53.5 acres, and will potentially include about 185 single family residences and 1.6 miles of roadway. We understand that the houses in this area will be single story units with no basements. As mentioned above, site specific geotechnical studies should be conducted after final grading and platting has been established.

SITE CONDITIONS

The project area is located to the northeast of the intersection of Marksheffel Road and Peaceful Valley Road. A detailed description of the project boundaries was given in the above section. In general, the western portion of the site is located on a ridge extending south. The ground slopes moderately to the east in this area. The eastern portion of the site (approximately 2/3 of the area) is flat with a very mild slope to the east. Based on the available USGS topographic maps, the elevation varies across the site from about 5680 to 5720 feet MSL. Jimmy camp creek is located about 1,200 feet east of the site at its nearest point.

The majority of the site was vacant at the time of our investigation, but several small well houses are located near the northwest corner, which will be outside of the considered development. Overhead power lines run along the east and north sides of the site. Vegetation on the site consists mostly of weeds and grass with some small deciduous trees, and prairie dog holes were noted throughout. A irrigation ditch was noted at the toe of the slope separating the ridge from the flatter area. Peaceful Valley Country Club Estates (Filing 1), is located just east of the project site.

FIELD EXPLORATION

The field exploration for this project was conducted on September 23 and 24, 2015. Nine exploratory borings were drilled with an all-terrain CME 550X drill rig equipped with an automatic hammer to evaluate the subsurface conditions in the soils. The boring locations are shown in Figure 2. The exploratory borings were logged by a representative of Hepworth-Pawlak Geotechnical, Inc.

Samples of the soils were taken with a nominal 2-inch I.D. California spoon sampler and 1-3/8 inch I.D. split spoon sampler. The samplers were driven into the subsoils at various depths with blows from a 140-pound hammer falling 30 inches. This test is similar to the standard penetration test described by ASTM Method D-1586. The penetration resistance values are an indication of the relative density or consistency of the subsoils. Depths at which the samples were taken and the penetration resistance values are shown on the Boring Logs, Figure 3 and 4. The samples were returned to our laboratory for review by the project engineer and testing.

SUBSURFACE CONDITIONS

GENERAL

Under a thin layer of topsoil up to about 1 foot thick, four major subsurface materials were identified in our investigation. These include sandy clay, clayey sand, silty sand, and claystone bedrock. Claystone was encountered at relatively shallow depths along the west side of the site, and dropped off steeply towards the east side, where it was encountered at depths of over 50 feet below the existing ground surface. A detailed discussion of each soil/bedrock type encountered follows.

<u>Sandy Clay (CL):</u>

Sandy clay was found under the topsoil in all nine borings and extended to depths of about 4 to 35 feet below the ground surface. Sandy clay cover was generally shallower at the west side of the site. The sandy clay was medium stiff to very stiff, with an average penetration resistance blow count of 15 that ranged from 6 to 38 blows required for 12 inches of sampler penetration. Swell-compression test results indicate the sandy clay has

a low to very high swell potential based on vertical expansion ranging from 0.3 to 9.1 percent under a surcharge of 1 ksf when wetted.

Clayey Sand (SC):

Clayey sand was encountered under the sandy clay in all Borings except Borings B-3 and B-4. The clayey sand was found to be loose to medium dense, with an average penetration resistance blow count of 11 that ranged from 6 to 18 blows required for 12 inches of sampler penetration. The clayey sand encountered was generally wet, and the samples tested had an in situ water content that ranged from 26.9 to 31.5 percent.

Silty Sand (SM):

Slightly silty to silty sand with some gravel was encountered below the clayey sand in all Borings except Borings B-3 and B-4. The silty sand was found to be medium dense to dense, with an average penetration resistance blow count of 26 that ranged from 13 to 42 blows required for 12 inches of sampler penetration. In situ water content ranging from 10.0 to 12.7 percent was recorded in the samples tested.

Claystone:

Claystone was found at depths as shallow as 4 feet below the ground surface at the west side of the site, and as deep as 53 feet elsewhere. It was generally hard to very hard, with an average penetration of 5½ inches after 50 blows. The sample of claystone taken at 4 feet at Boring B-4 was softer, with a blow count of 31 for 12 inches of sampler penetration.

