The information contained herein was obtained by the Department for design and estimating purposes only. It is being furnished with the express understanding that said information does not constitute a part of the Proposal or Contract and represents only the best knowledge of the Department as to the location, character and depth of the materials encountered. The information is only included and made available so that bidders may have access to subsurface information obtained by the Department and is not intended to be a substitute for personal investigation, interpretation and judgment of the bidder. The bidder should be cognizant of the possibility that conditions affecting the cost and/or quantities of work to be performed may differ from those indicated herein.
Shoulder Survey Report

AHTD Job No. CA0101
Cross County Line - Highway 147 (Widening) (S)
FAP NO.9991
Crittenden County, Arkansas
August 21, 2014
Terracon Project No. 35135123

Prepared for:
Buchart Horn, Inc.
Memphis, Tennessee

Prepared by:
Terracon Consultants, Inc.
Little Rock, Arkansas
August 21, 2014

Buchart Horn, Inc.
3150 Lenox Park Boulevard, Suite 300
Memphis, Tennessee 38115

Attn: Mr. Andy Pinkley, P.E., CPESC
P: [901] 363 6355

Re: Shoulder Survey Report
AHTD Job No. CA0101
Cross County Line – Highway 147 (Widening) (S)
FAP No. 9991
Crittenden County, Arkansas
Terracon Report No. 35135123

Dear Mr. Pinkley:

Terracon Consultants, Inc. (Terracon) has completed the shoulder survey services for the above-referenced project. The scope of our services was performed as Buchart Horn, Inc.'s sub consultant for Connecting Arkansas Program (CAP) On-Call Design Services (2011-2016), Task Order No. C044.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,

Terracon Consultants, Inc.
Certificate of Authorization #223, Expires 12/31/2015

Richa A. Schawane, E.I.
Senior Staff Engineer

Shaun P. Baker, P.E.
Department Manager • Geotechnical Services
Arkansas No. 11817

APR Reviewed by Craig K. Denny, Ph.D., P.E. (KS)
Copies to: Addresssee (3 via mail, 1 via email)
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>2.0 PROJECT INFORMATION</td>
<td></td>
</tr>
<tr>
<td>2.1 Project Description</td>
<td>1</td>
</tr>
<tr>
<td>2.2 Site Location and Description</td>
<td>2</td>
</tr>
<tr>
<td>3.0 SUBSURFACE CONDITIONS</td>
<td>2</td>
</tr>
<tr>
<td>3.1 Geology</td>
<td>2</td>
</tr>
<tr>
<td>3.2 Typical Profile</td>
<td>4</td>
</tr>
<tr>
<td>3.3 Shoulder Soil Survey</td>
<td>4</td>
</tr>
<tr>
<td>4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION</td>
<td>4</td>
</tr>
<tr>
<td>4.1 Geotechnical Considerations</td>
<td>4</td>
</tr>
<tr>
<td>4.2 Earthwork</td>
<td>5</td>
</tr>
<tr>
<td>4.2.1 Site Preparation</td>
<td>6</td>
</tr>
<tr>
<td>4.2.2 Import Material Specifications</td>
<td>6</td>
</tr>
<tr>
<td>4.2.3 Compaction Requirements</td>
<td>7</td>
</tr>
<tr>
<td>4.2.4 Lime Treated Subgrade</td>
<td>8</td>
</tr>
<tr>
<td>4.2.5 Excavation and Trench Construction</td>
<td>8</td>
</tr>
<tr>
<td>4.2.6 Utility Trench Backfill</td>
<td>8</td>
</tr>
<tr>
<td>4.3 Pavement Subgrade Preparation</td>
<td>8</td>
</tr>
<tr>
<td>4.4 Pavement Design Considerations</td>
<td>9</td>
</tr>
<tr>
<td>5.0 GENERAL COMMENTS</td>
<td>9</td>
</tr>
<tr>
<td>APPENDIX A – FIELD EXPLORATION</td>
<td></td>
</tr>
<tr>
<td>Exhibit A-1 Site Location Plan</td>
<td></td>
</tr>
<tr>
<td>Exhibits A-2 to A-7 Boring Location Plans</td>
<td></td>
</tr>
<tr>
<td>Exhibit A-8 Field Exploration Description</td>
<td></td>
</tr>
<tr>
<td>Exhibit A-9 Boring Location Summary Table</td>
<td></td>
</tr>
<tr>
<td>Exhibits A-10 to A-106 Boring Logs</td>
<td></td>
</tr>
<tr>
<td>APPENDIX B – LABORATORY TESTING</td>
<td></td>
</tr>
<tr>
<td>Exhibit B-1 Laboratory Testing Description</td>
<td></td>
</tr>
<tr>
<td>Exhibit B-2 Laboratory Data</td>
<td></td>
</tr>
<tr>
<td>APPENDIX C – SUPPORTING DOCUMENTS</td>
<td></td>
</tr>
<tr>
<td>Exhibit C-1 General Notes</td>
<td></td>
</tr>
<tr>
<td>Exhibit C-2 Unified Soil Classification System</td>
<td></td>
</tr>
<tr>
<td>Exhibit C-3 AASHTO Soil Classification System</td>
<td></td>
</tr>
<tr>
<td>APPENDIX D – PHOTOGRAPHIC LOG</td>
<td></td>
</tr>
</tbody>
</table>
SHOULDER SURVEY REPORT
AHTD JOB NO. CA0101, CROSS COUNTY LINE – HIGHWAY 147
(WIDENING) (S)
FAP NO. 9991
CRITTENDEN COUNTY, ARKANSAS
Terracon Project No. 35135123
August 21, 2014

1.0 INTRODUCTION

This report presents the results of the shoulder survey performed for the planned Highway 64 widening starting near Cross County Line and continuing to Highway 147 in Crittenden County, Arkansas. Ninety-two (92) exploratory borings extending to depths of approximately 10 feet below existing ground surface were drilled within the planned widening. The boring logs, site plan and boring location plans are attached.

2.0 PROJECT INFORMATION

2.1 Project Description

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site layout</td>
<td>See Appendix A, Exhibit A-2 to A-8, Boring Location Plans</td>
</tr>
<tr>
<td>Structures</td>
<td>We understand the project involves widening about 14.3 miles of Highway 64 between Wynne and Marion in Crittenden County, Arkansas. The planned widening will change the road configuration from a two-lane highway to a four-lane highway (two lanes each direction). Construction options include:</td>
</tr>
<tr>
<td></td>
<td>■ overlaying the existing asphalt pavement or rubblizing it as a base material;</td>
</tr>
<tr>
<td></td>
<td>■ constructing a new asphalt pavement section;</td>
</tr>
<tr>
<td></td>
<td>■ widening or constructing new bridges; and</td>
</tr>
<tr>
<td></td>
<td>■ extending and/or replacing culverts.</td>
</tr>
</tbody>
</table>
2.2  Site Location and Description

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>See Appendix A, Exhibit A-1, Site Location Plan. Begin STA 21+75.26, End STA 776+00. Approximately 14.3 miles of Highway 64 between Cross County Line (Road 819) and State Highway 147 near Earle, Crittenden County, Arkansas.</td>
</tr>
<tr>
<td>Existing improvements</td>
<td>Two lane highway. The existing section consists of asphaltic cement concrete.</td>
</tr>
<tr>
<td>Grading</td>
<td>Based on the 30% Plans and Profiles, most of the highway will remain near existing grade. We estimate up to about 15 feet of fill depth could be required for grading between STA 377+00 and STA 498+00. Fill will likely be required adjacent to the existing highway where widened.</td>
</tr>
</tbody>
</table>

3.0  SUBSURFACE CONDITIONS

3.1  Geology

<table>
<thead>
<tr>
<th>Formation 1</th>
<th>Description 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alluvium (Channel Meander)</td>
<td>This unit represents more recent channel meanders and current flood plain deposits of significant streams. Channel meander scars are distinct in this unit. The partition of this unit from other Holocene alluvial deposits was based more on geomorphic consideration than lithic or age consideration. The lower contact is unconformable. The thickness is variable.</td>
</tr>
<tr>
<td>Quaternary Period</td>
<td></td>
</tr>
<tr>
<td>Holocene Epoch</td>
<td></td>
</tr>
<tr>
<td>Alluvium (Local Streams or Overbank Flow )</td>
<td>These deposits are alluvial deposits of small streams, the overbank deposits of major streams, or older meander belt deposits of major streams. The partition of this unit from other Holocene alluvial deposits was based more on geomorphic considerations than lithology or age. Fossils are rare. The lower contact is unconformable and the thickness is variable.</td>
</tr>
<tr>
<td>Quaternary Period</td>
<td></td>
</tr>
<tr>
<td>Holocene Epoch</td>
<td></td>
</tr>
</tbody>
</table>


Based on the results of our borings and information published in the USDA Natural Resources Conservation Service “Soil Survey of Crittenden County, Arkansas” the site can be broadly divided into four soil map units.

