ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

SOIL, GEOLOGY AND GEOLOGIC HAZARD STUDY BANNING LEWIS RANCH VILLAGES A, B, C, AND D COLORADO SPRINGS, COLORADO

Prepared for

Oakwood Homes
1290 North Newport Road
Colorado Springs, Colorado 80916

Attn: Jarrod Walker

May 1, 2020
Revised June 17, 2020

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Kristen A. Andrew-Hoeser, P.G.
Senior Geologist

Reviewed by:

Joseph C. Goode, Jr., P.E.
President



LLL

Encl.

Entech Job No. 200393
AAProjects/2020/200393 soils geo

CITY OF COLORADO SPRINGS

APPLICATION FORM FOR GEOLOGIC HAZARD REPORT

Applicant: Oakwood Homes Telephone: 719-380-5049 Fax _____

Address: 1290 North Newport Rd Zip Code: 80916 E-mail: jwalker@oakwoodhomesco.com

Premises Involved: Development Plan/Subdivision Plat Name: Banning Lewis Ranch Villages A, B, C and D

Tax Schedule No(s). 53000-00-659, 53000-00542, 53000-00-653, 53000-00-654, 53130-00-103 and 53130-00-104
(This can be obtained from the El Paso County Tax Assessor located at 27 E. Vermijo Avenue on the 2nd Floor; phone: 520-6600 or at their web site http://www.land.elpasoco.com)

GEOLOGIC HAZARD REPORT REQUIRED: (FIVE (5) PRELIMINARY COPIES)

An application review fee will be required to accompany these applications (make checks payable to City of Colorado Springs). The fee schedule is as follows:

Review of Geologic Hazard Reports	City Planning Fee: $300 plus any Colorado Geological Survey Review Cost Over $300
	City Engineering Fee: $284

The following documents have been included and considered as part of this report (checked off by individual(s) preparing the geologic report):

Development Plan: _____

Landscape Plan (if applicable): _____

Grading Plan: _____

Drainage Report (necessary if debris and/or mud flow hazard is present): _____

ENGINEERS STATEMENT

I hereby attest that I am qualified to prepare a Geologic Hazard Study in accordance with the provisions of Section 504 of the Geologic Hazards Ordinance of Colorado Springs. I am qualified as:

__X__ Professional Geologist as defined by CRS 34-1-201(3); or,

____ _____ Professional Engineer as defined by Board Policy Statement 50.2 - "Engineering in Natural Hazard Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. Board authority as defined by CRS 12-25-107(1).

Submitted by: _____ Date: 6/22/2020
Logan L. Langford., P.G., Entech Engineering, Inc.

This Geologic Hazard Study is filed in accordance with the Zoning Code of the Code of the City of Colorado Springs, 2001, as amended.

Patrick V. Mamini 12/16/21
For the City Engineer Date

Katelynn Wirtz 12/16/21
For the City Planning Director Date

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1.0 SUMMARY

Project Location:

The project lies in portions of Sections 10, 11, 13, 14, 15, 22, and 23, Township 13 South, Range 65 West of the 6th Principal Meridian. The site is located north of Highway 24 and south of Woodmen Road, to the east of the existing Banning Lewis Ranch Subdivision, in the eastern extent of Colorado Springs, Colorado.

Project Description:

Total acreage involved in the project is 1,559.5 acres, consisting of Villages A (398.1 acres), B (317.2 acres), C (592.4 acres), and D (251.8 acres). The proposed development primarily consists of residential with some commercial areas, schools, parks, and open space/drainage areas.

Scope of Report:

The report presents the results of our geologic investigation and treatment of engineering geologic hazard study for the sketch plan submitted. This report presents the results of our geologic reconnaissance, a review of available maps, aerial photographs and our conclusions with respect to the impacts of the geologic conditions on development.

Land Use and Engineering Geology:

This site was found to be suitable for the proposed development. Geologic conditions will impose some constraints on development. These include areas of hydrocompaction, loose soils, potentially expansive soils, erosion, seasonal and potentially seasonal shallow groundwater areas, areas of ponded water, floodplains, and artificial fill. Site conditions will be discussed in greater detail in this report. All recommendations are subject to the limitations discussed in the report.

2.0 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The project lies in portions of Sections 10, 11, 13, 14, 15, 22, and 23, Township 13 South, Range 65 West of the 6th Principal Meridian. The site is located north of Highway 24 and south of Woodmen Road, to the east of the existing Banning Lewis Ranch Subdivision, in the eastern extent of Colorado Springs, Colorado. The location of the site is shown on the Vicinity Map, Figure 1.

The topography of the site consists of low rolling hills generally gradually sloping to the south with some moderate to steep slopes along drainages that flow through the site. Drainages on-site flow in southerly directions. Water was observed in some of the drainages, ponds and other low areas on the site. The approximate boundaries of the site are indicated on the USGS Map, Figure 2. Previous site uses have included grazing and pasture land. Vegetation on site consists primarily of field grasses and weeds. Site photographs are included in Appendix A. The approximate locations and directions of the photographs are indicated on Figure 3.

The report presents the results of our geologic investigation and treatment of engineering geologic hazard study for the sketch plan submitted. This report presents the results of our geologic reconnaissance, a review of available maps, aerial photographs and our conclusions with respect to the impacts of the geologic conditions on development. The area will be serviced by central water and sewer. The proposed Concept Plan is presented in Figure 4. A grading plan was not available at the time of this report.

3.0 SCOPE OF THE REPORT

The scope of this report includes a general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.

4.0 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site.

The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved field reconnaissance, measurements and interpretation. The same mapping procedures have also been utilized to produce the Engineering Geology Map which identifies pertinent geologic conditions affecting development.

Thirty-five (35) test borings were drilled as a part of the investigation to determine general soil and bedrock conditions. The borings were drilled with a power-driven continuous flight auger drill rig to depths of 20 feet. Samples were obtained during drilling using the Standard Penetration Test, ASTM D-1586, utilizing a 2-inch O.D. Split Barrel Sampler and a California Sampler. Results of the penetration tests are shown on the drilling logs to the right of the sampling point. The location of the test borings is shown on the Test Boring Location Map, Figure 3. The Test Boring Logs are included in Appendix B.

Laboratory testing was performed to classify and determine the soils engineering characteristic. Laboratory tests included moisture content, ASTM D-2216, grain size analysis, ASTM D-422, and Atterberg Limits, ASTM D-4318. Swell/Consolidation Testing, ASTM D-4546, was conducted on select samples to evaluate the expansive/compressive characteristics of the soils. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

The western half of Village B was previously by Entech Engineering, Inc. in a *Preliminary Subsurface Soil Investigation* dated January 6, 2019 (Reference 1). Test Boring Logs, Test Pit Logs, and Summary of Laboratory Testing Result are included in Appendix D.

5.0 SOIL, GEOLOGY AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 13 miles to the west is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be gently dipping in a northerly direction (Reference 2). Bedrock in the area of the site is sedimentary in nature, and typically Tertiary to Cretaceous in age. The bedrock underlying the site itself is the Dawson Formation. Overlying the Dawson are unconsolidated deposits of artificial, residual, alluvial, and eolian soils. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Service

The Natural Resource Conservation Service (Reference 3), previously the Soil Conservation Service (Reference 4) has mapped three soil types on the site (Figure 5). In general, the soils consist of loamy sand and gravelly sandy loam. Soils are described as follows:

Type	Description
8	Blakeland loamy sand, 1-9% slopes
9	Blakeland Complex, 1-9% slopes
96	Truckton sandy loam, 0-3% slopes

Complete descriptions of the soils are presented in Appendix E. The soils have generally been described to have rapid to very rapid permeabilities. The majority of the soils have been described by the Soil Conservation Service as good potential for urban development. Limitations include the hazard of flooding on some areas of Soil Type 9. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The majority of the soils have been described to have slight to moderate erosion hazards. The soil blowing hazard is severe if vegetation is removed.

5.3 Site Stratigraphy

The Falcon NW and Falcon Quadrangle Geology Maps showing the site is presented in Figure 6 (References 5 and 6). The Geology Map prepared for the site is presented in Figure 7. Eight mappable units were identified on this site, which are identified as follows:

Qaf **Artificial Fill of Quaternary Age:** These are man-made fill deposits associated with earthen dams and erosion berms on-site.

Qal **Recent Alluvium of Quaternary Age:** These are recent stream deposits in the drainages that exist on-site. These materials consist of silty sands and may contain lenses of silt, clay or gravel. Areas of organic soils will also be encountered.

Qay_2 **Young Alluvium Two of Holocene Age:** These materials consist of water deposited alluvium, typically classified as a silty to well-graded sand, brown to dark brown in color and of moderate density. This deposit correlates with the Piney Creek Alluvium.

Qam **Middle Alluvium of Quaternary Age:** These materials consist of lower stream terrace deposits. The alluvium typically consists of silty to clayey gravelly sands. This deposit correlates with the Broadway Alluvium.

Qao_1 **Old Alluvium One of Quaternary Age:** This is a stream deposited material typically occurring as terrace deposits on portions of the site. The Old Alluvium One typically consists of brown silty to clayey sands and may contain some silt and clay lenses. This deposit likely correlates with the Louviers Alluvium.

Qao_2 **Old Alluvium Two of Quaternary Age:** This is a stream deposited material typically occurring as terrace deposits on portions of the site. The Old Alluvium Two typically consists of brown to light-yellowish brown silty to clayey sands and gravel.

Qes **Eolian Sand of Quaternary Age:** These are deposits are fine to medium grained soil deposited by the action of the prevailing winds from the northwest. They typically occur as large dune deposits or narrow ridges. Additionally, low areas associated with blow-

outs may be encountered in these areas. The eolian soil types are typically tan to brown in color and tend to have a very uniform or well-sorted gradation. These materials tend to have a relatively high permeability and low density.

TKda Dawson Arkose Formation of Tertiary to Cretaceous Age: The bedrock underlying the site is the Dawson Formation. This formation consists of arkosic sandstone with interbedded lenses on fine grained sandstone, claystone or siltstone. Typically, it is buff to light brown and light gray in color. Overlying the Dawson is a variable layer of residual soil derived from the in-situ weathering of the bedrock materials.

The soils listed above were mapped from the *Geologic Map of the Falcon NW and Falcon Quadrangles* by Madole in 2003 (Figure 6, References 5 and 6), the *Geologic Map of the Pueblo 1°x2° Quadrangle, South-Central* distributed by the US Geological Survey in 1978 (Reference 7) and site-specific mapping of the site. The test borings from this study and the preliminary subsurface investigation were also used in evaluating the site. The test boring logs are included in Appendices B and D of this report.

5.4 Soil Conditions

The soils encountered in the test borings can be grouped into four general soil types. The soils were classified using the Unified Soil Classification System (USCS).

Soil Type 1 consists of slightly silty to silty and clayey sand (SW-SM, SM, SC). The sands were encountered in the upper soil profile of 33 of the test borings at the surface and extending to depths ranging from 4 to 19 feet, and to the termination of the Test Boring Nos. 8, 20, 21, 24, 29, and 34 (20 feet). Standard penetration testing on the sands resulted in N-values of 2 to 50 blows per foot (bpf), indicating very loose to dense states. Water content and grain size testing resulted in water contents of 1 to 21 percent with approximately 3 to 36 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing resulted in non-plastic results. FHA Swell Testing resulted in an expansion pressure of 30 psf, indicating low expansion potential. Sulfate testing resulted in 0.00 to less than 0.01 percent sulfate by weight indicating the sand exhibits negligible potential for below grade concrete degradation.

Soil Type 2 consists of very sandy to sandy clay and silty clay (CL, CH). The clay was encountered in Test Boring Nos. 5, 6, 7, 9, 12, 13, 14, 15, 19, 25, 26, 27, 28, 30, 31, 33, and 35 at depths ranging from the existing surface to 17 feet extending to depths ranging from 4 to 19 feet and to the termination of the Test Boring No. 25 (20 feet). Standard Penetration Testing on the clay resulted in values of 8 to 41 bpf, indicating firm to stiff to very stiff consistencies. Water content and grain size testing resulted in water contents of 14 to 36 percent with approximately 50 to 100 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in Liquid Limit of 50 and plastic indexes of 2 to 14. FHA Swell Testing resulted in an expansion pressure of 820 psf, indicating low to moderate expansion potential. Swell/Consolidation Testing resulted in volume changes of -0.3 to 3.2 percent, indicating low consolidation potential and moderate to high expansion potential. Sulfate testing resulted in less than 0.01 to 0.01 percent sulfate by weight indicating the clay exhibits negligible potential for below grade concrete degradation. Sulfate testing resulted in less than 0.01 percent sulfate by weight indicating the clay exhibits negligible potential for below grade concrete degradation.

Soil Type 3 consists of silty to clayey very clayey sandstone (SM, SC). The sandstone was encountered in Test Boring Nos. 1, 2, 3, 4, 5, 9, 12, 13, 14, 15, 19, and 32 at depths ranging from 4 to 19 feet and extending to the termination of the borings (20 feet). Standard penetration testing on the sandstone resulted in N-values of 38 bpf to greater than 50 bpf, indicating dense to very dense states. Water content and grain size testing resulted in water contents of 2 to 19 percent with approximately 14 to 42 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in Liquid Limits of 21 and 43 and plastic indexes of 2 to 14. Swell/Consolidation Testing resulted in a volume change of 2.1. Highly expansive claystone and siltstone is commonly interbedded in the sandstone in the area. Sulfate testing resulted in less than 0.01 percent sulfate by weight indicating the sandstone exhibits negligible potential for below grade concrete degradation.

Soil Type 4 consists of sandy to silty claystone and sandy, clayey siltstone (CH, ML, CL). The claystone and siltstone were encountered in Test Boring Nos. 3, 6, 7, 9, 10, 11, 12, 13, 14, 15, 18, 22, 27, 28, 30, 31, 32, 33, and 35 at depths ranging from 4 to 18 feet and extending to depths ranging from 19 to the termination of the borings (20 feet). Standard penetration testing on the claystone and siltstone resulted in N-values of 30 to greater than 50 bpf, indicating stiff to hard

consistencies. Water content and grain size testing resulted in water contents of 12 to 22 percent with approximately 76 to 100 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in liquid limits of 51 and 59 and plastic indexes of 26 and 27. Swell/Consolidation Testing resulted in volume changes of 1.0 to 5.7, indicating low to very high expansion potentials. Sulfate testing resulted in 0.00 to less than 0.01 percent sulfate by weight indicating the claystone and siltstone exhibits negligible potential for below grade concrete degradation.

A Summary of Laboratory Results is presented in Table 1. Laboratory results are included in Appendix C. A summary of the depth to bedrock is included in Table 2.

5.5 Groundwater

Groundwater was encountered in twenty of the test borings at depths ranging from 5 to 19 feet. Groundwater was not encountered in the other test borings which were drilled to 20 feet. A table showing the depth to groundwater is presented in Table 2. Areas of seasonal and potentially seasonal groundwater, flowing and ponded water have been mapped on the site and are discussed in the following section.

Groundwater was encountered at depths ranging from 3 to 18 feet in the test borings and test pits from the Preliminary Subsurface Soil Investigation from the western half of Village B. Shallow groundwater less than 10 feet was encountered in 31 of the locations tested and less than 5 feet in 5 locations (Reference 1, Appendix B).

Fluctuation in groundwater conditions may occur due to seasonal variations in precipitation and other factors not readily apparent at this time. Isolated sand layers within the variable soil profile, sometimes only a few feet in thickness and width, can carry water in the subsurface. Water may also flow on top of the sandstone. Contractors should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site. Grading involving cuts in areas of shallow water should be minimized.

6.0 ENGINEERING GEOLOGY - IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

Detailed mapping has been performed on this site to produce an Engineering Geology Map (Figure 7). This map shows the location of various geologic conditions of which the developers and planners should be cognizant during the planning, design and construction stages of the project. The hazards identified on this site include hydrocompaction, loose soils, erosion, artificial fill, potentially expansive soils, seasonal and potentially seasonal shallow groundwater areas, springs, and areas of ponded water. The following hazards have been addressed as a part of this investigation:

Expansive Soils

While the majority of the soils encountered in the test borings drilled on-site have low to moderate expansion potential, highly expansive clays and claystone are common in the area and may be encountered. Grading may result in shallow depths to expansive claystone in some areas. The expansive soils are present across the site; therefore, none have been indicated on the map. Expansive clays and claystone, if encountered beneath foundations, can cause differential movement in the structure foundation. These occurrences should be identified and dealt with on an individual basis.

Mitigation: Should expansive soils be encountered beneath foundations; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation which is common in the area. Drilled piers are another option that is used in areas where highly expansive soils are encountered. Typical minimum pier depths are on the order of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending on building loads. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be determined after additional investigation of each building site.

Subsidence Area

Based on a review of the *Mining Report for the Colorado Springs Coal Field* (Reference 8), a Subsidence Investigation Report for the Colorado Springs area by Dames and Moore, 1985 (Reference 9), and the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County* (Reference 10), the site is not undermined. The closest underground mines in the area are 8 miles to the south and southwest and the site is not mapped within any potential subsidence zones.

Slope Stability and Landslide Hazard

The slopes on-site are gently to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. Grading plans were not available at the time of this investigation. Slopes should be no steeper than 3:1, if regraded unless specifically evaluated. All topsoil and organics should be removed prior to any regrading or fill placement. All new fill should be properly benched into native slopes and compacted at a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557.

Rockfall Hazards

Based on our site observation, no rock outcrops or areas of rockfall hazard were observed on this site.

Areas of Erosion

These are areas that are undergoing erosion by water and sheetwash producing gullies and rill erosion. Significant erosion has occurred in the western portion of the old Tamlin Road. This are will be regraded during site development.

Mitigation: Due to the nature of the soils on this site, virtually all the soils are subject to erosion by wind and water. Other minor areas of erosion were observed on site other than those mapped, particularly where some rill erosion has occurred. Areas of erosion can occur across the entire site, particularly if the soils are disturbed during construction. Vegetation reduces the potential for erosion. The areas identified where erosion is actually taking place may require check dams, regrading and revegetation using channel lining mats to anchor vegetation. Further recommendations for erosion control are discussed under Section 9.0 "Erosion Control" of this report. Recommendations pertaining to revegetation may require input from a qualified

landscape architect and/or the Natural Resource Conservation Service (previously Soil Conservation Service).

Debris Fans

Based on site observations, debris fans were not observed in this area. Areas of recent sediment deposits were observed in some of the drainages on the site. The drainage areas are discussed below.

Groundwater and Drainage Areas

Groundwater was encountered in fourteen of the test borings at depths ranging from 5 to 19 feet. Areas within the drainages on-site have been identified as seasonal and potentially seasonal shallow groundwater. Only minor areas with water flowing in the drainages were noted at the time of this investigation, however, areas of ponded and standing water were observed. Areas of the site have been mapped as floodplain zones according to the FEMA Map Nos. 08041CO545G and 08041CO561G, Figure 8 (Reference 11).

Groundwater was encountered at depths ranging from 3 to 18 feet in the test borings and test pits from the Preliminary Subsurface Soil Investigation from the western half of Village B. Shallow groundwater less than 10 feet was encountered in 31 of the locations tested and less than 5 feet in 5 locations (Reference 1, Appendix B).

Groundwater areas are discussed as follows:

- *Seasonal and Potentially Seasonal Shallow Groundwater*

  In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and possible frost heave potential, depending on the soil conditions. The majority of the areas mapped with this designation lie within drainages designated as open space and will be avoided by development. However, areas in the northern portions of Villages B and D have been designated with this hazard will require mitigation. These areas have also been indicated as a wet spot on the Soil Survey Map, Figure 5. Areas exist on the site where groundwater becomes perched within permeable sand materials on top of impermeable

bedrock materials. Where structures encroach on, or lie within these areas, the following mitigation is recommended:

Mitigation: In these locations, foundations in areas subject to severe frost heave potential should penetrate sufficient depth so as to discourage the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth for frost protection of 30 inches is recommended. In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the intrusion of water into areas located below grade. A typical perimeter drain detail is presented in Figure 9. Where shallow groundwater is encountered, additional drains, such as capillary breaks and/or interceptor drains may be necessary. Typical drain details are included in Figures 10 and 11. Unstable conditions should be expected where excavations approach the groundwater level. The use of shot rock or geo-grids may be necessary to stabilize excavations. Additionally, swales should be created to intercept surface runoff and carry it safely around and away from structures. It is anticipated that the drainages can be avoided or site grading will mitigate the drainages and raise foundations further above the groundwater level. The water table may be of sufficient depth to minimize the effects on buildings. Additional investigation is recommended after development and grading plans are finalized.

- *Areas of Ponded Water*

These are areas where there is standing water observed in drainages or ponded water behind earthen dams. The majority of these areas lie within the drainages designated as open space and will be avoided by construction. Where construction is proposed, the following mitigation is recommended:

Mitigation: These areas are located in drainage ways across the site that are within areas designated as drainage easements or open space. Other areas where ponded water was observed are minor and can be avoided or regraded. All soft and organic soils should be removed prior to fill placement. Any drainage into these areas should be rerouted in a non-erosive manner where it does not create areas of ponded water around proposed structures.

The same mitigation techniques for the seasonal shallow groundwater areas are recommended for these areas as well.

- *Floodplains*

  Areas of the site have been mapped as floodplain zone according to the FEMA Map Nos. 08041CO545G and 08041CO561G (Figure 8, Reference 11). According to the Concept Plan Figure 4, it appears these areas are designated as drainage/open space areas and will be avoided by development. Any development with the floodplain will require approval of the drainage plan. Finished floors must be a minimum of one foot above the floodplain level. Exact floodplain locations and drainage studies are beyond the scope of this report.

Artificial Fill

Areas of artificial fill were observed on the site. Much of the fill is associated with earthen dams and erosion berms. The earthen dams lie within areas designated as open space or easements and will be avoided by construction. The majority of the erosion berms are shallow and may be penetrated by foundations or will likely be removed during site grading. Areas of fill and stock piling was observed in the southwestern portion of the site. We would anticipate these fill piles would be removed during site grading. All uncontrolled fill should be removed and recompacted prior to or during site grading. Any uncontrolled fill encountered beneath foundations will require removal and recompaction at 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557.

Hydrocompaction

Areas in which hydrocompaction have been identified are acceptable as building sites. In areas identified for this hazard classification, however, we anticipate a potential for settlement upon saturation of these surficial soils. The low density, uniform grain sized, windblown sand deposits are particularly susceptible to this type of phenomenon.

Mitigation: The potential for settlement is directly related to saturation of the soils below the foundation areas. Therefore, good surface and subsurface drainage is extremely critical in these areas in order to minimize the potential for saturation of these soils. The ground surface around all permanent structures should be positively sloped away from the structure to all points, and water must not be allowed to stand or pond anywhere on the site. We recommend that the ground

surface within 10 feet of the structures be sloped away with a minimum gradient of five percent. If this is not possible on the upslope side of the structures, then a well-defined swale should be created to intercept the surface water and carry it quickly and safely around and away from the structures. Roof drains should be made to discharge well away from the structures and into areas of positive drainage. Where several structures are involved, the overall drainage design should be such that water directed away from one structure is not directed against an adjacent building. Planting and watering in the immediate vicinity of the structures, as well as general lawn irrigation, should be minimized.

Collapsible Soils

Areas of loose or potentially collapsible soils were encountered in some of the test borings drilled on-site. Should loose or collapsible soils be encountered beneath foundations, removal and recompaction with thorough moisture conditioning at 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 will be necessary. Typically, the overexcavation extends to a depth of 2 to 3 feet. Specific recommendations should be made after additional investigation of each building site.

Faults

The closest fault is the Rampart Range Fault, located 13 miles to the west. No faults are mapped on the site itself. Previously Colorado was mapped entirely within Seismic Zone 1, a very low seismic risk. Additionally, the International Residential Code (IRC), 2003, currently places this area in Seismic Design Category B, also a low seismic risk. According to a report by the Colorado Geological Survey by Kirkman and Rogers, 1981, (Reference 12) this area should be designed for Zone 2 due to more recent data on the potential for movement in this area, and any resultant earthquakes.

Dipping Bedrock

The bedrock underlying the site is the Dawson Formation of Tertiary to Cretaceous Age. The Dawson in this area is gently dipping a northerly direction according to the *Geologic Structure Map of the Pueblo 1x2 Quadrangle, South-Central Colorado* (1978) (Reference 2). The bedrock encountered in the test borings and observed on-site did not exhibit steeply dipping characteristics; therefore, mitigation is not necessary.

Shallow Bedrock

Bedrock was encountered in twenty of the test borings at depths ranging from 4 to 19 feet. Bedrock was not encountered in the other borings which were drilled to 20 feet. Shallow bedrock (less than 10 feet) was encountered in Test Boring Nos. 1-3, 5, 9-11, 18, 22, 30, and 32. A Summary of the Depth to Bedrock is included in Table 2. Shallow bedrock may be encountered in some areas of this site, particularly those mapped as TKda: Dawson Arkose Formation. Where shallow sandstone is encountered, higher allowable bearing capacities are anticipated. Shallow claystone may require mitigation for expansive soils. Excavations extending in the sandstone or claystone bedrock may be difficult requiring track excavators.

Radioactivity

Radon levels for the area have been reported by the Colorado Geologic Survey in the Open-File, Report No. 91-4 (Reference 13). Radon levels ranging from 0 to 20 pci/l have been measured in the area. The following is a table of radon levels in this area.

0<4 pci/l	50.00%
4<10 pci/l	50.00%
10<20 pci/l	0.00%
>20 pci/l	0.00%

Only two readings have been taken in the area. The minimal information from this report is not sufficient to determine if radon levels are higher for this site. An occurrence of radioactive minerals has been identified approximately 8 miles northwest of the site (Reference 14). This occurrence is associated with a limonite deposit in the Dawson Formation. No known occurrences exist on the site, however, radon gas originating in the bedrock underlying the site could migrate up into the upper soil profile.

Mitigation: The potential exists for radon gas to build up in areas of the site. Build-ups of radon gas can be mitigated by providing increased ventilation of basements and crawlspaces and sealing of joints. Specific requirements for mitigation should be based on-site specific testing after the site is constructed.

7.0 EROSION CONTROL

The soil types observed on the site are mildly to moderately susceptible to wind erosion, and moderately to highly susceptible to water erosion. A minor wind erosion and dust problem may be created for a short time during and immediately after construction. Should the problem be considered severe enough during this time, watering of the cut areas or the use of chemical palliative may be required to control dust. However, once construction has been completed, and vegetation reestablished, the potential for wind erosion should be considerably reduced.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on-site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap.

In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to re-vegetate successfully. Therefore, recommendations pertaining to

the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

8.0 ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 15), the area is mapped as upland deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 11), areas of the site are mapped as A3 – Alluvial fan: sand resource and E3/E4 – wind-deposited sand and probable aggregate resource. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 10), the area of the site has been mapped as "Good" for industrial minerals. The sands associated with the eolian and alluvial deposits are considered a sand resource. Considering the silty to clayey nature of much of these materials and abundance of similar materials through the region and close proximity to developed land, they would be considered to have little significance as an economic resource.

According to *the Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 10), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "Poor" for coal resources. No active or inactive mines have been mapped in the area of the site. The *El Paso County Aggregate Resource Map* (Reference 15) has mapped coal resources in the Falcon area approximately ½ mile south of the site; however, the coal resources are estimated at 1,500 feet below the surface (Reference 10). At this depth, mining the coal would not be economical at this time. No metallic mineral resources have been mapped on the site (Reference 10).

The site has been mapped as "Fair" for oil and gas resources (Reference 10). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it would not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine If the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The

practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

9.0 RELEVANCE OF GEOLOGIC AND SITE CONDITIONS TO LAND USE PLANNING

We understand that the development will be primarily residential with schools, parks, and open space areas. It is our opinion that the existing geologic and engineering geologic conditions will impose some constraints on the proposed development and construction. The most significant hazards associated with the site are those associated with the drainage areas and potential for seasonal shallow groundwater conditions. These can be satisfactorily mitigated by either avoidance, regrading, or through proper engineering design, construction and drainage systems. Constraints identified on the site such as hydrocompaction, collapsible soils, artificial fill, and expansive soils can also be mitigated through proper engineering design and construction.

The upper materials are typically at loose to dense states. The medium dense to dense granular soils encountered in the upper soil profiles of the test borings should provide good support for foundations. Loose soils, if encountered beneath foundations or slabs, will require removal and recompaction. Expansive soils, although sporadic, were encountered. Expansive clayey sandstone, siltstone and claystone are common in the Dawson Formation, and may require mitigation. Foundations anticipated for the site are standard spread footings possibly in conjunction with overexcavation in areas of expansive soils or loose soils. Areas of artificial fill, if encountered beneath foundations will require penetration or recompaction. Areas containing arkosic sandstone will have high allowable bearing conditions. Expansive layers may also be encountered in the soil and bedrock on this site. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas of hydrocompation have been identified on this site where there is the potential for settlement movements upon saturation of the surficial soils. Good surface and subsurface drainage is critical in these areas and the ground surface should be positively sloped away from structures at all points. Roof drains should be made to discharge well away from structures and planting and watering in the immediate vicinity of structures should be minimized.

Areas of seasonal and potentially seasonal shallow groundwater, ponded water, and floodplains exist on this site. The floodplains and areas of ponded water are to be avoided by development and preserved as open space in drainage easements. According to the site plan, some of the minor drainages can be avoided or filled which will mitigate the hazard. Blow-out areas may also exist where surface waters could collect seasonally. The majority of these areas are in permeable sands that do not show signs of collecting and retaining moisture. It is anticipated these areas and some of the minor drainage swales would be regraded and filled during site development. Where drainages are filled or truncated, groundwater still has the potential to follow old drainage paths underground. Interceptor drains may be necessary in these areas. Where structures encroach on areas of potential shallow groundwater or construction and regrading is proposed, drains may be necessary. Typical drain details are included in Figures 9 through 11. It appears the floodplain areas lie within designated drainage/open space areas and will be avoided by development. Finished floor levels must be a minimum of one foot above the floodplain level. Exact floodplain locations and drainage studies are beyond the scope of this report.

Areas of perched groundwater may be encountered on this site in areas other than those mapped. Permeable sands exist on the site that may carry water in the subsurface perched on less permeable bedrock. Groundwater was encountered at depths ranging from 5 to 19 feet in fourteen of the test borings drilled on the site. Additionally, groundwater was encountered at depths ranging from 3 to 18 feet in the test borings and test pits from the Preliminary Subsurface Soil Investigation from the western half of Village B. Shallow groundwater less than 10 feet was encountered in 31 of the locations tested and less than 5 feet in 5 locations (Reference 1, Appendix B). Site grading, including cuts, in areas of shallow water should be kept to a minimum. Fluctuation in groundwater conditions may occur due to variations in rainfall, soil conditions and development of surrounding areas. Builders should be cognizant of the potential for the occurrence of subsurface water features during construction and deal with each individual problem as necessary at the time of construction. Subsurface drains and dewatering systems may be necessary in some areas where seepage and perched water occurs. Unstable conditions should be expected where excavations approach the groundwater level. Stabilization using geofabric or shot rock may be necessary.

In summary, development of the site can be achieved if the items discussed above are mitigated. These items can be mitigated through proper design and construction or by avoidance. Additional investigation is recommended as grading and development plans are prepared, prior to construction.

10.0 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some constraints on development and construction of the site. The geologic hazards identified on the site can either be avoided by development or satisfactorily mitigated through proper engineering design and construction practices. The report was prepared for the proposed master plan. Additional soils investigation is recommended as the development and grading plans are prepared to provide more detailed information on soil, groundwater and bedrock.

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Discrepancies should be reported to Entech Engineering, Inc. soon after they are discovered so that the evaluation and recommendations presented can be reviewed and revised if necessary. Planning and design personnel should be made familiar with the contents of this report.

This report has been prepared for Oakwood Homes for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

We trust this report has provided you with all the information you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

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TABLES

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D
JOB NO. 200393

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	1	5			15.2	NV	NP	<0.01			SM	SAND, SILTY
1	4	2-3			14.9						SM	SAND, SILTY
1	8	2-3			17.8	NV	NP				SM	SAND, SILTY
1	11	5			13.9						SM	SAND, SILTY
1	13	2-3			31.9						SM	SAND, SILTY
1	15	10			36.2						SC	SAND, CLAYEY
1	16	5			16.6			<0.01			SM	SAND, SILTY
1	19	5			13.4						SM	SAND, SILTY
1	20	10			9.0	NV	NP				SM-SW	SAND, SLIGHTLY SILTY
1	21	2-3			28.6						SM	SAND, SILTY
1	23	2-3			13.1						SM	SAND, SILTY
1	24	10			10.3				30		SM-SW	SAND, SLIGHTLY SILTY
1	25	2-3			4.5	NV	NP	0.00			SP	SAND
1	26	5			3.4						SP	SAND
1	29	5			22.0						SM	SAND, SILTY
1	31	2-3			21.5						SM	SAND, SILTY
1	33	2-3			30.8						SM	SAND, SILTY
1	34	5			13.5						SM	SAND, SILTY
1	35	10			6.2						SM-SW	SAND, SLIGHTLY SILTY
2	7	10			69.5			<0.01	820		CL	CLAY, SANDY
2	12	10			99.4				1700		CL	CLAY, SILTY
2	14	10	26.4	98.9	99.5					1.4	CL	CLAY, SANDY
2	25	20	28.7	95.0	94.3	50	23	<0.01		3.2	CH	CLAY, SANDY
2	26	15	17.7	107.3	50.1					-0.3	CL	CLAY, VERY SANDY
2	28	10	23.6	99.4	64.0					0.6	CL	CLAY, SANDY
2	30	5	14.6	111.9	81.7					3.2	CL	CLAY, SANDY
2	35	15	37.8	83.9	97.1					0.5	CL	CLAY, SANDY
3	2	10			13.5	21	2	<0.01			SM	SANDSTONE, SILTY
3	17	15			21.9	43	14				SM	SANDSTONE, SILTY
3	32	10	19.2	109.6	42.0					2.1	SC	SANDSTONE, VERY CLAYEY
4	3	10			92.4	51	27				CH	CLAYSTONE, SANDY
4	5	5	27.0	97.2	94.6	59	26	<0.01		3.8	ML	SILTSTONE, CLAYEY, SANDY
4	6	15	28.2	95.9	98.3					5.7	CL	CLAYSTONE, SILTY
4	9	5			96.0						CL	CLAYSTONE, SANDY
4	10	10	22.7	104.6	99.8					5.3	CL	CLAYSTONE, SILTY
4	18	10	24.6	101.3	99.9					2.6	CL	CLAYSTONE, SILTY

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
4	22	15			76.3			<0.01			CL	CLAYSTONE, SANDY
4	27	20	22.2	107.0	98.1	46	12	<0.01		5.1	ML	SILTSTONE, CLAYEY, SANDY
4	28	20	20.6	107.1	98.4					1.2	CL	SILTSTONE, SANDY, CLAYEY
4	30	10	18.4	108.6	79.4	41	15	0.00		1.0	ML	SILTSTONE, CLAYEY, SANDY
4	33	15	19.3	110.7	96.9					2.3	ML	SILTSTONE, CLAYEY, SANDY

Table 2: Summary of Depth to Bedrock and Groundwater

Test Boring No.	Depth to Bedrock (ft)	Depth to Groundwater (ft.)
1	9	6
2	9	18
3	9	18
4	19	>20
5	4	19
6	11	17
7	14	17
8	>20	>20
9	4	>20
10	8	>20
11	9	>20
12	14	>20
13	14	>20
14	14	>20
15	14	19
16	14	19
17	14	16
18	8	18
19	19	>20
20	>20	19
21	>20	19
22	9	5
23	19	16
24	>20	>20

Test Boring No.	Depth to Bedrock (ft)	Depth to Groundwater (ft.)
25	>20	>20
26	>20	>20
27	18	14.5
28	17	>20
29	>20	>20
30	9	>20
31	19	16.5
32	4	19.5
33	14	13
34	>20	12.5
35	18	13.5

FIGURES



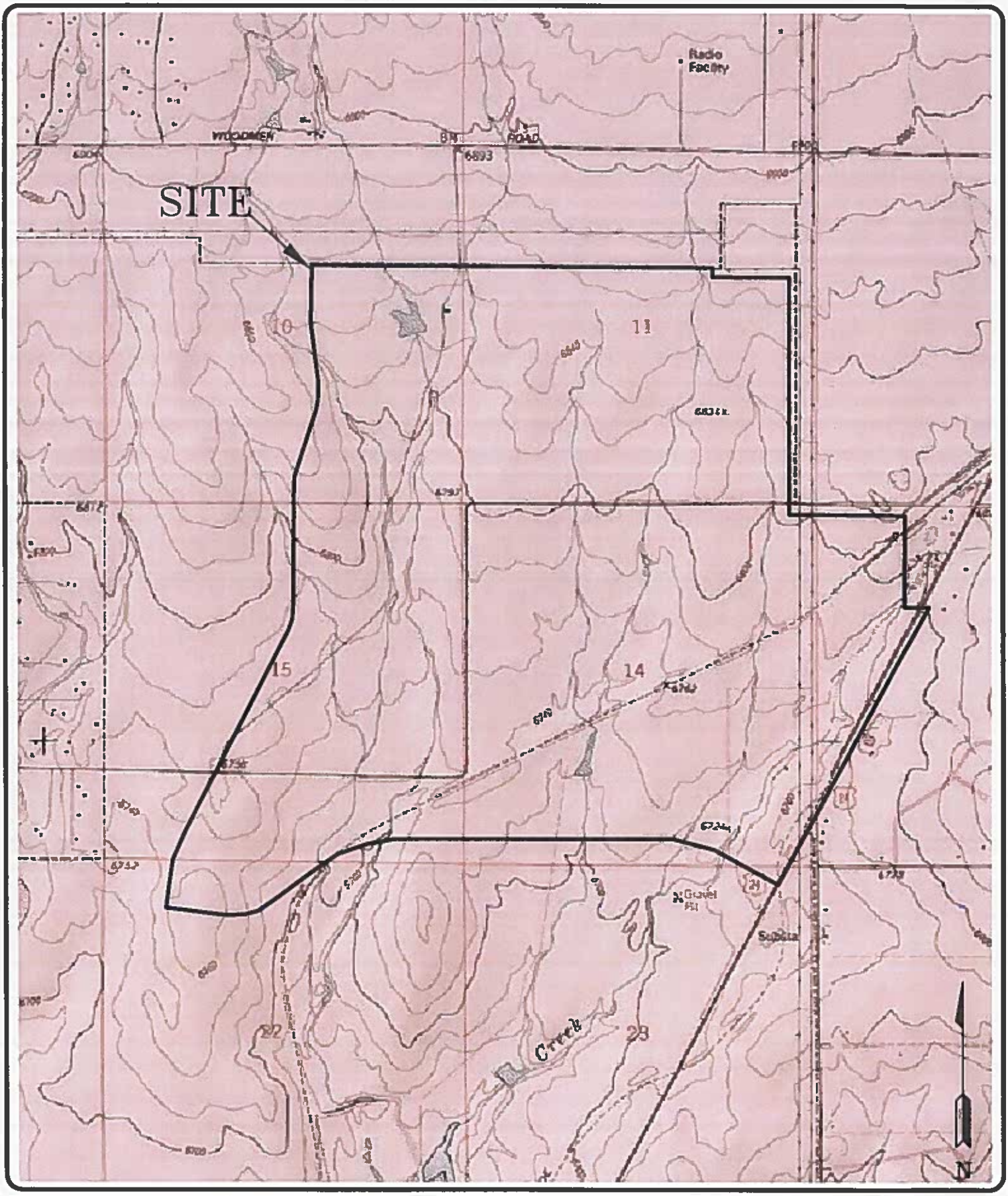
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VICINITY MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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JOB NO.: 200393