LABORATORY TESTING:

Laboratory testing included moisture content, unit weight, Atterberg limits, sieve analysis, percent passing #200 sieve, swell-compression, and water soluble sulfate concentration. Detailed results of swell-compression testing are shown on Figures 6-13 and gradation analyses on Figures 14 and 15. Test results are shown on the boring logs, Figures 3 and 4, and are summarized in Table 1

The concentration of water-soluble sulfates in the samples tested ranged from 0.065 to 0.813 percent. According to the Portland Cement Association's publication "Design and Control of Concrete Mixtures, 14th Edition" sulfate concentrations between 0.2 and 2.0 percent represent a severe sulfate exposure to concrete. To limit the effects of sulfate attack, Type V concrete is recommended. Additionally, a water to cementitious material ratio not exceeding 0.42 is recommended.

GROUNDWATER:

Groundwater was generally found at a depth of about 20 feet below the ground surface when measured several days after drilling. The table below lists the specific depths at which ground water was encountered.

Boring	Water Depth at time of Drilling	Water Depth Several Days After Drilling	Cave Depth
B-1	(no water found)	21 feet	21.5 feet
B-2	22 feet	20 feet	20 feet
B-3	(no water found)	(no water found)	19 feet
B-4	(no water found)	(no water found)	14 feet
B-5	(omitted from drilling program)		
B-6	15 feet	(no water found)	20 feet
B-7	22 feet	22 feet	22 feet
B-8	(no water found)	22 feet	24 feet
B-9	44 feet	21 feet	22 feet
B-10	(no water found)	22 feet	26 feet

Our review of previous studies conducted by STE indicate that groundwater depths were significantly shallower in the past. Perched groundwater and water contained in lenses of relatively permeable sands within less permeable clays are likely to be encountered.

It is anticipated that the depth to ground water will fluctuate with time based on seasonal, climatic, and other factors including irrigation.

GEOLOGIC SITE ASSESSMENT

The geologic formations in the vicinity of the project area include Quaternary Piney Creek Alluvium, Colluvium, and Pierre Shale below a thin layer of colluvium on the western side of the proposed development. Geologic hazards include moisture sensitive soils.

MOISTURE SENSITIVE SOILS

Our laboratory testing shows that the clay layers and the Pierre Shale have a medium to very high expansion potential when wetted and some of the soils have a collapse potential. These conditions must be considered in the design of building foundations and road pavements. The previous reports issued by STE have noted the hazards and some of our borings have encountered them. Both compression and swell can be remediated by removal and replacement with suitable material. For the clay, replacement at moisture contents above optimum is a common method. More detailed exploration and testing is required to better define the limits and their effect on the development.

EARTHQUAKE CONSIDERATIONS

The project area could experience earthquake related ground shaking. Modified Mercalli Intensity VI ground shaking should be expected during a reasonable exposure time for the development, but the probability for stronger ground shaking is low. Intensity VI ground shaking is felt by most people and causes general alarm, but results in negligible damage to structures of good design and construction. Occupied structures should be designed to withstand moderately strong ground shaking with little or no damage, and not to collapse under stronger ground shaking. According to the 2003 IBC and local codes, the property is considered to be Site Class C where the overburden is less than 15 feet and Site Class D where the overburden is greater than 15 feet. The Seismic Design Category is considered to be B.

ENGINEERING ANALYSIS

Because of the relatively large area considered within the proposed development, different conditions were identified within different areas of the site. At the western portion, expansive clay over shallow expansive claystone will be the dominant subsurface materials encountered at the anticipated foundation levels. Overburden consisting of

collapsible to expansive soils will encountered throughout the remainder of the site. Though no exceedingly soft/loose areas were identified in our study, such conditions have been identified in past studies, and it is possible that areas requiring significant remediation will be identified when site specific studies are conducted. Particularly, if shallow groundwater is identified, additional fill placement may be necessary to elevate foundations to a suitable distance from the groundwater.