Alligator Silty Clay – This consists of poorly drained level soils in old slack-water areas on bottom land along the Mississippi river. These soils formed in thick beds of clayey
sediments. In a representative profile, the surface layers are grayish brown silty clays. The subsoil is grayish-brown clay to gray silty clay. The underlying material is mottled gray and yellowish-brown silt loam. This level soil is the largest acreage of Alligator soils in the county.

Dubbs Silt Loam – The Dubbs series consists of well-drained, level and gently undulating soils on older natural levees along bayous and abandoned river channels. These soils formed in stratified beds of loamy sediments. In a representative profile, the surface layer is grayish-brown silt loam. The upper portion of the subsoil is silty clay loam and the underlying material is stratified, mottled yellowish-brown, brown, gray, and light brownish-gray silt-loam, loamy fine sand, and fine sandy loam.

Dundee Silt Loam – The Dundee series consists of somewhat poorly drained soils on the lower parts of the older natural levees along bayous and abandoned river channels. These soils formed in stratified beds of loamy sediments. In a representative profile, the surface layer is dark grayish-brown silt loam about 8 inches thick. The sub-soil is grayish-brown and light grayish-brown silt loam mottled with yellowish-brown. Below this is mottled gray silt loam that is underlain by mottled gray silty clay.

Sharkey Silty Clay – The Sharkey series consists of poorly drained, level and gently undulating soils in slack-water areas. These soils formed in thick beds of clayey sediments. In a representative profile, the surface layer is mottled very dark grayish-brown and very dark gray silty clay. The subsoil is mottled dark-gray and gray clay. Below the subsoil is mottled gray silty clay loam underlain by mottled gray clay.

The soil map units described in this section were obtained by locating the subject site on available large-scale soil survey maps. Due to the scales involved, precise location of the borings can be difficult to determine. In addition, the large scale soil survey maps describe only general trends. Local variations are possible and site-specific soil conditions may differ from those described above. A site-specific detailed soil survey was not included in our scope of work for this project.
3.2 Typical Profile

Based on the results of the borings, subsurface conditions at the pavement borings are comprised of fat clays, lean clays, silty lean clays, or sands. Conditions and details observed at the boring locations are indicated on the boring logs included in Appendix A. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual.

Atterberg limits (liquid limit and plastic limit) tests were performed on representative samples of cohesive native soils. The tested native soils were classified as lean clays, silty lean clays and fat clay soils having low to high plasticity with liquid limit ranging between 22 and 96 and the PI ranging between 4 and 70. The laboratory test results are shown on the boring logs in Appendix A. A description of the laboratory testing program is provided in Appendix B.

3.3 Shoulder Soil Survey

Terracon drilled a total of ninety-seven borings, designated as B-1 through B-97 for this project at the approximate locations shown on the attached boring location plans in Appendix A. The borings were drilled in the proposed widening areas and spaced approximately 800 feet apart on alternating sides of the road.

Water content and classification tests were performed on selected soil samples obtained from the borings. Classification, moisture-density relationship (standard Proctor) and resilient modulus tests were performed on the four composite bulk samples. The results of these tests are in Appendix B. Based on the results of the laboratory testing, the anticipated pavement subgrade soils classify as AASHTO A-6, A-7-5, A-7-6 and A-4.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

Based upon the field penetration resistance values, moisture content values and the classification test results, it is our opinion that the native soils or new engineered fill should be able to support new pavements.

Low-strength (SPT N-values of 5 blows per foot or less) soils were encountered at several borings to depths of about 3.5 feet below the existing ground surface. A summary of the low-strength areas is presented in the following table:
Boring Locations | Stations | Weak Soil Thickness (ft)
--- | --- | ---
B-9 to B-12 | 84+00 to 108+00 | 3.5
B-22 to B-25 | 188+00 to 212+00 | >3.5
B-31 to B-34 | 260+00 to 284+00 | >3.5
B-38 to B-44 | 316+00 to 364+00 | 3.5
B-46 to B-49 | 380+00 to 404+00 | 2 to 3.5
B-53 to B-55 | 436+00 to 452+00 | 3.5
B-59 to B-66 | 484+00 to 540+00 | 2
B-69 to B-73 | 564+00 to 596+00 | 3.5
B-82 to B-86 | 676+00 to 700+00 | 2
B-89 to B-91 | 724+00 to 740+00 | 3.5
B-94 to B-97 | 764+00 to 775+00 | >3.5

Additionally, the lean clay/silty lean clay soils encountered at this site are susceptible to further strength loss with moisture content increases. In their present condition, the low-strength soils are not suitable for supporting new fill or pavements. We expect that ground improvement will be required and difficult construction conditions will exist during site preparation and grading due to the presence of the near-surface low-strength soils and shallow groundwater. We strongly recommend the geotechnical engineer be retained to evaluate the site conditions during site grading and construction and provide ground improvement recommendations based on the actual conditions. The pavement subgrade soils should be evaluated, tested and improved as necessary as described in this report.

Fat clay soils were observed in many of the borings. The fat clays have high plasticity and are subject to shrinking and swelling with variations in moisture content. These shrink/swell movements can be detrimental to pavement surfaces. Although it may not be possible to eliminate all shrink/swell movement of the fat clay soils, we recommend replacing at least a 3.5-foot thickness of the fat clays with a low-volume change, engineered fill or chemically treating them to reduce the amount of shrink/swell movement of the subsurface soils.

### 4.2 Earthwork

Earthwork should be performed as required in the Arkansas State Highway and Transportation Department “Standard Specifications for Highway Construction”, current edition. The following presents general recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The evaluation of earthwork should include overexcavation operations, observation and testing of engineered fills, subgrade preparation, and other geotechnical conditions exposed during construction of the project.
4.2.1 Site Preparation

Where new pavement is planned, all surface vegetation, topsoil, existing pavements, tree roots and stumps and any surface or subsurface structures from previous site use should be removed full-depth. Excavations resulting from the removal of any surface or subsurface structures should be cleaned of all loose and disturbed material before placing fill. Soils containing organic matter, debris or deleterious matter should not be used as engineered fill.

Areas requiring new fill placement should be initially graded to create a relatively level surface to receive fill and to provide for a relatively uniform thickness of fill beneath the roadway. The exposed subgrade should be proofrolled prior to placing fills to confirm there are no unstable areas that could prevent proper compaction of additional fills. If unstable areas are noted, the geotechnical engineer should be notified to provide supplemental recommendations.

All exposed subgrade areas, once properly cleared and effectively proofrolled, should be scarified to a maximum depth of 12 inches, conditioned to near optimum moisture content and compacted. Subgrade soils exposed to the elements for an extended period of time should be checked for density and moisture content prior to placing additional fill and/or constructing pavements. During construction of the subgrade, exposed surfaces should be graded to prevent water from ponding adjacent to the existing roadway pavement and on the exposed subgrade.