FIG NO.: 1



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USGS MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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JOB NO.: 200393

FIG NO.: 2

TB-1
TB-2
TB-3
TB-26
TB-6
TB-27
TB-5
TB-4
TB-7
TB-28
TB-25
TB-10
TB-8
TB-33
TB-30
TB-9
TB-19
TB-11
TB-24
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TB-23
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TB-35
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TB-17
TB-21

TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

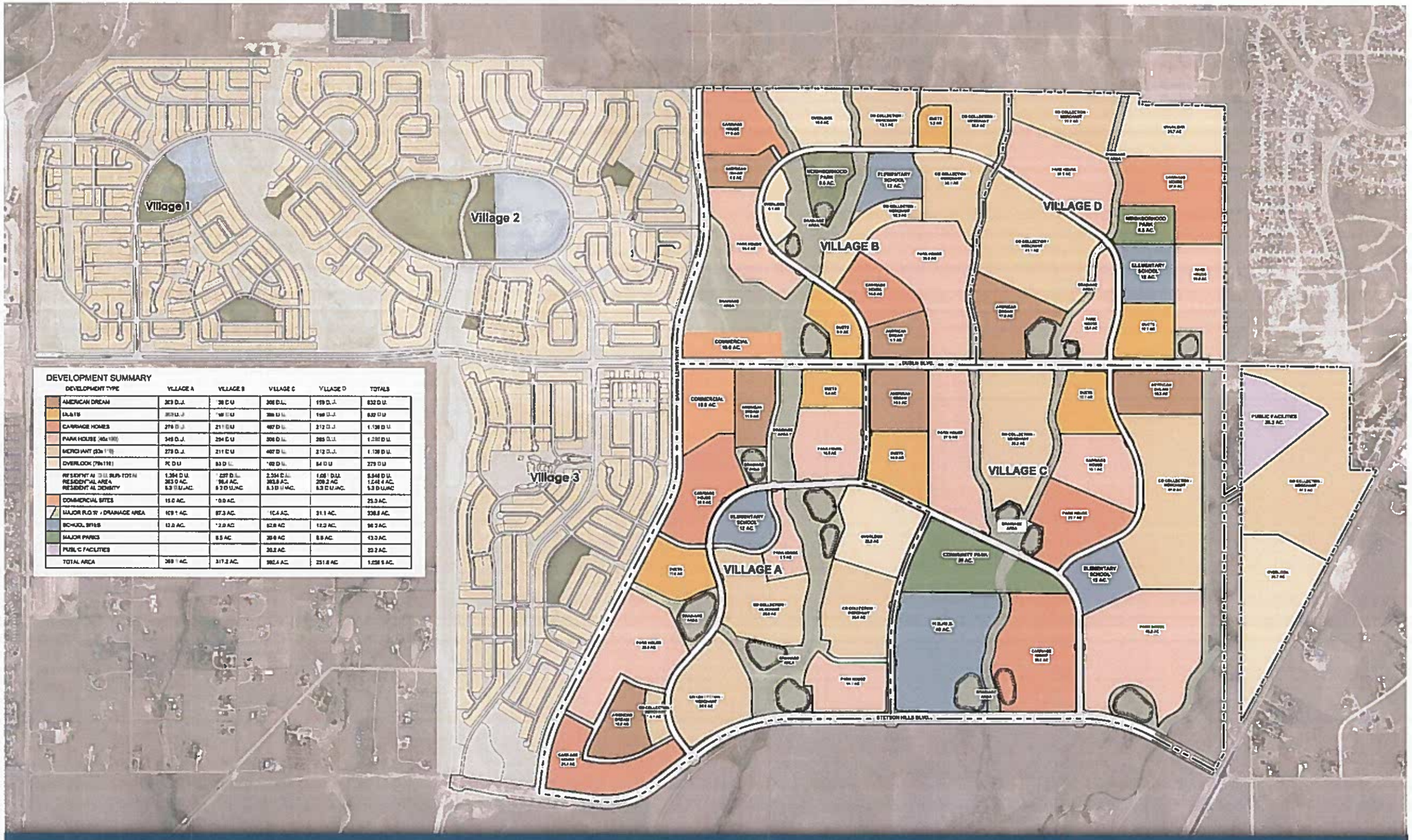
P2 - APPROXIMATE TEST PIT LOCATION AND NUMBER

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SITE PLAN/TEST BORING LOCATION MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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SCALE	AS SHOWN
JOB NO.	200393
FIGURE No.	3



DEVELOPMENT SUMMARY

DEVELOPMENT TYPE	VILLAGE A	VILLAGE B	VILLAGE C	VILLAGE D	TOTALS
AMERICAN DREAM	363 D.U.	38 D.U.	306 D.U.	159 D.U.	832 D.U.
LA-Z-15	363 D.U.	38 D.U.	306 D.U.	159 D.U.	832 D.U.
CARRIAGE HOMES	276 D.U.	211 D.U.	487 D.U.	212 D.U.	1,186 D.U.
PARK HOUSE (45x100)	345 D.U.	294 D.U.	306 D.U.	285 D.U.	1,230 D.U.
MERCHANT (53x118)	276 D.U.	211 D.U.	487 D.U.	212 D.U.	1,186 D.U.
OVERLOOK (79x118)	PC D.U.	83 D.U.	102 D.U.	84 D.U.	279 D.U.
RESIDENTIAL SUB-TOTAL RESIDENTIAL AREA RESIDENTIAL DENSITY	1,384 D.U. 263.0 AC. 5.3 D.U./AC.	837 D.U. 99.4 AC. 8.2 D.U./AC.	2,294 D.U. 383.8 AC. 5.3 D.U./AC.	1,051 D.U. 209.2 AC. 5.3 D.U./AC.	5,646 D.U. 1,245.4 AC. 5.3 D.U./AC.
COMMERCIAL SITES	15.0 AC.	10.0 AC.			25.0 AC.
MAJOR R.O.W. / DRAINAGE AREA	109.1 AC.	87.3 AC.	104 AC.	31.1 AC.	336.5 AC.
SCHOOL SITES	10.0 AC.	12.0 AC.	62.8 AC.	12.2 AC.	96.2 AC.
MAJOR PARKS		6.5 AC.	28.6 AC.	6.5 AC.	43.0 AC.
PUBLIC FACILITIES			35.2 AC.		35.2 AC.
TOTAL AREA	388.1 AC.	317.2 AC.	592.4 AC.	251.8 AC.	1,258.5 AC.

BANNING LEWIS RANCH
VILLAGES A, B, C & D CONCEPT PLAN

OAKWOOD HOMES

LAI Design Group

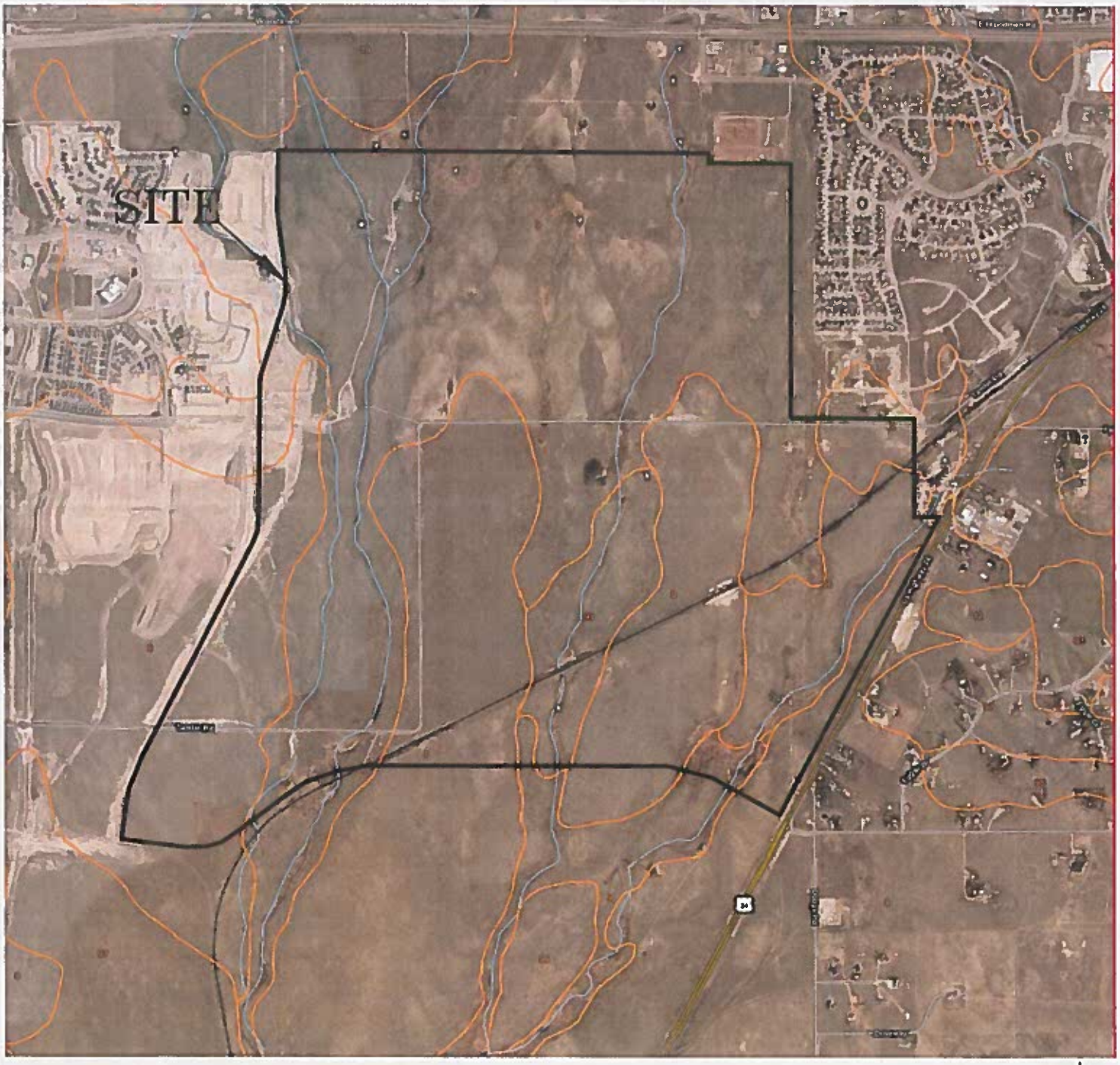
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CONCEPT PLAN
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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SCALE	AS SHOWN
JOB NO.	200393
FIGURE No.	4



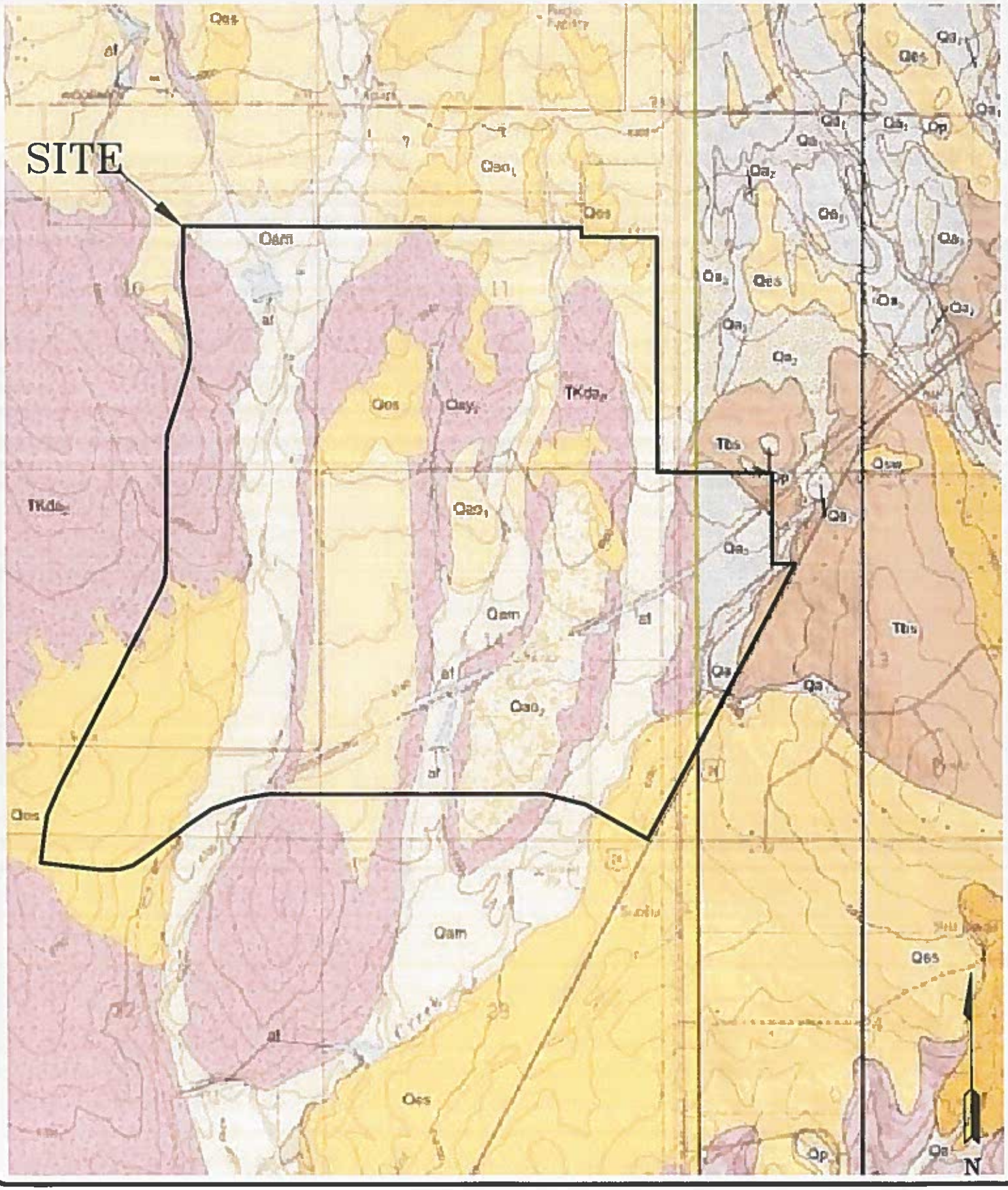
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SOIL SURVEY MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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FIG NO.: 5



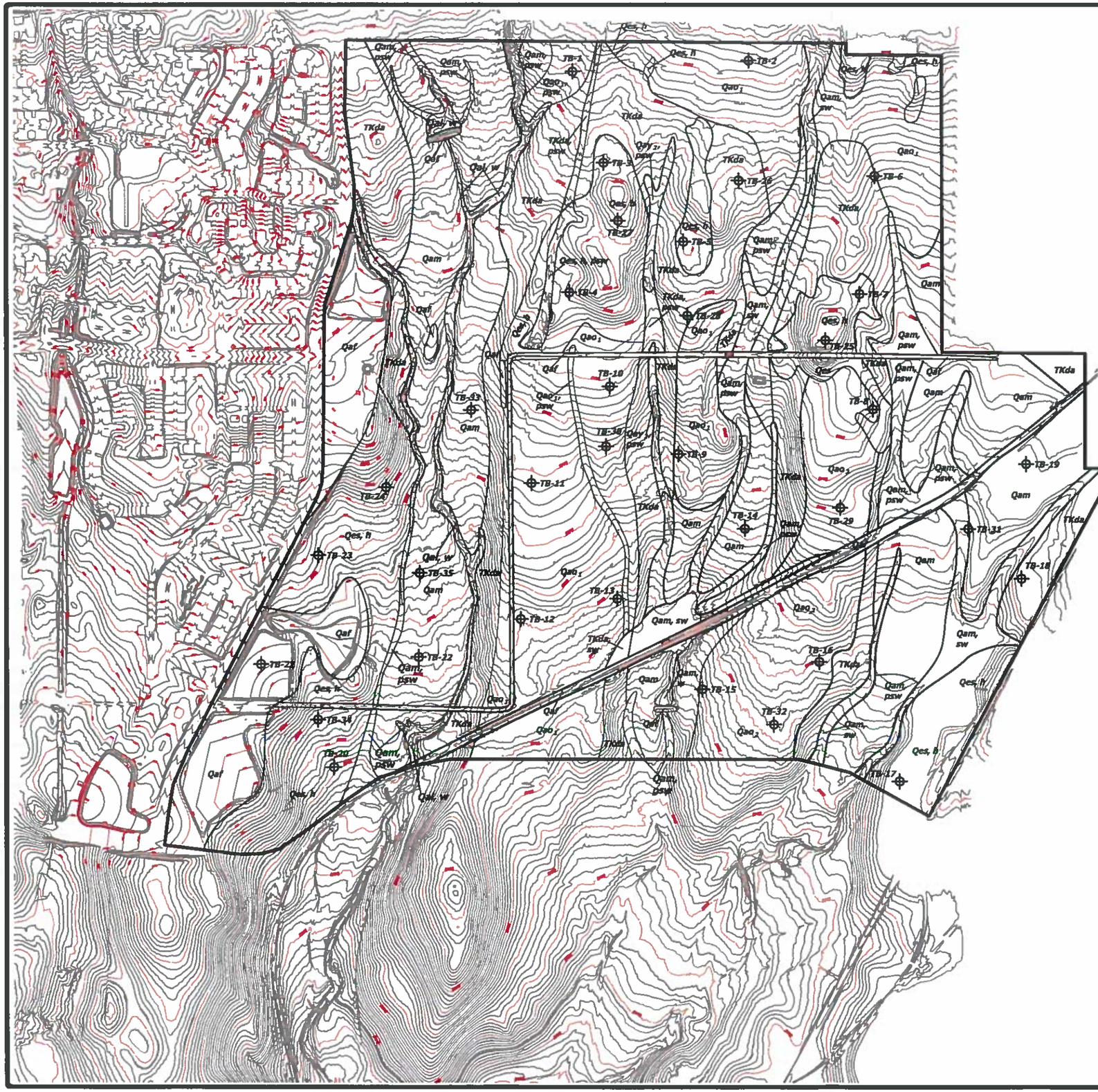
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FALCON NW & FALCON QUADRANGLES GEOLOGY MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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JOB NO.: 200393

FIG NO.: 6



Legend:

Qaf -	*Artificial Fill of Holocene Age:* Man-made fill deposits
Qal -	*Recent Alluvium of Holocene Age:* recent water deposited sediments
Qay_2 -	*Young Alluvium Two of Holocene Age:* water deposited sands, correlates wtih Piney Creek Alluvium
Qam -	*Middle Alluvium of Quaternary Age:* water deposited sand, terrace deposits
Qao_1 -	*Old Alluvium One of Quaternary Age:* water deposited sand, terrace deposits
Qao_2 -	*Old Alluvium Two of Quaternary Age:* water deposited sand, terrace deposits
Qes -	*Eolian Sand of Quaternary Age:* windblown sand deposits
Tkda -	*Dawson Formation of Tertiary to Cretaceou Age:* arkosic sandstone, with interbedded claystone and siltstone
h -	hydrocompaction
psw -	potentially seasonal shallow groundwater
sw -	seasonally shallow groundwater
w -	ponded water

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ENGINEERING GEOLOGY MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

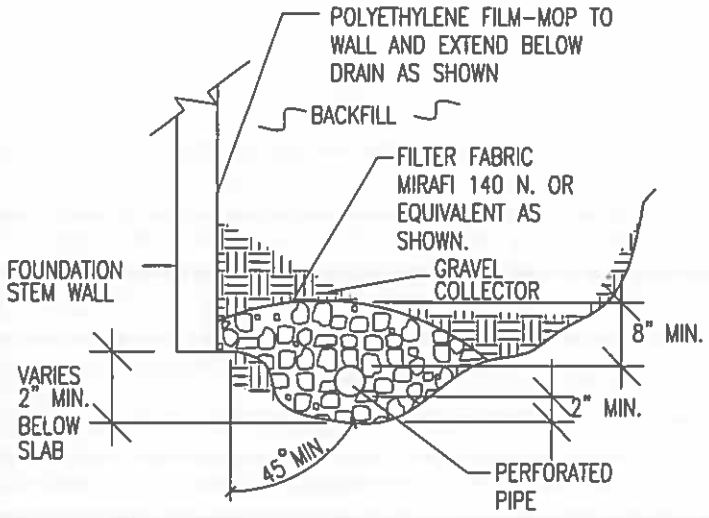
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SCALE	AS SHOWN
JOB NO.	150549
FIGURE No.	7

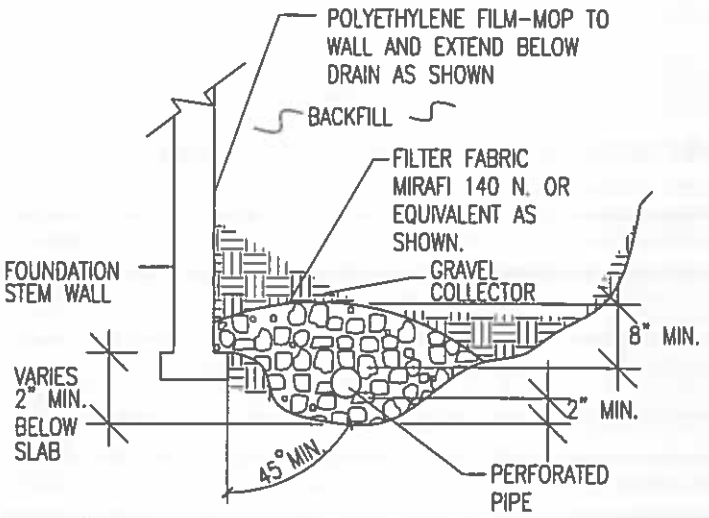
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FLOODPLAIN MAP
BANNING LEWIS RANCH
VILLAGES A, B, C, & D
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

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DATE	4/9/20
SCALE	AS SHOWN
JOB NO.	200393
FIGURE No.	8





NOTES:

-GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS–85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

-PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4-INCH DIAMETER IS MOST OFTEN USED.

-ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON–PERFORATED PIPE.

-FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

-MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

-DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUT FALL IS NOT AVAILABLE.

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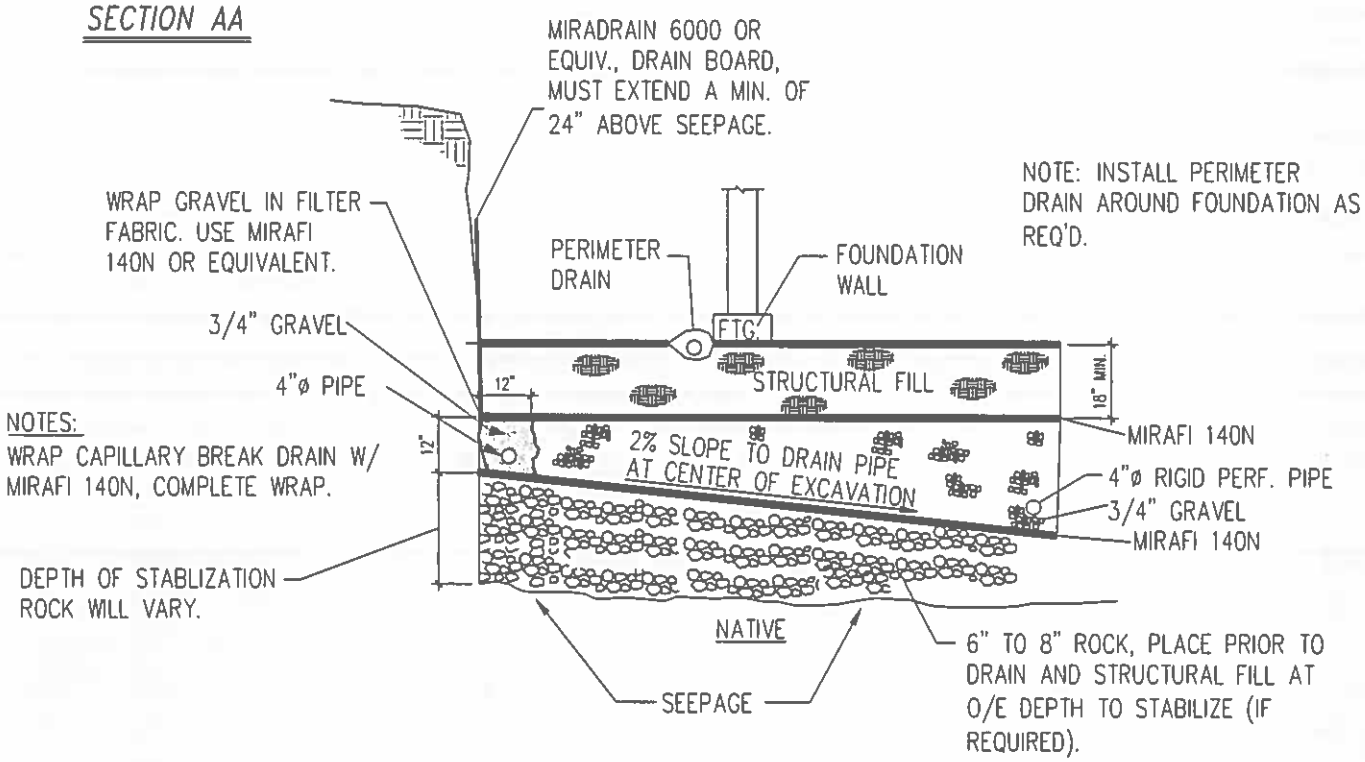
PERIMETER DRAIN DETAIL

DRAWN:	DATE:	DESIGNED:	CHECKED:
		DS	LLV

JOB NO.: 200393

FIG NO.: 9

SECTION AA



CROSS SECTION A–A

NOTE:

- THE DEPTH OF THE STABILIZATION ROCK MUST ALLOW FOR THE DRAIN AND STRUCTURAL FILL LAYER TO BE INSTALLED BELOW FOOTING LEVEL.

- THE DEPTH OF THE OVEREXCAVATION/ STABILIZATION WILL VARY. THE CONTRACTOR MUST VERIFY THAT THE STABILIZED ELEVATION ALLOWS FOR INSTALLATION OF THE DRAIN AND STRUCTURAL FILL LAYER.

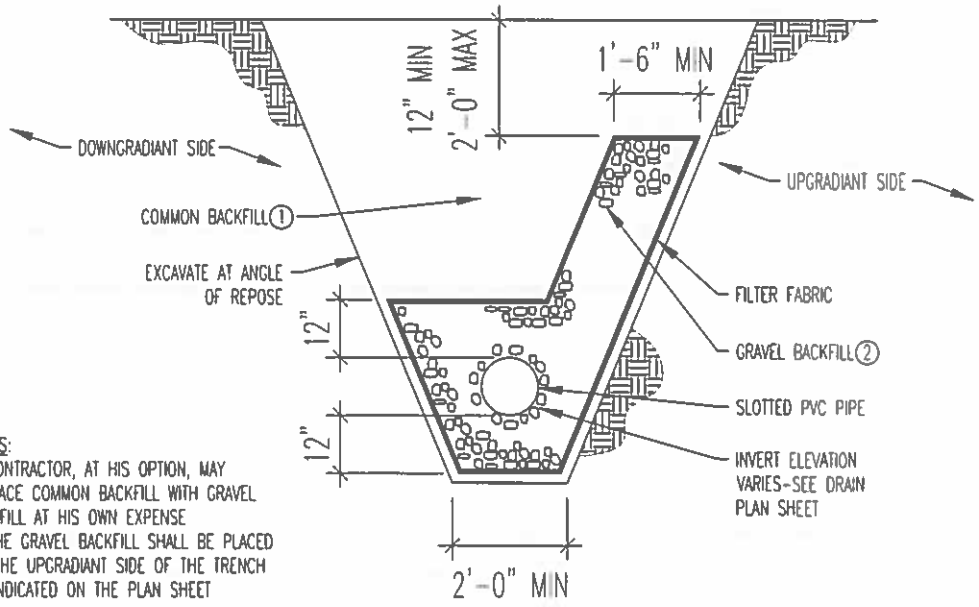
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CAPILLARY BREAK DRAIN DETAIL

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		DS	LLL

JOB NO. 200393

FIG. NO. 10

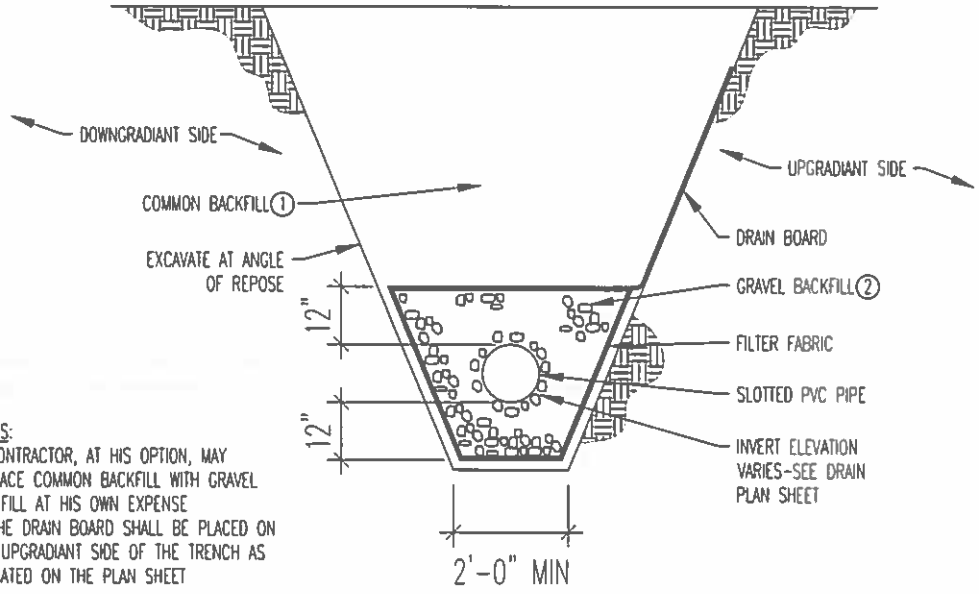


NOTES:
1. CONTRACTOR, AT HIS OPTION, MAY REPLACE COMMON BACKFILL WITH GRAVEL BACKFILL AT HIS OWN EXPENSE
2. THE GRAVEL BACKFILL SHALL BE PLACED ON THE UPGRADIANT SIDE OF THE TRENCH AS INDICATED ON THE PLAN SHEET

EXTEND PIPE TO DAYLIGHT

INTERCEPTOR DRAIN DETAIL

N.T.S.



NOTES:
1. CONTRACTOR, AT HIS OPTION, MAY REPLACE COMMON BACKFILL WITH GRAVEL BACKFILL AT HIS OWN EXPENSE
2. THE DRAIN BOARD SHALL BE PLACED ON THE UPGRADIANT SIDE OF THE TRENCH AS INDICATED ON THE PLAN SHEET

EXTEND PIPE TO DAYLIGHT

INTERCEPTOR DRAIN DETAIL

N.T.S.

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INTERCEPTOR DRAIN DETAIL			
DRAWN BY:	DATE:	DESIGNED: DS	CHECKED: LLL

JOB NO. 200393

FIG. NO. 11

APPENDIX A: Site Photographs



1

Looking east from southwest portion of the site.

March 27, 2020



2

Looking northeast from central portion of the site.

March 27, 2020

Job No. 200393



3

Looking north from central portion of the site.

March 27, 2020



4

Looking south from the northeastern portion of the site.

March 27, 2020

Job No. 200393



5

Looking west from the northeastern portion of the site.

March 27, 2020



6

Looking north from the northeaster portion of the site.

March 27, 2020

Job No. 200393



7

Looking northwest from the north-central portion of the site.

March 27, 2020



8

Looking west from the north-central portion of the site.

March 27, 2020

Job No. 200393



9

Looking south along Tamlin Road in the western portion of the site.

March 27, 2020



10

Looking southwest towards fill pile in the western portion of the site along Tamlin Road.

March 27, 2020

Job No. 200393



11

Looking west from Tamlin Road in the western portion of the site.

March 27, 2020



12

Looking northeast from Tamlin Road in the western portion of the site.

March 27, 2020

Job No. 200393



13

Looking south along drainage in the western portion of the site.

March 27, 2020



14

Looking north along drainage in the western portion of the site.

March 27, 2020

Job No. 200393



15

Looking north along dirt road in the western portion of the site.

March 7, 2020



16

Looking south towards fill in the western portion of the site.

March 7, 2020

Job No. 200393



17

Looking west from the southern portion of the site.

March 7, 2020



18

Looking west along railroad embankment in the southern portion of the site.

March 7, 2020

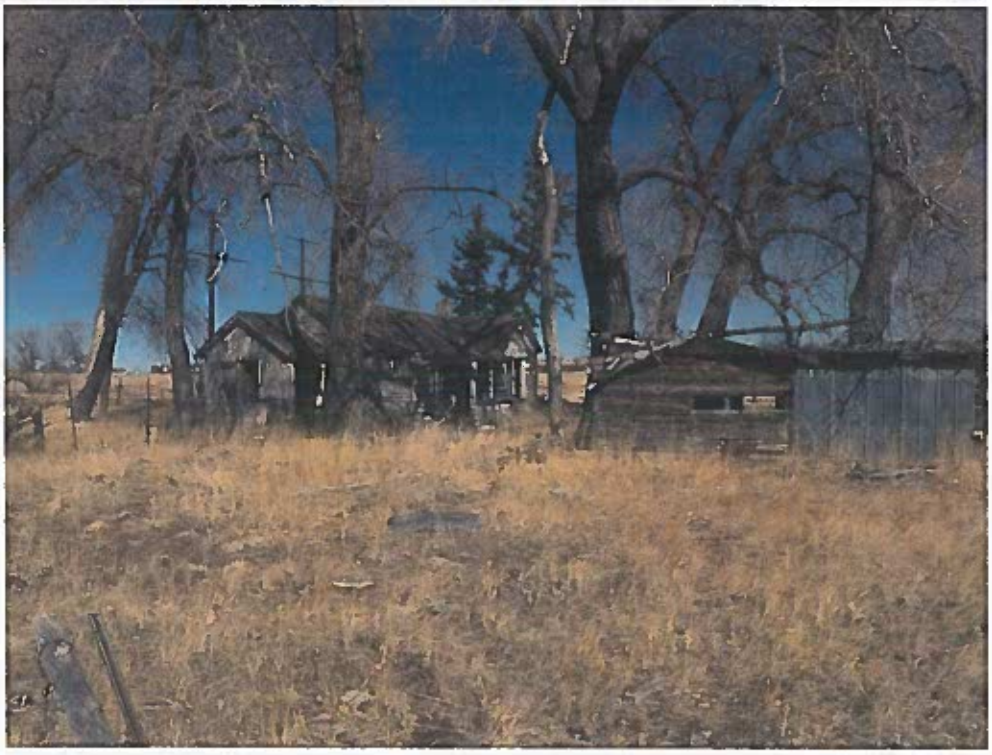
Job No. 200393



19

Looking northeast along railroad embankment in the southern portion of the site.

March 7, 2020



20

Looking northeast towards old house and shed in the southeastern portion of the site.

March 7, 2020

Job No. 200393



21

Looking west towards fill in southwestern portion of the site.

March 7, 2020



22

Looking north towards fill in southwestern portion of the site.

March 7, 2020

Job No. 200393



23

Looking west at old structure in the eastern central portion of the site.

March 7, 2020



24

Looking southwest at tank and old well in the eastern central portion of the site.