Generally, the moisture sensitive soils should be remediated under all roadways, utility infrastructure, paved walks, drives, and flatwork, and under foundations. This can be accomplished in large part by removing, moisture conditioning, and replacing the existing soils in controlled compacted lifts. Unsuitable material, which includes the expansive claystone bedrock and some highly expansive clay should not be used below foundations. Because of the shallow depth of the bedrock along the western portion of the site, deep foundations, such as drilled piers may be a more cost effective option than over-excavation and replacement. In areas where the existing expansive material is replaced with a more permeable granular material, a toe drain at the base of the fill will be necessary to prevent the accumulation of surface water at this interface.

Structural floors built above crawlspaces will perform the best in the moisture sensitive soils encountered, but if the increased risk of slab movement can be tolerated, on-grade slabs can be used for the garage areas provided the area below has been over-excavated and replaced with suitable material. A more detailed discussion of floor types has been provided in the *Floors* subsection of the *Preliminary Design Recommendations* section below.

We recommend that the potential homeowner be supplied with, read and follow the recommendations presented in the Colorado Geologic Survey's Special Publication 43 "Home Landscaping and Maintenance on Swelling Soil". This publication provides a thorough description of the construction of homes on expansive soil, and includes information about the additional maintenance and care required for such homes. In particular, information about surface drainage and irrigation should be reviewed.

Because high concentrations of water soluble sulfates were found, special cement will likely be necessary for concrete in contact with the native soils. Because special cement could potentially add substantial construction costs, additional testing during the site specific investigations is recommended to determine the extent of these high concentrations.

Roadways will require subgrade improvement, which could be accomplished via over-excavation and replacement, and/or the use of geogrid below the pavement section. Lime stabilization of the native soils with high sulfate concentrations is not recommended due to the potential formation of calcium-sulfate-aluminate-hydrates, and the soil heave associated with the formation of these crystalline compounds.

PRELIMINARY DESIGN RECOMMENDATIONS

Based on the subsurface conditioned encountered, and our understanding of the proposed development, the following preliminary design recommendations have been provided.

SITE GRADING

We anticipate relatively shallow cuts and fills. We should have the opportunity to review construction plans for consistency with our recommendations.

Site Preparation:

The following preliminary recommendations should be observed for site preparation.

1. Permanent cut and fill slopes should be no steeper than 3:1 (horizontal to vertical). Any man-made slopes higher than 10 feet should be evaluated for slope stability.
2. All unsuitable organic material, debris or soft soils should be removed from areas to receive fill. This applies particularly to the placement of fill on slopes. If grading creates any slope steeper than 4 horizontal to 1 vertical, the ground should be benched to provide a relatively level surface for compaction. The exposed soils should be scarified, moisture conditioned, and compacted to the same density as the overlying fill.

3. All fill and backfill should be approved by the geotechnical engineer, placed in uniform lifts with a thickness compatible with the type of compaction equipment being used, moisture conditioned within 0 to +3 percent of optimum moisture content for the clay soil, and ±2 percent of optimum for the sand soils. The soils should be compacted with the appropriate equipment for the lift thickness used. The following minimum percentages of the maximum dry density, as determined by ASTM D698 (standard Proctor), are considered suitable for the anticipated development.
    a) Below foundations……..95%
    b) Below slabs and pavements……95%
    c) Landscaped area fill……90%
    d) Retaining or Foundation Wall Backfill……..95%

Suitability of On-Site Soil:

The clay soils encountered in the borings were found to have a relatively high swell potential at their in-situ moisture content and density, and will likely be expansive when placed as fill. Moisture conditioning to optimum and above can reduce the swell potential, but will not eliminate the risk of heaving caused by expansive soils. For fills that contain these clay soils, we recommend Standard Proctor criteria (ASTM D698) as opposed to modified Proctor criteria (ASTM D1557), because its use generally yields fill at higher optimum moisture content at a lower density and hence a lower expansion potential. All soils proposed for use below slabs or foundations should be tested for suitability. Bedrock will not be suitable for placement under structures.

Borrow areas should be stripped and segregated so that the fill will be free of deleterious materials. The on-site soil should be processed so that the fill does not contain rock or soil fragments larger than 4 inches in diameter. Any soils imported to the site should be approved by the geotechnical engineer.