It is anticipated excavations for the proposed construction can be accomplished with conventional earthmoving equipment.

The stability of subgrade soils may also be affected by precipitation, repetitive construction traffic or other factors. If unstable conditions are encountered or develop during construction, workability can be improved by overexcavating the wet, unstable zones and mixing these soils with crushed gravel or recycled concrete and recompaction. Use of lime and fly ash could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction.

4.2.2 Import Material Specifications

Fill materials should be free of organic matter and debris. Clean on-site soils or approved imported borrow materials may be used as fill material. While the AHTD has no specific requirements for borrow materials, they do require that the materials must be capable of forming and maintaining a stable embankment when compacted. Therefore, we recommend specifically avoiding elastic silts (MH) and organic soils (OL, OH and PT) when considering materials for use as borrow. Clay soils should exhibit well defined moisture-density relationships.
We suggest that imported soils for borrow (if required) should meet the following material property requirements:

<table>
<thead>
<tr>
<th>Gradation</th>
<th>Percent finer by weight (ASTM C136)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3”</td>
<td>100</td>
</tr>
<tr>
<td>No. 4 Sieve</td>
<td>50-100</td>
</tr>
<tr>
<td>No. 200 Sieve</td>
<td>15-50</td>
</tr>
</tbody>
</table>

- Plastic Limit…………………………………………………..20 (max)

### 4.2.3 Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fill Maximum Lift Thickness</td>
<td>10 inches or less in loose thickness</td>
</tr>
<tr>
<td>Compaction Requirements ¹</td>
<td>95% of the material’s standard Proctor maximum dry density (AASHTO T 99)</td>
</tr>
<tr>
<td></td>
<td>This density will not be required immediately adjacent to wingwalls of box culverts.</td>
</tr>
<tr>
<td>Moisture Content of Cohesive Material ¹</td>
<td>Within ±2 percentage points of the optimum moisture content value as determined by the standard Proctor test (AASHTO T 99) at the time of compaction</td>
</tr>
<tr>
<td>Moisture Content of Granular Material ²</td>
<td>Workable moisture levels</td>
</tr>
</tbody>
</table>

1. We recommend engineered fill be tested for moisture content and compaction during placement (AASHTO T 310 or AHTD Test Method 347 or 348). Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.

2. Specifically, moisture levels should be maintained low enough to allow for satisfactory compaction to be achieved without the fill material pumping when proofrolled.
4.2.4 Lime Treated Subgrade

Low-strength (SPT N-values of 5 blows per foot or less) soils were encountered at several borings to depths of about 3.5 feet below the existing ground surface. To improve the subgrade conditions, use of lime could also be considered as a stabilization technique, as outlined in Section 301 of ‘AHTD – Standard Specifications for Highway Construction’ manual. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction.

4.2.5 Excavation and Trench Construction

Excavations into the on-site fill materials and native soils may encounter caving soils and possibly groundwater, depending upon the final depth of excavation. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

Soils penetrated by the proposed excavations may vary significantly across the site. The soil classifications are based solely on the materials encountered in the exploratory test borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that spoil piles be kept a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.

4.2.6 Utility Trench Backfill

All trench excavations should be made with sufficient working space to permit construction including backfill placement and compaction. It is strongly recommended that a qualified person provide full-time observation and compaction testing of trench backfill within pavement areas.

4.3 Pavement Subgrade Preparation

Based on the subsurface conditions encountered at the boring locations and considering the subgrade is prepared as recommended in section 4.2 Earthwork, the pavement subgrade materials should consist of tested and approved native soils or new engineered fill.

We recommend the moisture content and density of the top 12 inches of the subgrade be re-evaluated and that it be proof-rolled within two days prior to placing aggregate base. Areas not in compliance with the required ranges of moisture or density should be moisture...
conditioned and recompacted. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills.

4.4 Pavement Design Considerations

We understand that the pavement section will be designed by others. Terracon performed resilient modulus tests on representative subgrade soils of the major soil map units. The laboratory test results are presented in Appendix B. For the design pavement subgrade support parameter, we recommend using the average of the five resilient modulus test values performed on the remolded soil having a moisture content at 2 percent above the material's optimum moisture content at a chamber confining pressure of 2 psi.

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, pavement construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur along the equipment between borings, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations
contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.
APPENDIX A
FIELD EXPLORATION
Field Exploration Description

Ninety-two (92) borings, designated as B-1 through B-97, were drilled at the site in January 2014. The borings were drilled to depths of about 10 feet below the ground surface at the approximate locations shown on the preceding Boring Location Plans. Ninety-seven borings were planned; however, five of the borings, B-9, B-15, B-22, B-40 and B-52, were located in flooded fields and could not be offset and drilled. Boring B-23 encountered an apparent concrete structure and was terminated at a depth of about 2 feet below the ground surface. We are scheduling to drill the remaining borings B-9, B-15, B-22, B-23, B-40 and B-52 when site conditions improve.

The boring locations were marked in the field by Terracon using a hand-held GPS at locations determined by Terracon. The borings were spaced approximately 800 feet apart in the proposed highway widening alignment on alternating sides of the existing highway. The locations of the borings in State Plane coordinates and Station and Offset from existing centerline are shown near the top of the boring logs. The locations of the borings should be considered accurate only to the degree implied by the methods used to define them. Ground surface elevations at the boring locations were measured after completion and are shown near the top of the boring logs. The final boring locations and elevations were recorded by NTB Associates, Inc. and are presented in the following summary table.

The boreholes were advanced with a buggy-mounted CME-55 drill rig using solid-stem flight augers. Standard penetration tests were performed with an automatic hammer to collect split-spoon samples. Thin-walled (Shelby) tube samples were also obtained at the borings where thick fills are expected for grading. At the completion of the drilling activities, the boreholes were checked for the presence of groundwater and were backfilled with auger cuttings at the completion of field exploration.

In the split-spoon sampling procedure, the number of blows required to advance a standard 2-inch O.D. split-spoon sampler the last 12 inches of the typical total 18-inch penetration by means of a 140-pound standard hammer with a free fall of 30 inches, is the standard penetration resistance value (SPT-N). This value is used to estimate the in-situ consistency of cohesive soils and relative density of granular soils.

An automatic SPT hammer was used to advance the split-barrel sampler in the borings performed on this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Relatively undisturbed samples were obtained in thin-walled tube samples. These were obtained by hydraulically pushing tubes into the soil.
The samples were tagged for identification, sealed to reduce moisture loss, and taken to our laboratory for further examination, testing, and classification.

Field logs were prepared by the drill crew. The logs included visual classifications of the materials encountered during drilling as well as the driller’s interpretation of the subsurface conditions between samples. The final boring logs included with this report represent the engineer’s interpretation of the subsurface conditions at the boring locations based on field and laboratory data and observation of the samples.