March 7, 2020

Job No. 200393

APPENDIX B: Test Boring Logs

TEST BORING NO. 1
DATE DRILLED 3/10/2020
Job # 200393

REMARKS

WATER @ 6', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			15	2.3	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN TO GRAY BROWN, MEDIUM DENSE, DRY TO MOIST
5			22	12.0	1	
10			50/10"	17.3	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, WET
15			50/9"	18.5	3	
20			50/6"	12.3	3	

TEST BORING NO. 2
DATE DRILLED 3/10/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 18', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			13	4.6	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST TO DRY
5			17	2.6	1	
10			50/10"	10.1	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE TO DENSE, MOIST
15			44	14.2	3	WEATHERED CLAYEY LENSES
20			50/7"	16.9	3	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/20/20

JOB NO.: 200393
FIG NO.: B- 1

TEST BORING NO. 3
DATE DRILLED 3/10/2020
Job # 200393

REMARKS

WATER @ 18', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			13	6.8	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST
5			18	5.0	1	
10			30	17.9	4	WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, BROWN TO GRAY BROWN, VERY STIFF TO HARD, MOIST
15			50/11"	16.9	4	
20			50/6"	9.3	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, VERY MOIST

TEST BORING NO. 4
DATE DRILLED 3/10/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

DRY TO 20', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			6	5.7	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST
5			5	10.2	1	
10			6	16.1	1	FINE GRAINED LENSES
15			20	11.7	1	
20			38	15.0	3	WEATHERED SANDSTONE, SILTY, FINE TO MEDIUM GRAINED, GRAY BROWN, DENSE, MOIST

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TEST BORING LOG

DRAWN:	DATE	CHECKED: LLL	DATE 3/26/20

JOB NO. 200393
FIG NO. B- 2

TEST BORING NO. 5
DATE DRILLED 3/10/2020
Job # 200393

REMARKS

WATER @ 19', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			14	10.4	2
			30	21.1	4
5					
			43	15.6	3
10					
			50/8"	16.7	3
15					
			50/6"	19.1	3
20					

6" TOPSOIL, CLAY, SANDY, SILTY, BROWN, FIRM, MOIST

WEATHERED SILTSTONE, CLAYEY, SANDY, BROWN, VERY STIFF, MOIST

WEATHERED TO FORMATIONAL SANDSTONE, VERY CLAYEY, FINE GRAINED, BROWN TO GRAY BROWN, VERY DENSE, MOIST

SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, VERY MOIST

TEST BORING NO. 6
DATE DRILLED 3/10/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 17', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			7	3.2	1
			11	3.5	1
5					
			28	17.3	2
10					
			42	20.0	4
15					
			50/8"	13.7	4
20					

6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, LOOSE TO MEDIUM DENSE, MOIST

CLAY, SANDY, GRAY BROWN, STIFF, MOIST

WEATHERED TO FORMATIONAL CLAYSTONE, SILTY, GRAY BROWN, VERY STIFF TO HARD, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/26/20

JOB NO. 200393
FIG NO. B- 3

TEST BORING NO. 7
DATE DRILLED 3/10/2020
Job # 200393

REMARKS

WATER @ 17', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			6	3.2	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, BROWN, LOOSE, MOIST
5			7	4.8	1	
10			8	18.8	2	CLAY, SANDY, BROWN, FIRM, MOIST
15			36	17.4	4	WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, GRAY BROWN, VERY STIFF TO HARD, MOIST
20			50/7"	16.6	4	

TEST BORING NO. 8
DATE DRILLED 3/10/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

DRY TO 20', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			11	4.9	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE TO LOOSE, MOIST
5			9	7.8	1	
10			12	13.2	1	
15			17	6.0	1	SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE TO DENSE, MOIST
20			30	3.2	1	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/26/20

JOB NO. 200393
FIG NO. B- 4

TEST BORING NO. 9
DATE DRILLED 3/12/2020
Job # 200393

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 19', 3/13/20						
6" TOPSOIL, CLAY, SANDY, GRAY BROWN, STIFF, MOIST				22	18.6	2
WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, GRAY BROWN, VERY STIFF TO HARD, MOIST	5			40	14.0	4
	10			50/7"	13.8	4
	15			50/7"	15.6	4
SANDSTONE, SILTY, FINE GRAINED, BLUE GRAY, VERY DENSE, MOIST	20			50/6"	14.9	3

TEST BORING NO. 10
DATE DRILLED 3/11/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 3/12/20						
6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, DRY TO MOIST				21	1.9	1
	5			13	4.5	1
WEATHERED TO FORMATIONAL CLAYSTONE, SILTY, GRAY BROWN, VERY STIFF TO HARD, MOIST	10			37	16.9	4
	15			39	15.5	4
	20			50/11"	13.2	4

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TEST BORING LOG

DRAWN:	DATE	CHECKED:	DATE:
		LLL	3/26/20

JOB NO: 200393
FIG NO: B- 5

TEST BORING NO. 11
DATE DRILLED 3/11/2020
Job # 200393

REMARKS

DRY TO 20', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			19	1.1	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY
5			27	1.3	1	
10			35	13.1	4	WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, GRAY BROWN, VERY STIFF TO HARD, MOIST
15			50 10"	19.9	4	
20			50 7"	14.8	4	

TEST BORING NO. 12
DATE DRILLED 3/11/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

DRY TO 20', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			11	1.7	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY TO MOIST
5			14	3.0	1	
10			20	17.5	2	CLAY, SILTY, BROWN, STIFF, MOIST
15			50 10"	19.1	4	CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST
20			50 8"	21.7	4	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/16/20

JOB NO.: 200393
FIG NO.: B- 6

TEST BORING NO. 13
DATE DRILLED 3/11/2020
Job # 200393

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 3/12/20						
6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, BROWN, MEDIUM DENSE TO LOOSE, MOIST				13	3.3	1
	5			5	4.0	1
CLAY, SANDY, BROWN, STIFF, MOIST	10			23	20.9	2
WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, GRAY BROWN, VERY STIFF TO HARD, MOIST	15			36	21.6	4
	20			50/6"	16.4	4

TEST BORING NO. 14
DATE DRILLED 3/10/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 3/12/20						
6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, DRY				6	1.3	1
	5			18	1.6	1
CLAY, SILTY, BROWN, STIFF, MOIST	10			18	22.7	2
CLAYSTONE, SILTY, GRAY BROWN, HARD, MOIST	15			50/11"	16.2	4
	20			50/10"	22.2	4

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/26/20

JOB NO.: 200393
FIG NO.: B- 7

TEST BORING NO. 15
DATE DRILLED 3/11/2020
Job # 200393

REMARKS

WATER @ 19', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			15	4.6	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST
5			12	13.9	2	CLAY, SANDY, BROWN, FIRM, MOIST
10			38	16.2	1	SAND, CLAYEY, FINE GRAINED, RUSTY BROWN, DENSE, MOIST
15			37	19.7	4	WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, DARK BROWN TO GRAY, VERY STIFF TO HARD, MOIST
20			50/9"	18.2	4	

TEST BORING NO. 16
DATE DRILLED 3/11/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 19', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			13	1.6	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE TO LOOSE, DRY TO MOIST
5			7	5.2	1	
10			18	13.4	1	SAND, CLAYEY, FINE GRAINED, RUSTY BROWN, MEDIUM DENSE, MOIST
15			50/10"	16.9	3	SANDSTONE, SILTY, FINE GRAINED, RUSTY BROWN TO BLUE GRAY, VERY DENSE, MOIST
20			50/7"	17.4	3	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/26/20

JOB NO.: 200393
FIG NO.: B- 8

TEST BORING NO. 17
DATE DRILLED 3/11/2020
Job # 200393

REMARKS

WATER @ 16', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			10	2.1	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, DARK BROWN, MEDIUM DENSE TO LOOSE, MOIST
5			4	3.9	1	
10			36	12.7	2	SAND, CLAYEY, FINE GRAINED, RUSTY BROWN, DENSE, MOIST
15			50/9"	14.4	3	SANDSTONE, SILTY, FINE GRAINED, GRAY BROWN, VERY DENSE, MOIST
20			50/8"	15.1	3	

TEST BORING NO. 18
DATE DRILLED 3/11/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 18', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			20	5.5	1	6" TOPSOIL, SAND, CLAYEY TO SILTY, FINE TO COARSE GRAINED, DARK BROWN TO BROWN, MEDIUM DENSE, MOIST
5			12	4.2	1	
10			35	14.5	4	WEATHERED TO FORMATIONAL CLAYSTONE, SILTY, GRAY BROWN, VERY STIFF TO HARD, MOIST
15			50/9"	13.6	4	
20			50/6"	11.8	4	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/26/20

JOB NO: 200393
FIG NO: B- 9

TEST BORING NO. 19
DATE DRILLED 3/11/2020
Job # 200393

REMARKS

DRY TO 20', 3/12/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			21	1.5	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY TO MOIST
5			18	2.4	1	
10			18	5.5	1	
15			24	19.6	2	CLAY, SANDY, BROWN, STIFF, MOIST
20			50/7"	12.8	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, RUSTY BROWN, VERY DENSE, MOIST

TEST BORING NO. 20
DATE DRILLED 3/12/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 19', 3/13/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			6	2.4	1	6" TOPSOIL, SAND, SILTY TO SLIGHTLY SILTY, FINE TO MEDIUM GRAINED, TAN, LOOSE TO MEDIUM DENSE, DRY TO WET
5			6	5.6	1	
10			7	4.3	1	
15			10	12.4	1	FINE GRAINED LENSES
20			7	26.0	1	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 3/26/20

JOB NO.: 200393
FIG NO.: B- 10

TEST BORING NO. 21
DATE DRILLED 3/12/2020
Job # 200393

REMARKS

WATER @ 19', 3/13/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			15	17.5	1
5			11	1.4	1
10			6	4.5	1
15			11	19.6	1
20			10	21.3	1

6" TOPSOIL, SAND, SILTY WITH ORGANICS, FINE TO MEDIUM GRAINED, BROWN TO TAN, MEDIUM DENSE TO LOOSE, DRY TO WET

FINE GRAINED LENSES

TEST BORING NO. 22
DATE DRILLED 3/12/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 5', 3/13/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			11	3.5	1
5			7	3.7	1
10			49	19.8	4
15			50/9"	17.4	4
20			50/10"	19.6	4

6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE TO LOOSE, MOIST

CLAYSTONE, SANDY, BLUE GRAY, VERY STIFF TO HARD, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/26/20

JOB NO. 200393
FIG NO. B-11

TEST BORING NO. 23
DATE DRILLED 3/12/2020
Job # 200393

REMARKS

WATER @ 16', 3/13/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			18	2.2	1
5			17	2.3	1
10			10	4.8	1
15			17	9.1	1
20			40	14.2	3

6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, DRY TO VERY MOIST

MEDIUM GRAINED LENSES

WEATHERED SANDSTONE, CLAYEY, FINE TO MEDIUM GRAINED, GRAY BROWN, DENSE, VERY MOIST

TEST BORING NO. 24
DATE DRILLED 3/12/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

DRY TO 20', 3/13/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			7	7.9	1
5			9	7.9	1
10			8	8.9	1
15			9	5.8	1
20			25	6.4	1

6" TOPSOIL, SAND, SILTY TO SLIGHTLY SILTY, FINE TO COARSE GRAINED, BROWN TO TAN, LOOSE TO MEDIUM DENSE, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/26/20

JOB NO.: 200393
FIG NO.: B- 12

TEST BORING NO. 25
DATE DRILLED 5/19/2020
Job # 200393

REMARKS

DRY TO 20', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			6	2.6	1
5			8	4.9	1
10			9	19.3	1
15			8	8.8	1
20			21	28.4	2

6" TOPSOIL, SAND, CLEAN TO SILTY, FINE TO MEDIUM GRAINED, FINE TO COARSE GRAINED, TAN, LOOSE, DRY TO MOIST

VERY SILTY LENSES

CLAY, SANDY, GRAY BROWN, STIFF, MOIST

TEST BORING NO. 26
DATE DRILLED 5/19/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

DRY TO 20', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			4	2.2	1
5			4	4.1	1
10			14	3.6	1
15			22	18.3	2
20			41	17.1	2

6" TOPSOIL, SAND, CLEAN TO SILTY, FINE TO MEDIUM GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST

CLAY, VERY SANDY TO SANDY, GRAY BROWN, STIFF TO VERY STIFF, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/17/20

JOB NO.: 200393
FIG NO.: B- 13

TEST BORING NO. 27
DATE DRILLED 5/19/2020
Job # 200393

REMARKS

WATER @ 14.5', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			8	1.7	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST
5			19	5.1	1	
10			32	11.6	1	SAND, CLAYEY, FINE TO COARSE GRAINED, TAN, DENSE, MOIST
15			40	16.0	2	CLAY, SANDY, GRAY BROWN, VERY STIFF, MOIST ▼
20			50/11"	22.7	4	SILTSTONE, CLAYEY, SANDY, GRAY BROWN, HARD, MOIST

TEST BORING NO. 28
DATE DRILLED 5/19/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

DRY TO 20', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			27	1.1	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE TO VERY DENSE, DRY
5			50	2.0	1	
10			20	21.0	2	CLAY, SANDY, GRAY BROWN, STIFF TO VERY STIFF, MOIST
15			43	22.2	2	
20			50/8"	20.8	4	SILTSTONE, CLAYEY, SANDY, GRAY BROWN, HARD, MOIST

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 6/17/20

JOB NO.: 200393
FIG NO.: B- 14

TEST BORING NO. 29
DATE DRILLED 5/19/2020
Job # 200393

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 5/27/20						
6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE TO DENSE, MOIST				23	2.6	1
	5			34	5.8	1
	10			15	5.6	1
	15			11	10.4	1
COARSE GRAINED LENSES	20			25	6.0	1

TEST BORING NO. 30
DATE DRILLED 5/19/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
DRY TO 20', 5/27/20						
6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY				15	1.7	1
CLAY, SANDY, GRAY BROWN, STIFF, MOIST	5			27	16.5	2
SILTSTONE, CLAYEY, SANDY, GRAY BROWN, HARD, MOIST	10			50/8"	17.9	4
	15			50/8"	19.8	4
	20			50/5"	14.1	4

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/17/20

JOB NO. 200393
FIG NO. B- 15

TEST BORING NO. 31
DATE DRILLED 5/19/2020
Job # 200393

REMARKS

WATER @ 16.5', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			30	1.9	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, DENSE, DRY TO MOIST
5			35	4.1	1	
10			18	4.2	1	
15			15	25.2	2	CLAY, VERY SANDY, BROWN, STIFF, MOIST
20			50/9"	13.6	3	SANDSTONE, CLAYEY, FINE TO MEDIUM GRAINED, GRAY BROWN, VERY DENSE, MOIST

TEST BORING NO. 32
DATE DRILLED 5/19/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 19.5', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			34	3.3	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, DENSE, MOIST
5			50/10"	1.6	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, DRY
10			50/6"	16.5	3	SANDSTONE, VERY CLAYEY, FINE GRAINED, GRAY BROWN, VERY DENSE, MOIST
15			42	41.8	4	WEATHERED ZONE CLAYSTONE, SANDY, DARK BROWN, VERY STIFF, MOIST SILTSTONE, CLAYEY, SANDY, GRAY BROWN, HARD, MOIST
20			50/10"	22.9	4	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/17/20

JOB NO.: 200393
FIG NO.: B- 16

TEST BORING NO. 33
DATE DRILLED 5/20/2020
Job # 200393

REMARKS

WATER @ 13', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			9	3.3	1	6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST TO DRY
5			20	1.2	1	
10			31	25.2	2	CLAY, SANDY, BLUE GRAY, VERY STIFF, MOIST
15			50/11"	17.3	4	SILTSTONE, CLAYEY, SANDY, BLUE GRAY, HARD, MOIST
20			50/7"	19.6	4	

TEST BORING NO. 34
DATE DRILLED 5/20/2020
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 12.5', 5/27/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			9	3.9	1	6" TOPSOIL, SAND, SILTY, FINE TO MEDIUM GRAINED, BROWN TO TAN, LOOSE, MOIST TO WET
5			9	5.3	1	
10			7	11.6	1	SAND, VERY SILTY, FINE GRAINED, TAN, LOOSE TO VERY LOOSE, MOIST TO WET
15			4	27.2	1	
20			2	27.7	1	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/17/20

JOB NO.: 200393
FIG NO.: B- 17

TEST BORING NO. 35
DATE DRILLED 5/20/2020
Job # 200393

TEST BORING NO.
DATE DRILLED
CLIENT OAKWOOD HOMES
LOCATION BLR - VILLAGES A, B, C, D

REMARKS

WATER @ 13.5', 5/27/20

REMARKS

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Description
			13	2.5	1	6" TOPSOIL, SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE TO DENSE, DRY TO MOIST
5			12	8.0	1	
10			41	3.8	1	
15			9	36.3	2	CLAY, SANDY, BLUE GRAY, FIRM, WET
20			36	30.5	4	WEATHERED SILTSTONE, CLAYEY, SANDY, BLUE GRAY, VERY STIFF, WET

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5					
10					
15					
20					

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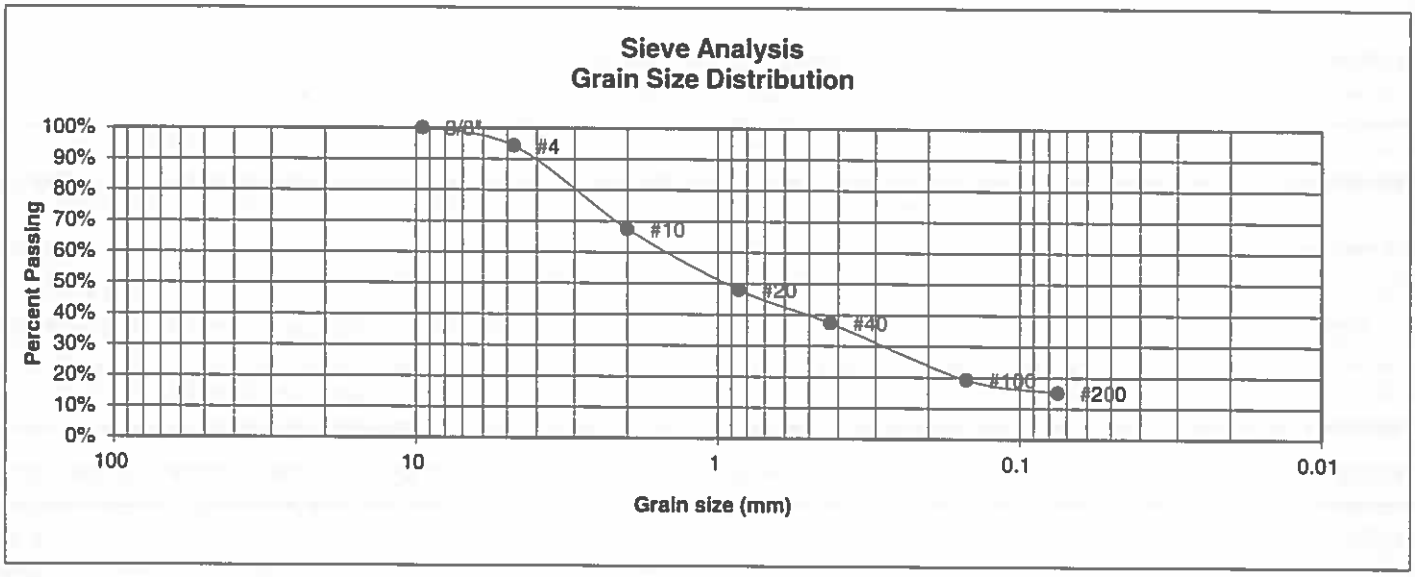
TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/17/20

JOB NO.: 200393
FIG NO.: B- 18

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	1	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.3%
10	67.5%
20	48.0%
40	37.4%
100	19.3%
200	15.2%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

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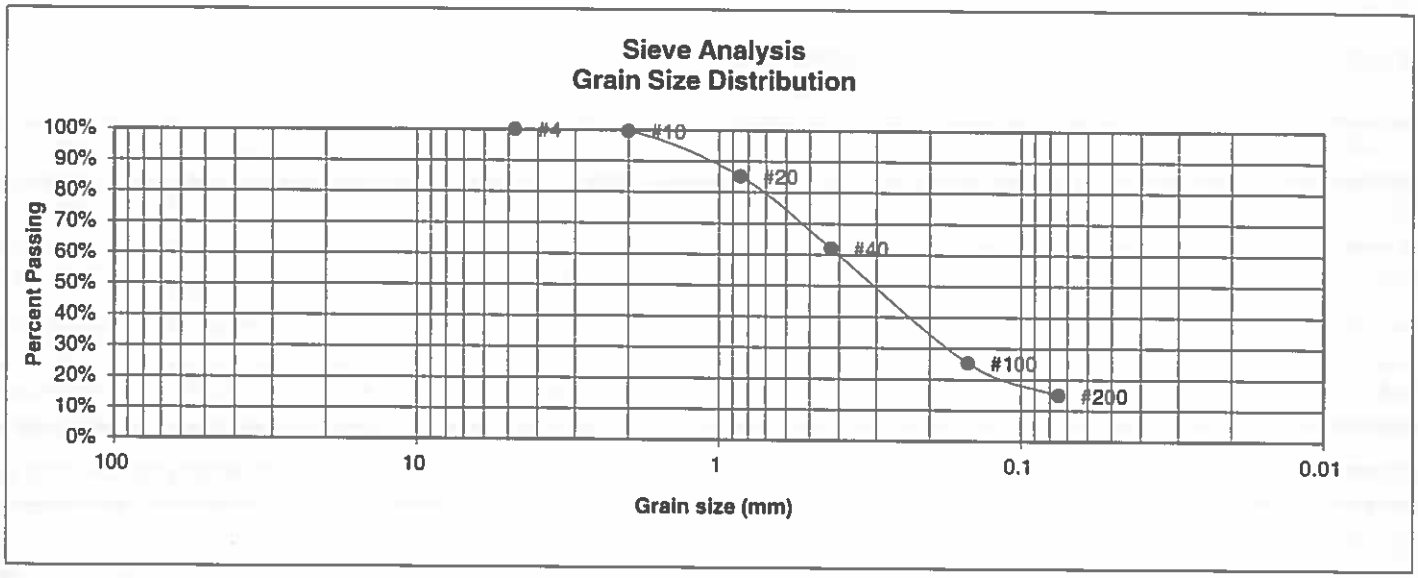
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-1

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	4	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.6%
20	85.2%
40	62.0%
100	25.3%
200	14.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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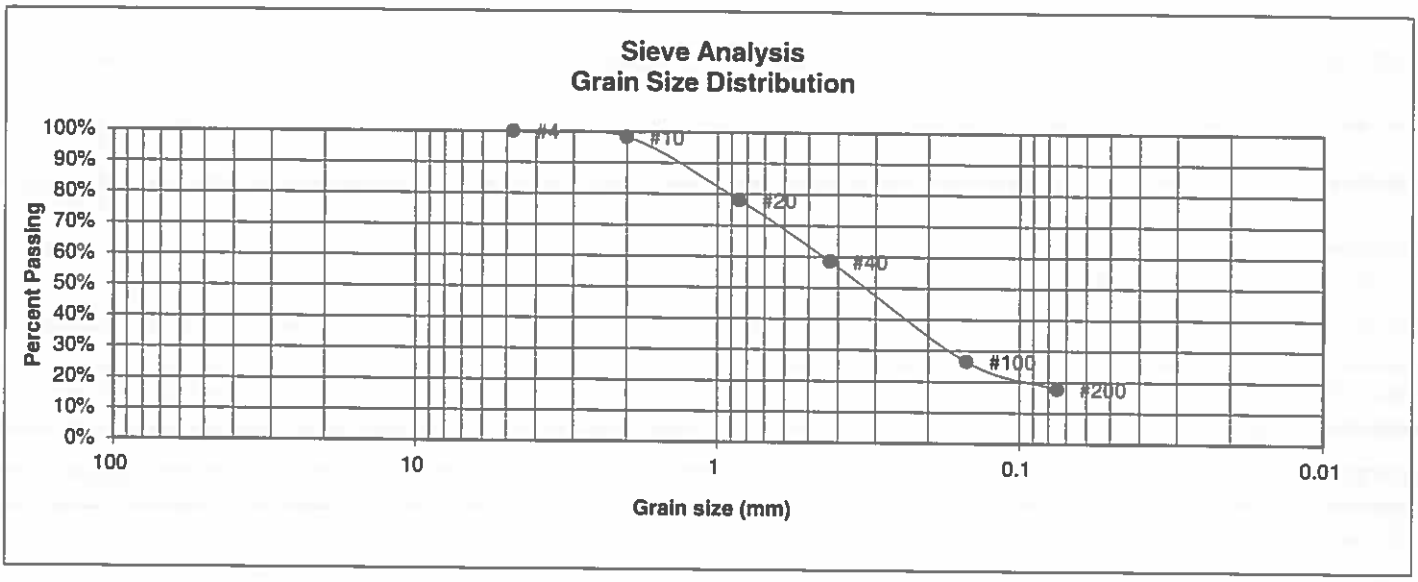
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-2

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	8	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.2%
20	78.1%
40	58.6%
100	26.5%
200	17.8%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

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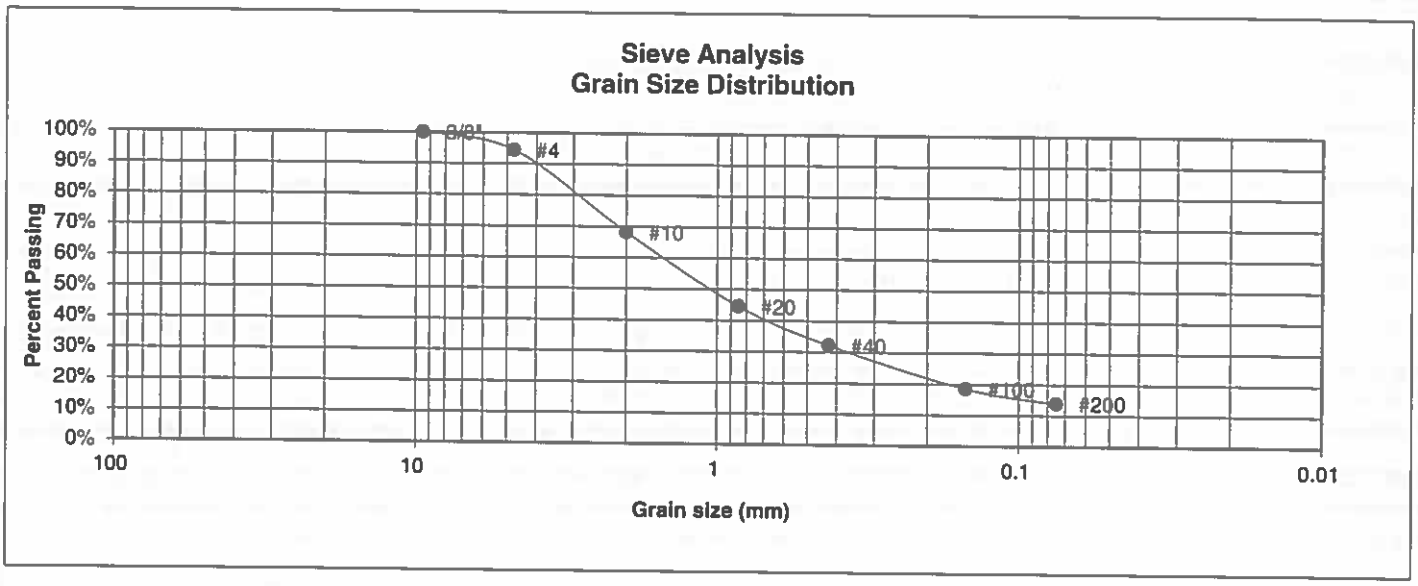
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-3

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	11	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.5%
10	68.2%
20	44.6%
40	32.2%
100	18.5%
200	13.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

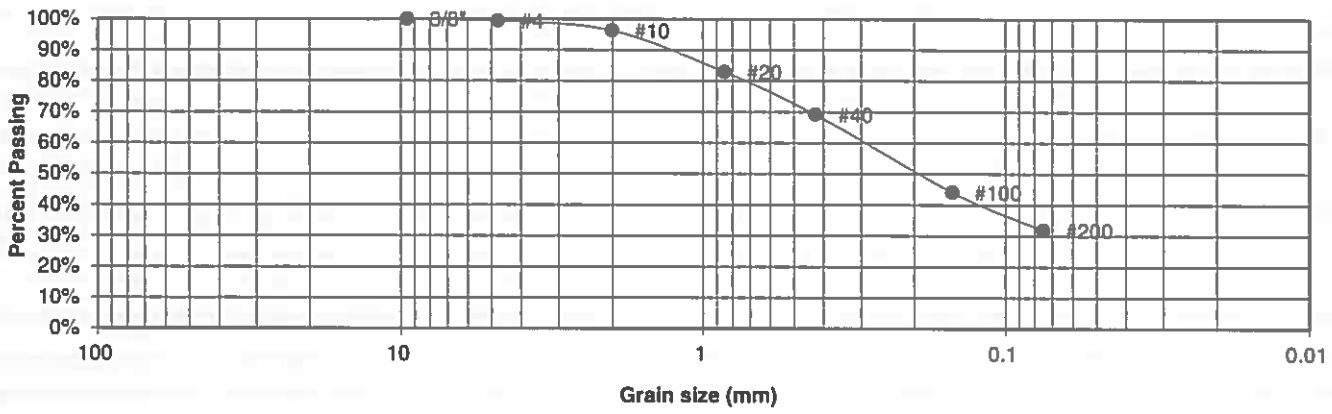
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-4

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	13	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.4%
10	96.3%
20	82.9%
40	69.2%
100	44.1%
200	31.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

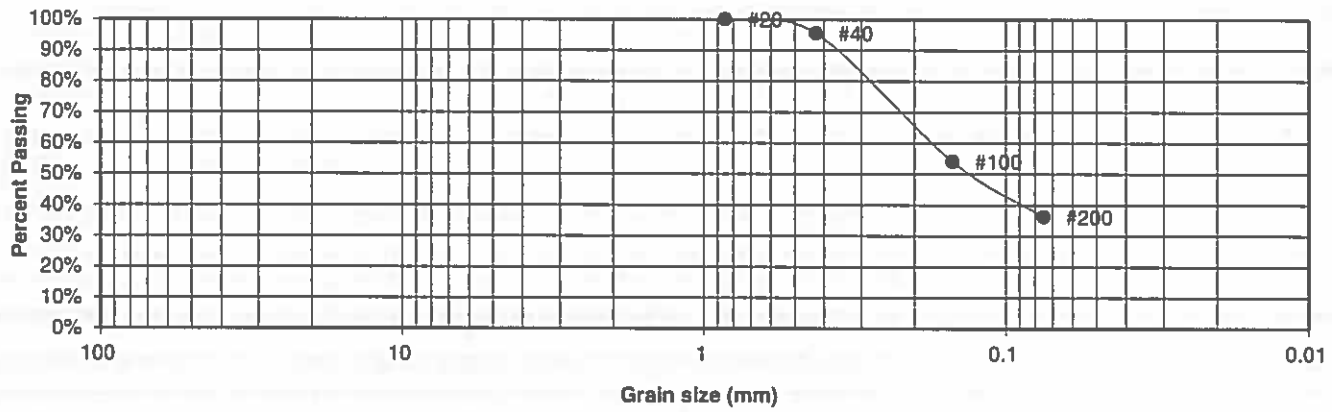
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO: 200393

FIG NO: C-5

UNIFIED CLASSIFICATION	SC	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	15	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	95.5%
100	54.1%
200	36.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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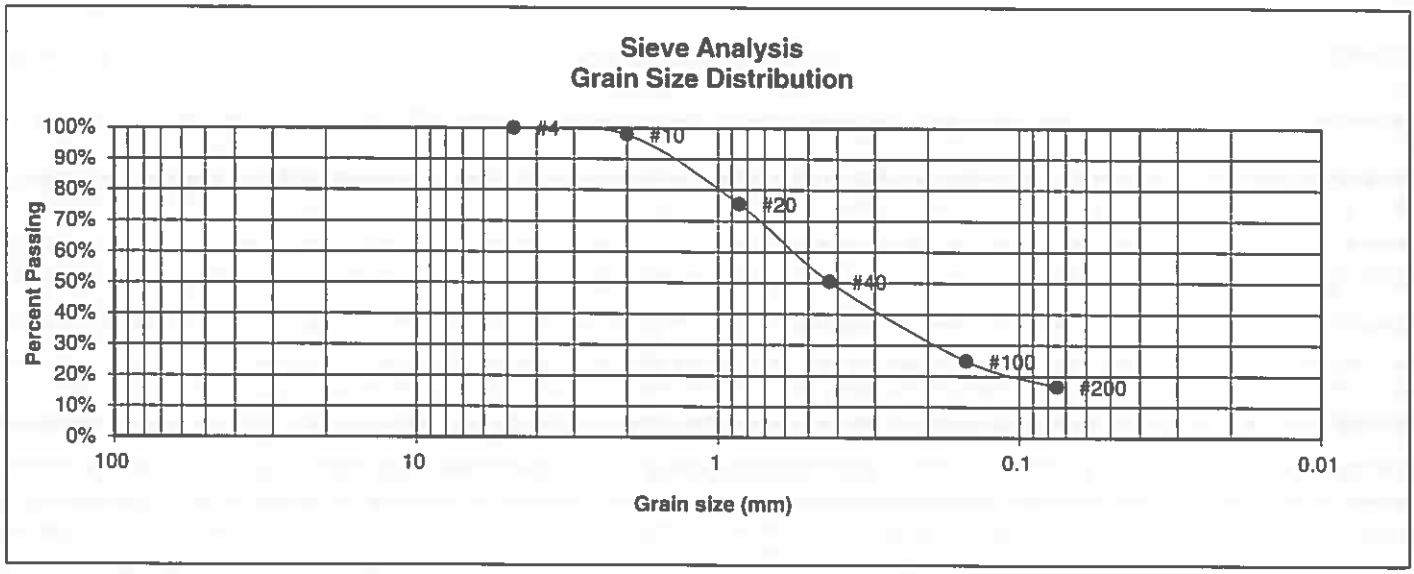
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-5

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	16	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	97.9%
20	75.5%
40	50.5%
100	24.9%
200	16.6%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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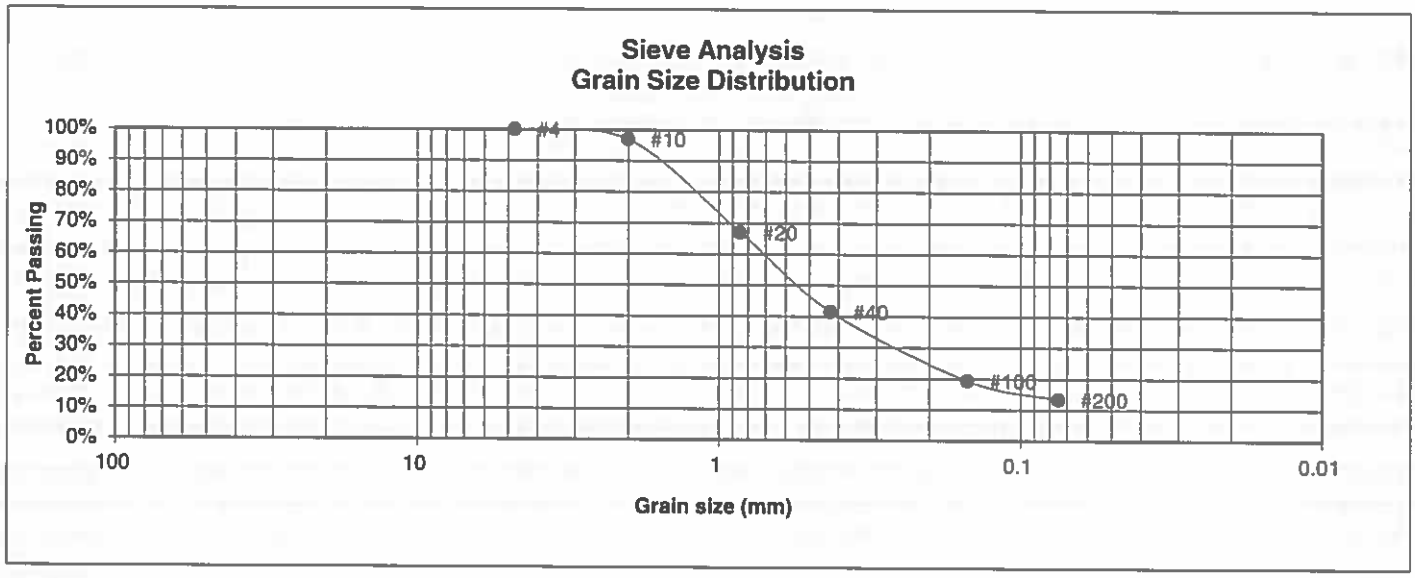
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-6

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	19	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	97.0%
20	67.0%
40	41.5%
100	19.4%
200	13.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

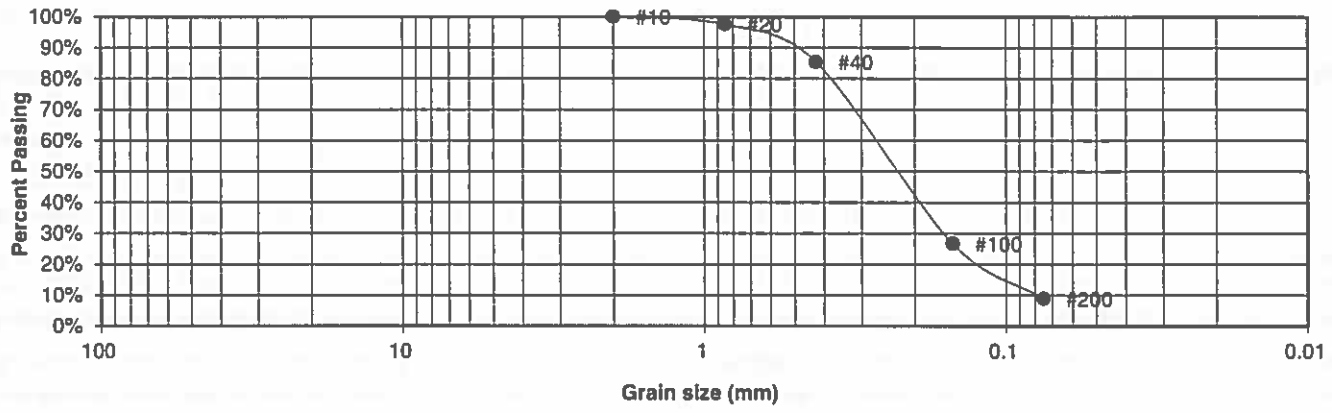
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-7

UNIFIED CLASSIFICATION	SM-SW	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	20	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	97.6%
40	85.4%
100	26.7%
200	9.0%

Atterberg Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell

Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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LABORATORY TEST RESULTS