EXCAVATIONS:

The sandy clay overburden, and the bedrock encountered in our borings can be excavated with typical heavy duty excavation equipment. Relatively shallow excavations are

anticipated for the construction of the proposed residences, but deeper excavations may be required for utility trenches.

It is the responsibility of the Contractor to provide safe working conditions and to comply with the regulations in OSHA Standards, Excavations, 29CFS Part 1926. The on-site native clay will likely classify as "Type B" in accordance with OSHA regulations. The regulations allow slopes of 1:1 horizontal to vertical for Type B soils for temporary excavations less than 20 feet deep. Some of the hard native sandy clay and claystone or sandstone bedrock will classify as "Type A" in accordance with OSHA regulations. The regulation allows for slopes of ¾:1 for temporary excavations less than 20 feet deep. The native sands encountered below the clay will likely classify as "Type C" in accordance with OSHA regulations. The regulations allow slopes of 1½:1 horizontal to vertical (34°) for Type C soils for temporary excavations less than 20 feet deep. The presence of water, seepage, fissuring, vibrations or surcharge loads will require temporary excavation to have slopes flatter than those allowed by OSHA regulations. The Contractor's competent person should make decisions regarding cut slopes. A qualified Geotechnical engineer should observe any questionable slopes or conditions. Temporary shoring or trench boxes may be necessary. Trench cut slopes in cohesive soils and bedrock should stand at near vertical for a sufficient length of time to install any required temporary shoring unless adversely affected by groundwater seepage, vibrations or surcharge loads. Trenches cut in non-cohesive sand may not stand at a near vertical slope during the time required to install trench boxes, and these areas may require the trench to be sloped instead.

FOUNDATIONS

Considering the subsurface conditions encountered in our investigation and the nature of the proposed construction, either deep foundation systems or over-excavation and replacement should be utilized for proposed structures. Deep foundations consisting of typical drilled shaft piers will likely be suitable at the west side of the site. Helical piers bearing in the overburden materials will be necessary for areas where deep bedrock exists. Particularly in the east portion of the site, deep foundations will not likely be required if over-excavation and replacement is conducted.

These criteria are presented for preliminary planning purposes only. Actual design criteria should be established by drilling closely-spaced borings within each building footprint and performing laboratory testing.

FLOOR SLABS

Floor slabs present a difficult problem where expansive materials are near the proposed floor slab elevation because sufficient dead load cannot be imposed on them to resist the uplift pressure generated when the materials become wet and expand. The only positive method to control floor slab movement on these soils is to construct a structural floor system above a crawl space. The evaluation of mold hazards is beyond the scope of this study and H-P Geotech does not provide recommendations regarding mold mitigation.

Garage floors are subject to the same difficult soils conditions as described above, but are difficult to construct over crawlspaces due to the relatively high live loading conditions anticipated. Slab-on-grade construction can be used for the garage floors provided that the risk of distress resulting from floor slab movement is recognized and accepted by the builder/potential homeowner. In areas with high swell potential, over-excavation of the native soils, and replacement with suitable moisture conditioned soils will be required.

DRAINAGE

Underdrains

Though groundwater was found at relatively low elevations compared to those of the anticipated foundations, it has been known to be significantly higher in the past. Additionally, surface water infiltration due to storm events and irrigation will change the groundwater depth. Therefore, we recommend below-grade construction, including crawlspaces be protected from excessive wetting by an underdrain system. The drain also will act to prevent buildup of hydrostatic pressures behind foundation walls.

Surface Drainage and Erosion Control:

Moisture-sensitive and erodible subsoils were identified at this site. The satisfactory performance of foundations, floor slabs and pavements are directly related to positive surface and subsurface drainage systems to prevent subgrade wetting. Surface grades should be maintained such that irrigation, snowmelt and precipitation water will easily

run off away from the structures and pavement. A 10 percent slope adjacent to foundations is commonly used. Positive drainage away from all structures and roadways should be maintained.

Additionally, good surface drainage should be provided around all fill areas and cut slopes to direct surface runoff away from these areas. Slopes and other stripped areas should be protected against erosion by paving, re-vegetation or other means.

CONTINUING SERVICES

Two additional elements of geotechnical engineering service are important for the successful completion of this project.