Our exploration services include storing the collected soil samples and making them available for inspection until after construction is completed. The samples will then be discarded unless requested otherwise.
## Boring Location Summary Table

<table>
<thead>
<tr>
<th>Boring</th>
<th>Station</th>
<th>Offset (feet)</th>
<th>Northing</th>
<th>Easting</th>
<th>Elevation (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>14+00</td>
<td>50 R</td>
<td>341872.84</td>
<td>1756136.51</td>
<td>212.8</td>
</tr>
<tr>
<td>B-2</td>
<td>22+00</td>
<td>43 L</td>
<td>342157.21</td>
<td>175941.38</td>
<td>210.0</td>
</tr>
<tr>
<td>B-3</td>
<td>30+00</td>
<td>40 R</td>
<td>342216.13</td>
<td>1757745.2</td>
<td>209.9</td>
</tr>
<tr>
<td>B-4</td>
<td>38+00</td>
<td>35 L</td>
<td>342524.58</td>
<td>1758451.88</td>
<td>209.7</td>
</tr>
<tr>
<td>B-5</td>
<td>46+00</td>
<td>30 R</td>
<td>342617.69</td>
<td>1759296.27</td>
<td>213.4</td>
</tr>
<tr>
<td>B-6</td>
<td>54+00</td>
<td>47 L</td>
<td>342973.31</td>
<td>1760028.15</td>
<td>214.7</td>
</tr>
<tr>
<td>B-7</td>
<td>62+00</td>
<td>32 R</td>
<td>343049.41</td>
<td>1760878.43</td>
<td>213.3</td>
</tr>
<tr>
<td>B-8</td>
<td>70+00</td>
<td>26 L</td>
<td>343348.28</td>
<td>1761562.52</td>
<td>215.8</td>
</tr>
<tr>
<td>B-9 *</td>
<td>78+00</td>
<td>40 L</td>
<td>343924.53</td>
<td>1762116.98</td>
<td>215.5</td>
</tr>
<tr>
<td>B-10</td>
<td>86+00</td>
<td>40 R</td>
<td>344447.76</td>
<td>1762897.22</td>
<td>216.0</td>
</tr>
<tr>
<td>B-11</td>
<td>94+00</td>
<td>32 L</td>
<td>344887.05</td>
<td>1763446.60</td>
<td>216.0</td>
</tr>
<tr>
<td>B-12</td>
<td>102+00</td>
<td>36 R</td>
<td>345392.38</td>
<td>1764030.91</td>
<td>216.0</td>
</tr>
<tr>
<td>B-13</td>
<td>110+00</td>
<td>30 L</td>
<td>346038.74</td>
<td>1764609.62</td>
<td>212.5</td>
</tr>
<tr>
<td>B-14</td>
<td>118+00</td>
<td>33 R</td>
<td>346288.62</td>
<td>1765350.93</td>
<td>211.5</td>
</tr>
<tr>
<td>B-15 *</td>
<td>126+00</td>
<td>27 L</td>
<td>346569.90</td>
<td>1766111.30</td>
<td>212.2</td>
</tr>
<tr>
<td>B-16</td>
<td>134+00</td>
<td>28 R</td>
<td>346505.81</td>
<td>1766966.89</td>
<td>216.0</td>
</tr>
<tr>
<td>B-17</td>
<td>142+00</td>
<td>28 L</td>
<td>346594.67</td>
<td>1767688.22</td>
<td>216.0</td>
</tr>
<tr>
<td>B-18</td>
<td>150+00</td>
<td>34 L</td>
<td>346605.54</td>
<td>1768489.29</td>
<td>212.0</td>
</tr>
<tr>
<td>B-19</td>
<td>158+00</td>
<td>41 L</td>
<td>346633.96</td>
<td>1769266.83</td>
<td>208.0</td>
</tr>
<tr>
<td>B-20</td>
<td>166+00</td>
<td>33 R</td>
<td>346552.57</td>
<td>1769995.45</td>
<td>208.1</td>
</tr>
<tr>
<td>B-21</td>
<td>174+00</td>
<td>30 L</td>
<td>346520.38</td>
<td>1770762.74</td>
<td>203.5</td>
</tr>
<tr>
<td>B-22 *</td>
<td>182+00</td>
<td>36 R</td>
<td>Boring location could not be found to survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-23 *</td>
<td>190+00</td>
<td>30 L</td>
<td>346553.97</td>
<td>1772454.37</td>
<td>201.3</td>
</tr>
<tr>
<td>B-24</td>
<td>198+00</td>
<td>30 R</td>
<td>346562.92</td>
<td>1773282.32</td>
<td>201.3</td>
</tr>
<tr>
<td>B-25</td>
<td>206+00</td>
<td>30 L</td>
<td>346724.38</td>
<td>1774084.62</td>
<td>202.2</td>
</tr>
<tr>
<td>B-26</td>
<td>214+00</td>
<td>32 R</td>
<td>346553.85</td>
<td>1774958.24</td>
<td>212.4</td>
</tr>
<tr>
<td>B-27</td>
<td>222+00</td>
<td>33 L</td>
<td>346517.85</td>
<td>1775690.21</td>
<td>210.8</td>
</tr>
<tr>
<td>B-28</td>
<td>230+00</td>
<td>30 R</td>
<td>346210.59</td>
<td>1776267.36</td>
<td>213.2</td>
</tr>
<tr>
<td>Boring</td>
<td>Station</td>
<td>Offset (feet)</td>
<td>Northing</td>
<td>Easting</td>
<td>Elevation (feet)</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>--------------</td>
<td>-----------</td>
<td>-----------</td>
<td>------------------</td>
</tr>
<tr>
<td>B-29</td>
<td>238+00</td>
<td>37 L</td>
<td>346091.43</td>
<td>1777181.03</td>
<td>210.9</td>
</tr>
<tr>
<td>B-30</td>
<td>246+00</td>
<td>40 L</td>
<td>346081.50</td>
<td>1777972.20</td>
<td>211.2</td>
</tr>
<tr>
<td>B-31</td>
<td>246+00</td>
<td>29 L</td>
<td>346080.26</td>
<td>1778805.95</td>
<td>211.2</td>
</tr>
<tr>
<td>B-32</td>
<td>254+00</td>
<td>46 R</td>
<td>345958.16</td>
<td>1779616.89</td>
<td>210.6</td>
</tr>
<tr>
<td>B-33</td>
<td>270+00</td>
<td>28 L</td>
<td>345964.36</td>
<td>1780381.44</td>
<td>212.0</td>
</tr>
<tr>
<td>B-34</td>
<td>278+00</td>
<td>39 R</td>
<td>345947.77</td>
<td>1781195.76</td>
<td>212.5</td>
</tr>
<tr>
<td>B-35</td>
<td>286+00</td>
<td>34 L</td>
<td>346070.16</td>
<td>1781986.74</td>
<td>213.2</td>
</tr>
<tr>
<td>B-36</td>
<td>294+00</td>
<td>36 R</td>
<td>346106.46</td>
<td>1782769.67</td>
<td>211.3</td>
</tr>
<tr>
<td>B-37</td>
<td>302+00</td>
<td>35 L</td>
<td>346103.33</td>
<td>1783578.27</td>
<td>208.5</td>
</tr>
<tr>
<td>B-38</td>
<td>310+00</td>
<td>42 R</td>
<td>346081.45</td>
<td>1784403.23</td>
<td>209.1</td>
</tr>
<tr>
<td>B-39</td>
<td>318+00</td>
<td>31 L</td>
<td>346059.99</td>
<td>1785177.08</td>
<td>207.7</td>
</tr>
<tr>
<td>B-40 *</td>
<td>326+00</td>
<td>35 R</td>
<td></td>
<td></td>
<td>Boring location could not be found to survey</td>
</tr>
<tr>
<td>B-41</td>
<td>324+00</td>
<td>47 L</td>
<td>345970.17</td>
<td>1786808.27</td>
<td>205.3</td>
</tr>
<tr>
<td>B-42</td>
<td>342+00</td>
<td>26 R</td>
<td>345969.64</td>
<td>1787553.33</td>
<td>205.0</td>
</tr>
<tr>
<td>B-43</td>
<td>350+00</td>
<td>35 L</td>
<td>346043.38</td>