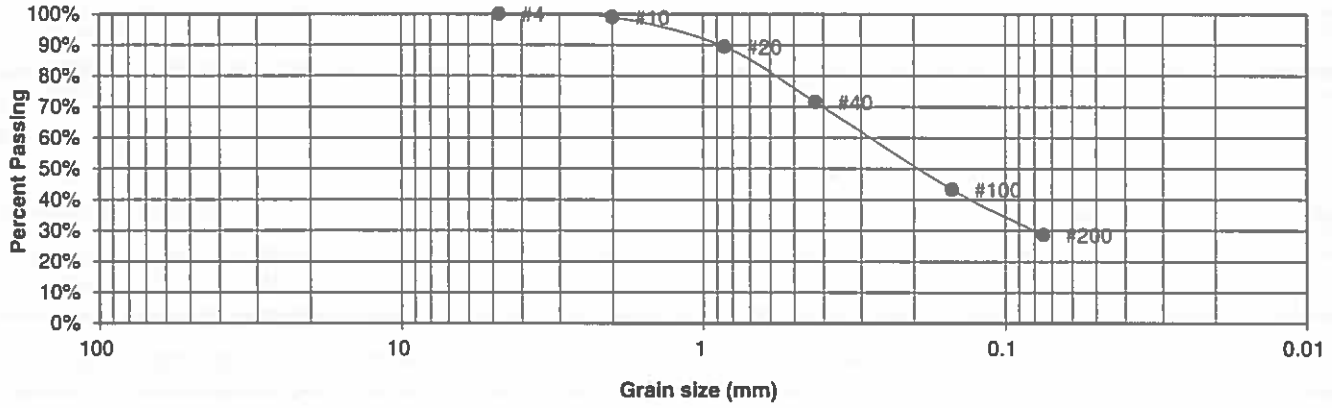
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-8

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	21	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.0%
20	89.5%
40	71.5%
100	43.3%
200	28.6%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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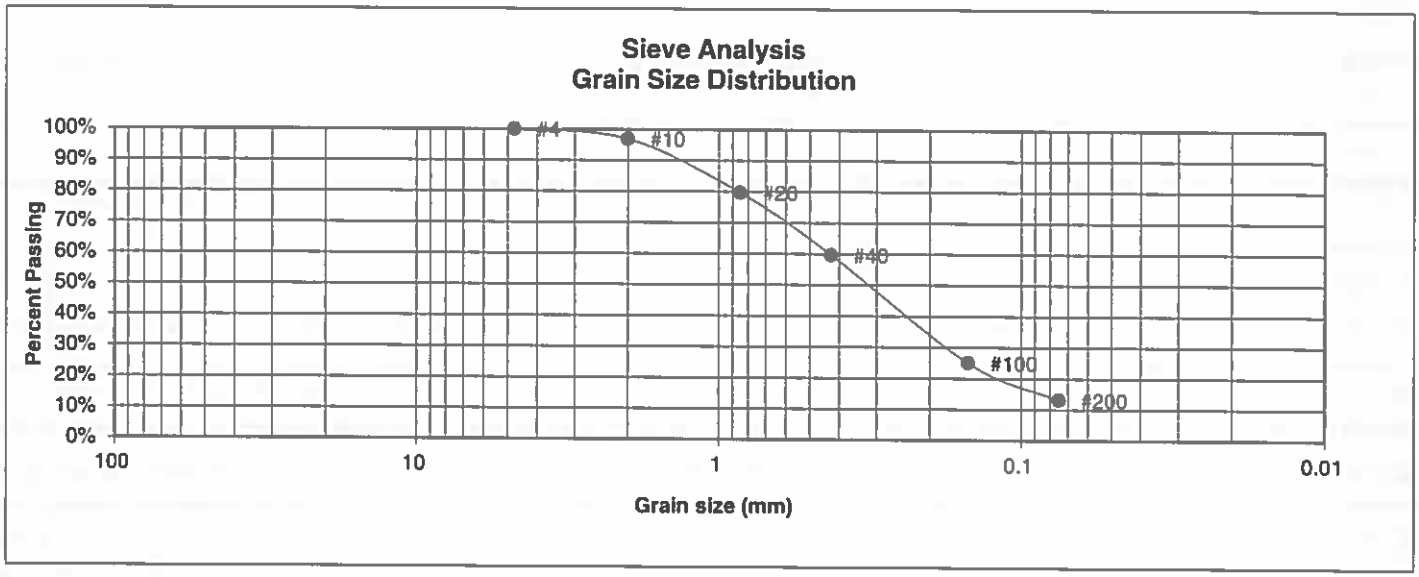
LABORATORY TEST RESULTS

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		LLL	3/27/20

JOB NO.: 200393

FIG NO.: L-9

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	23	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	96.9%
20	79.7%
40	59.7%
100	25.1%
200	13.1%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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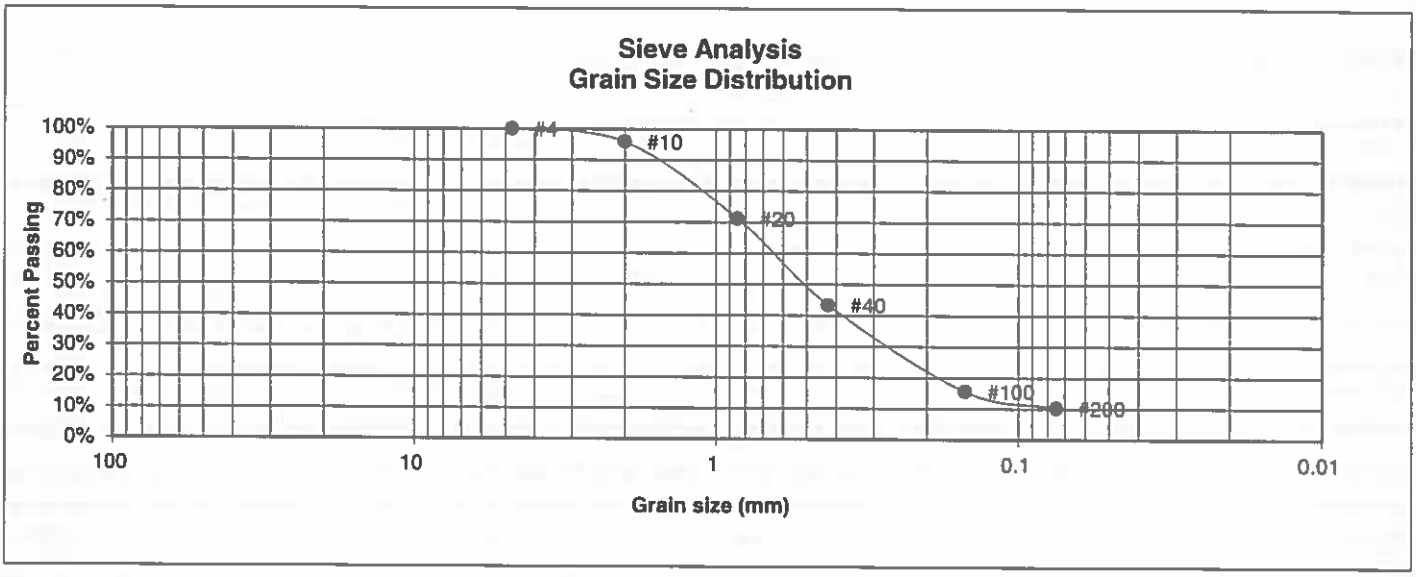
LABORATORY TEST RESULTS

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		LLL	3/27/20

JOB NO: 200393

FIG NO: C-16

UNIFIED CLASSIFICATION	SM-SW	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	24	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	95.9%
20	71.2%
40	43.4%
100	15.6%
200	10.3%

Atterberg Limits	
Plastic Limit	
Liquid Limit	
Plastic Index	

Swell	
Moisture at start	10.6%
Moisture at finish	23.1%
Moisture increase	12.4%
Initial dry density (pcf)	101
Swell (psf)	30

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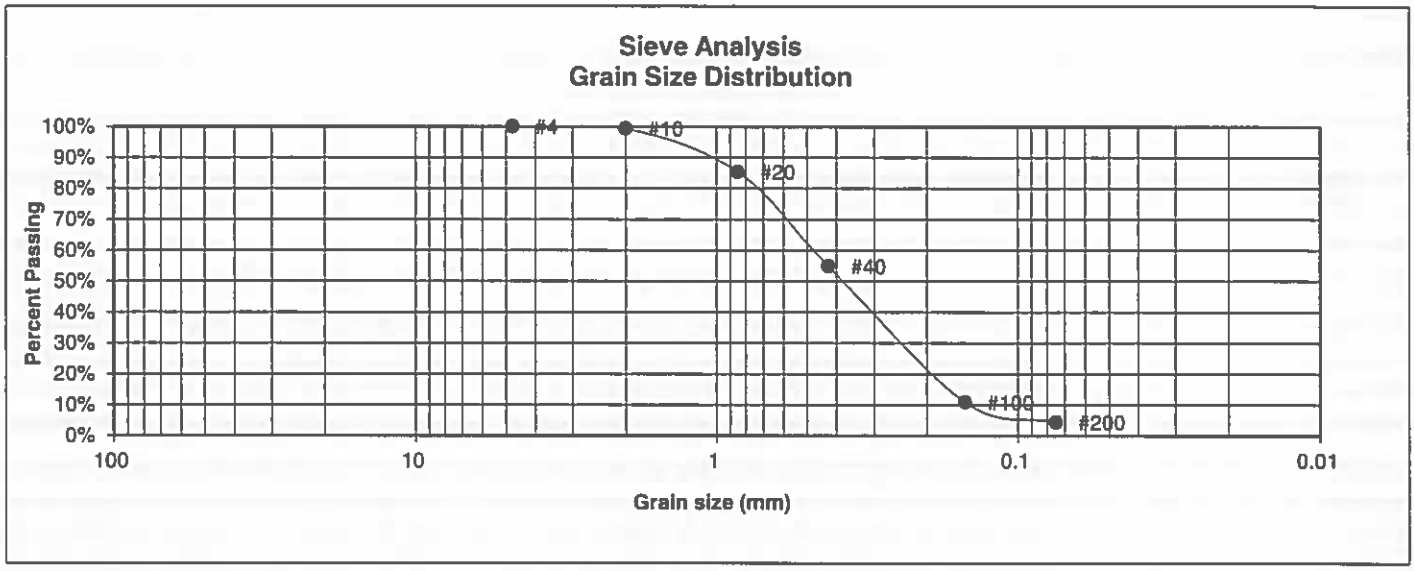
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO: 200393

FIG NO: C-11

UNIFIED CLASSIFICATION	SP	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	25	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.4%
20	85.4%
40	54.8%
100	10.9%
200	4.5%

Atterberg Limits	
Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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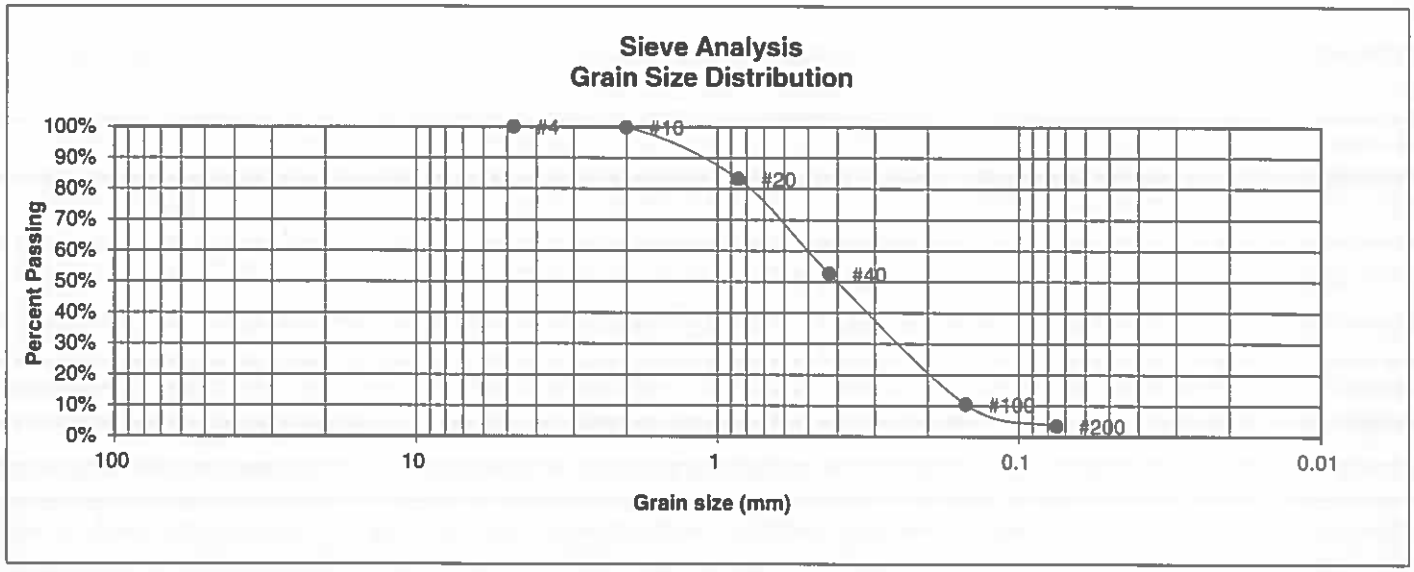
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 6/5/20

JOB NO.: 200393

FIG NO.: C-12

UNIFIED CLASSIFICATION	SP	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	26	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	83.1%
40	52.5%
100	10.5%
200	3.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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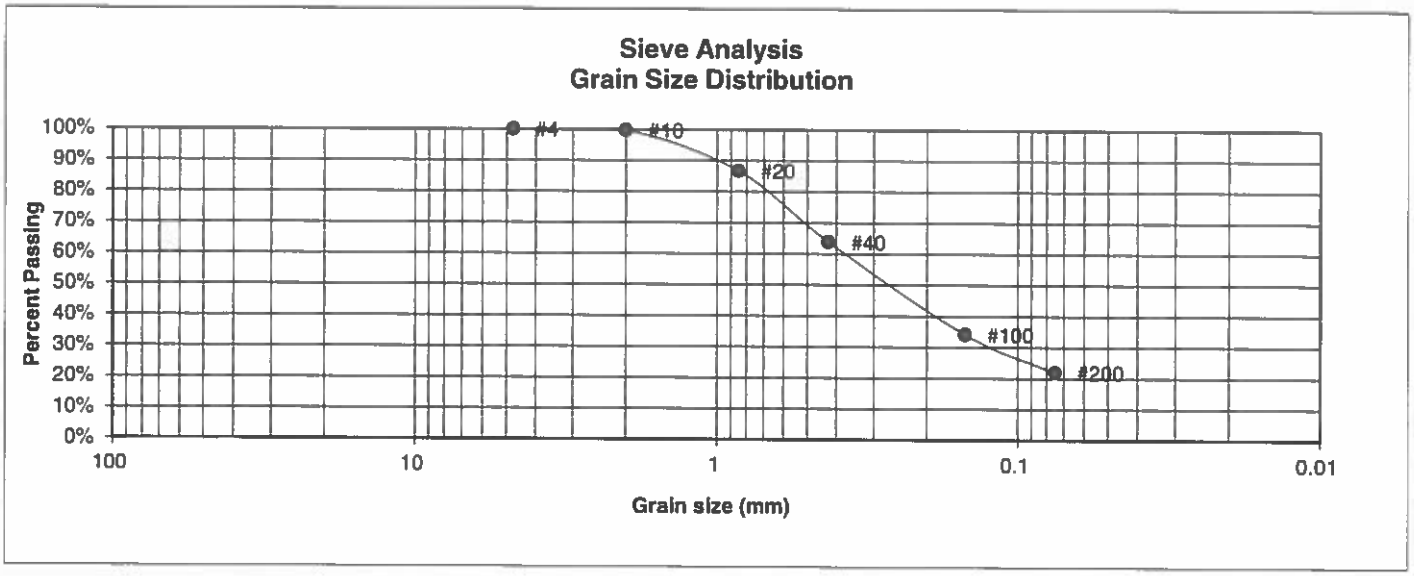
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/12

JOB NO.: 200393

FIG NO.: C-13

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	29	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	86.7%
40	63.9%
100	34.1%
200	22.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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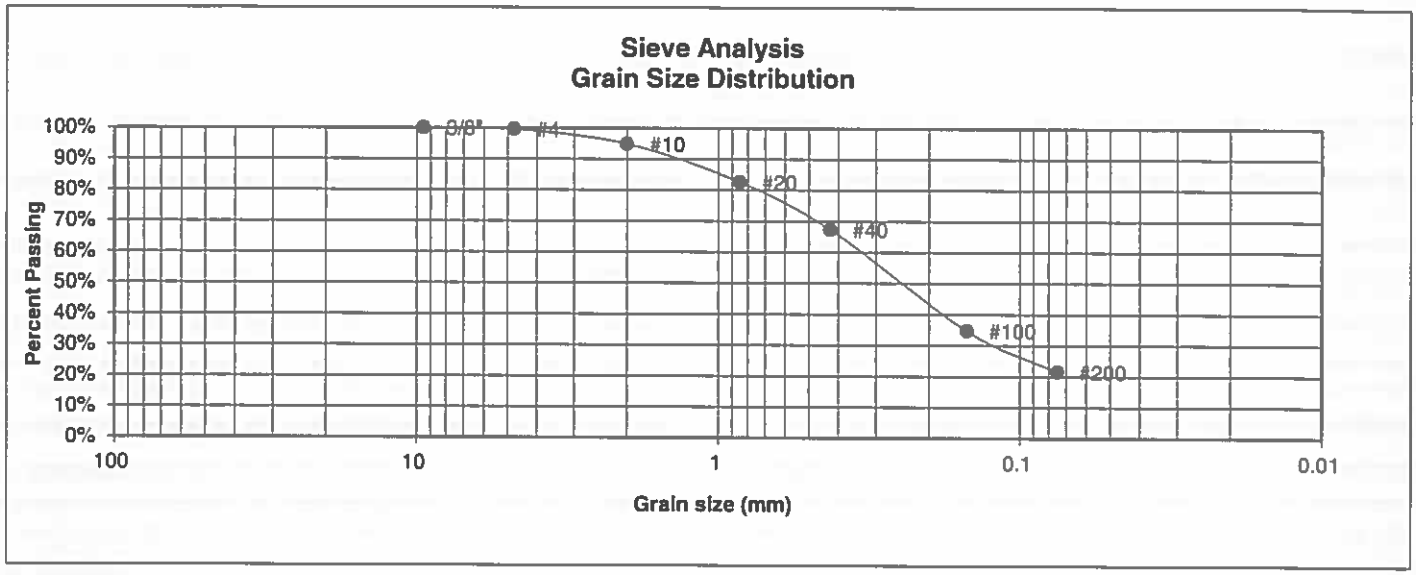
LABORATORY TEST RESULTS

DRAWN:	DATE	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-14

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	31	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.5%
10	94.8%
20	82.6%
40	67.3%
100	34.7%
200	21.5%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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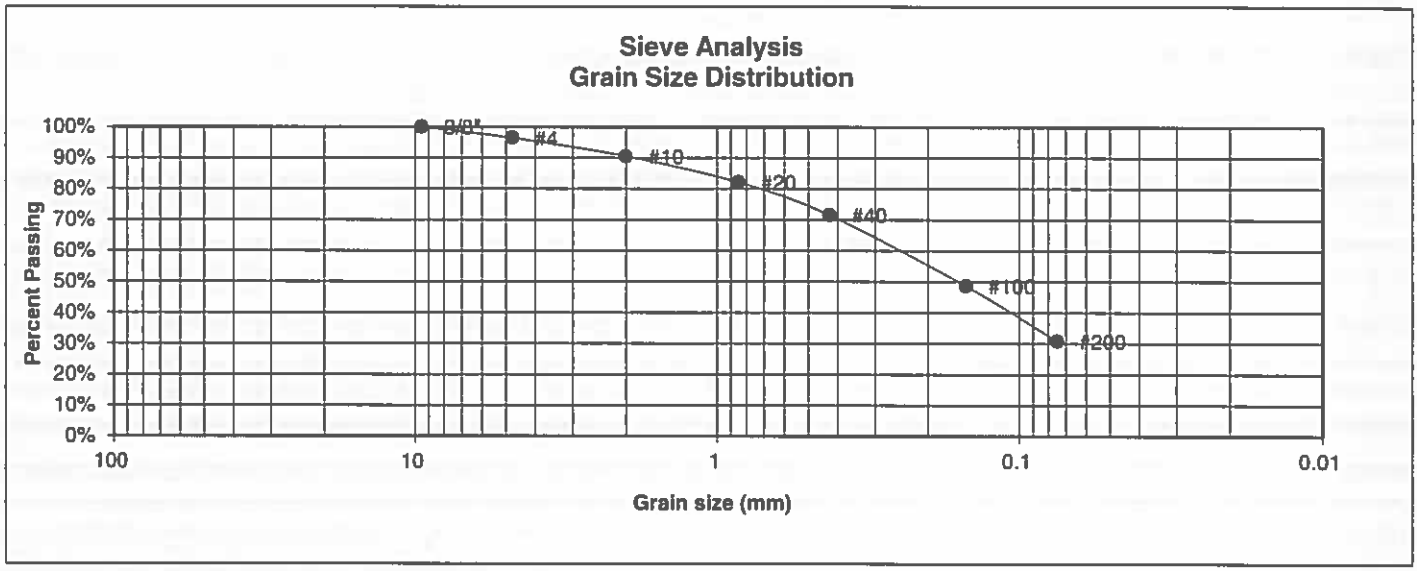
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: L-15

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	33	JOB NO.	200393
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.4%
10	90.5%
20	82.1%
40	71.6%
100	48.7%
200	30.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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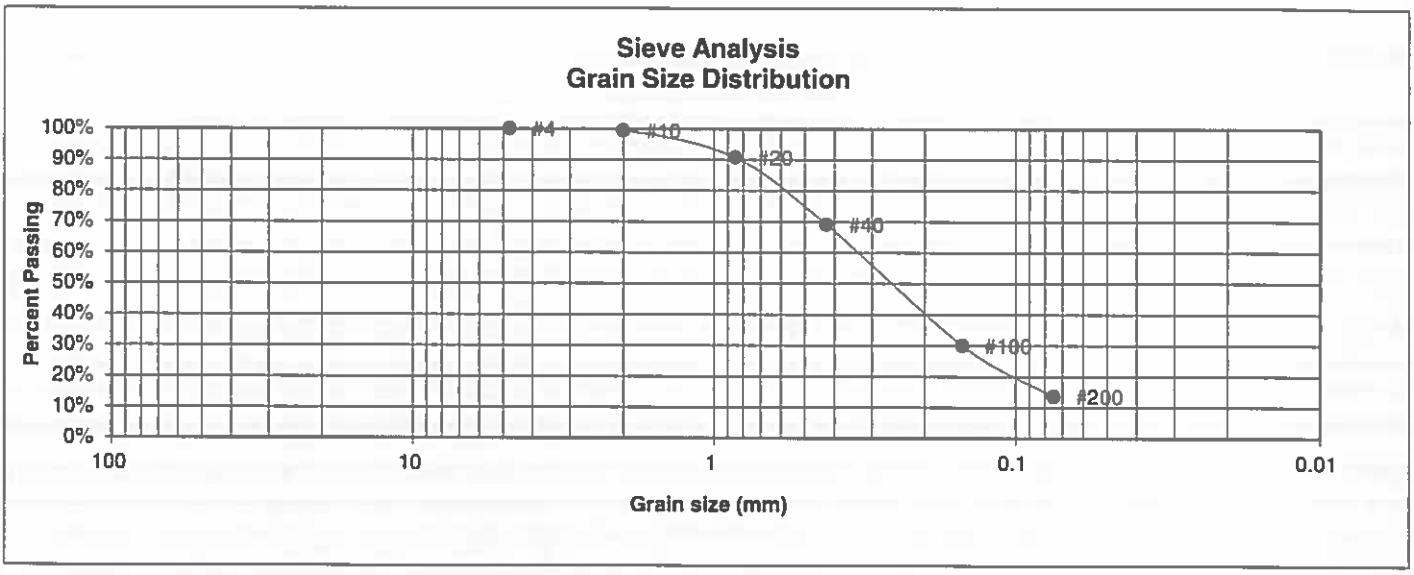
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-16

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	34	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.4%
20	90.8%
40	69.1%
100	30.0%
200	13.5%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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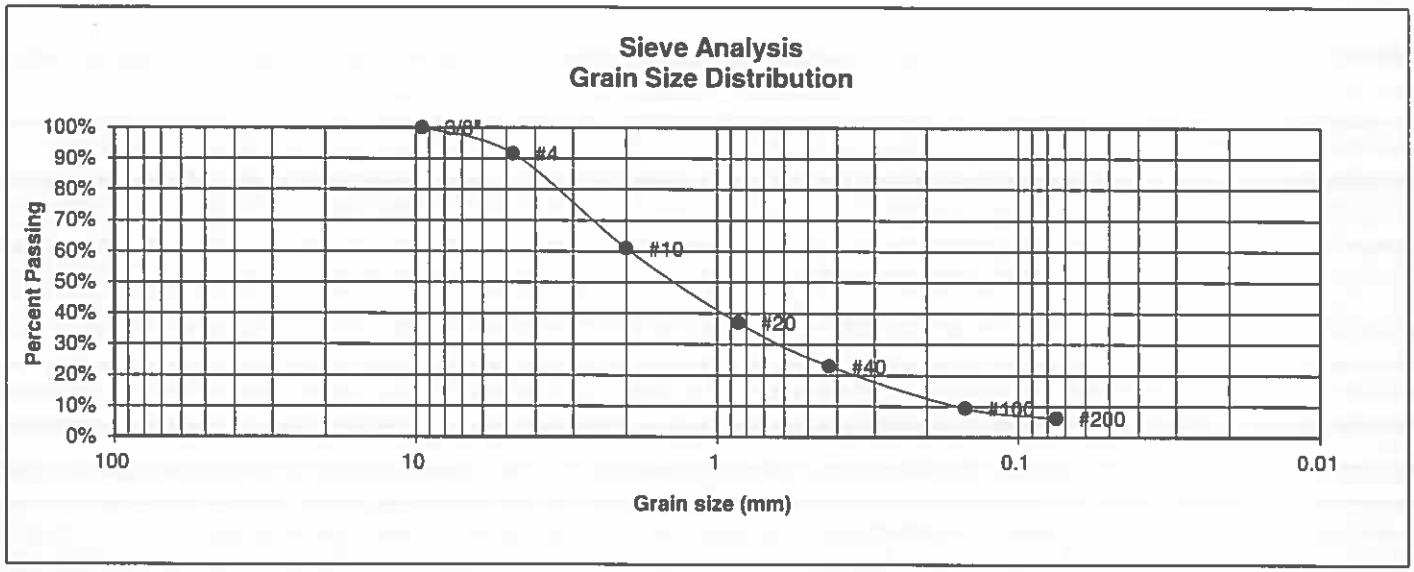
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-17

UNIFIED CLASSIFICATION	SM-SW	CLIENT	OAKWOOD HOMES
SOIL TYPE #	1	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	35	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.6%
10	61.0%
20	37.0%
40	23.0%
100	9.4%
200	6.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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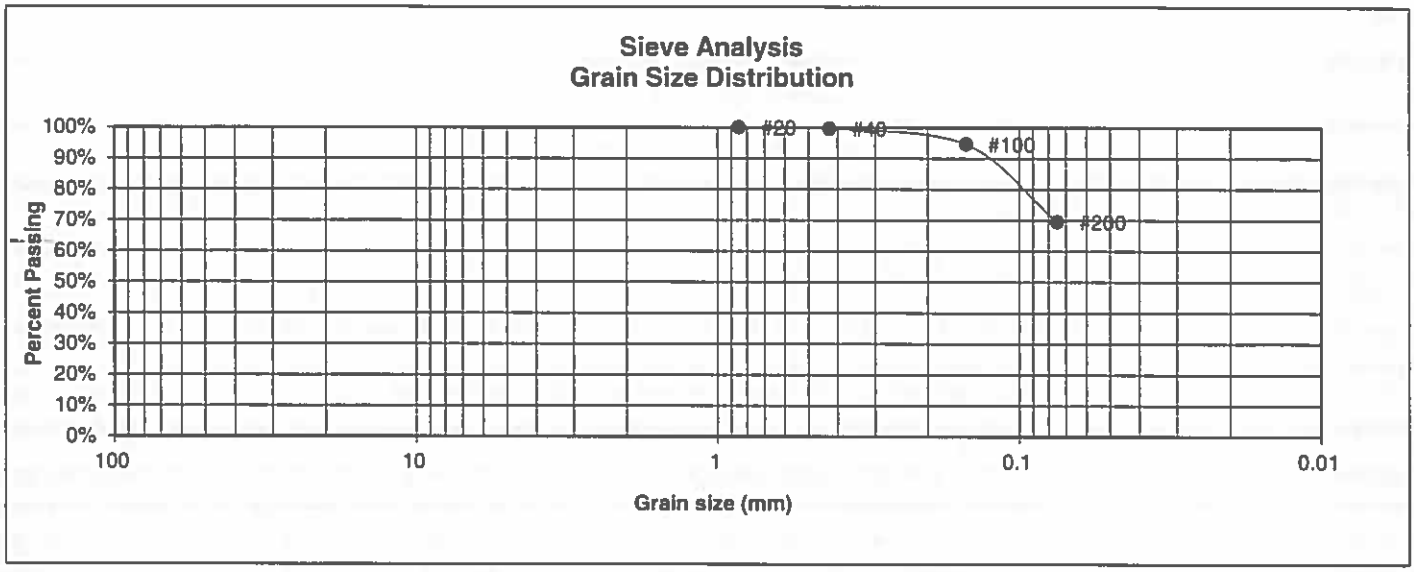
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 6/5/20

JOB NO.: 200393

FIG NO.: C-18

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	7	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.6%
100	94.6%
200	69.5%

Atterberg Limits	
Plastic Limit	
Liquid Limit	
Plastic Index	
Swell	
Moisture at start	20.9%
Moisture at finish	24.7%
Moisture increase	3.8%
Initial dry density (pcf)	94
Swell (psf)	820

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LABORATORY TEST RESULTS

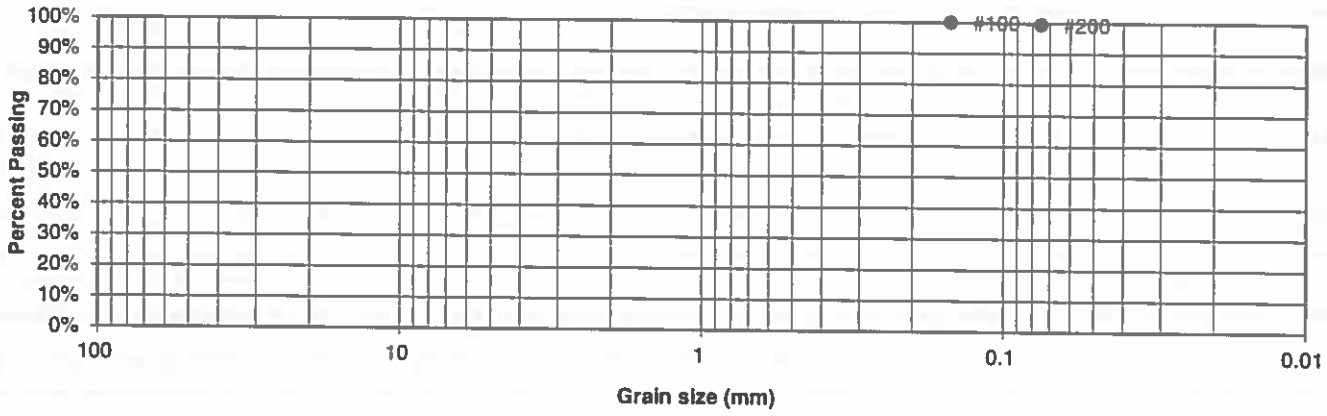
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-19

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	12	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	99.4%

Atterberg Limits

Plastic Limit	
Liquid Limit	
Plastic Index	

Swell

Moisture at start	25.6%
Moisture at finish	36.7%
Moisture increase	11.1%
Initial dry density (pcf)	83
Swell (psf)	1700

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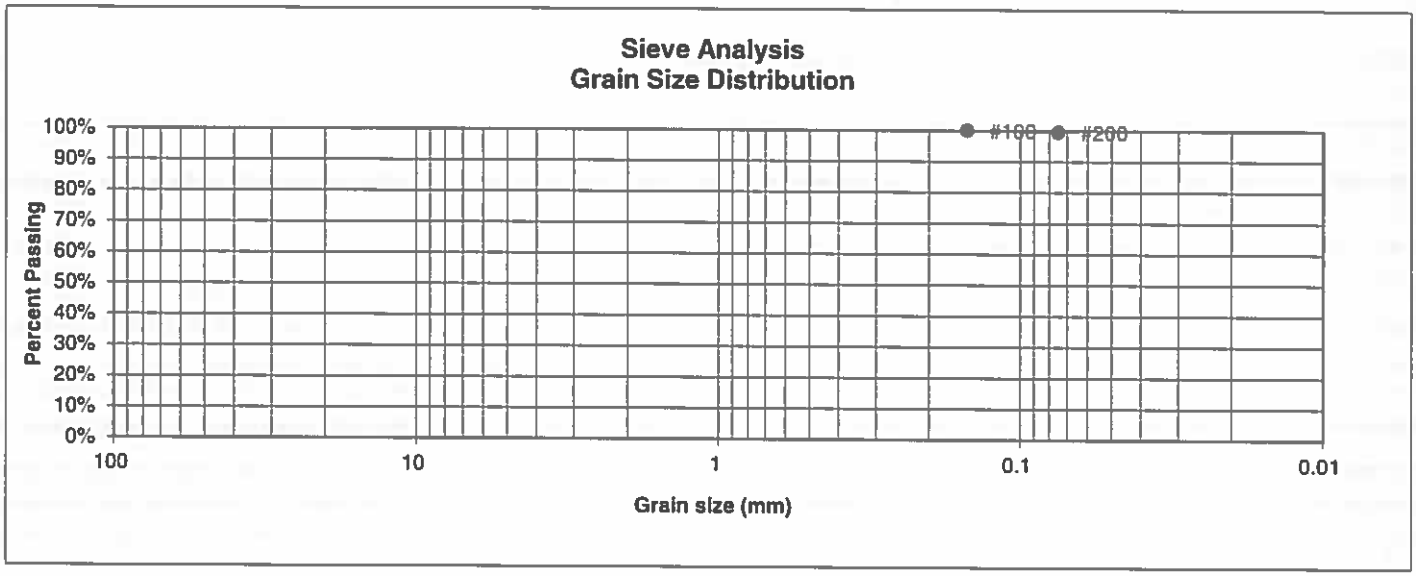
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO. 200393

FIG NO. C-20

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	14	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	99.5%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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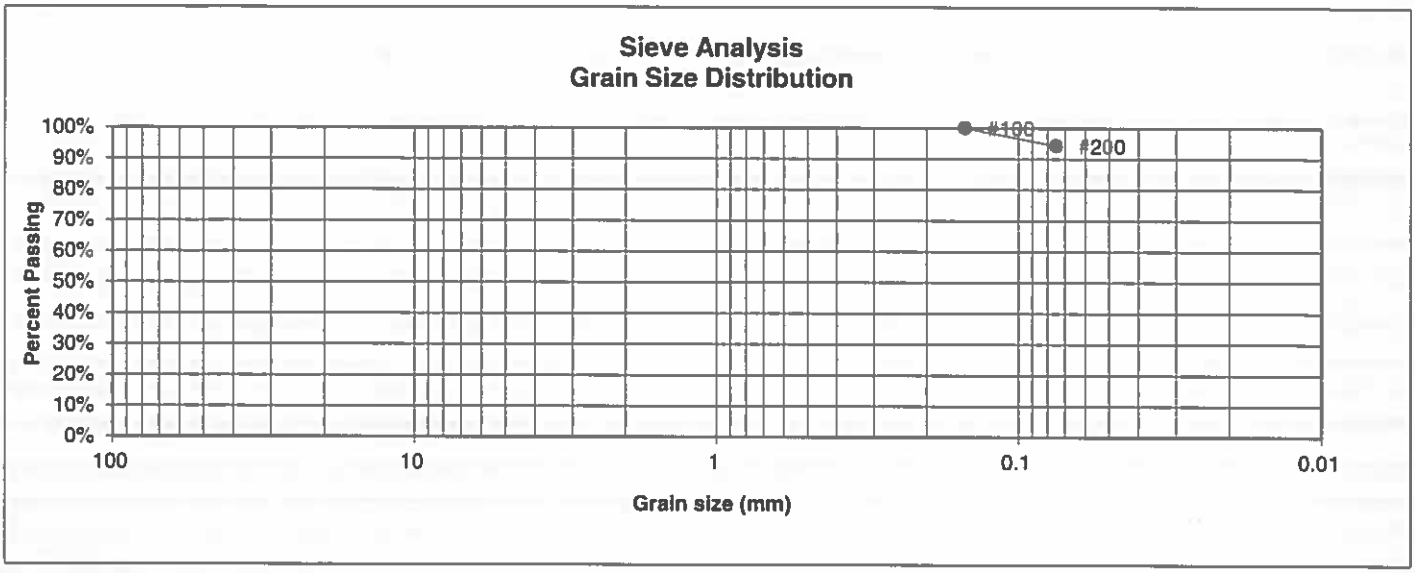
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-21

UNIFIED CLASSIFICATION	CH	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	25	JOB NO.	200393
DEPTH (FT)	20	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	94.3%