1. Consultation with design professionals during the design phases. This is important so the intentions of our recommendations are properly incorporated in the design, and that any changes in the design concept properly consider geotechnical aspects. A design-level geotechnical study should be undertaken once siting and configuration of the project is final.
2. Observation and monitoring during construction. A geotechnical engineer from our firm should observe the excavation, earthwork, and foundation phases of the work to judge that subsurface conditions are compatible with those used in the analysis and design. During site grading, placement of fill should be observed and tested to confirm that the proper placement conditions have been achieved.

LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering principles and practices in this area at this time. We make no warranty either express or implied. The conclusions and recommendations submitted in this report are based upon the data obtained from widely-spaced exploratory borings drilled at the locations indicated on Figure 2, the proposed type of construction and our experience in the area, and the review of previous studies conducted in the area. Our findings are preliminary in nature and include interpolation and extrapolation of the subsurface conditions identified at the exploratory borings and variations in the subsurface

conditions may not become evident until further exploration or excavation is performed. A site specific geotechnical study should be performed for each lot.

This report has been prepared for the exclusive use by our client for preliminary design purposes. We are not responsible for technical interpretations by others of our exploratory information which has not been described or documented in this report. As the project evolves, we should provide continued consultation and field services during construction to review and monitor the implementation of our recommendations, and to verify that the recommendations have been appropriately interpreted.

If you have any questions or if we can be of further service, please call. We appreciate the opportunity to have worked on this project.

Sincerely,
HEPWORTH - PAWLAK GEOTECHNICAL, INC.

Cuong Vu, Ph.D., P.E.

and

Arben Kalaveshi, P.E.

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 SITE LOCATION	FIG. 1

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 BORING LOCATIONS	FIG. 2

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 BORING LOCATIONS	FIG. 2a

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 BORING LOGS	FIG. 3

213116A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 BORING LOGS	FIG. 4

NOTES:

1. The materials shown and their boundaries have been inferred and interpreted from the boring data available and the surface conditions observed, and may differ from the actual subsurface conditions.
2. The surface topography end elevations are approximate.
3. The free water line shown is an extrapolation of the water level shown in boreholes when measured at least 1 day after drilling was completed.

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 SOIL CROSS SECTIONS	FIG. 4A

NOTES:

1. The materials shown and their boundaries have been inferred and interpreted from the boring data available and the surface conditions observed, and may differ from the actual subsurface conditions.
2. The surface topography end elevations are approximate.
3. The free water line shown is an extrapolation of the water level shown in boreholes when measured at least 1 day after drilling was completed.

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, Inc.	THE GLEN AT WIDEFIELD, FILING 7 SOIL CROSS SECTIONS	FIG. 5

LEGEND

TOPSOIL: Clay (CL), sandy, slightly moist to moist, brown, with grass/weed cover.

CLAY (CL), sandy, fine to medium grained, medium stiff to very stiff, medium plasticity, moist to wet, brown.

SAND (SC), clayey, fine to coarse grained, low plasticity, loose to medium dense, very moist moist to wet, brown.

SAND (SP-SM), silty, gravelly, fine to coarse grained, medium dense, moist, brown.

Claystone, fine grained, medium hard to very hard, moist, brown to blue.

17/12 Indicates 1⅜ inch I.D. Split Spoon sampler. 17/12 indicates 17 blows of a 140-pound hammer falling 30 inches were required to drive the sampler 12 inches.

17/12 Indicates 2-inch I.D. California sampler. 17/12 indicates 17 blows of a 140-pound hammer falling 30 inches were required to drive the sampler 12 inches.

27 Indicates depth of cave and number of days after drilling measurement was made.

27 Indicates depth of free water and number of days after drilling measurement was made.

NOTES:

1. FIeld work was conducted on September 23 and 24, 2015. The Boring was drilled and sampled using a truck mounted CME 550X All Terrain Drill Rig.
2. Location of borings shown on Figure 2 are approximate.
3. Elevations of borings were not measured during our site visit.
4. The lines between strata represent approximate boundaries and transitions may be gradual.
5. Laboratory Testing Results:
   MC=Moisture content (%).
   DD=Dry density (pcf).
   +4 = Percent of gravel fraction
   -200 = Percent of silt and clay fraction.
   LL = Liquid limit.
   PI = Plastic index.
   SP = Percent swell under a surcharge of 1,000 psf when wetted.
   WSS = Water Soluble Sulfates in Percent.