<td>1788409.90</td>
<td>207.4</td>
</tr>
<tr>
<td>B-44</td>
<td>358+00</td>
<td>34 R</td>
<td>345820.80</td>
<td>1789177.32</td>
<td>214.0</td>
</tr>
<tr>
<td>B-45</td>
<td>366+00</td>
<td>33 L</td>
<td>345717.00</td>
<td>1789953.91</td>
<td>215.5</td>
</tr>
<tr>
<td>B-46</td>
<td>374+00</td>
<td>38 R</td>
<td>345276.10</td>
<td>1790714.15</td>
<td>212.7</td>
</tr>
<tr>
<td>B-47</td>
<td>382+00</td>
<td>40 L</td>
<td>344940.13</td>
<td>1791423.53</td>
<td>206.0</td>
</tr>
<tr>
<td>B-48</td>
<td>390+00</td>
<td>34 R</td>
<td>344409.89</td>
<td>1791878.41</td>
<td>204.8</td>
</tr>
<tr>
<td>B-49</td>
<td>398+00</td>
<td>33 L</td>
<td>343751.52</td>
<td>1792576.28</td>
<td>214.4</td>
</tr>
<tr>
<td>B-50</td>
<td>406+00</td>
<td>36 R</td>
<td>343185.58</td>
<td>1792913.26</td>
<td>213.1</td>
</tr>
<tr>
<td>B-51</td>
<td>414+00</td>
<td>35 L</td>
<td>342490.65</td>
<td>1793595.17</td>
<td>204.9</td>
</tr>
<tr>
<td>B-52 *</td>
<td>422+00</td>
<td>30 R</td>
<td></td>
<td></td>
<td>Boring location could not be found to survey</td>
</tr>
<tr>
<td>B-53</td>
<td>430+00</td>
<td>35 L</td>
<td>341288.21</td>
<td>1794530.24</td>
<td>207.3</td>
</tr>
<tr>
<td>B-54</td>
<td>438+00</td>
<td>28 R</td>
<td>340689.40</td>
<td>1795016.04</td>
<td>204.9</td>
</tr>
<tr>
<td>B-55</td>
<td>446+00</td>
<td>30 L</td>
<td>340055.38</td>
<td>1795525.58</td>
<td>208.5</td>
</tr>
<tr>
<td>B-56</td>
<td>454+00</td>
<td>25 R</td>
<td>339321.61</td>
<td>1795943.13</td>
<td>213.7</td>
</tr>
<tr>
<td>B-57</td>
<td>462+00</td>
<td>34 R</td>
<td>338834.98</td>
<td>1796343.90</td>
<td>215.8</td>
</tr>
<tr>
<td>B-58</td>
<td>470+00</td>
<td>32 R</td>
<td>338201.75</td>
<td>1796879.38</td>
<td>213.9</td>
</tr>
<tr>
<td>Boring</td>
<td>Station</td>
<td>Offset (feet)</td>
<td>Northing</td>
<td>Easting</td>
<td>Elevation (feet)</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---------------</td>
<td>----------</td>
<td>---------</td>
<td>-----------------</td>
</tr>
<tr>
<td>B-59</td>
<td>478+00</td>
<td>35 L</td>
<td>337781.38</td>
<td>1797722.00</td>
<td>212.8</td>
</tr>
<tr>
<td>B-60</td>
<td>486+00</td>
<td>39 R</td>
<td>337468.44</td>
<td>1798534.09</td>
<td>212.7</td>
</tr>
<tr>
<td>B-61</td>
<td>494+00</td>
<td>31 L</td>
<td>337616.70</td>
<td>1798952.89</td>
<td>214.3</td>
</tr>
<tr>
<td>B-62</td>
<td>502+00</td>
<td>32 R</td>
<td>337464.50</td>
<td>1800057.62</td>
<td>214.1</td>
</tr>
<tr>
<td>B-63</td>
<td>510+00</td>
<td>33 L</td>
<td>337601.70</td>
<td>1800764.86</td>
<td>214.3</td>
</tr>
<tr>
<td>B-64</td>
<td>518+00</td>
<td>49 L</td>
<td>337468.34</td>
<td>1801678.02</td>
<td>215.3</td>
</tr>
<tr>
<td>B-65</td>
<td>526+00</td>
<td>30 R</td>
<td>337008.27</td>
<td>1802324.68</td>
<td>214.5</td>
</tr>
<tr>
<td>B-66</td>
<td>534+00</td>
<td>24 L</td>
<td>336745.43</td>
<td>1803119.91</td>
<td>214.3</td>
</tr>
<tr>
<td>B-67</td>
<td>542+00</td>
<td>38 R</td>
<td>336254.73</td>
<td>1803794.77</td>
<td>215.1</td>
</tr>
<tr>
<td>B-68</td>
<td>550+00</td>
<td>41 L</td>
<td>335979.13</td>
<td>1804662.99</td>
<td>215.0</td>
</tr>
<tr>
<td>B-69</td>
<td>558+00</td>
<td>47 R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-70</td>
<td>566+00</td>
<td>42 L</td>
<td>335312.38</td>
<td>1805952.48</td>
<td>215.4</td>
</tr>
<tr>
<td>B-71</td>
<td>574+00</td>
<td>45 R</td>
<td>334853.78</td>
<td>1806534.19</td>
<td>216.7</td>
</tr>
<tr>
<td>B-72</td>
<td>582+00</td>
<td>60 L</td>
<td>334571.69</td>
<td>1807413.21</td>
<td>218.0</td>
</tr>
<tr>
<td>B-73</td>
<td>590+00</td>
<td>36 R</td>
<td>334107.73</td>
<td>1808011.76</td>
<td>219.6</td>
</tr>
<tr>
<td>B-74</td>
<td>598+00</td>
<td>44 L</td>
<td>333869.56</td>
<td>1809463.88</td>
<td>219.0</td>
</tr>
<tr>
<td>B-75</td>
<td>606+00</td>
<td>39 R</td>
<td>333367.08</td>
<td>1809463.88</td>
<td>219.0</td>
</tr>
<tr>
<td>B-76</td>
<td>614+00</td>
<td>32 L</td>
<td>333121.17</td>
<td>1810275.29</td>
<td>221.7</td>
</tr>
<tr>
<td>B-77</td>
<td>622+00</td>
<td>38 R</td>
<td>332630.81</td>
<td>1810932.64</td>
<td>221.0</td>
</tr>
<tr>
<td>B-78</td>
<td>630+00</td>
<td>35 L</td>
<td>332392.71</td>
<td>1811690.62</td>
<td>223.3</td>
</tr>
<tr>
<td>B-79</td>
<td>638+00</td>
<td>38 R</td>
<td>331909.14</td>
<td>1812338.57</td>
<td>222.0</td>
</tr>
<tr>
<td>B-80</td>
<td>646+00</td>
<td>30 L</td>
<td>331689.91</td>
<td>1813048.43</td>
<td>222.0</td>
</tr>
<tr>
<td>B-81</td>
<td>654+00</td>
<td>39 R</td>
<td>331216.72</td>
<td>1813709.50</td>
<td>220.4</td>
</tr>
<tr>
<td>B-82</td>
<td>662+00</td>
<td>27 L</td>
<td>330833.72</td>
<td>1814449.58</td>
<td>222.7</td>
</tr>
<tr>
<td>B-83</td>
<td>670+00</td>
<td>33 R</td>
<td>330482.59</td>
<td>1815142.80</td>
<td>222.5</td>
</tr>
<tr>
<td>B-84</td>
<td>678+00</td>
<td>30 L</td>
<td>330188.44</td>
<td>1815996.02</td>
<td>222.5</td>
</tr>
<tr>
<td>B-85</td>
<td>686+00</td>
<td>33 L</td>
<td>329908.57</td>
<td>1816594.87</td>
<td>223.5</td>
</tr>
<tr>
<td>B-86</td>
<td>694+00</td>
<td>34 R</td>
<td>329406.70</td>
<td>1817285.90</td>
<td>224.6</td>
</tr>
<tr>
<td>B-87</td>
<td>702+00</td>
<td>29 L</td>
<td>329139.29</td>
<td>1818077.68</td>
<td>225.2</td>
</tr>
<tr>
<td>B-88</td>
<td>710+00</td>
<td>37 R</td>
<td>328659.40</td>
<td>1818723.39</td>
<td>223.6</td>
</tr>
</tbody>
</table>
### Shoulder Survey Report
AHTD Job No. CA0101, Cross County Line – Highway 147 (Widening) (S)
August 21, 2014  Terracon Project No. 35135123