Atterberg Limits	
Plastic Limit	27
Liquid Limit	50
Plastic Index	23

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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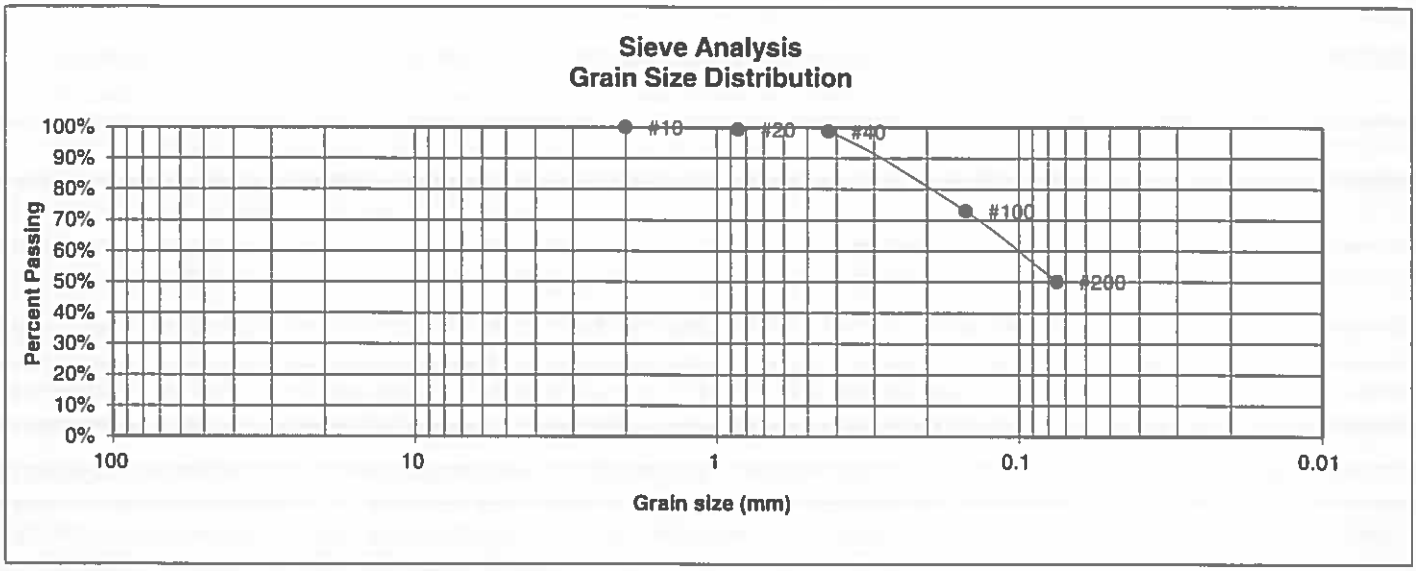
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		h	6/15/20

JOB NO.: 200393

FIG NO.: C-22

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	26	JOB NO.	200393
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer	Atterberg Limits
3"		Plastic Limit
1 1/2"		Liquid Limit
3/4"		Plastic Index
1/2"		
3/8"		
4		Swell
10	100.0%	Moisture at start
20	99.3%	Moisture at finish
40	98.6%	Moisture increase
100	72.9%	Initial dry density (pcf)
200	50.1%	Swell (psf)

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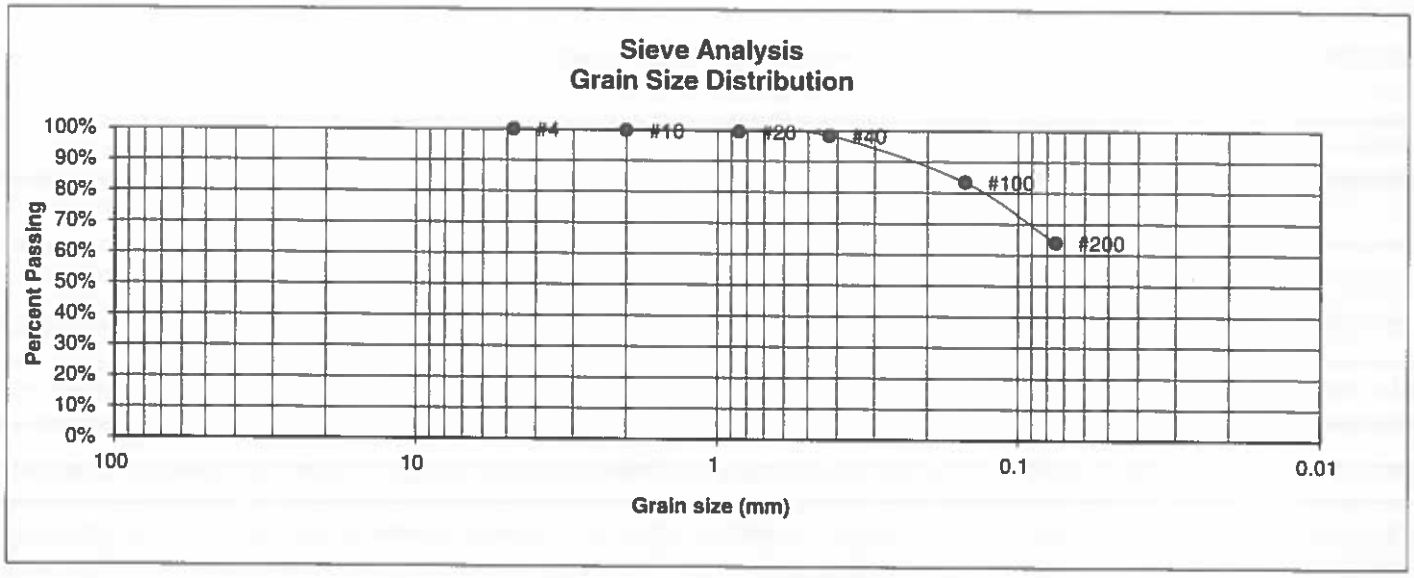
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/6/20

JOB NO.: 200393

FIG NO.: C-23

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	28	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	99.5%
40	98.3%
100	83.4%
200	64.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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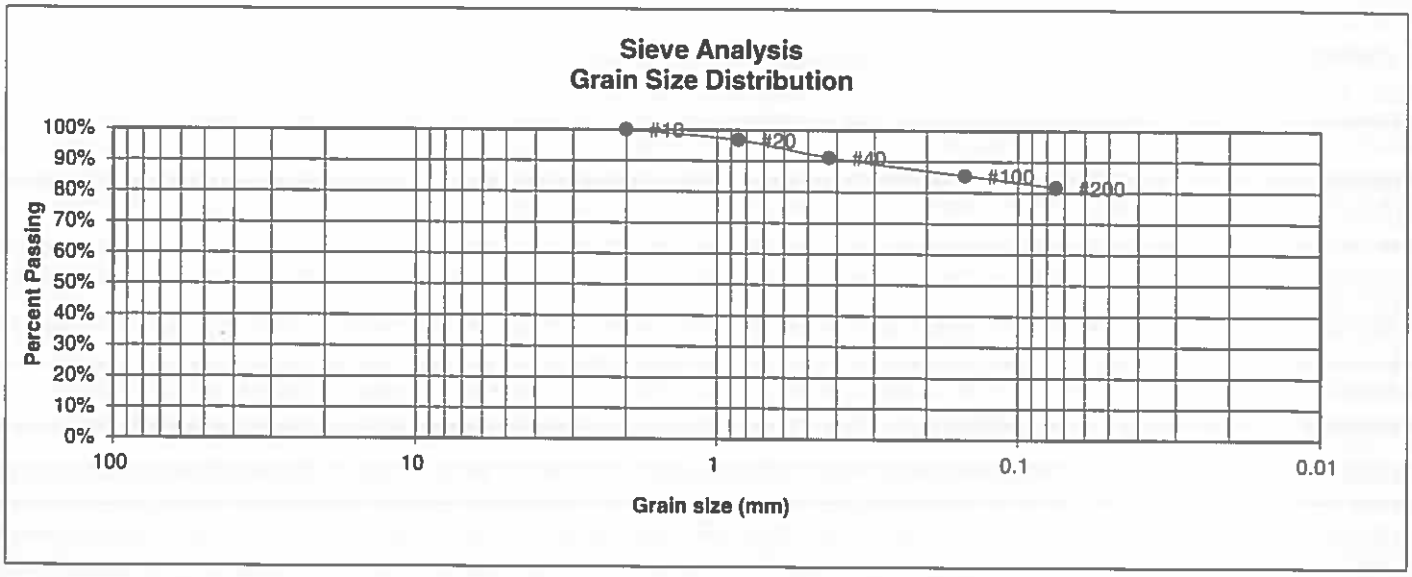
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-24

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	30	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	96.7%
40	91.1%
100	85.5%
200	81.7%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

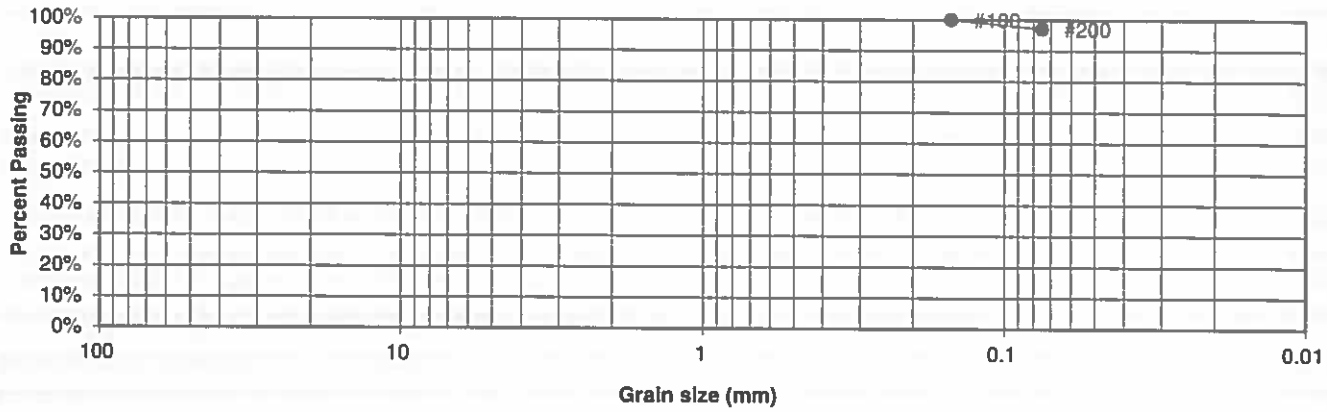
DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-25

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	2	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	35	JOB NO.	200393
DEPTH (FT)	15	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	97.1%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

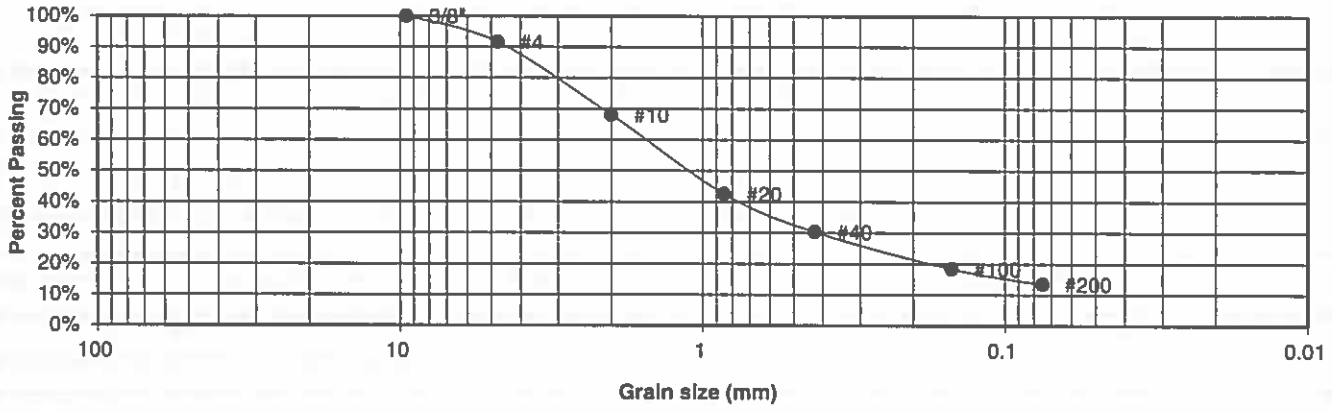
DRAWN:	DATE:	CHECKED:	DATE:
			6/15/20

JOB NO.: 200393

FIG NO.: L-26

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	3	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	2	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.6%
10	68.1%
20	42.5%
40	30.3%
100	18.4%
200	13.5%

Atterberg Limits	
Plastic Limit	19
Liquid Limit	21
Plastic Index	2

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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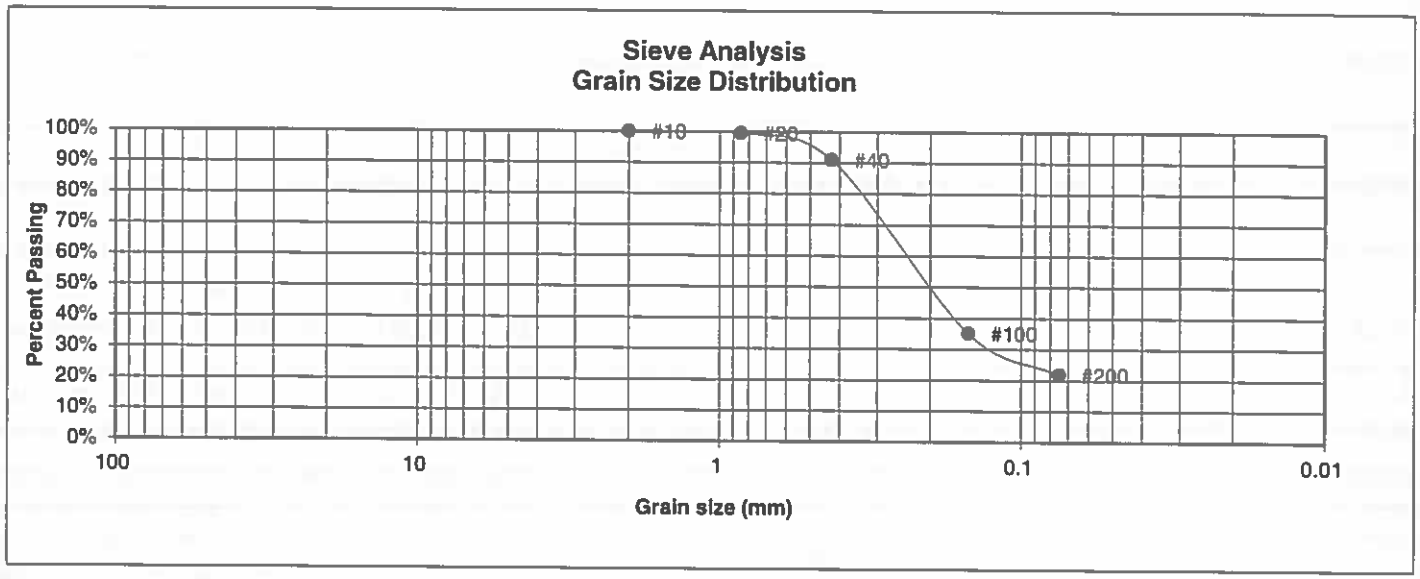
LABORATORY TEST RESULTS

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		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-27

UNIFIED CLASSIFICATION	SM	CLIENT	OAKWOOD HOMES
SOIL TYPE #	3	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	17	JOB NO.	200393
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	99.5%
40	90.9%
100	35.1%
200	21.9%

Atterberg Limits

Plastic Limit	29
Liquid Limit	43
Plastic Index	14

Swell

Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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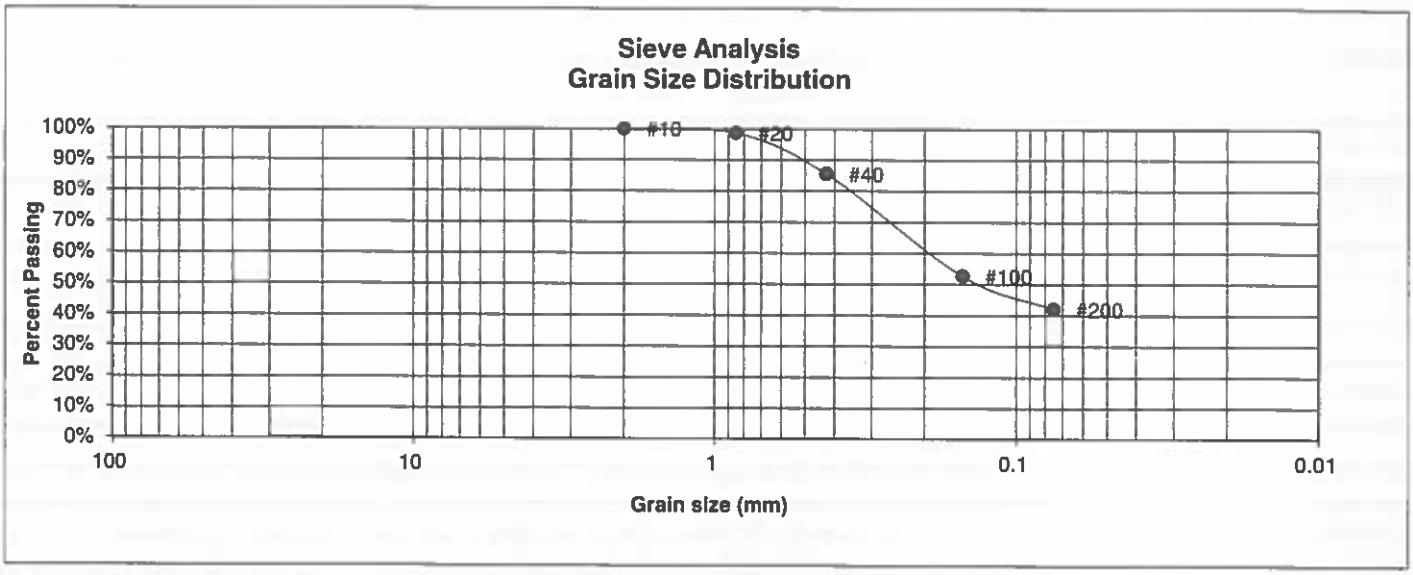
LABORATORY TEST RESULTS

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		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-28

UNIFIED CLASSIFICATION	SC	CLIENT	OAKWOOD HOMES
SOIL TYPE #	3	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	32	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	98.6%
40	85.5%
100	52.7%
200	42.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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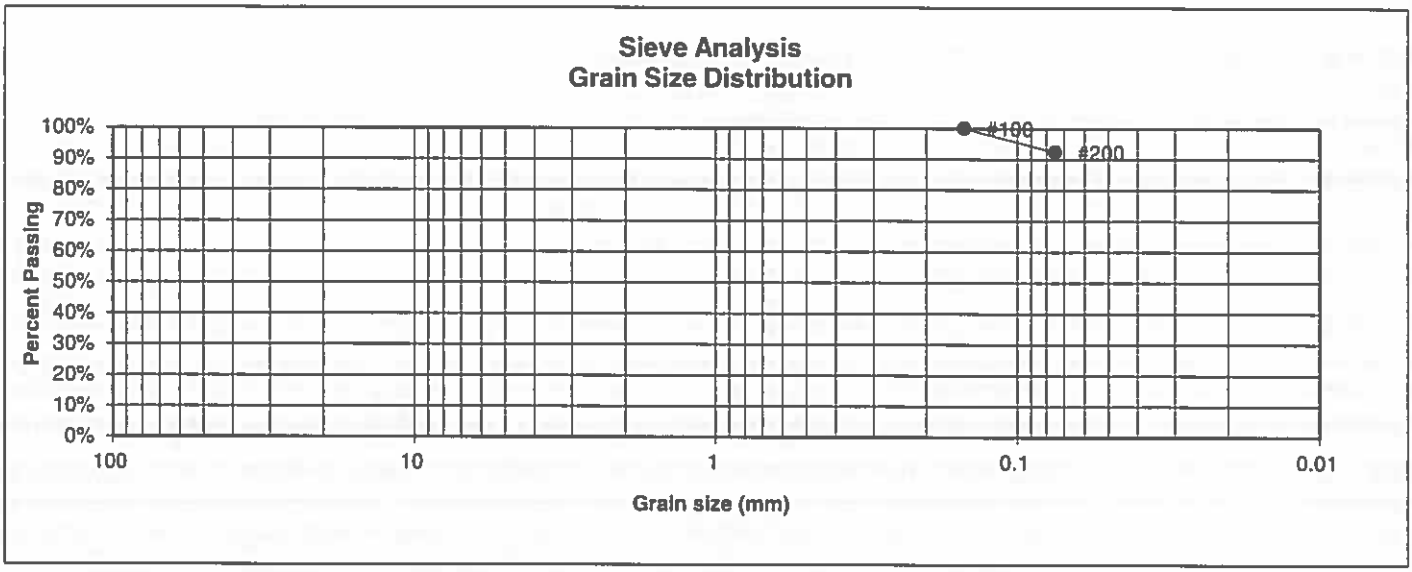
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-29

UNIFIED CLASSIFICATION	CH	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	3	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	92.4%

Atterberg Limits	
Plastic Limit	24
Liquid Limit	51
Plastic Index	27

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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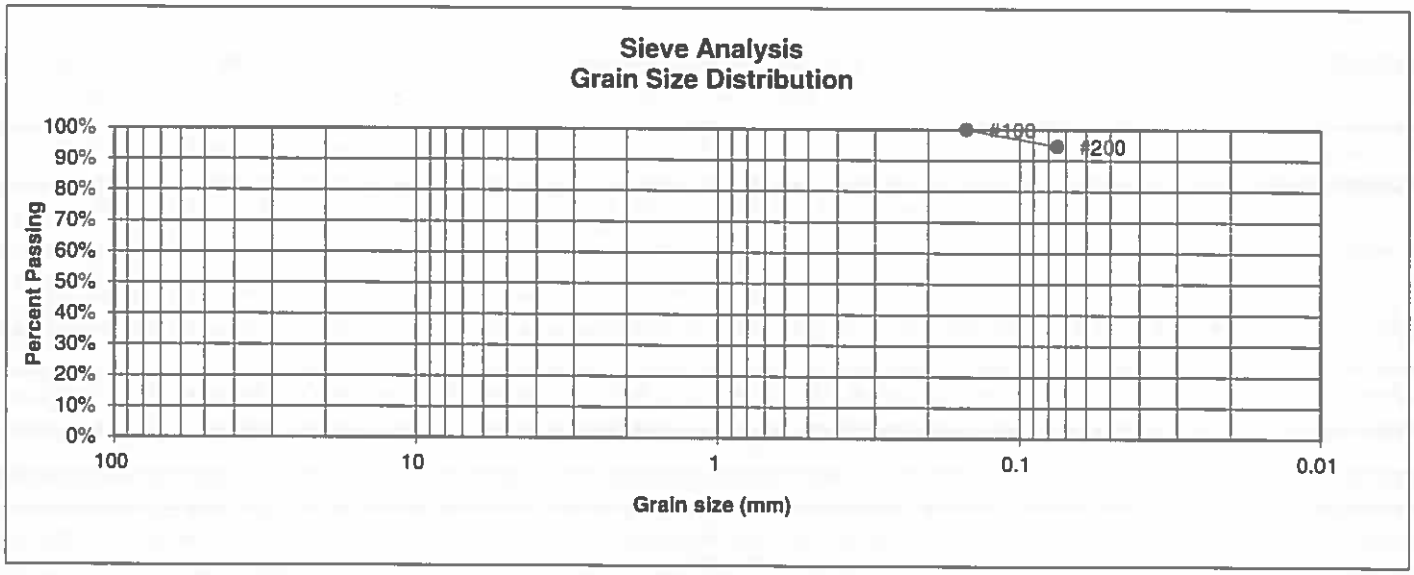
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-30

UNIFIED CLASSIFICATION	ML	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	5	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	94.6%

Atterberg Limits	
Plastic Limit	33
Liquid Limit	59
Plastic Index	26

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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LABORATORY TEST RESULTS

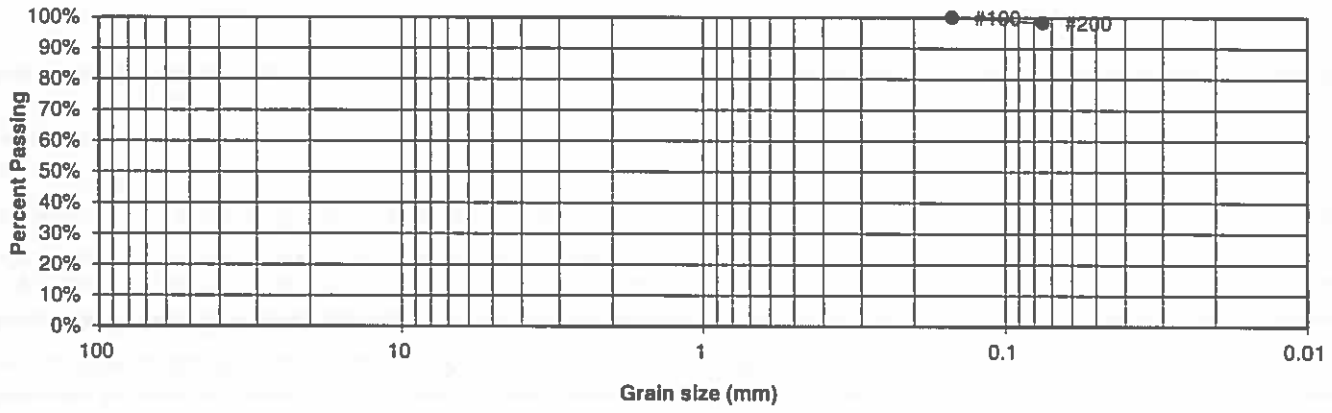
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-31

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	6	JOB NO.	200393
DEPTH (FT)	15	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	98.3%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

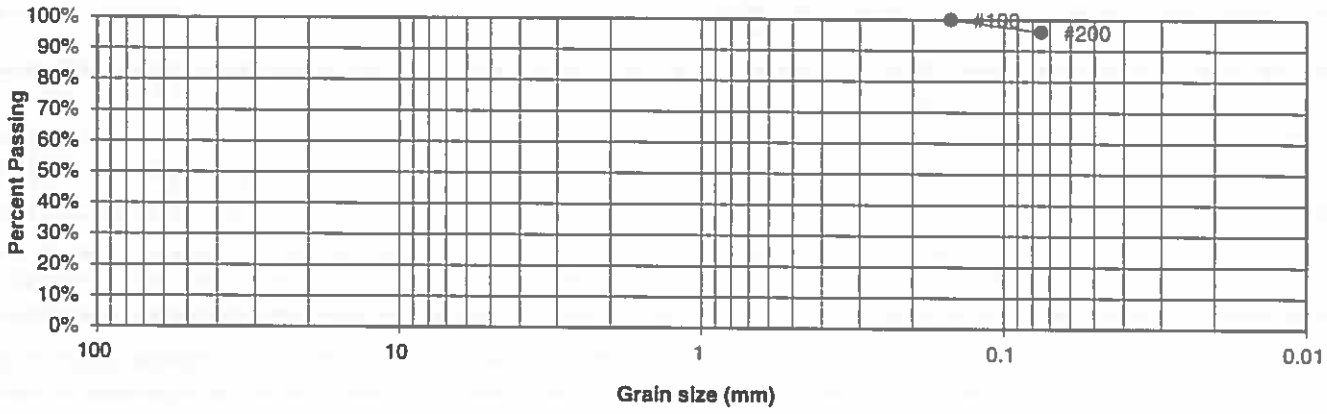
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO: 200393

FIG NO: C-32

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	9	JOB NO.	200393
DEPTH (FT)	5	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	96.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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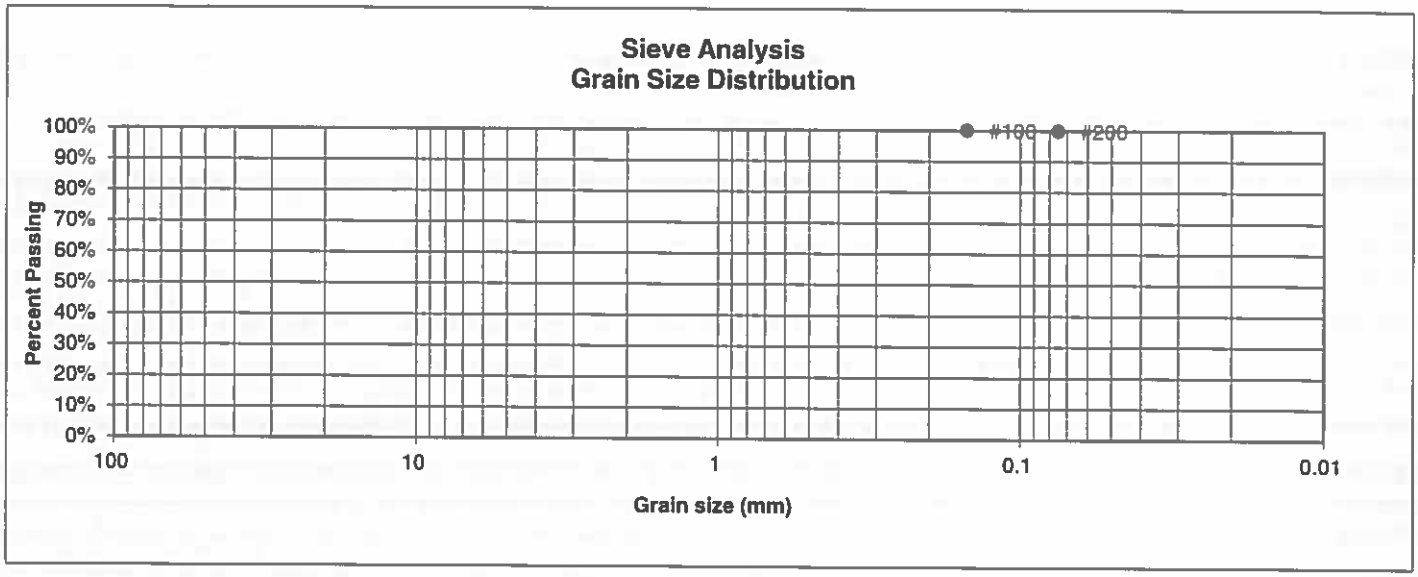
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-33

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	10	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	99.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

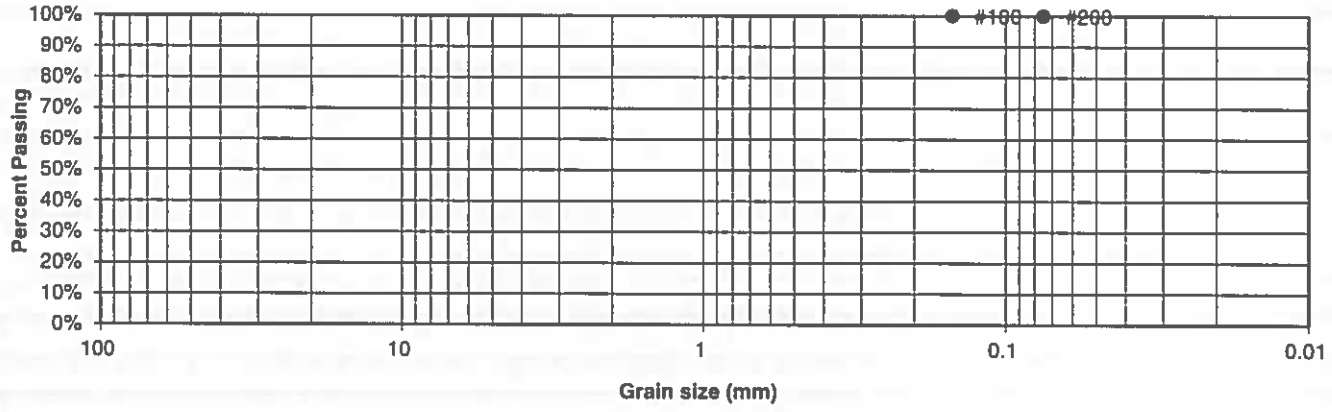
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/08

JOB NO.: 200393

FIG NO.: L-34

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	18	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	99.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

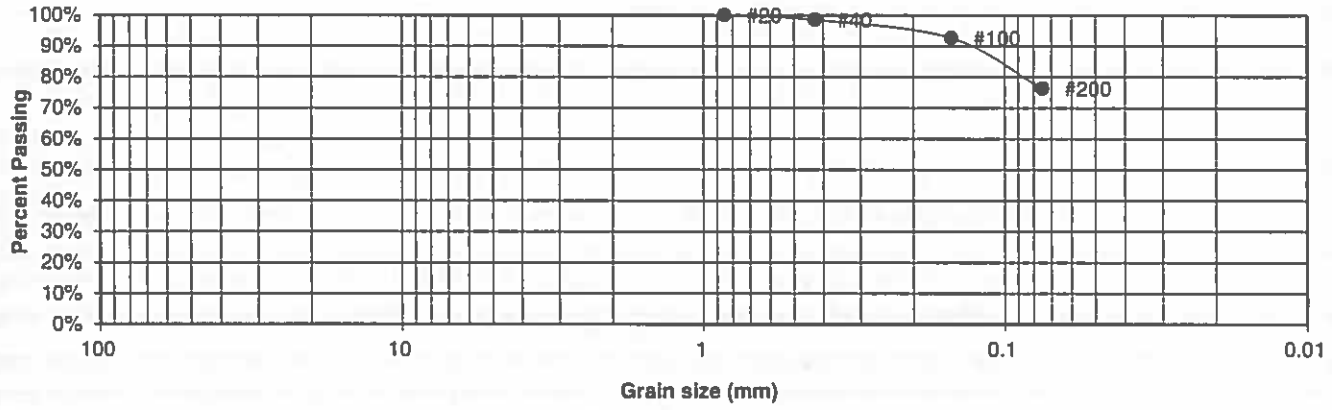
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-35

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	22	JOB NO.	200393
DEPTH (FT)	15	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	98.5%
100	92.7%
200	76.3%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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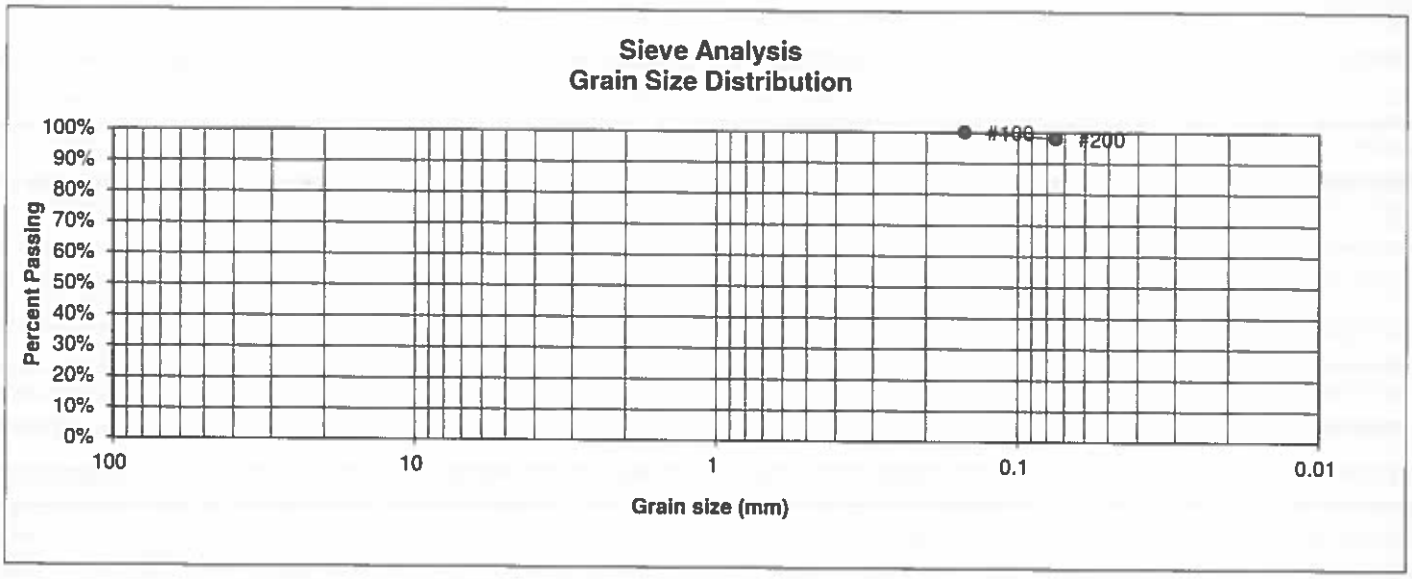
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393

FIG NO.: C-36

UNIFIED CLASSIFICATION	ML	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	27	JOB NO.	200393
DEPTH (FT)	20	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	98.1%

Atterberg Limits	
Plastic Limit	34
Liquid Limit	46
Plastic Index	12

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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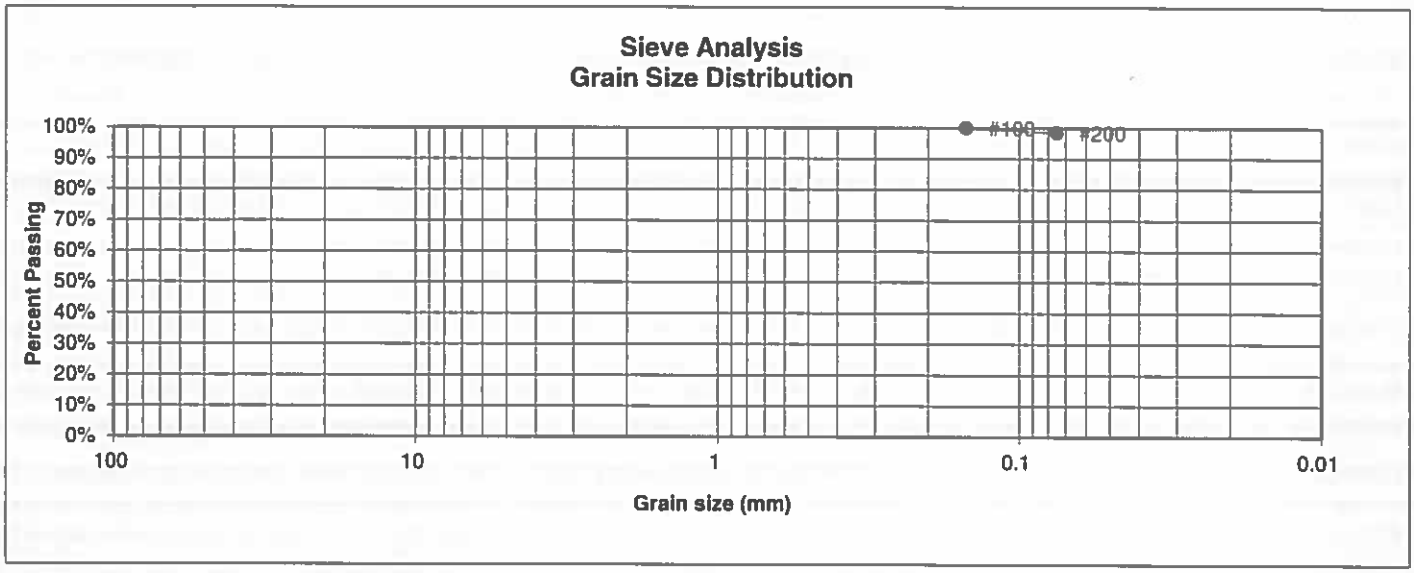
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393