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 6

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 7

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 8

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 9

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 10

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 11

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 12

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD SWELL-COMPRESSION TEST RESULTS	FIG. 13

GRAVEL: 0% SAND: 57% SILT AND CLAY: 43%
LIQUID LIMIT: PLASTICITY INDEX:
SAMPLE OF: SAND (SC), clayey FROM: B2 @ 24 feet

GRAVEL: 16% SAND: 70% SILT AND CLAY: 14%
LIQUID LIMIT: PLASTICITY INDEX:
SAMPLE OF: SAND (SP-SM), gravelly, silty FROM: B2 @ 44 feet

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD GRADATION ANALYSIS	FIG. 14

GRAVEL: 13% SAND: 75% SILT AND CLAY: 12%
LIQUID LIMIT: PLASTICITY INDEX:
SAMPLE OF: SAND (SP-SM), gravelly, sandy FROM: B8 @ 39 feet

GRAVEL: 10% SAND: 78% SILT AND CLAY: 12%
LIQUID LIMIT: PLASTICITY INDEX:
SAMPLE OF: SAND (SP-SM), gravelly, silty FROM: B2 @ 44 feet

215292A	HEPWORTH-PAWLAK GEOTECHNICAL, INC.	WIDEFIELD GRADATION ANALYSIS	FIG. 15

HEPWORTH-PAWLAK GEOTECHNICAL, INC.

JOB NO. 215292A

PROJECT: WIDEFIELD

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY UNIT WEIGHT (PCF)	GRADATION			ATTERBERG LIMITS		SWELL/COMP WITH 1,000 psf SURCHARGE (%)	WATER SOLUBLE SULFATES (%)	SOIL OR BEDROCK TYPE (USCS CLASSIFICATION)
BORING	DEPTH (feet)			GRAVEL (%)	SAND (%)	SILT & CLAY (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)			
B-1	4	21.9	89			94	63	39	6.9		CLAY (CL), sandy
	9	14.3	111			75	51	34		0.07	CLAY (CL), sandy
	19	25.8	97			91	62	42	1.7		CLAY (CL), sandy
B-2	4	12.7	95			71			2.4		CLAY (CL), sandy
	14	16.4	103			68				0.675	CLAY (CL), sandy
	24	26.9	95	0	57	43					SAND (SM), silty
	44	12.7		16	70	14					SAND (SP-SM), gravelly, silty
B-3	4	6.4	95			62	33	19	2.1		CLAY (CL), sandy
	14	13.9	118			83			3.6		CLAYSTONE
B-4	4	15.3	113			91				0.813	CLAYSTONE
	9	13.5	114			66			2.5		CLAYSTONE
	14	13.9	118			83			2.3		CLAYSTONE
B-6	4	15.8	96			88			2.7		CLAY (CL), sandy
	14	17.3	108			78					CLAY (CL), sandy
	19	23.7	101			97			5.0		CLAY (CL), sandy
	29	31.5	90			41					SAND (SC), clayey
	54	13.7	119			40					CLAYSTONE
B-7	34	20.5	15								CLAY (CL), sandy
B-8	4	17.2	103			78			1.9		CLAY (CL), sandy
	14	19.6	104			79			0.6		CLAY (CL), sandy
	19	30.3	91			71					CLAY (CL), sandy
	39	11.8	120	13	75	12					SAND (SP-SM), gravelly, silty
B-9	4	18.2	87			91			9.1	0.065	CLAY (CL), sandy
	9	17.3	94			91					CLAY (CL), sandy
	34	35.3	87			98					CLAY (CL), sandy
	54	12.7				87					CLAYSTONE
B-10	4	12.9	86			66			1.7		CLAY (CL), sandy
	14	10.9	110			72			0.3	0.065	CLAY (CL), sandy
	19	22.9	93			65					CLAY (CL), sandy
	44	10.0	124	10	88	12					SAND (SC), clayey