#### Boring Data

<table>
<thead>
<tr>
<th>Boring</th>
<th>Station</th>
<th>Offset (feet)</th>
<th>Northing</th>
<th>Easting</th>
<th>Elevation (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-89</td>
<td>718+00</td>
<td>27 L</td>
<td>328403.47</td>
<td>1819508.14</td>
<td>223.2</td>
</tr>
<tr>
<td>B-90</td>
<td>726+00</td>
<td>39 R</td>
<td>327942.83</td>
<td>1820140.81</td>
<td>223.4</td>
</tr>
<tr>
<td>B-91</td>
<td>734+00</td>
<td>22 L</td>
<td>327688.87</td>
<td>1820922.08</td>
<td>223.5</td>
</tr>
<tr>
<td>B-92</td>
<td>742+00</td>
<td>44 R</td>
<td>327179.45</td>
<td>1821522.88</td>
<td>222.9</td>
</tr>
<tr>
<td>B-93</td>
<td>750+00</td>
<td>31 L</td>
<td>326611.51</td>
<td>1822249.96</td>
<td>225.4</td>
</tr>
<tr>
<td>B-94</td>
<td>758+00</td>
<td>54 R</td>
<td>325951.08</td>
<td>1822468.08</td>
<td>225.1</td>
</tr>
<tr>
<td>B-95</td>
<td>766+00</td>
<td>46 L</td>
<td>325347.49</td>
<td>1823019.47</td>
<td>222.7</td>
</tr>
<tr>
<td>B-96</td>
<td>774+00</td>
<td>65 R</td>
<td>324526.33</td>
<td>1823302.27</td>
<td>224.1</td>
</tr>
<tr>
<td>B-97</td>
<td>782+00</td>
<td>50 L</td>
<td>323732.51</td>
<td>1823762.10</td>
<td>223.2</td>
</tr>
</tbody>
</table>

**Note:** Borings B-9, B-15, B-22, B-40 and B-52, marked with an asterisk, have not been completed because of flooding and inaccessibility. The borings are planned to be drilled, offsetting if necessary, when the fields dry. Boring B-23 encountered a buried concrete object when originally drilled and will be drilled at an offset location. The results of the borings will be included in a final geotechnical engineering report.
**BORING LOG NO. B-1**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**LOCATION**  
See Exhibit A-2

- **Latitude:** 341872.84°  
- **Longitude:** 1756136.51°

**Station:** 14+00  
**Surface Elev.:** 212.8 (ft.)

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>DEPTH (FL.)</th>
<th>ELEVATION (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>LATITUDE (ft.)</th>
<th>LONGITUDE (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>FAT CLAY (CH), with sand, brown, stiff</td>
<td>204.5</td>
<td>0.5</td>
<td>POORLY GRADED SAND (SP), trace clay, brown, loose</td>
<td>203.0</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>Boring Terminated at 10 Feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **FIELD TEST RESULT:**
  - 4-4-5 N=9  
  - 2-4-5 N=9  
  - 5-5-10 N=15

- **LABORATORY TEST:**
  - Torvane/HP (psf)
  - Percent fines
  - Water content (%)
  - LL-PL-PI

- **ATTERBERG LIMITS:**
  - 50-23-27
  - 76
  - 24
  - 24

- **PERCENT FINES:**
  - 14

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

- **Drill Rig:** CME 55  
- **Driller:** SP

**Terracon**  
25800 I-30 South  
Bryan, Arkansas

**Boring Started:** 1/14/2014  
**Boring Completed:** 1/14/2014

---

Stratification lines are approximate. In-situ, the transition may be gradual. 

Hammer Type: Rope and Cathead

---

Advancement Method:  
0-10: Solid stem auger

Abandonment Method:  
Boring backfilled with soil cuttings upon completion.
**BORING LOG NO. B-2**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 342157.21°  
Longitude: 1756941.38°  
Station: 22+00  
Surface Elev.: 210.0 (Ft.)

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORMELE (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
</table>
| 8.5        | LEAN CLAY (CL), with gravel, dark brown, medium stiff to stiff | 6-17-10  
N=27 | 3000 (HP) | 13 | 25-13-12 |
| 10.0       | POORLY GRADED SAND (SP), brown, loose | 2-5-5  
N=10 | 3000 (HP) | 12 |
|            | 2-3-3  
N=8 | 3000 (HP) | 18 | |

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.  
Hammer Type: Rope and Cathead

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**See Exhibit A-3 for description of field procedures.**  
**See Appendix B for description of laboratory procedures and additional data (if any).**  
**See Appendix C for explanation of symbols and abbreviations.**

**WATER LEVEL OBSERVATIONS**

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.: 35135123**  
**Exhibit:** A-11

Drill Rig: CME 55  
Driller: SP

**Notes:**

Boring Started: 1/15/2014  
Boring Completed: 1/15/2014

**Terracon**  
2580 S 30 South  
Bryant, Arkansas

**Terracom**  
25809 S 30 South  
Bryant, Arkansas
LOCATION: See Exhibit A-2
Latitude: 34°22'16.13" Longitude: 17°57'745.2"

Station: 30+00

DEPTH (Ft.) LOCATION

ELEVATION (Ft.) GRAPHIC LOG

FIELD TEST RESULTS

LABORATORY RESULTS

WATER LEVEL OBSERVATIONS

WATER LEVEL OBSERVATIONS

FAT CLAY (CH), brown, medium stiff to very stiff

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Notes:

Project No.: 35135123
Drill Rig: CME 55
Driller: SP

Atterberg Limits

Percent Finer

Elevation (Ft.): Surface Elev.: 209.9 (Ft.)

Sample Type

Water Content (%)

LL - PL - PI

Water Level Observations

Coring: See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

Advancement Method: 0-10: Solid stem auger

Abandonment Method: Boring backfilled with soil cuttings upon completion.

Full report: See original report

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT - GEO SMART LOG NO: WELL - 35135123-FINAL SHOULDER SURVEY.GPJ

PROJECT: CA0101 Highway 147 (Widening) (S)

CLIENT: Buchart Horn, Inc.
Memphis Tennessee

SITE: Cross Co. Line - Highway 147
Earle, Arkansas

Driller: SP
Boring Started: 1/16/2014
Boring Completed: 1/16/2014
### BORING LOG NO. B-4

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**CLIENT:** Buchart Horn, Inc.  
**LOCATION:** Earle, Arkansas

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5</td>
<td>LEAN CLAY (CL), with sand, brown, medium stiff to stiff</td>
<td>2-3-4 N=7 3000 (HP)</td>
<td>28 49-22-27</td>
<td>3-5-5 N=10 3000 (HP)</td>
<td>16 3000 (HP)</td>
</tr>
<tr>
<td>10.0</td>
<td>POORLY GRADED SAND (SP), loose</td>
<td>4-4-6 N=10 1000 (HP)</td>
<td>25 3000 (HP)</td>
<td>3-2-3 N=5</td>
<td>18</td>
</tr>
</tbody>
</table>

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

**Notes:**  
Advancement Method: 0-10: Solid stem auger  
Abandonment Method: Boring backfilled with soil cuttings upon completion.