FIG NO.: C-37

UNIFIED CLASSIFICATION	CL	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	28	JOB NO.	200393
DEPTH (FT)	20	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	98.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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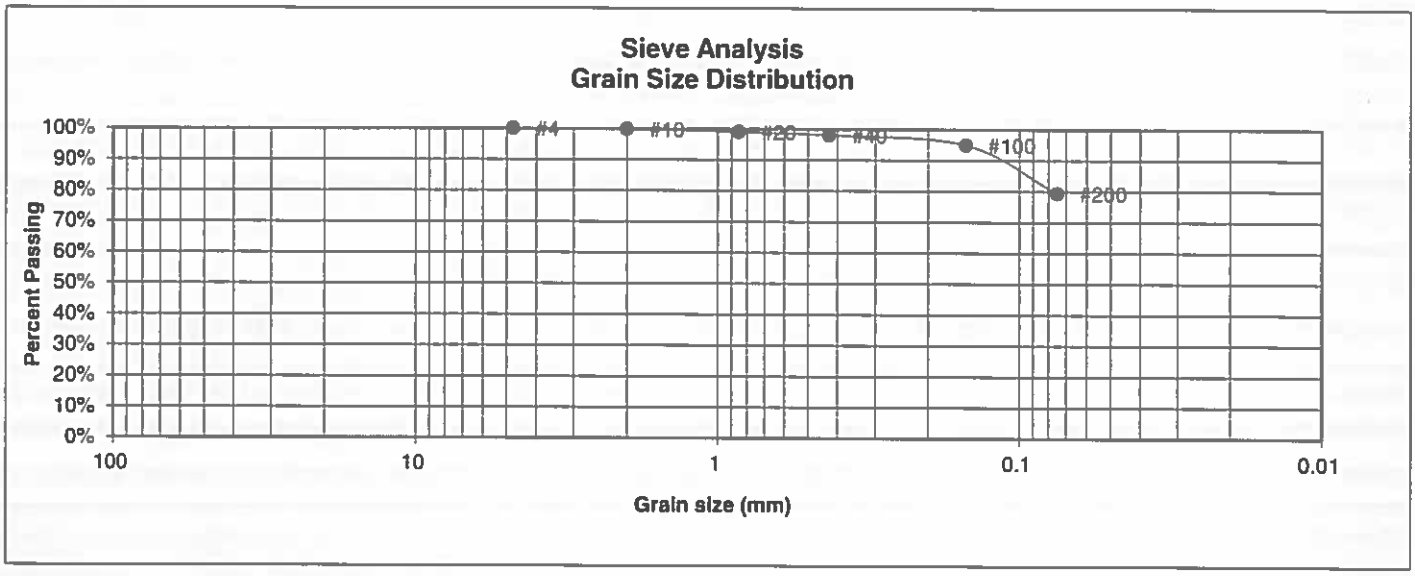
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/15/20

JOB NO.: 200393

FIG NO.: C-38

UNIFIED CLASSIFICATION	ML	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	30	JOB NO.	200393
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	99.0%
40	98.0%
100	95.0%
200	79.4%

Atterberg Limits

Plastic Limit	26
Liquid Limit	41
Plastic Index	15

Swell

Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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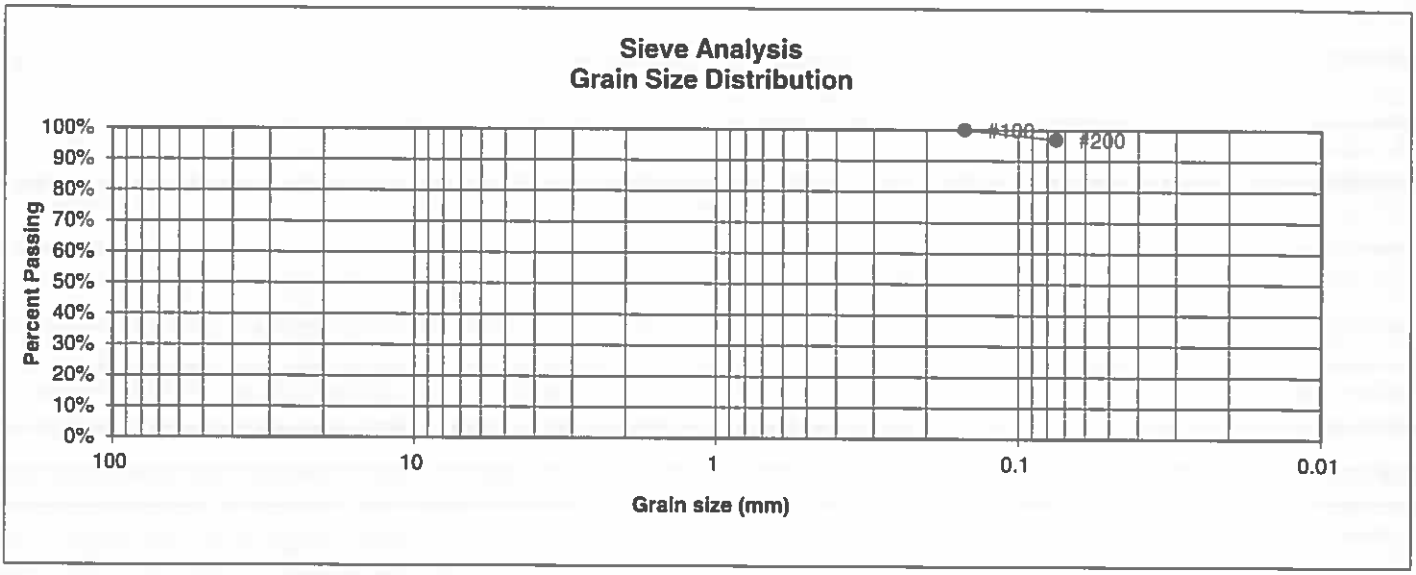
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 6/15/20

JOB NO.: 200393

FIG NO.: C-39

UNIFIED CLASSIFICATION	ML	CLIENT	OAKWOOD HOMES
SOIL TYPE #	4	PROJECT	BLR - VILLAGES A, B, C, D
TEST BORING #	33	JOB NO.	200393
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	
40	
100	100.0%
200	96.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 6/5/20

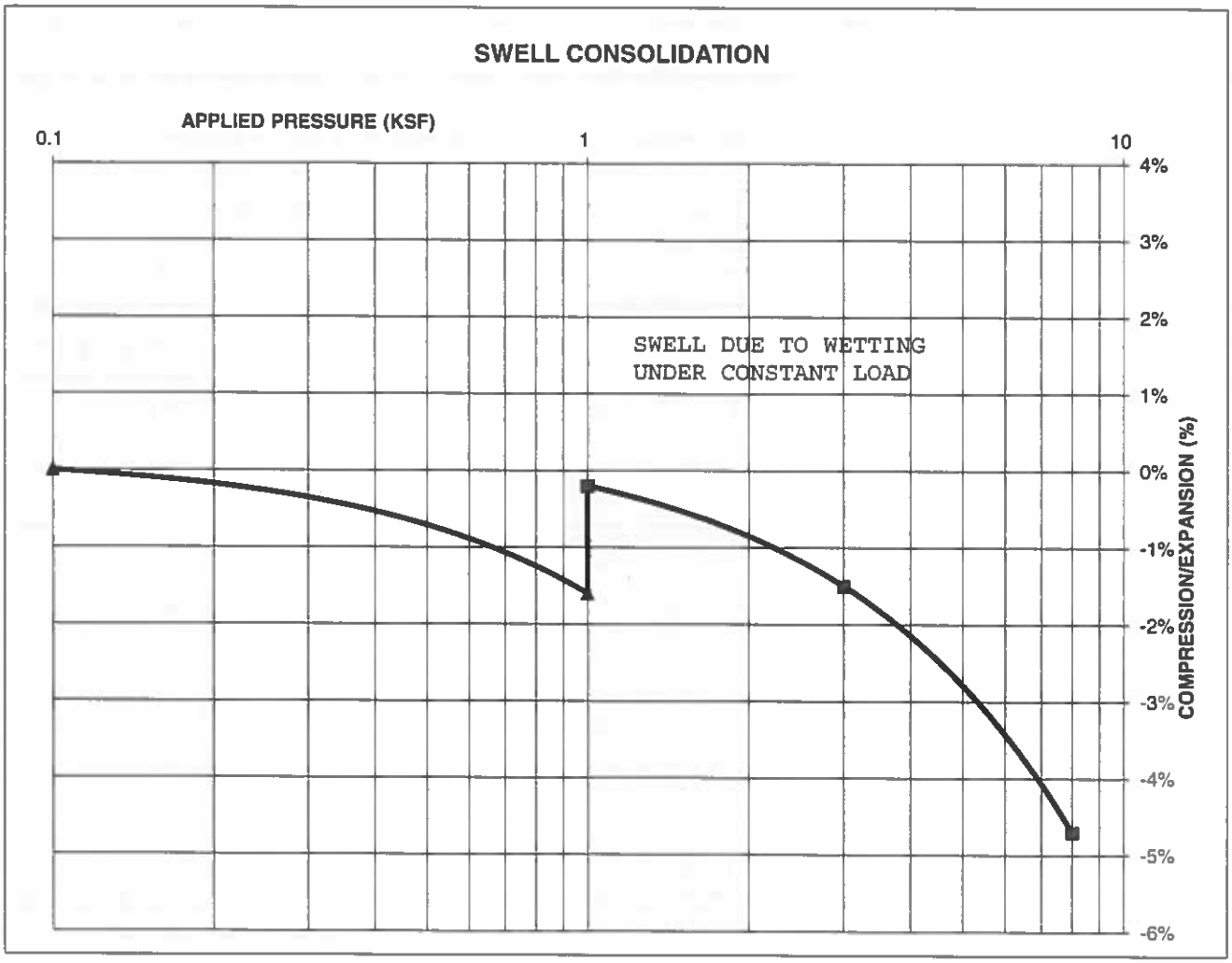
JOB NO.: 200393

FIG NO.: C-40

CONSOLIDATION TEST RESULTS

TEST BORING #	14	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			99
NATURAL MOISTURE CONTENT			26.4%
SWELL/CONSOLIDATION (%)			1.4%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

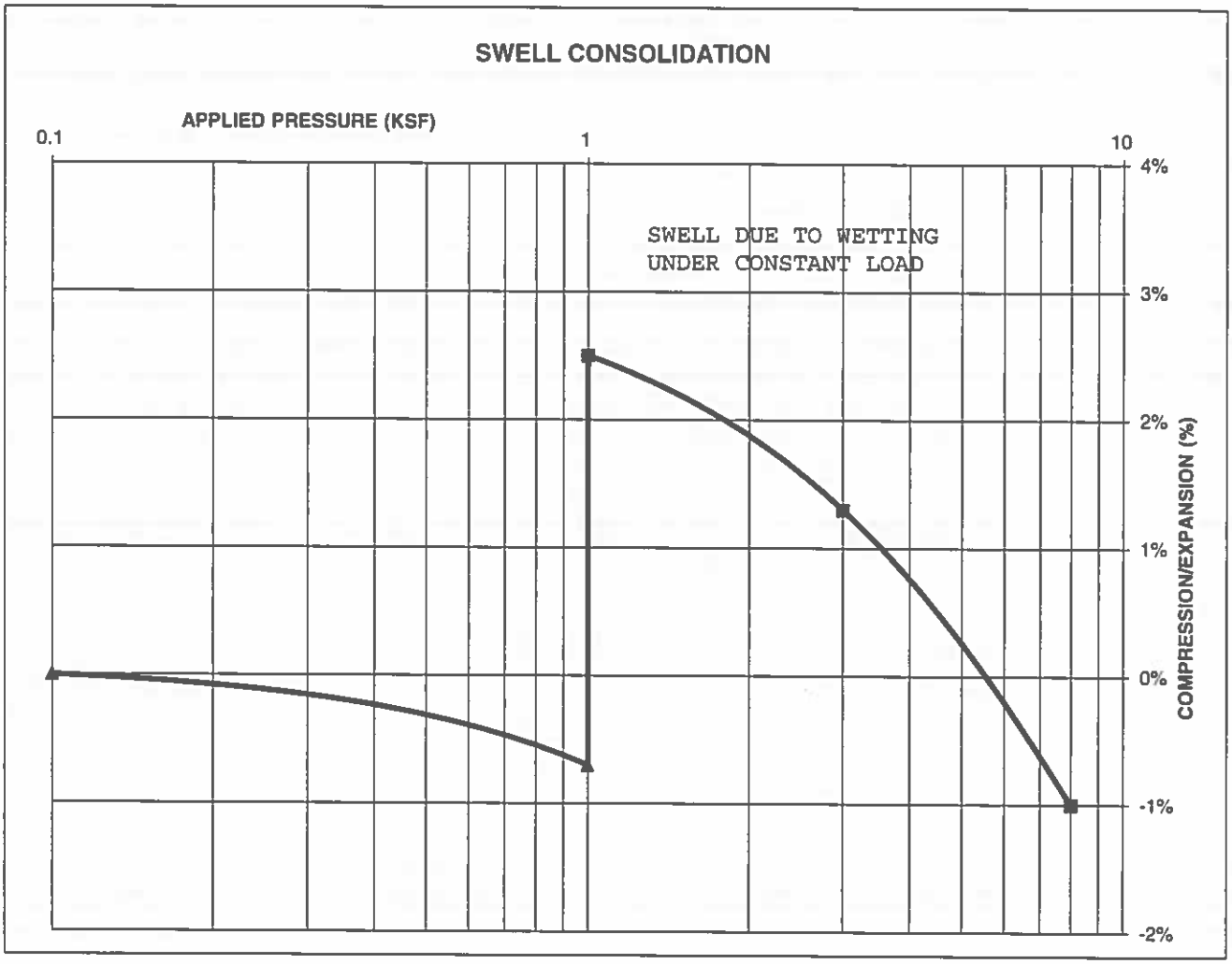
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO. 200393
FIG NO. C-41

CONSOLIDATION TEST RESULTS

TEST BORING #	25	DEPTH(ft)	20
DESCRIPTION	CH	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			95
NATURAL MOISTURE CONTENT			28.7%
SWELL/CONSOLIDATION (%)			3.2%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

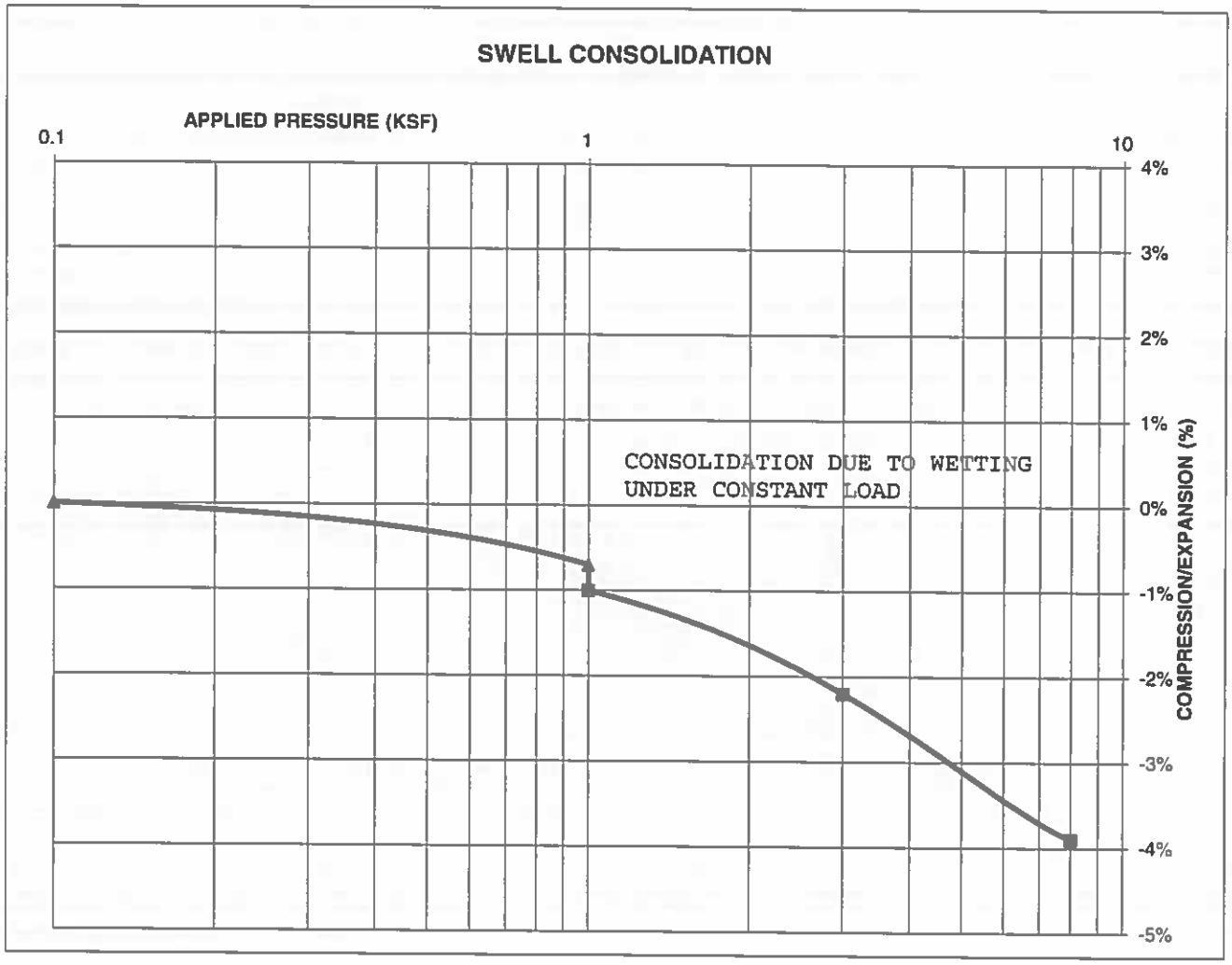
DRAWN:	DATE:	CHECKED:	DATE:
			6/15/20

JOB NO.: 200393
FIG NO.: C-42

CONSOLIDATION TEST RESULTS

TEST BORING #	26	DEPTH(ft)	15
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			107
NATURAL MOISTURE CONTENT			17.7%
SWELL/CONSOLIDATION (%)			-0.3%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

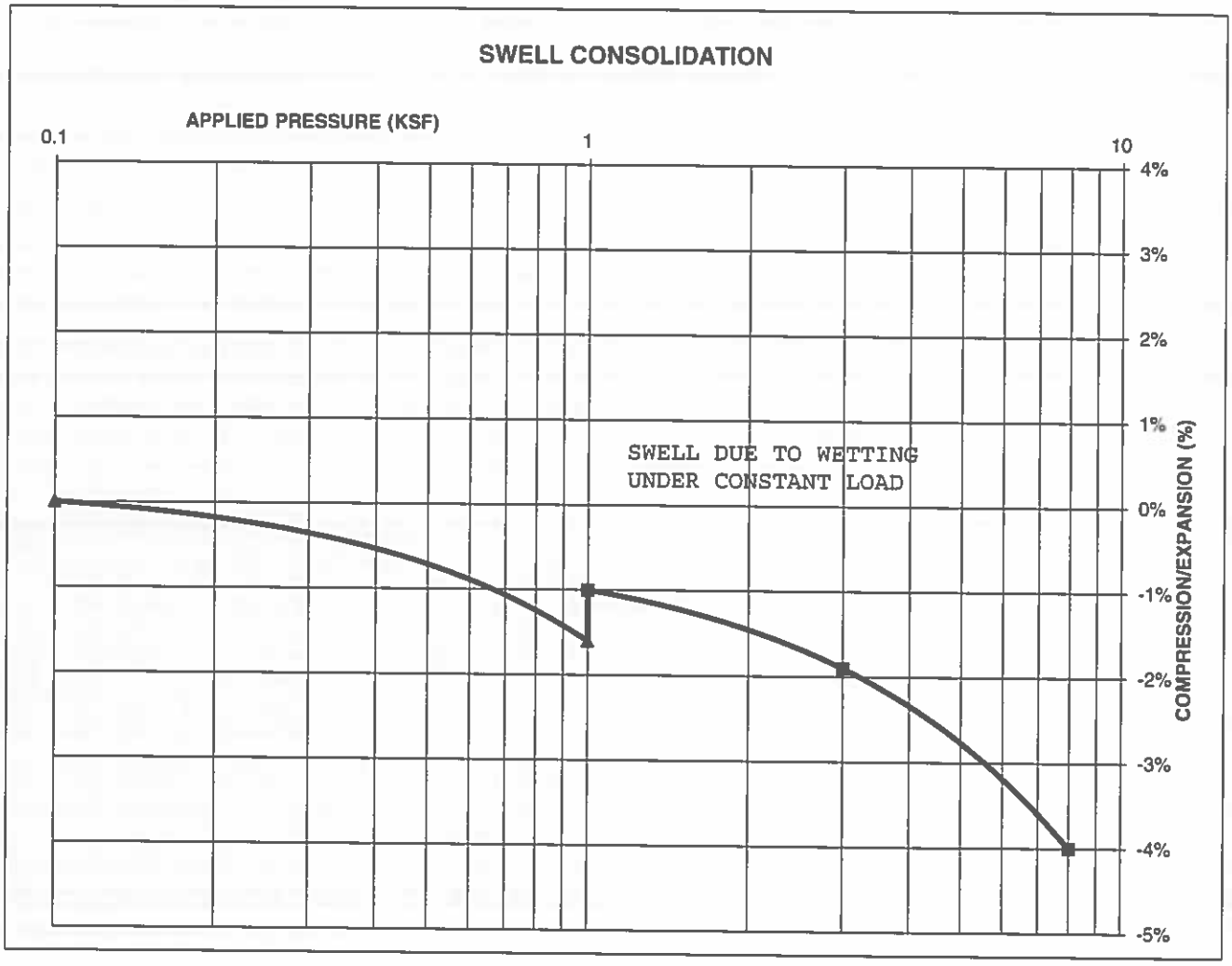
DRAWN:	DATE:	CHECKED:	DATE:
		h	6/3/20

JOB NO.: 200393
FIG NO.: C-43

CONSOLIDATION TEST RESULTS

TEST BORING #	28	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			99
NATURAL MOISTURE CONTENT			23.6%
SWELL/CONSOLIDATION (%)			0.6%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

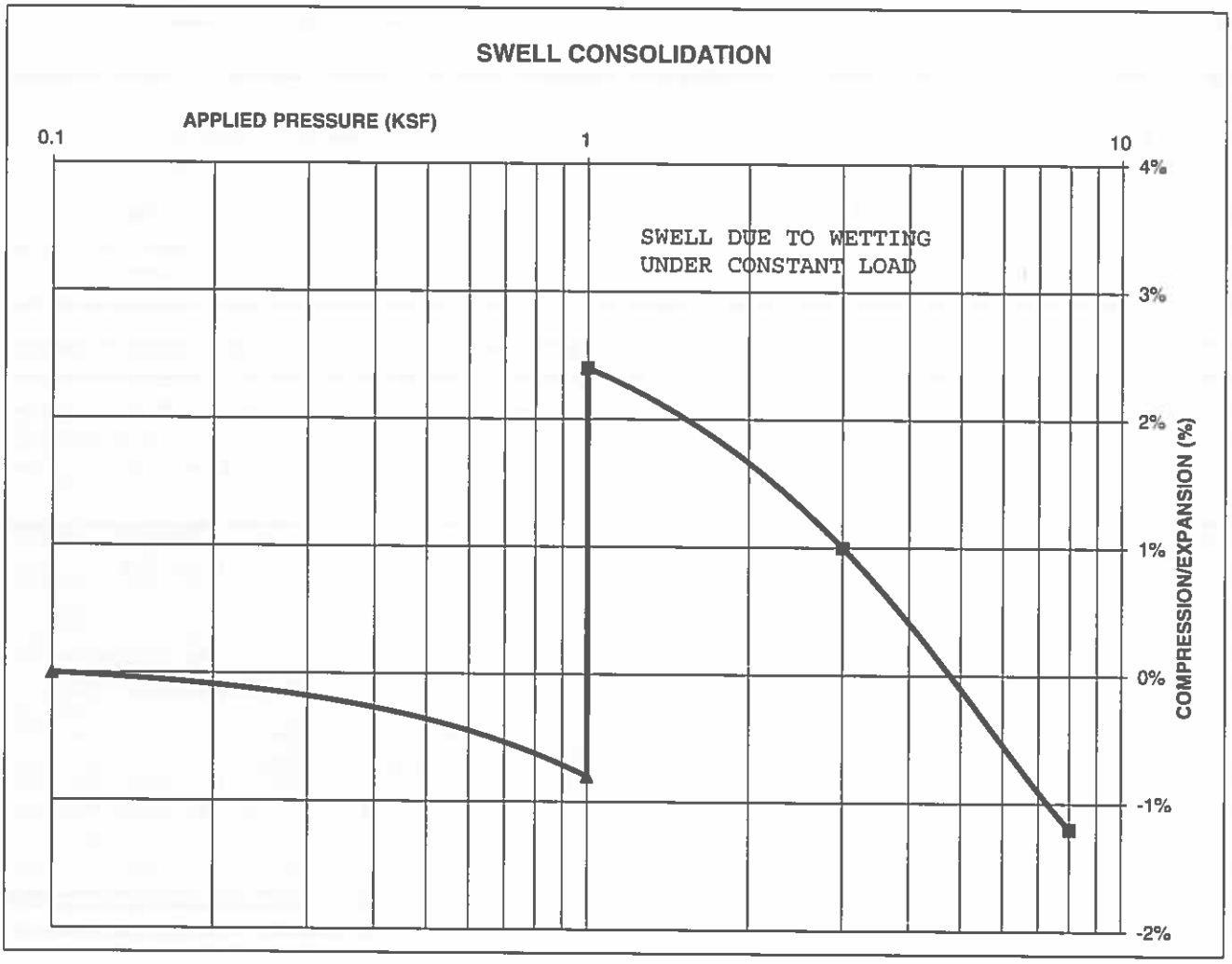
DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393
FIG NO.: C-44

CONSOLIDATION TEST RESULTS

TEST BORING #	30	DEPTH(ft)	5
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			112
NATURAL MOISTURE CONTENT			14.6%
SWELL/CONSOLIDATION (%)			3.2%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

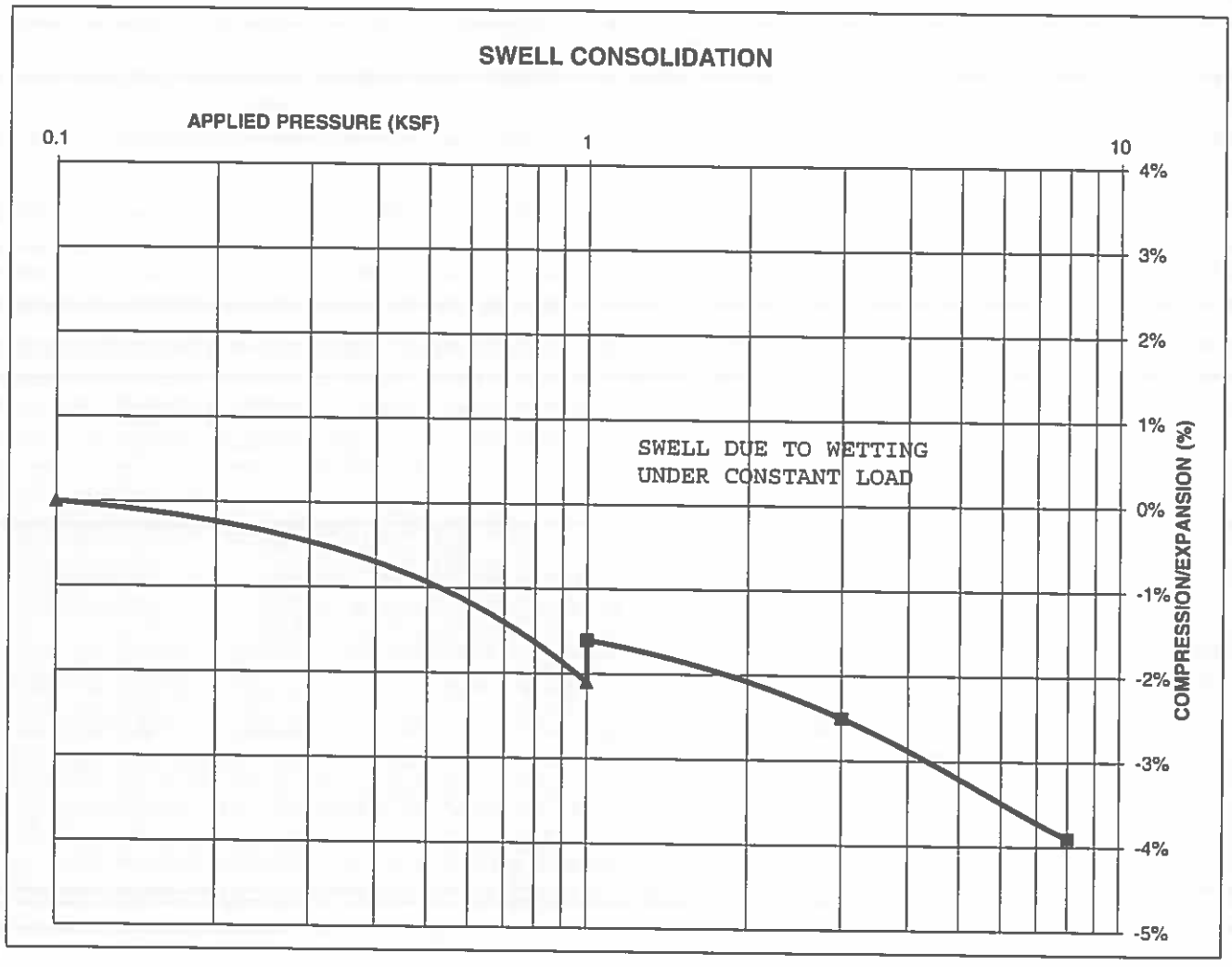
DRAWN:	DATE:	CHECKED:	DATE:
			6/15/20

JOB NO.: 200393
FIG NO.: L-45

CONSOLIDATION TEST RESULTS

TEST BORING #	35	DEPTH(ft)	15
DESCRIPTION	CL	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			84
NATURAL MOISTURE CONTENT			37.8%
SWELL/CONSOLIDATION (%)			0.5%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

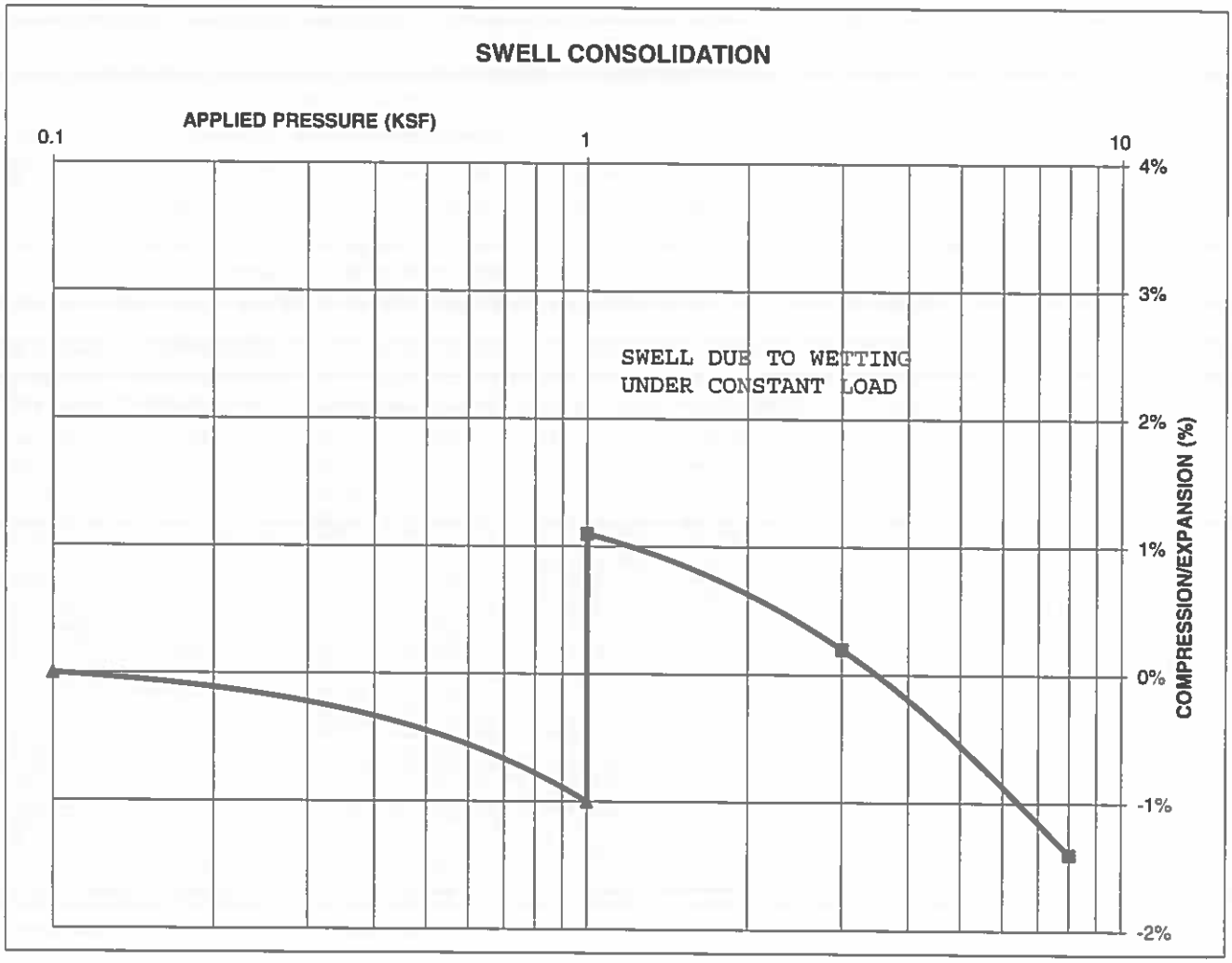
DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393
FIG NO.: C-46

CONSOLIDATION TEST RESULTS

TEST BORING #	32	DEPTH(ft)	10
DESCRIPTION	SC	SOIL TYPE	3
NATURAL UNIT DRY WEIGHT (PCF)			110
NATURAL MOISTURE CONTENT			19.2%
SWELL/CONSOLIDATION (%)			2.1%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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505 ELKTON DRIVE
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SWELL CONSOLIDATION
TEST RESULTS

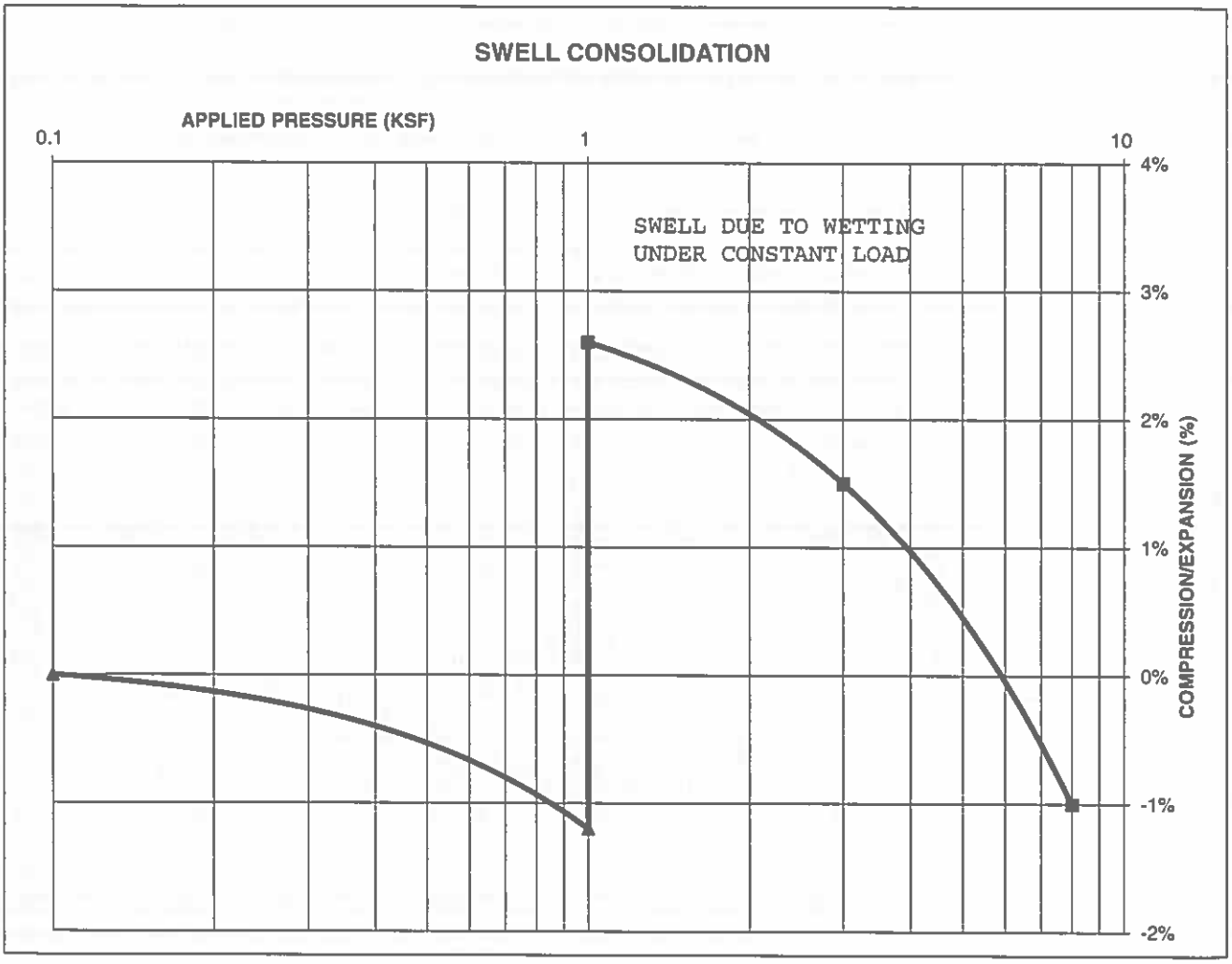
DRAWN:	DATE:	CHECKED:	DATE: 6/5/20

JOB NO.: 200393
FIG NO.: C-47

CONSOLIDATION TEST RESULTS

TEST BORING #	5	DEPTH(ft)	5
DESCRIPTION	ML	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			97
NATURAL MOISTURE CONTENT			27.0%
SWELL/CONSOLIDATION (%)			3.8%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