**Awterberg Limits:** LL-PL-PI

**Terracon**
25809 I-30 South  
Bryant, Arkansas

**Project No.: 35135123**  
**Exhibit:** A-13
Lean Clay (CL), brown, stiff to very stiff

Boring Terminated at 10 Feet
### Graphic Log

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST (HP)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4-5N=9</td>
<td>8000 (HP)</td>
<td>27</td>
<td>27-21-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-2-3N=5</td>
<td>2000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-5N=9</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-2-3N=5</td>
<td></td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

**Advancement Method:** 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**Notes:**

See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

### Water Level Observations

**Drill Rig:** CME 55

**Driller:** SP

**Project No.:** 35135123

**Exhibit:** A-15
## BORING LOG NO. B-7

### PROJECT: CA0101 Highway 147 (Widening) (S)

### SITE: Cross Co. Line - Highway 147 Earle, Arkansas

**LOCATION**

See Exhibit A-2

Latitude: 34°30'49.41" Longitude: 176°08'78.43"

Station: 62+00 Surface Elev.: 213.3 (Ft.)

### DEPTH (FT.)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Elevation (Ft.)</th>
<th>Laboratory Torvane/HP (PSF)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fineness</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>203.5</td>
<td>3000 (HP)</td>
<td>19</td>
<td>27-20-7</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td>3000 (HP)</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>1000 (HP)</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>3000 (HP)</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Silty Lean Clay (CL-ML), brown, medium stiff**

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

**Advancement Method:**

0-10: Solid stem auger

**Abandonment Method:**

Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

**Notes:**

- Boring Started: 1/19/2014
- Boring Completed: 1/19/2014
- Drill Rig: CME 55
- Driller: SP
- Project No.: 35135123
- Exhibit: A-16
SILTY LEAN CLAY (CL-ML), brown, medium stiff to stiff

Boring Terminated at 10 Feet

See Exhibit A-2

LOCATION

Latitude: 34°33’48.28"  Longitude: 176°15’62.52"

Station: 70+00  Surface Elev.: 215.8 (ft.)

GRAPHIC LOG

Buchart Horn, Inc.

CLINT: Memphis Tenneessee

SITE: Cross Co. Line - Highway 147

Earle, Arkansas

PROJECT: CA0101 Highway 147 (Widening) (S)

Driller: SP

Boring Completed: 1/20/2014

Notes:

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Drill Rig: CME 55

Driller: SP

Project No.: 35135123

Exhibit: A-17
**BORING LOG NO. B-9**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

---

**LOCATION**  
See Exhibit A-2  
Latitude: 343924.53°  
Longitude: 1762116.98°  
Station: 78+00

---

**DEPTH**  
Surface Elev.: 215.5 (Ft)

---

**ADVANCEMENT METHOD**  
0-10: Solid stem auger

---

**ABANDONMENT METHOD**  
Boring backfilled with soil cuttings upon completion.

---

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

---

**Boring could not be drilled because of flooded field.**

---

**Boring Terminated at 10 Feet**

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**

---

**Hammer Type:** Automatic

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**DRILLER:** SP  
**DRILL RIG:** CME 55  
**BORING STARTED:** 1/22/2014  
**BORING COMPLETED:** 1/22/2014  
**PROJECT NO.:** 35135123  
**EXHIBIT:** A-18  
25809 I-30 South  
Bryant, Arkansas
## BORING LOG NO. B-10

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**LOCATION:** See Exhibit A-2  
**DEPTH:**  

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DEPTH</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 344447.76°    Longitude: 1762897.22°</td>
<td>10.0</td>
<td>Silty Lean Clay (CL-ML), brown, medium stiff</td>
<td>2-2-2 N=4 9000 (HP) 25 30-21-9</td>
<td>2-3-4 N=7 2000 (HP) 24</td>
<td>2-3-5 N=8 2000 (HP) 30</td>
</tr>
<tr>
<td>Station: 86+00 Offset: 50’ East</td>
<td></td>
<td></td>
<td>3-3-5 N=8 2000 (HP) 37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Elev.: 216.0 (Ft.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEPTH</td>
<td>ELEVATION (FL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>206</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Stratification lines are approximate. In-situ, the transition may be gradual.**
- **Hammer Type:** Rope and Cathead

---

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

---

**FIELD TEST RESULTS**

- **WATER CONTENT (%):**
- **ATTERBERG LIMITS:**

**LABORATORY TEST RESULTS**

- **TBRVANE/HP (psf):**
- **PERCENT FINES:**

**WATER LEVEL OBSERVATIONS**

- **Boring Terminated at 10 Feet**

---

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

---

**Terracon**  
25809 I-30 South  
Bryant, Arkansas

**Boring Started:** 1/14/2014  
**Boring Completed:** 1/14/2014

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.: 35135123**  
**Exhibit:** A-19
**BORING LOG NO. B-11**

**PROJECT:** CA0101 Highway 147 ( Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

### LOCATION

- **Latitude:** 34°48'87.05"  
- **Longitude:** 176°34'46.6°

**Station:** 94+00  
**Surface Elev.:** 216.0 (Ft.)

### GRAPHIC LOG

**STRATIFICATION LINES ARE APPROXIMATE. IN-SITU, THE TRANSITION MAY BE GRADUAL.**

**CLAY (CL), brown, medium stiff to stiff**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>ELEVATION (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>205</td>
<td>2-2-2 N=4    2000 (HP) 19 42-20-22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-2-2 N=4    3000 (HP) 23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-5-4 N=9    4000 (HP) 26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-3-4 N=7    4000 (HP) 36</td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**ADVANCEMENT METHOD:**
0-10: Solid stem auger

**ABANDONMENT METHOD:**
Boring backfilled with soil cuttings upon completion.

**FIELD TEST RESULTS**

- **WATER CONTENT (%):**
- **PERCENT FINES:**
- **PLASTIC LIMIT:**
- **ELEVATION (Ft.):**
- **Surface Elev.:** 216.0 (Ft.)

**LABORATORY TORSION TEST**

- **TORVANE/HP (psf):**
- **PERCENT FINES:**
- **PLASTIC LIMIT:**

**ATTERBURY LIMITS**

- **LL-PL-PI**

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

### WATER LEVEL OBSERVATIONS

- **Drill Rig:** CME 55  
- **Driller:** SP  
- **Project No.:** 35135123  
- **Exhibit:** A-20

- **Boring Started:** 1/14/2014  
- **Boring Completed:** 1/14/2014

**Hammer Type:** Rope and Cathead

- **Cross Co. Line - Highway 147**  
- **Earle, Arkansas**

**SITE:**
**BORING LOG NO. B-12**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**  
**CLIENT:** Buchart Horn, Inc.  
**Memphis Tennessee**

### LOCATION

See Exhibit A-2  
Latitude: 34°53′2.38″  
Longitude: 176°40′30.91″  
Station: 102+00  
Surface Elev.: 216.0 (Ft.)