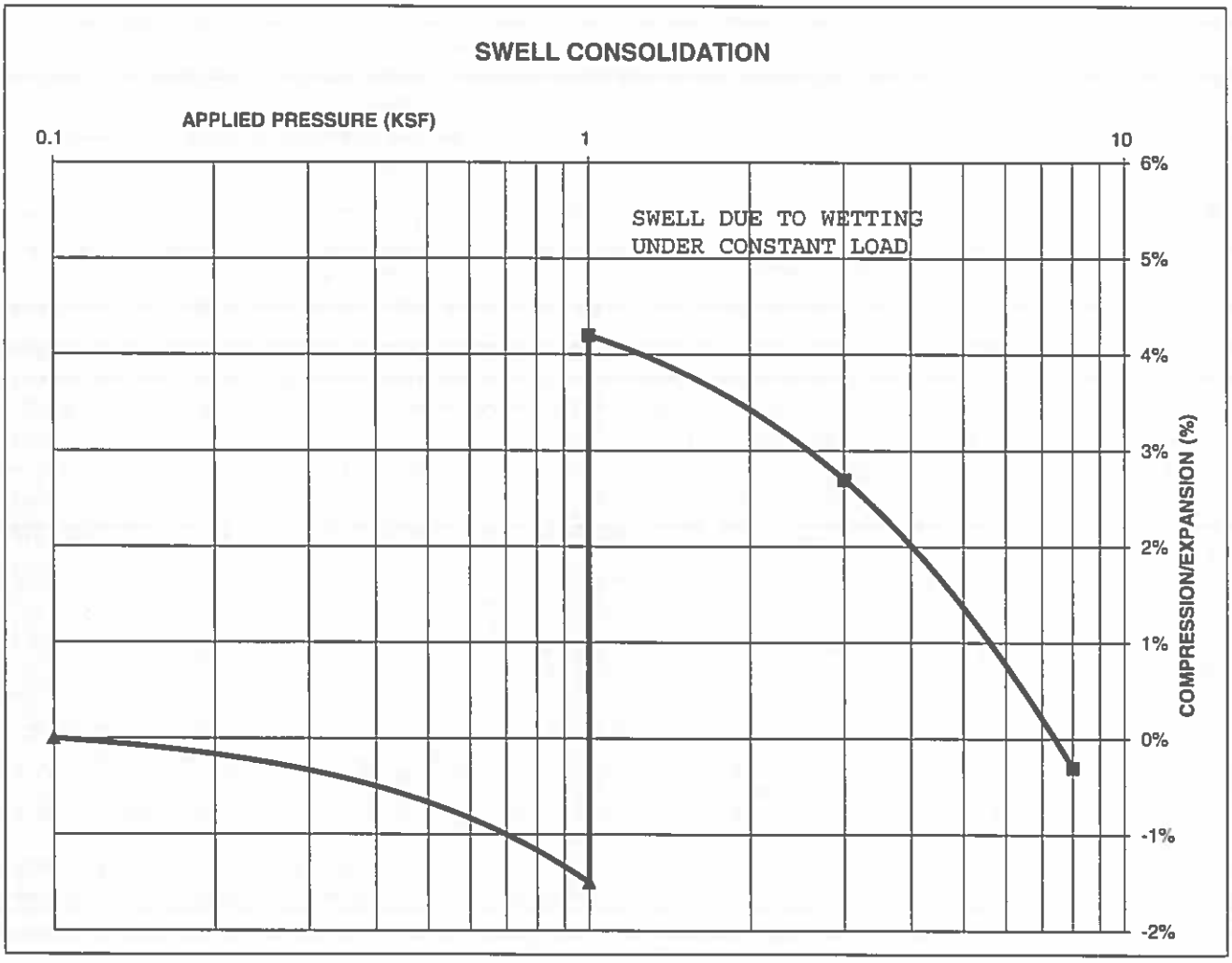
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393
FIG NO.: C-48

CONSOLIDATION TEST RESULTS

TEST BORING #	6	DEPTH(ft)	15
DESCRIPTION	CL	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			96
NATURAL MOISTURE CONTENT			28.2%
SWELL/CONSOLIDATION (%)			5.7%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

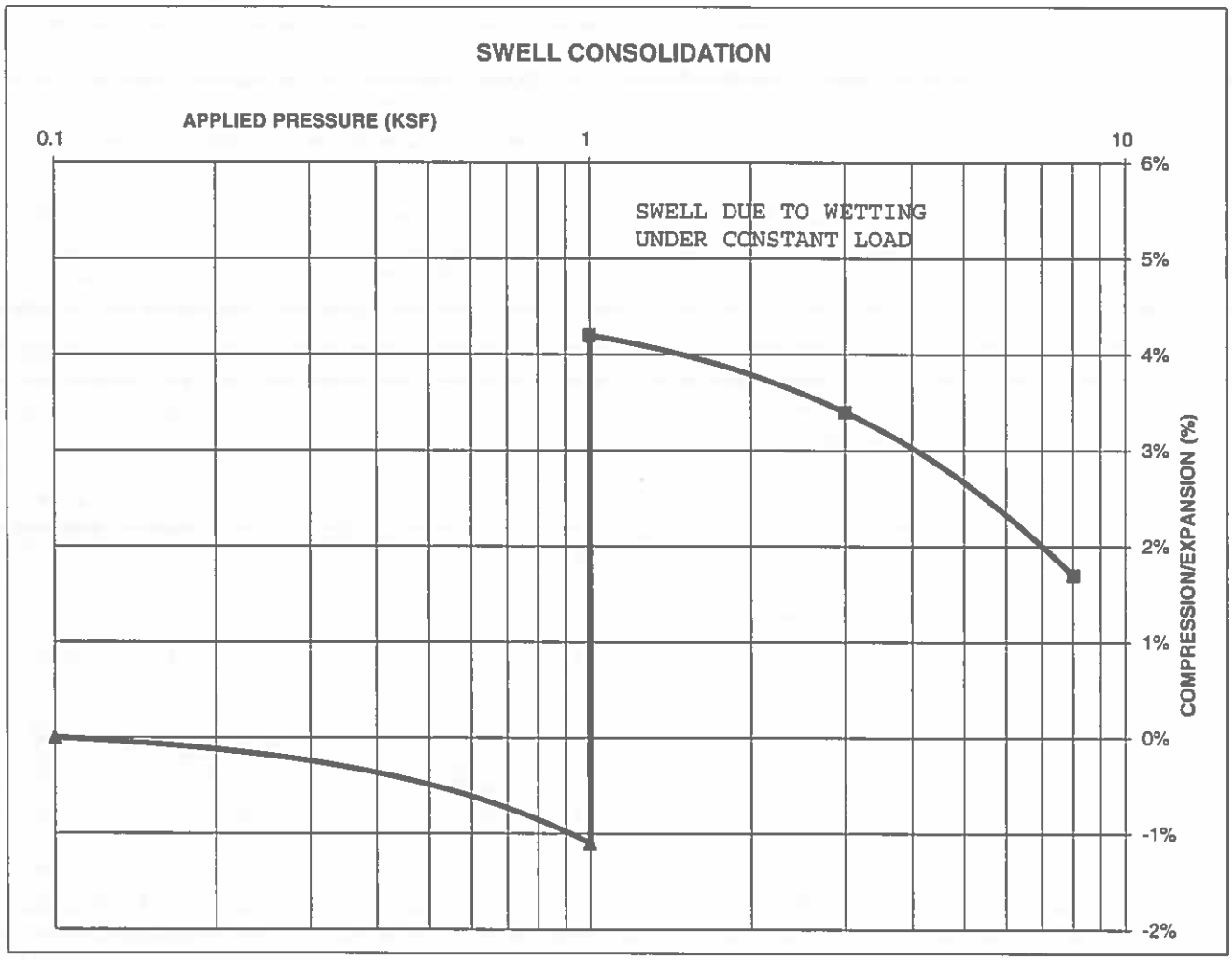
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393
FIG NO.: C-49

CONSOLIDATION TEST RESULTS

TEST BORING #	10	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			105
NATURAL MOISTURE CONTENT			22.7%
SWELL/CONSOLIDATION (%)			5.3%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

SWELL CONSOLIDATION
TEST RESULTS

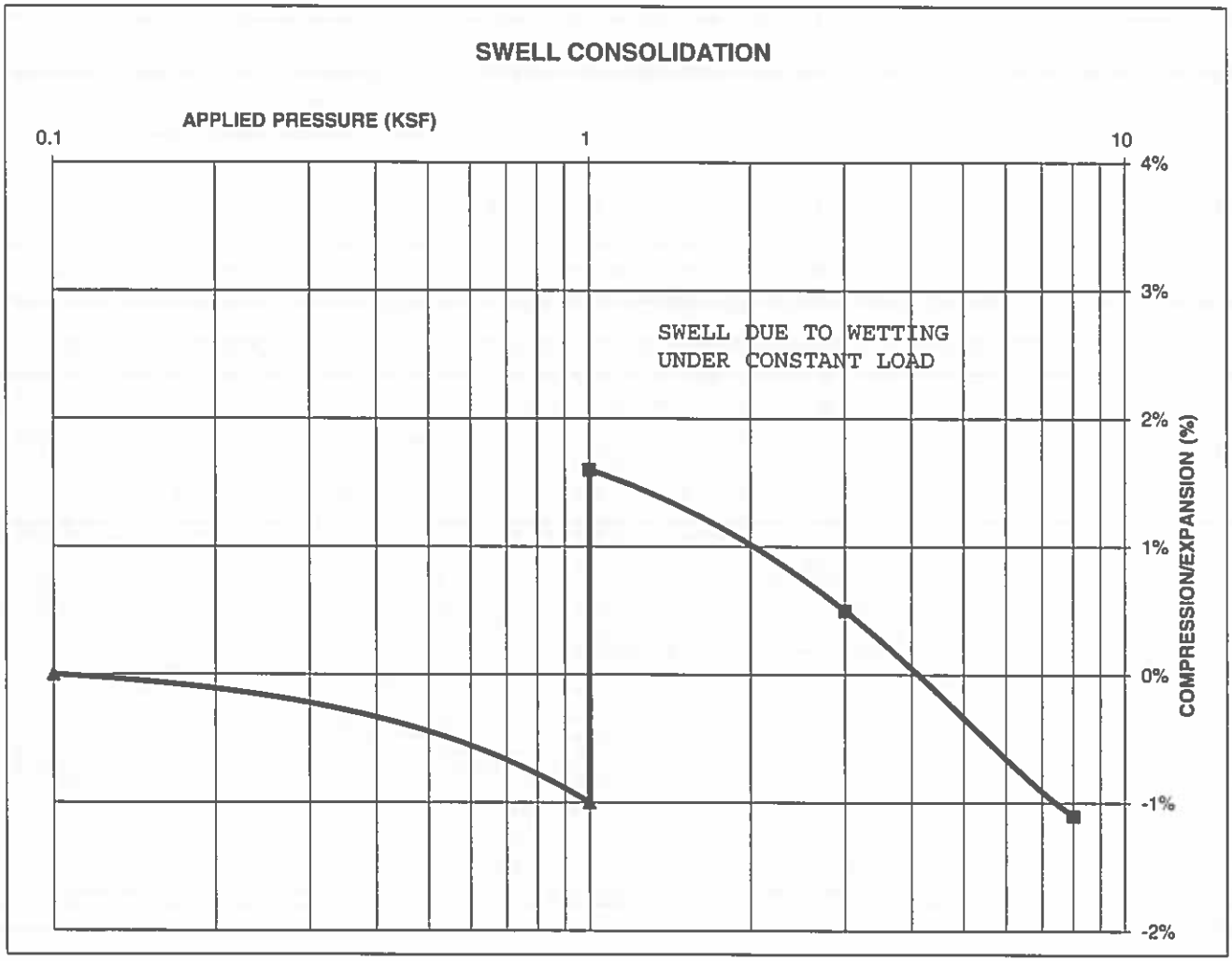
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393
FIG NO.: C-50

CONSOLIDATION TEST RESULTS

TEST BORING #	18	DEPTH(ft)	10
DESCRIPTION	CL	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			101
NATURAL MOISTURE CONTENT			24.6%
SWELL/CONSOLIDATION (%)			2.6%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

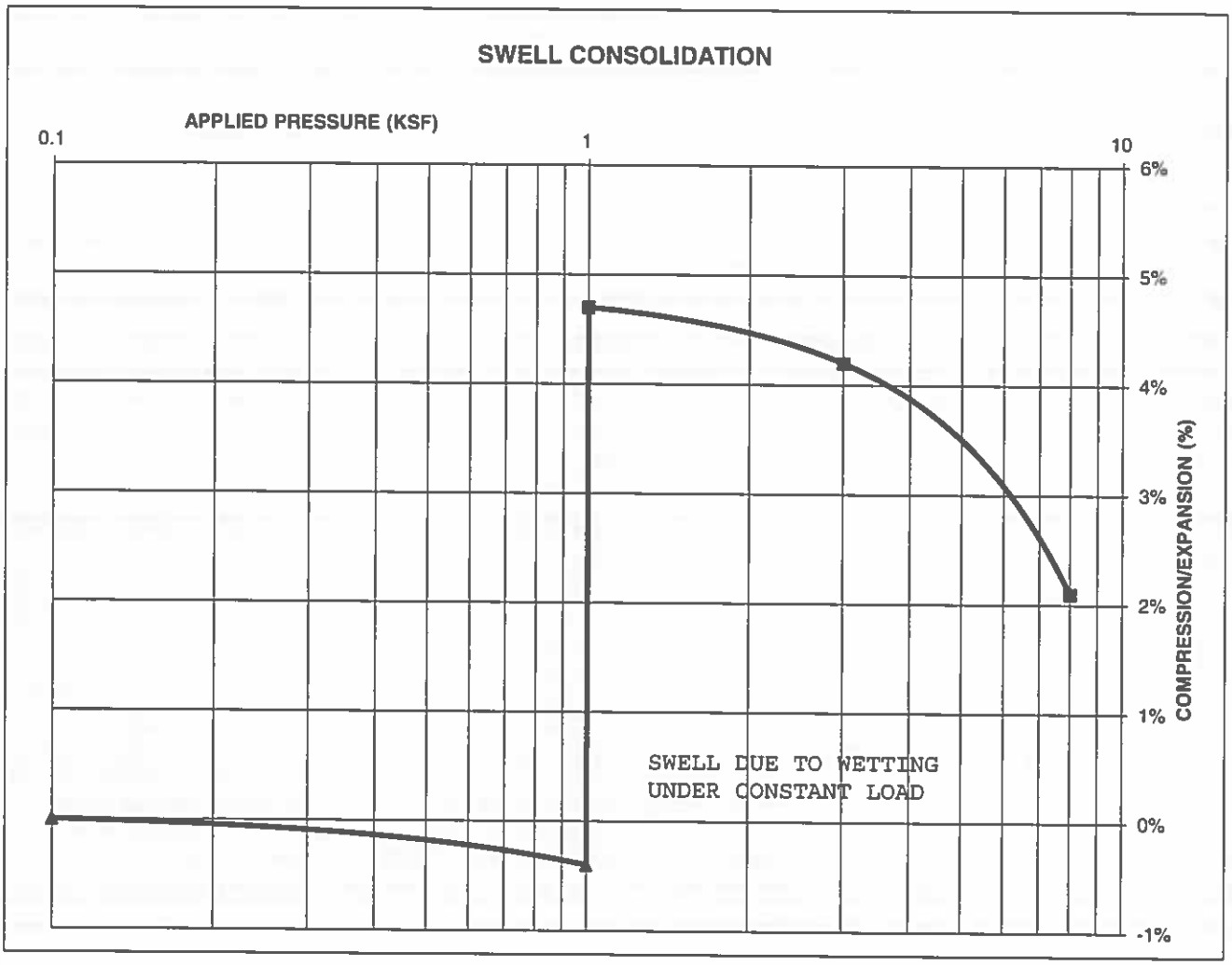
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393
FIG NO.: C-5/

CONSOLIDATION TEST RESULTS

TEST BORING #	27	DEPTH(ft)	20
DESCRIPTION	ML	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			107
NATURAL MOISTURE CONTENT			22.2%
SWELL/CONSOLIDATION (%)			5.1%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

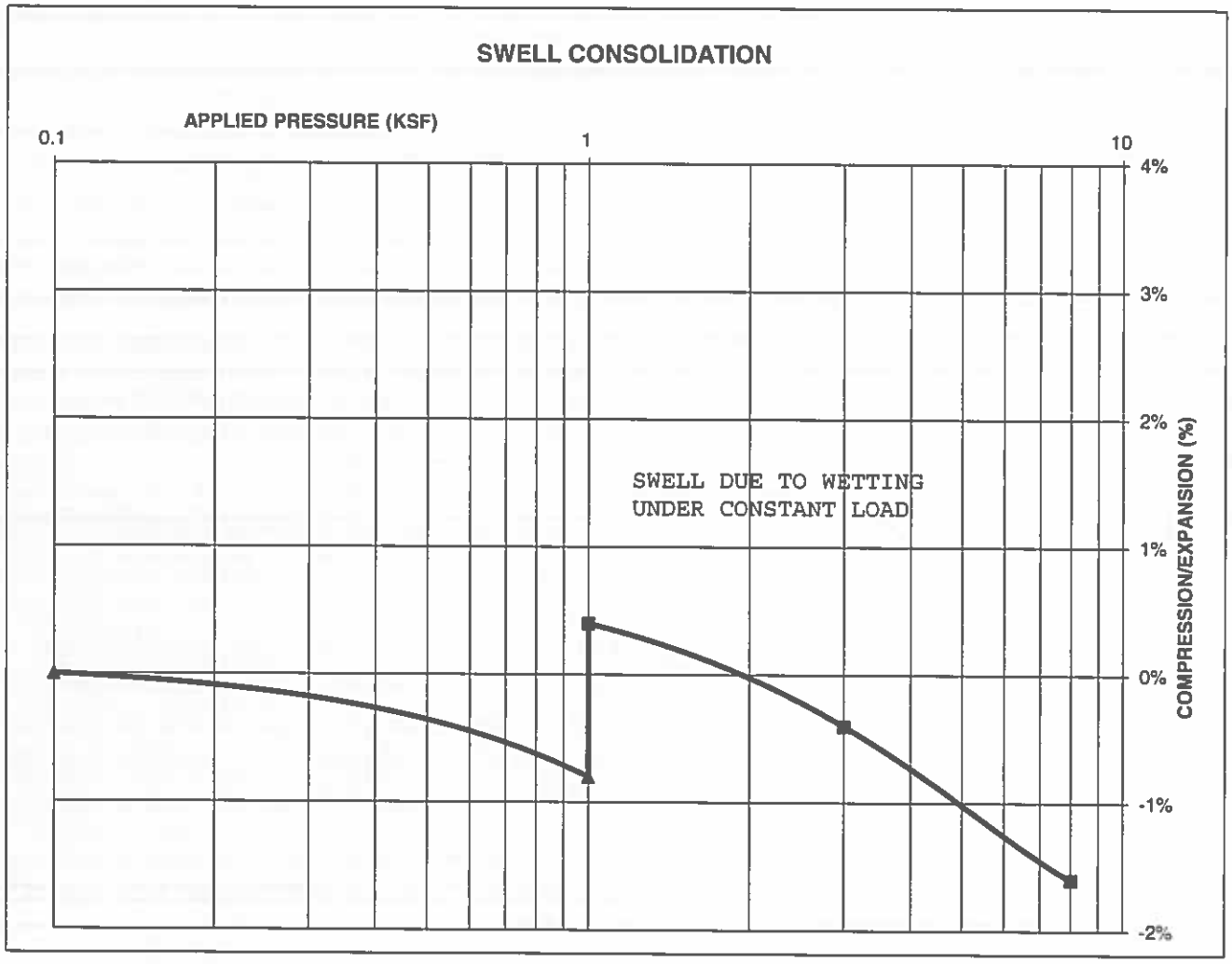
DRAWN:	DATE:	CHECKED:	DATE:
		h	6/5/20

JOB NO.: 200393
FIG NO.: C-52

CONSOLIDATION TEST RESULTS

TEST BORING #	28	DEPTH(ft)	20
DESCRIPTION	CL	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			107
NATURAL MOISTURE CONTENT			20.6%
SWELL/CONSOLIDATION (%)			1.2%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

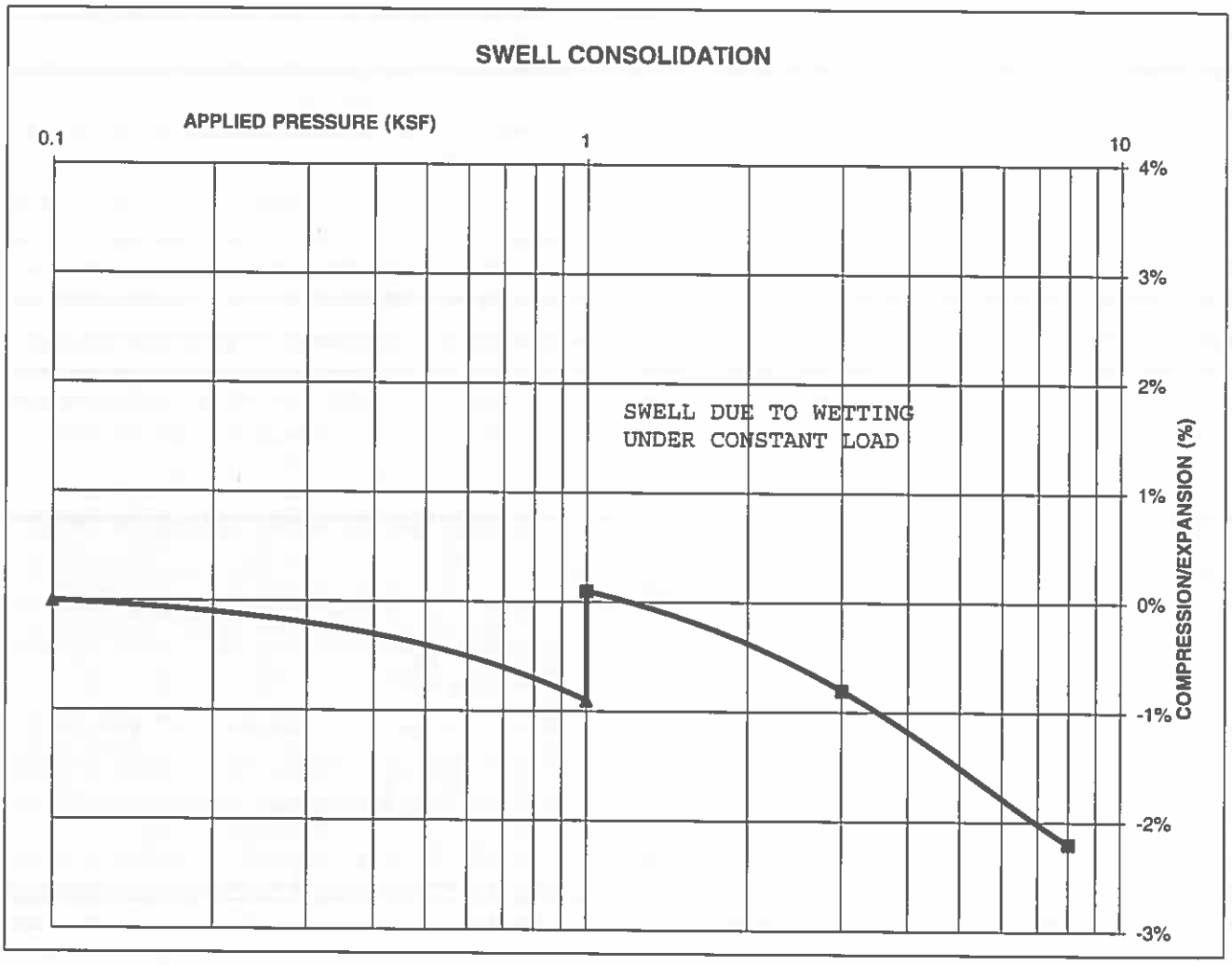
DRAWN:	DATE:	CHECKED:	DATE:
			6/6/20

JOB NO.: 200393
FIG NO.: C-53

CONSOLIDATION TEST RESULTS

TEST BORING #	30	DEPTH(ft)	10
DESCRIPTION	ML	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			109
NATURAL MOISTURE CONTENT			18.4%
SWELL/CONSOLIDATION (%)			1.0%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

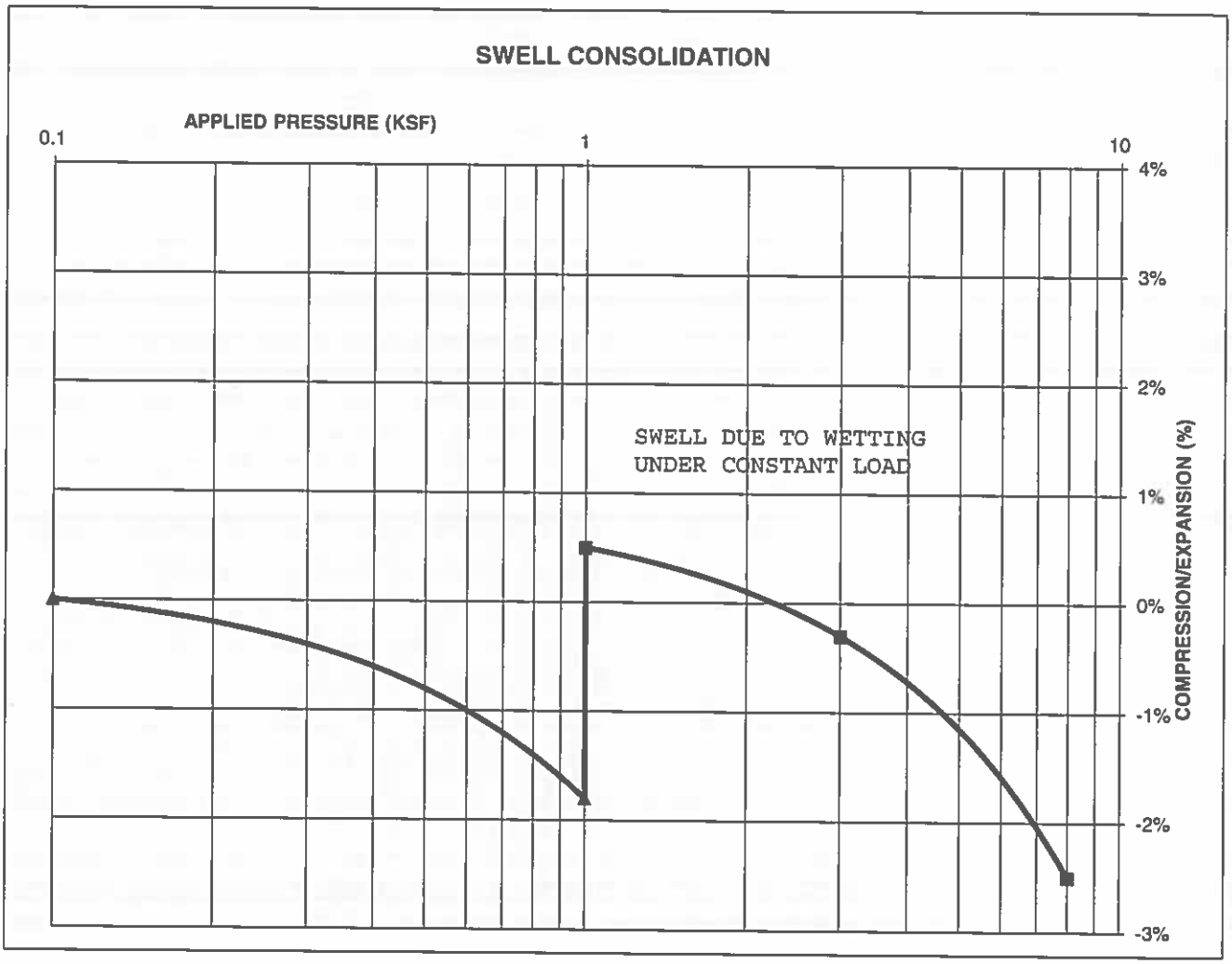
DRAWN:	DATE:	CHECKED:	DATE:
		h	6/C/20

JOB NO: 200393
FIG NO: C-54

CONSOLIDATION TEST RESULTS

TEST BORING #	33	DEPTH(ft)	15
DESCRIPTION	ML	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			111
NATURAL MOISTURE CONTENT			19.3%
SWELL/CONSOLIDATION (%)			2.3%

JOB NO. 200393
CLIENT OAKWOOD HOMES
PROJECT BLR - VILLAGES A, B, C, D



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SWELL CONSOLIDATION
TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			6/5/20

JOB NO.: 200393
FIG NO.: C-55

CLIENT	OAKWOOD HOMES	JOB NO.	200393
PROJECT	BLR - VILLAGES A, B, C, D	DATE	3/24/2020
LOCATION	BLR - VILLAGES A, B, C, D	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-1	5	1	SM	<0.01
TB-2	10	3	SM	<0.01
TB-5	5	4	ML	<0.01
TB-7	10	2	CL	<0.01
TB-16	5	1	SM	<0.01
TB-22	15	4	CL	<0.01

QC BLANK PASS

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LABORATORY TEST
SULFATE RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	3/27/20

JOB NO.: 200393
FIG NO.: C-56

CLIENT	OAKWOOD HOMES	JOB NO.	200393
PROJECT	BLR - VILLAGES A, B, C, D	DATE	3/24/2020
LOCATION	BLR - VILLAGES A, B, C, D	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-25	2-3	1	SP	0.00
TB-25	20	2	CH	<0.01
TB-27	20	4	ML	<0.01
TB-30	10	4	CL	0.00

QC BLANK PASS

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ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST SULFATE RESULTS

DRAWN:	DATE.	CHECKED	DATE: 6/5/20

JOB NO.: 200393

FIG NO.: C-57

APPENDIX D: Laboratory Test Results Summary, Test Boring and Test Pit Logs, Entech Job No. 191764

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

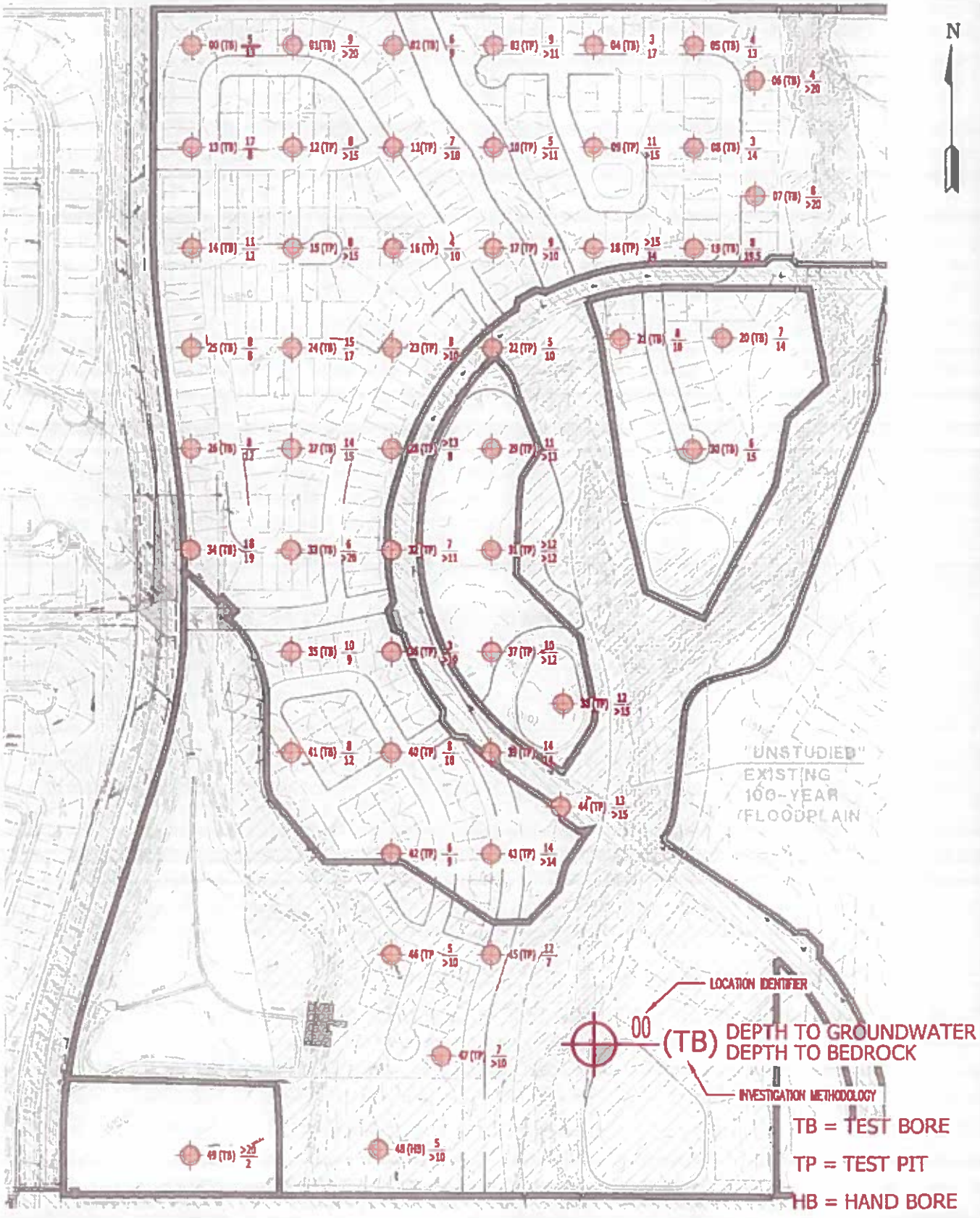
CLIENT OAKWOOD HOMES
PROJECT BANNING LEWIS, VILLAGE B
JOB NO. 191764

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1A	01	2-3			36.2						SM	FILL, SAND, SILTY
1A	06	2-3			19.1				370		SC	FILL, SAND, CLAYEY
1A	34	5			11.1						SM-SW	FILL, SAND, SLIGHTLY SILTY
1	00	2-3			6.3	NV	NP	<0.01			SM-SW	SAND, SLIGHTLY SILTY
1	02	10			4.9						SW	SAND
1	04	5			12.9						SM	SAND, SILTY
1	08	10			5.7	NV	NP				SM-SW	SAND, SLIGHTLY SILTY
1	12	5			11.5						SM-SW	SAND, SLIGHTLY SILTY
1	14	15			8.0	NV	NP	<0.01			SM-SW	SAND, SLIGHTLY SILTY
1	15	3			8.3						SM-SW	SAND, SLIGHTLY SILTY
1	17	2-3			3.5						SW	SAND
1	19	10			37.6				1010		SC	SAND, CLAYEY
1	20	5			8.1						SM-SW	SAND, SLIGHTLY SILTY
1	21	2-3			2.9	NV	NP				SW	SAND
1	24	10			6.5						SM-SW	SAND, SLIGHTLY SILTY
1	26	5			37.1						SC	SAND, CLAYEY
1	27	5			15.4						SM	SAND, SILTY
1	30	10			11.9						SM-SW	SAND, SLIGHTLY SILTY
1	32	4			4.7						SW	SAND
1	33	2-3			16.8						SM	SAND, SILTY
1	35	5			7.0						SM-SW	SAND, SLIGHTLY SILTY
1	36	4			30.9						SC	SAND, CLAYEY
1	38	10			1.9						SW	SAND
1	41	15			33.7	29	8				SC	SAND, CLAYEY
1	44	3			23.4						SM	SAND, SILTY
1	48	2			21.7						SM	SAND, SILTY
1	49	5			32.3						SC	SAND, CLAYEY
2A	07	2-3	16.0	98.9	69.9					0.3	CL	FILL, CLAY, SANDY
2	05	2-3	10.6	99.7	97.7					-2.9	CL	CLAY, SANDY
2	08	2-3	25.6	92.3	96.4	84	52	0.31		5.6	CH	CLAY, SANDY
2	10	2-3			51.4				520		CL	CLAY, VERY SANDY
2	44	9			79.6				1030		CL	CLAY, SANDY
3	05	15			7.1	NV	NP				SM-SW	SANDSTONE, SLIGHTLY SILTY
3	40	11			41.3				820		SC	SANDSTONE, VERY CLAYEY
4	19	20	16.1	114.4	98.3					2.9	CL	CLAYSTONE, SANDY
4	13	10	25.8	93.0	98.1	55	22	<0.01		0.7	MH	SILTSTONE, CLAYEY, SANDY
4	25	15	12.8	115.9	98.9					1.0	CL	CLAYSTONE, SANDY
4	28	10			99.3				1500		CL	CLAYSTONE, SANDY
4	49	10			94.3						CL	CLAYSTONE, SANDY
4	49	15	21.5	105.7						3.6	CL	CLAYSTONE, SANDY

Subsurface Soil Investigation Summary
Banning Lewis Ranch - Village B
Table 2

Location ID	Investigation Practice	Total Depth (ft)	Bedrock (ft)	Groundwater (ft)
00	TB	20	13	5
01	TB	20	>20	9
02	TB	20	14	6
03	TP	10	>10	9
04	TB	15	>15	3
05	TB	20	13	4
06	TB	20	>20	4
07	TB	20	>20	8
08	TB	20	14	3
09	TP	15	>15	11
10	TP	10	>10	5
11	TP	10	>10	7
12	TP	14	>14	8
13	TB	20	8	17
14	TB	20	12	11
15	TP	15	>15	8
16	TP	10	>10	4
17	TP	10	>10	9
18	TP	15	>15	>15
19	TB	20	14	8
20	TB	15	>15	7
21	TB	10	>10	8
22	TP	10	9	5
23	TP	10	>10	8
24	TB	18	>18	15
25	TB	20	12	8
26	TB	20	8	14
27	TB	15	>15	14
28	TP	13	12	>13
29	TP	13	>13	11
30	TB	20	14	6.5
31	TP	12	>12	>12
32	TP	10	>10	7
33	TB	20	13	6
34	TB	20	>20	18
35	TB	20	12	10
36	TP	10	>10	3
37	TP	12	>12	10
38	TP	12	>12	12
39	TP	15	14	14
40	TP	12	10	8
41	TB	20	19	8
42	TP	10	9	6
43	TP	15	>15	14
44	TP	15	>15	13
45	TP	15	7	12
46	TP	12	>12	5
47	TP	10	>10	7
48	HB	5	>5	5
49	TB	20	1	>20

TB - Test Boring
TP - Test Pit
HB - Hand Boring



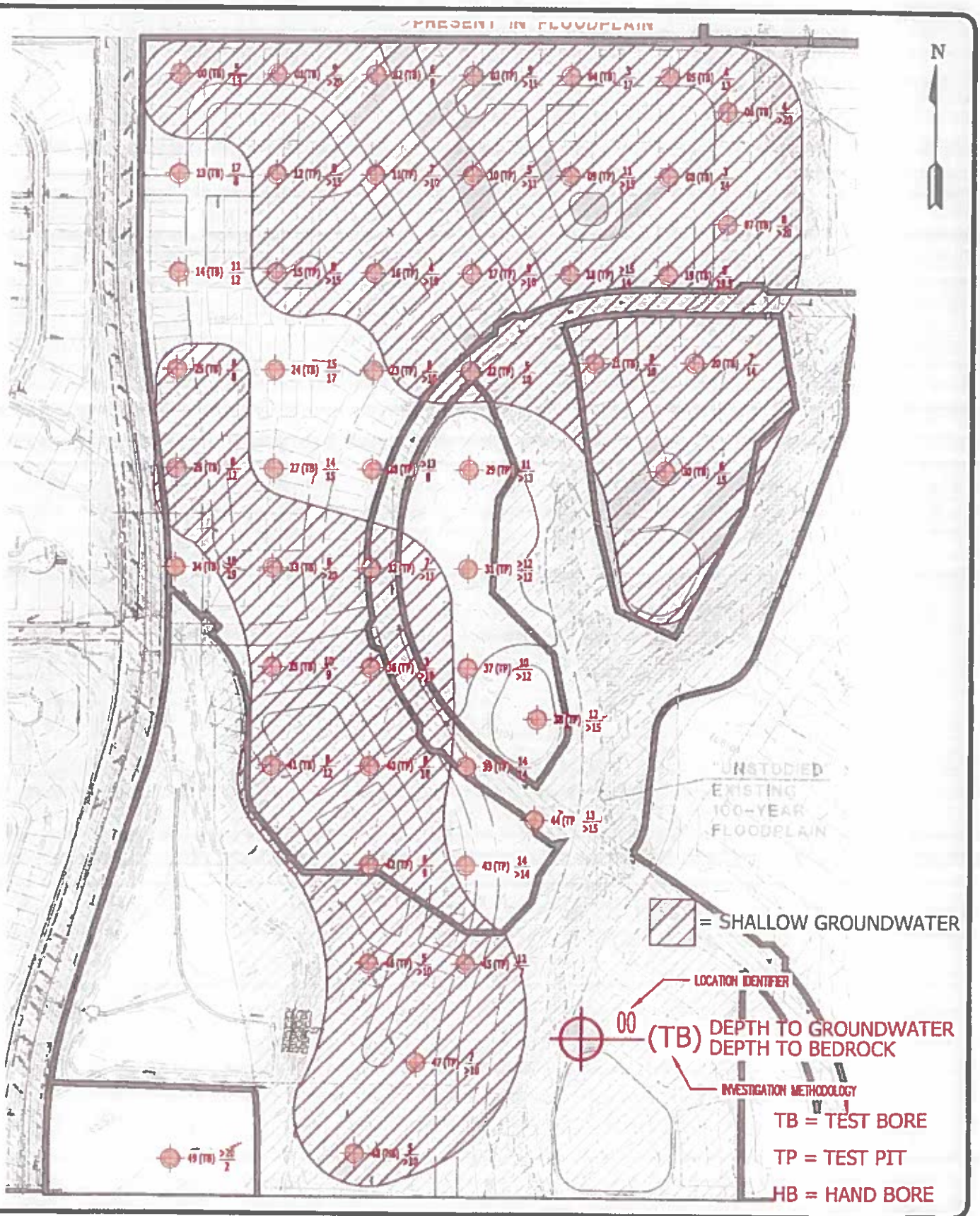
ENTECH ENGINEERING, INC.
325 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

TEST BORING LOCATION PLAN
BANNING LEWIS RANCH – VILLAGE B
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

DRAWN BY:	DATE DRAWN:	DESIGNED BY:	CHECKED:
KDK	01/03/20	SC	

JOB NO.: 191764

FIG. NO.: 2

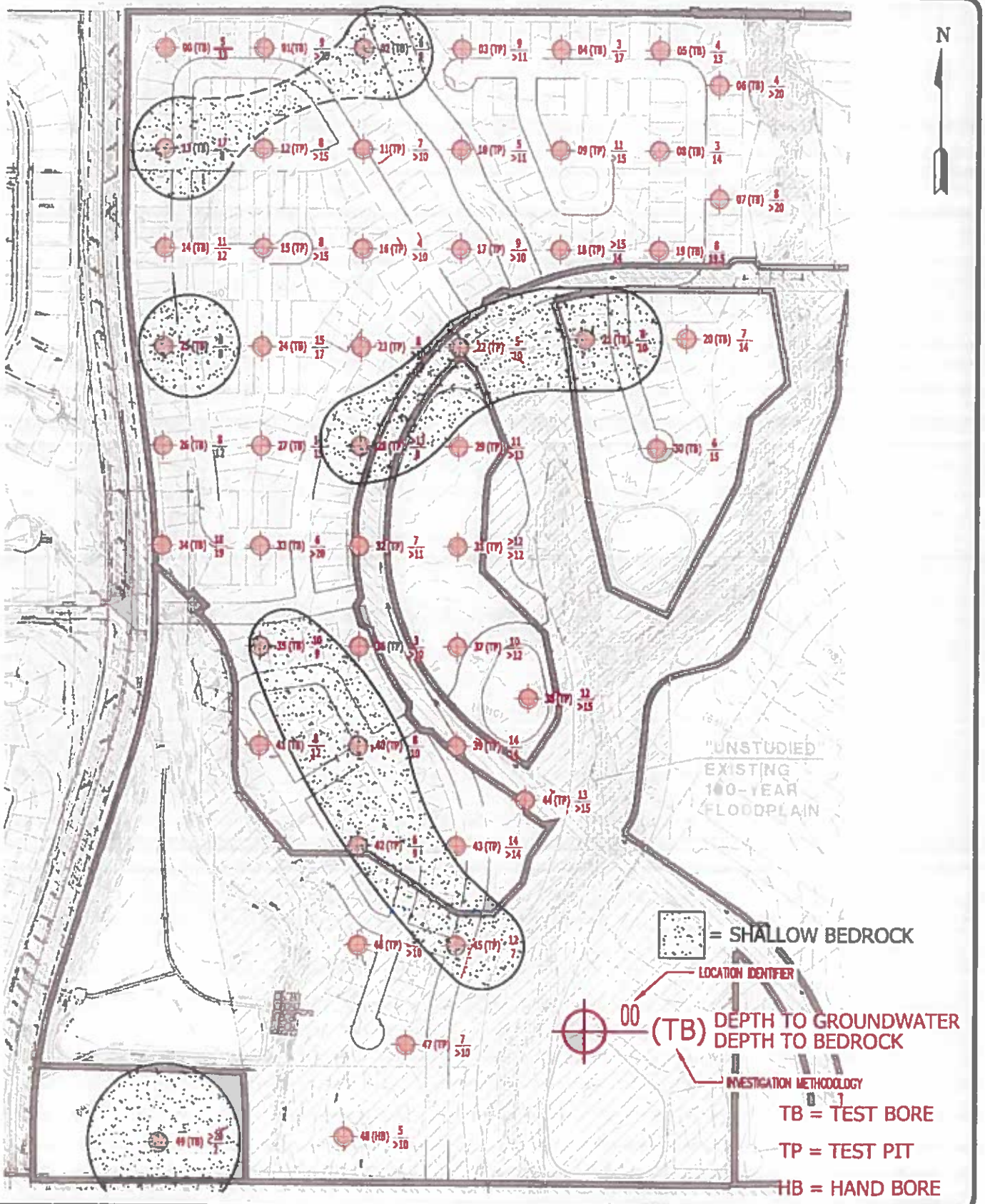


ENTECH ENGINEERING, INC.
[redacted]

SHALLOW GROUNDWATER PLAN
BANNING LEWIS RANCH – VILLAGE B
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

DRAWN BY:	DATE DRAWN:	DESIGNED BY:	CHECKED:
EDK	01/03/20	SC	

JOB NO.: 191764
FIG. NO.: 3

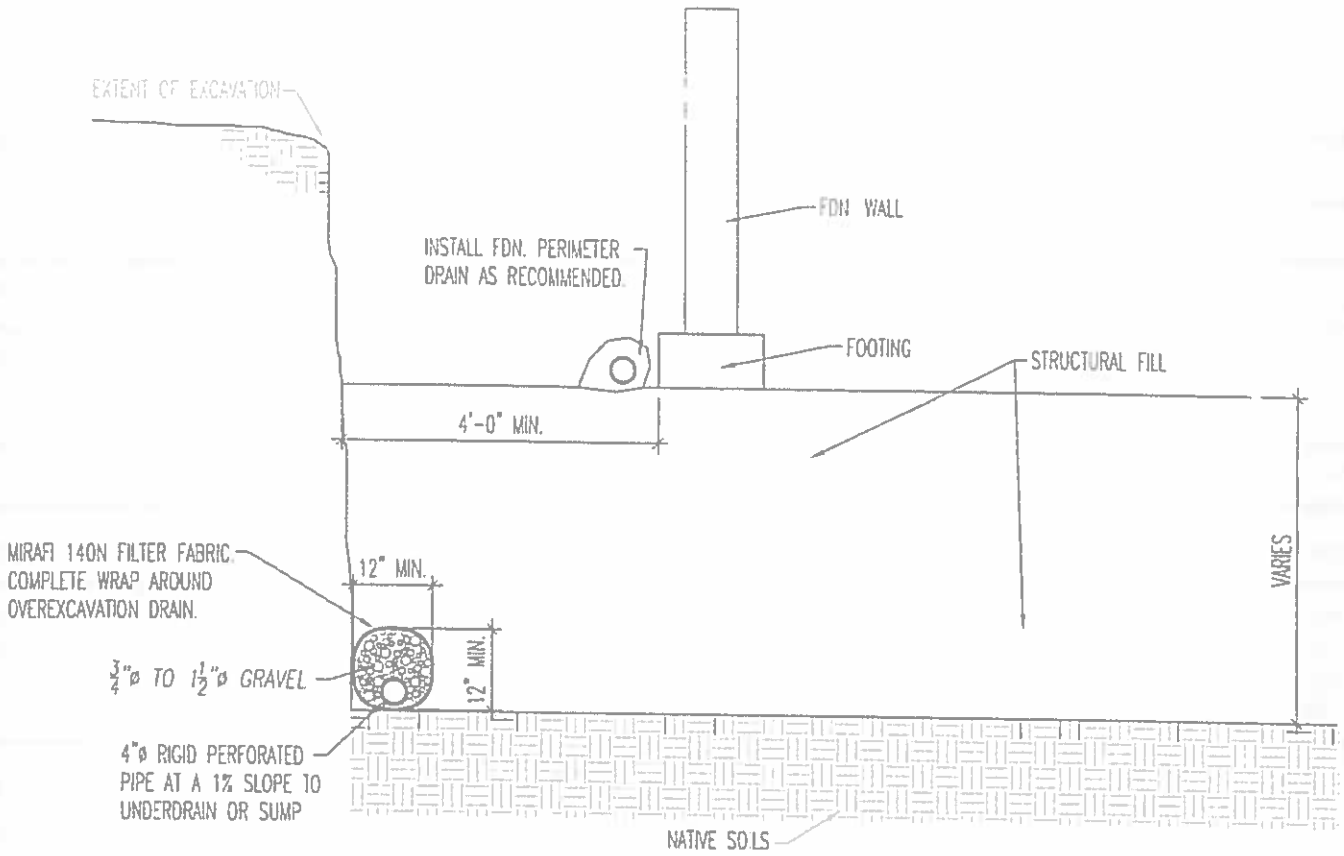


ENTECH ENGINEERING, INC.
203 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

SHALLOW BEDROCK PLAN
BANNING LEWIS RANCH – VILLAGE B
COLORADO SPRINGS, CO
FOR: OAKWOOD HOMES

DRAWN BY:	DATE DRAWN:	DESIGNED BY:	CHECKED:
EDE	01/03/20	SC	

JOB NO.: 191764
FIG. NO.: 4



OVEREXCAVATION DRAIN DETAIL

N.T.S.

NOTE:

EXTEND DRAIN TO SUMP AS REQ'D.

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505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

OVEREXCAVATION DRAIN DETAIL

DRAWN BY: M. WELLS	DATE DRAWN:	DESIGNED BY: D. STEGMAN	CHECKED:

JOB NO. 191764
FIG. NO. 5

TEST BORING NO. 00
DATE DRILLED 10/15/2019
Job # 191764

REMARKS

WATER @ 5', 10/16/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Description
			17	2.7	1	SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY TO WET
5			14	15.5	1	
10			7	27.2	2	CLAY, SANDY, GRAY BROWN, FIRM, MOIST
15			46	14.5	3	WEATHERED TO FORMATIONAL SANDSTONE, SILTY, FINE TO MEDIUM GRAINED, GRAY BROWN, DENSE TO VERY DENSE, WET
20			50/8"	16.4	3	

TEST BORING NO. 01
DATE DRILLED 10/18/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 9', 10/21/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	Description
			20	7.7	1A	POSS. FILL 0-3', SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN, MEDIUM DENSE, MOIST
5			14	2.7	1	SAND, SILTY, FINE TO COARSE GRAINED, TAN TO GRAY BROWN, MEDIUM DENSE, MOIST TO WET
10			16	11.8	1	
15			11	19.4	1	
20			15	19.2	1	

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 1

TEST BORING NO. 02
DATE DRILLED 10/18/2019
Job # 191764

REMARKS

WATER @ 6', 10/21/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			16	12.5	1	SAND, CLAYEY WITH ORGANICS, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST
5			*	15.1	1	SAND, SLIGHTLY SILTY TO CLEAN, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE, MOIST
10			12	14.8	1	
15			50/4"	18.5	3	SANDSTONE, CLAYEY, FINE GRAINED, GRAY BROWN, VERY DENSE, MOIST
20			*	21.4	3	

* - BULK SAMPLE TAKEN

TEST BORING NO. 03
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 9', 11/4/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
					1	SAND, SILTY, DARK BROWN
5					1	SAND, CLAYEY, GRAY BROWN
10						
15						
20						

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		TJS	12/23/19

JOB NO.: 191764
FIG NO.: A- 2

TEST BORING NO. 04
DATE DRILLED 10/31/2019
Job # 191764

REMARKS

WATER @ 3', 11/1/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						SAND, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE, WET
			17	14.8	1	
5			*	16.3	1	
10			14	14.7	1	
15			*	15.3	1	* - BULK SAMPLE TAKEN
20						

TEST BORING NO. 05
DATE DRILLED 10/25/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 4', 10/28/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						CLAY, SANDY, GRAY BROWN, SOFT, VERY MOIST TO WET
			6	32.1	2	
5			*	33.5	2	
10			14	13.1	1	SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE, WET
15			50/11"	11.7	3	SANDSTONE, SLIGHTLY SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST
20			50	16.0	3	

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		TJS	12/23/19

JOB NO. 191764
FIG NO. A- 3

TEST BORING NO. 06
DATE DRILLED 11/13/2019
Job # 191764

REMARKS

WATER @ 4', 11/14/19

FILL 0-5', SAND, CLAYEY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE TO VERY LOOSE, MOIST TO WET

SAND, SILTY, WET

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			17	10.3	1A
5			3	57.7	1A
					1
10					
15					
20					

TEST BORING NO. 07
DATE DRILLED 11/14/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 8', 11/15/19

POSS. FILL 0-3', CLAY, SANDY, DARK BROWN, FIRM, MOIST

SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, WET

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			14	8.0	2A
5			12	15.2	1
10			*	16.9	1
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 4

TEST BORING NO. 08
DATE DRILLED 10/25/2019
Job # 191764

REMARKS

WATER @ 3', 10/28/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	CLAY, SANDY, GRAY BROWN, FIRM, MOIST		10	25.9	2
	SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, GRAY BROWN, LOOSE, WET		*	30.5	1
5					
10			6	14.8	1
	WEATHERED TO FORMATIONAL SANDSTONE, SILTY, FINE GRAINED, GRAY BROWN, DENSE TO VERY DENSE, WET				
15			46	16.2	3
20			50/5"	17.2	3

TEST BORING NO. 09
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 11', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
	SAND, CLAYEY, FINE TO MEDIUM GRAINED, DARK BROWN TO BROWN				1
5					
10	SAND, SILTY, GRAY BROWN, DRY TO VERY MOIST		*	2.6	1
15					
20					

* - BULK SAMPLE TAKEN

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE
		DS	12/23/19

JOB NO. 191764
FIG NO. A- 5

TEST BORING NO. 10
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 5', 11/2/19

CLAY, VERY SANDY, GRAY BROWN, MOIST TO VERY MOIST

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5		*		20.4	2
10					
15					
20					

TEST BORING NO. 11
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 7', 11/2/19

SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN TO GRAY BROWN

CLAY, SANDY, GRAY

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5		*		10.1	1
10					2
15					
20					

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TEST BORING LOG

DRAWN	DATE	CHECKED	DATE
		DS	12/23/19

JOB NO. 191764
FIG NO. A- 6

TEST BORING NO. 12
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

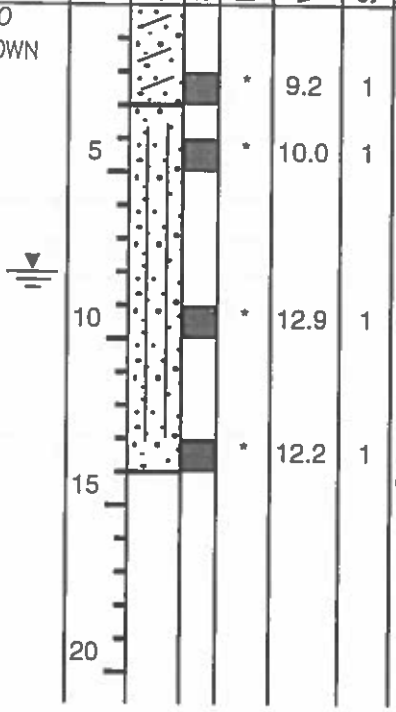
EXCAVATED TEST PIT

WATER @ 8', 11/6/19

SAND, VERY CLAYEY, FINE TO MEDIUM GRAINED, DARK BROWN

SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MOIST TO VERY MOIST

* - BULK SAMPLE TAKEN



Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
0	*		9.2	1
5	*		10.0	1
10	*		12.9	1
15	*		12.2	1
20				

TEST BORING NO. 13
DATE DRILLED 10/15/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

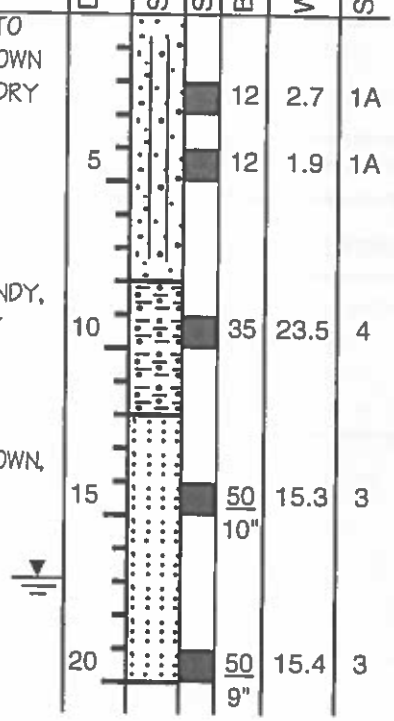
REMARKS

WATER @ 17', 10/16/19

FILL 0-8', SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN TO BROWN, MEDIUM DENSE, DRY

WEATHERED SILTSTONE, SANDY, CLAYEY, DARK BROWN, VERY STIFF, MOIST

SANDSTONE, SILTY, FINE TO MEDIUM GRAINED, GRAY BROWN, VERY DENSE, MOIST



Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
0		12	2.7	1A
5		12	1.9	1A
10		35	23.5	4
15		50/10"	15.3	3
20		50/9"	15.4	3

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO. 191764

FIG NO. A-7

TEST BORING NO. 14
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

WATER @ 11', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			8	2.4	1	SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, DRY TO MOIST TO WET
5			12	4.5	1	
10			21	19.2	1	
15			50/9"	17.6	3	SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, BLUE GRAY, VERY DENSE, MOIST
20			50/6"	18.9	3	

TEST BORING NO. 15
DATE DRILLED 11/5/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 8', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			*	1.7	1	SAND, SLIGHTLY SILTY, FINE TO MEDIUM GRAINED, TAN, DRY TO WET
5			*	2.4	1	
10			*	15.2	1	COARSE GRAINED LENSES
15						* - BULK SAMPLE TAKEN
20						

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TEST BORING LOG

DRAWN	DATE	CHECKED	DATE
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 8

TEST BORING NO. 16
DATE DRILLED 11/1/2019
Job # 191764

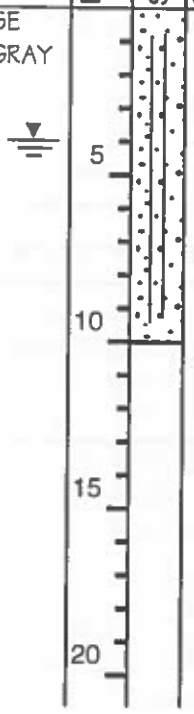
REMARKS

EXCAVATED TEST PIT

WATER @ 4', 11/2/19

SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN TO GRAY BROWN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1



TEST BORING NO. 17
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

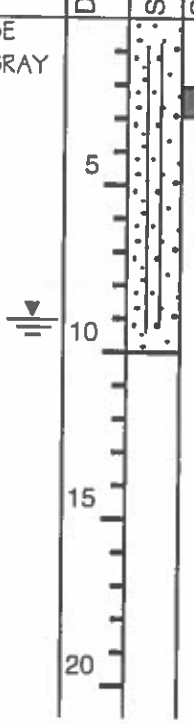
EXCAVATED TEST PIT

WATER @ 9', 11/2/19

SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN TO GRAY BROWN, MOIST

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
		1	*	3.4	1



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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 9

TEST BORING NO. 18
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

DRY TO 15', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						SAND, CLAYEY, FINE GRAINED, GRAY BROWN, MOIST
			*	4.7	1	
5						CLAYEY LENSES
10						
15						
20						

TEST BORING NO. 19
DATE DRILLED 11/13/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 8', 11/14/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			11	1.2	1	SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, DRY
5			10	1.3	1	
10			6	25.5	1	SAND, CLAYEY, FINE GRAINED, GRAY BROWN, LOOSE, VERY MOIST
15			50/10"	14.2	3	SANDSTONE, SILTY, FINE TO MEDIUM GRAINED, GRAY BROWN, VERY DENSE, WET
20			50/10"	16.1	4	CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST

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TEST BORING LOG

DRAWN	DATE	CHECKED	DATE
		DS	12/23/19

JOB NO. 191764
FIG NO. A- 10

TEST BORING NO. 20
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

WATER @ 7', 11/6/19

SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY TO WET

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			17	0.9	1
5			25	7.6	1
10			*	12.5	1
15			*	16.4	1
20					

TEST BORING NO. 21
DATE DRILLED 11/5/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 8', 11/7/19

SAND, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE TO DENSE, DRY TO WET

CLAYEY LENSE

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			23	1.6	1
5			30	2.3	1
10			*	14.8	1
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE
		DS	12/23/19

JOB NO. 191764
FIG NO. A- 11

TEST BORING NO. 22
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 5', 11/2/19

SAND, CLAYEY, FINE GRAINED, GRAY BROWN

CLAYSTONE, SANDY, GRAY BROWN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5					1
10					4
15					
20					

TEST BORING NO. 23
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 8', 11/2/19

SAND, CLAYEY, FINE GRAINED, GRAY BROWN

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			*	8.6	1
10			*	4.5	1
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 12

TEST BORING NO. 24
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

WATER @ 15', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			12	1.2	1	SAND, SLIGHTLY SILTY, FINE TO MEDIUM GRAINED, TAN, MEDIUM DENSE TO LOOSE, DRY TO WET
5			12	1.9	1	
10			13	3.5	1	
15			6	3.0	1	
20						

TEST BORING NO. 25
DATE DRILLED 10/18/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 8', 10/21/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			9	2.9	1A	POSS. FILL 0-8', SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, LOOSE TO MEDIUM DENSE, DRY TO MOIST
5			29	5.6	1A	
10			17	27.3	2	CLAY, SANDY, GRAY BROWN, STIFF, MOIST
15			50/11"	14.0	4	CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST
20			50/11"	16.3	4	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 13

TEST BORING NO. 26
DATE DRILLED 10/17/2019
Job # 191764

REMARKS

WATER @ 14', 10/18/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			23	5.3	1	SAND, SILTY TO CLAYEY, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE, MOIST
5			25	12.4	1	
			50/10"	12.5	3	SANDSTONE, SILTY, FINE TO MEDIUM GRAINED, TAN TO GRAY BROWN, VERY DENSE, MOIST TO WET
10						
15			50/9"	14.7	3	COARSE GRAINED LENSES
			50/6"	13.9	3	
20						

TEST BORING NO. 27
DATE DRILLED 11/5/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 14', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			8	10.4	1	SAND, SILTY, FINE TO COARSE GRAINED, BROWN TO TAN, LOOSE TO MEDIUM DENSE, MOIST
5			12	10.2	1	
10			20	6.3	1	
15			19	33.0	2	CLAY, SANDY, BROWN, STIFF, VERY MOIST
20						

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TEST BORING LOG

DRAWN	DATE	CHECKED	DATE
		DS	12/23/19

JOB NO. 191764
FIG NO. A- 14

TEST BORING NO. 28
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

DRY TO 13', 11/2/19

SAND, SILTY, FINE TO COARSE GRAINED, BROWN, DRY

CLAY, SANDY, BROWN, MOIST

SANDSTONE, TAN

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			*	1.6	1
10			*	29.0	2
					3
15					
20					

TEST BORING NO. 29
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 11', 11/2/19

CLAY, SANDY, BROWN TO GRAY BROWN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5					2
10					
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO. 191764

FIG NO. A- 15

TEST BORING NO. 30
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

WATER @ 6.5', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			10	2.4	1
5			23	4.4	1
10			*	13.1	1
15			*	16.2	4
20					

SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY TO WET

CLAYSTONE, SANDY, GRAY BROWN, WET

* - BULK SAMPLE TAKEN

TEST BORING NO. 31
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

DRY TO 12', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
					2
5					1
10			*	18.6	2
15					
20					

SAND, SILTY, DARK BROWN

CLAY, SANDY, TAN

SAND, SILTY, TAN

CLAY, SANDY, GRAY BROWN

* - BULK SAMPLE TAKEN

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 16

TEST BORING NO. 32
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 7', 11/2/19



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						SAND, FINE TO COARSE GRAINED, BROWN, MOIST
			*	10.2	1	
5			*	4.0	1	
10						
15						
20						

TEST BORING NO. 33
DATE DRILLED 11/5/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 6', 11/6/19



Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						SAND, SILTY, FINE TO MEDIUM GRAINED, TAN, LOOSE TO MEDIUM DENSE, MOIST
			9	9.1	1	
5			15	6.1	1	
10			14		2	CLAY, SANDY, GRAY BROWN, FIRM, MOIST
15			49		4	WEATHERED TO FORMATIONAL CLAYSTONE, SANDY, BLUE GRAY, VERY STIFF TO HARD, MOIST
20			50/8"	19.2	4	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO: 191764
FIG NO: A- 17

TEST BORING NO. 34
DATE DRILLED 10/18/2019
Job # 191764

REMARKS

WATER @ 18', 10/19/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			18	12.4	1A	FILL 0-8', SAND, SLIGHTLY SILTY, FINE TO MEDIUM GRAINED, DARK BROWN TO BROWN, MEDIUM DENSE, MOIST
5			16	9.7	1A	
			9	6.1	1	SAND, SILTY, FINE TO MEDIUM GRAINED, DARK BROWN TO TAN, LOOSE TO MEDIUM DENSE, MOIST
10						
15			14	3.6	1	
						▼
20			18	32.8	2	CLAY, SANDY, BROWN, STIFF, WET

TEST BORING NO. 35
DATE DRILLED 10/18/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 10', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			8	2.4	1	SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, LOOSE TO MEDIUM DENSE, DRY TO MOIST
5			12	4.5	1	
10			21	19.2	1	▼ FINE GRAINED CLAYEY LENSES
15			50	17.6	3	SANDSTONE, SILTY, FINE GRAINED, BLUE GRAY, VERY DENSE, MOIST
20			50/6"	18.9	3	

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 18

TEST BORING NO. 36
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 3', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, CLAYEY, FINE TO MEDIUM GRAINED, GRAY BROWN, MOIST					
5			*	17.2	1
SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MOIST					
10			*	8.4	1
15					
20					

TEST BORING NO. 37
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 10', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, CLAYEY, TAN					1
5					
CLAY, SANDY, TAN					2
SAND, CLAYEY, GRAY BROWN					1
10					
15					
20					

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: DS	DATE 12/23/19

JOB NO. 191764
FIG NO. A- 19

TEST BORING NO. 38
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 12', 11/6/19

SAND, SILTY, FINE TO COARSE GRAINED, TAN, MOIST

SAND, FINE TO COARSE GRAINED, TAN, MOIST TO WET

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			*	6.9	1
5			*	3.1	1
10			*	3.7	1
			*	13.1	1
15					
20					

TEST BORING NO. 39
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 14', 11/2/19

SAND, CLAYEY, BROWN

CLAYSTONE, SANDY, GRAY BROWN, DRY

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
5					1
10					1
15			*	2.1	4
20					

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COLORADO SPRINGS, COLORADO 80907

TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO. 191764
FIG NO. A- 20

TEST BORING NO. 40
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 8', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
CLAY, SANDY, GRAY BROWN, MOIST					
		*		21.8	2
SAND, SILTY, BROWN					
5					1
10					
SANDSTONE, VERY CLAYEY, FINE GRAINED, DARK GRAY, VERY MOIST		*		20.5	3
15					
* - BULK SAMPLE TAKEN					
20					

TEST BORING NO. 41
DATE DRILLED 11/5/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

WATER @ 8', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
POSS. FILL 0-6', SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST			15		1A
5			23		1A
SAND, SILTY TO CLAYEY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST					
10			21		1
15		*			1
CLAYSTONE, SANDY, BLUE GRAY, HARD, MOIST			50/10"		4
20					

* - BULK SAMPLE TAKEN

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 21

TEST BORING NO. 42
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 6', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					2
CLAY, SANDY, GRAY BROWN					
5					1
SAND, CLAYEY, GRAY BROWN ▼					
10					4
CLAYSTONE, SANDY, GRAY BROWN					
15					
20					

TEST BORING NO. 43
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 14', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
SAND, CLAYEY, BROWN TO GRAY BROWN					
		*		2.7	1
5					
10					
15 ▼					
20					

* - BULK SAMPLE TAKEN

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO. 191764

FIG NO.: A- 22

TEST BORING NO. 44
DATE DRILLED 11/5/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 13', 11/6/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			*	2.8	1
5			*	3.6	1
10			*	23.0	2
15			*	17.4	1
20					

SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MOIST

CLAY, SANDY, GRAY BROWN, MOIST

SAND, SILTY, FINE TO COARSE GRAINED, BROWN, VERY MOIST

TEST BORING NO. 45
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

EXCAVATED TEST PIT

WATER @ 12', 11/2/19

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
5					
					4
10					
15					
20					

SAND, SILTY, RED BROWN

CLAYSTONE, SANDY, GRAY BROWN

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TEST BORING LOG

DRAWN:	DATE:	CHECKED: DS	DATE: 12/23/19

JOB NO. 191764

FIG NO. A- 23

TEST BORING NO. 46
DATE DRILLED 11/1/2019
Job # 191764

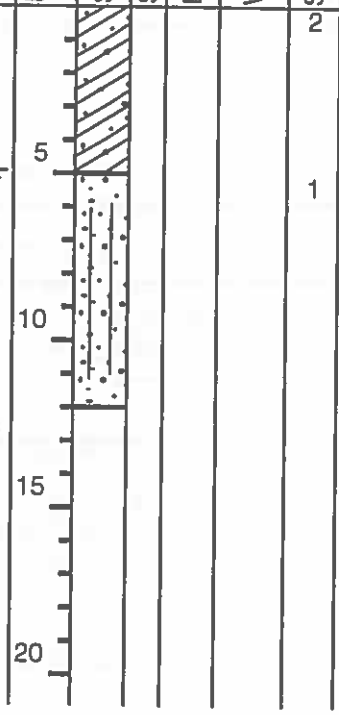
REMARKS

EXCAVATED TEST PIT

WATER @ 5', 11/2/19

CLAY, SANDY, GRAY BROWN

SAND, SILTY, GRAY BROWN



TEST BORING NO. 47
DATE DRILLED 11/1/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

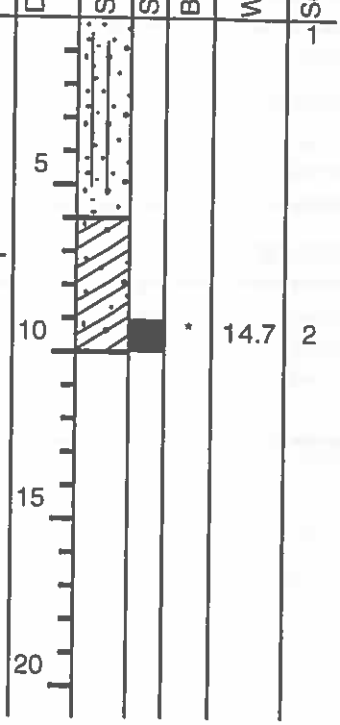
EXCAVATED TEST PIT

WATER @ 7', 11/2/19

SAND, SILTY, BROWN

CLAY, SANDY, GRAY BROWN

* - BULK SAMPLE TAKEN



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TEST BORING LOG

DRAWN:	DATE:	CHECKED: DS	DATE: 12/23/19

JOB NO.: 191764
FIG NO.: A- 24

TEST BORING NO. 48
DATE DRILLED 11/1/2019
Job # 191764

REMARKS

EXCAVATED TEST PIT

WATER @ 5', 11/2/19

SAND, SILTY, FINE TO COARSE GRAINED, DARK BROWN TO TAN

* - BULK SAMPLE TAKEN

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
5			*	8.1	1
			*	8.5	1

TEST BORING NO. 49
DATE DRILLED 11/5/2019
CLIENT OAKWOOD HOMES
LOCATION BANNING LEWIS, VILLAGE B

REMARKS

DRY TO 20', 10/10/19

SAND, CLAYEY, BROWN

SANDSTONE, CLAYEY, FINE GRAINED, TAN, VERY DENSE, MOIST

CLAYSTONE, SANDY, BLUE GRAY, HARD, MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
					1
			50/7"	13.8	3
5			50/7"	16.1	3
10			50/8"	17.3	4
15			50/6"	18.2	4
20			50/6"	18.3	4

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TEST BORING LOG

DRAWN:	DATE:	CHECKED:	DATE:
		DS	12/23/19

JOB NO.: 191764
FIG NO.: A- 25

APPENDIX E: Soil Survey Descriptions

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

9—Blakeland-Fluvaquentic Haplaquolls

Map Unit Setting

National map unit symbol: 36b6
Elevation: 3,500 to 5,800 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 110 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 60 percent
Fluvaquentic haplaquolls and similar soils: 38 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose and/or eolian deposits derived from arkose

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)

Hydric soil rating: No

Description of Fluvaquentic Haplaquolls

Setting

Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 12 inches: variable

Properties and qualities

Slope: 1 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

96—Truckton sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 36bf
Elevation: 6,000 to 7,000 feet
Mean annual precipitation: 14 to 15 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Truckton and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 8 inches: sandy loam
Bt - 8 to 24 inches: sandy loam
C - 24 to 60 inches: coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019