### DEPTH (FL.)  
DEPTH:  
ELEVATION (FL.)

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**Boring Terminated at 10 Feet**

**Notes:**  
- Stratification lines are approximate. In-situ, the transition may be gradual.  
- Advancement Method:  
  0-10: Solid stem auger  
- Abandonment Method:  
  Boring backfilled with soil cuttings upon completion.  
- Hammer Type: Rope and Cathead  
- Project No.: 35135123  
- Exhibit: A-21

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**PROJECT: CA0101 Highway 147 (Widening) (S)**

**LOCATION:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**CLIENT:** Buchart Horn, Inc.  
**Memphis Tennessee**

**Located at:**  
Latitude: 34°53′2.38″  
Longitude: 176°40′30.91″  
Station: 102+00  
Surface Elev.: 216.0 (Ft.)

**DEPTH (FL.)**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**Boring Terminated at 10 Feet**

**Notes:**  
- Stratification lines are approximate. In-situ, the transition may be gradual.  
- Advancement Method:  
  0-10: Solid stem auger  
- Abandonment Method:  
  Boring backfilled with soil cuttings upon completion.  
- Hammer Type: Rope and Cathead  
- Project No.: 35135123  
- Exhibit: A-21

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**PROJECT: CA0101 Highway 147 (Widening) (S)**

**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**CLIENT:** Buchart Horn, Inc.  
**Memphis Tennessee**

**Located at:**  
Latitude: 34°53′2.38″  
Longitude: 176°40′30.91″  
Station: 102+00  
Surface Elev.: 216.0 (Ft.)

**DEPTH (FL.)**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**Boring Terminated at 10 Feet**

**Notes:**  
- Stratification lines are approximate. In-situ, the transition may be gradual.  
- Advancement Method:  
  0-10: Solid stem auger  
- Abandonment Method:  
  Boring backfilled with soil cuttings upon completion.  
- Hammer Type: Rope and Cathead  
- Project No.: 35135123  
- Exhibit: A-21

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**PROJECT: CA0101 Highway 147 (Widening) (S)**

**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**CLIENT:** Buchart Horn, Inc.  
**Memphis Tennessee**

**Located at:**  
Latitude: 34°53′2.38″  
Longitude: 176°40′30.91″  
Station: 102+00  
Surface Elev.: 216.0 (Ft.)

**DEPTH (FL.)**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |

**Boring Terminated at 10 Feet**

**Notes:**  
- Stratification lines are approximate. In-situ, the transition may be gradual.  
- Advancement Method:  
  0-10: Solid stem auger  
- Abandonment Method:  
  Boring backfilled with soil cuttings upon completion.  
- Hammer Type: Rope and Cathead  
- Project No.: 35135123  
- Exhibit: A-21

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE PIPE</th>
<th>PERCENT FINES</th>
</tr>
</thead>
</table>
| 10.0        | 2000 (HP)  
N=17  
27-19-8    | 2000 (HP)  
N=5  
3000 (HP)  
28    |
**BORING LOG NO. B-13**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 34°60.38’N   Longitude: 96°52.98’W

**DEPTH**  
Station: 110+00  
Surface Elev.: 212.5 (ft.)

**DEPTH (FL.)**  
**ELEVATION (FL.)**

<table>
<thead>
<tr>
<th>Depth (fl.)</th>
<th>Elevation (fl.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>202.5</td>
<td>10</td>
</tr>
<tr>
<td>202.0</td>
<td>5</td>
</tr>
<tr>
<td>200.0</td>
<td>10</td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL), brown, medium stiff to stiff**

<table>
<thead>
<tr>
<th>Water Level Observations</th>
<th>Field Test Result</th>
<th>Laboratory Torvane (HP)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5-7</td>
<td>7000 (HP)</td>
<td></td>
<td>26</td>
<td>48-18-30</td>
<td></td>
</tr>
<tr>
<td>3-4-4</td>
<td>5000 (HP)</td>
<td></td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-7-6</td>
<td>4000 (HP)</td>
<td></td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3-4</td>
<td>4000 (HP)</td>
<td></td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.  

Hammer Type: Rope and Cathead  

**Advancement Method:** 0-10: Solid stem auger  
**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**  

<table>
<thead>
<tr>
<th>Water Level Observations</th>
<th>Field Test Result</th>
<th>Laboratory Torvane (HP)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5-7</td>
<td>7000 (HP)</td>
<td></td>
<td>26</td>
<td>48-18-30</td>
<td></td>
</tr>
<tr>
<td>3-4-4</td>
<td>5000 (HP)</td>
<td></td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-7-6</td>
<td>4000 (HP)</td>
<td></td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3-4</td>
<td>4000 (HP)</td>
<td></td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**Boring Started:** 1/14/2014  
**Boring Completed:** 1/14/2014

**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.:** 35135123  
**Exhibit:** A-22
## BORING LOG NO. B-14

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

### LOCATION

- See Exhibit A-2
- Latitude: 34°6286.62”  
Longitude: 176°5350.93”

### Station: 118+00  
Surface Elev.: 211.5 (Ft.)

### LEAN CLAY (CL), brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>2-4-4</td>
<td>N=8</td>
<td>4000 (HP)</td>
<td>27</td>
<td>27-19-8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-3-3</td>
<td>N=6</td>
<td>3000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-5-6</td>
<td>N=11</td>
<td>3000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-4-4</td>
<td>N=8</td>
<td>3000 (HP)</td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

#### Advancement Method:

- 0-10: Solid stem auger

#### Abandonment Method:

- Boring backfilled with soil cuttings upon completion.

#### Notes:

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

### WATER LEVEL OBSERVATIONS

- **Boring Started:** 1/14/2014  
- **Boring Completed:** 1/14/2014

- **Drill Rig:** CME 55  
- **Driller:** SP

- **Project No.:** 35135123  
- **Exhibit:** A-23
**BORING LOG NO. B-15**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

---

**LOCATION**  
See Exhibit A-2  
Latitude: 34659.9°  
Longitude: 176611.3°  
Station: 126+00

**DEPTH**  
Surface Elev.: 212.2 (Ft.)

**GRAPHIC LOG**  
Boring could not be drilled because of flooded field.

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

---

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

---

**WATER LEVEL OBSERVATIONS**

- **Boring Started:** 1/14/2014  
- **Boring Completed:** 1/14/2014

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**PROJECT NO:** 35135123  
**Exhibit:** A-24

---

**TORVANE/HP (psf)**  
**PERCENT FINES**  
**WATER CONTENT (%)**  
**LL-PL-PI**

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

---

**LOCATION**  
See Exhibit A-2  
Latitude: 34659.9°  
Longitude: 176611.3°  
Station: 126+00

**DEPTH**  
Surface Elev.: 212.2 (Ft.)

**GRAPHIC LOG**  
Boring could not be drilled because of flooded field.

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

---

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

---

**WATER LEVEL OBSERVATIONS**

- **Boring Started:** 1/14/2014  
- **Boring Completed:** 1/14/2014

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**PROJECT NO:** 35135123  
**Exhibit:** A-24

---

**TORVANE/HP (psf)**  
**PERCENT FINES**  
**WATER CONTENT (%)**  
**LL-PL-PI**
LEAND CLAY (CL), brown, medium stiff to very stiff

Boring Terminated at 10 Feet
### BORING LOG NO. B-17

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

#### LOCATION
- **See Exhibit A-2**  
- **Latitude:** 34°6594.67°  
- **Longitude:** 176°7688.22°

#### DEPTH (FT.)  
**ELEVATION (FT.)**

<table>
<thead>
<tr>
<th>Layer Descriptions</th>
<th>Depth (Ft.)</th>
<th>Elevation (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEAN CLAY (CL), with sand, brown, medium stiff to stiff</strong></td>
<td>10.0</td>
<td>200</td>
</tr>
</tbody>
</table>

- **Boring Terminated at 10 Feet**

<table>
<thead>
<tr>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-6 N=8</td>
<td>9000 (HP)</td>
<td>19</td>
<td>37-22-15</td>
<td>72</td>
</tr>
<tr>
<td>3-3-3 N=6</td>
<td>5000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-5 N=9</td>
<td>4000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-7 N=11</td>
<td>6000 (HP)</td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Rope and Cathead

**Advancement Method:**  
- **0-10:** Solid stem auger

**Abandonment Method:**  
- Boring backfilled with soil cuttings upon completion.

**Notes:**
- See Exhibit A-3 for description of field procedures.  
- See Appendix B for description of laboratory procedures and additional data (if any).  
- See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**  
- **Drill Rig:** CME 55  
- **Driller:** SP  
- **Project No.:** 35135123  
- **Exhibit:** A-26  

**Boring Started:** 1/14/2014  
**Boring Completed:** 1/14/2014
**BORING LOG NO. B-18**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  

| LOCATION | See Exhibit A-2  
|———|———  
| Latitude: 346605.54° | Longitude: 1768489.29°  
| Station: 150+00 | Surface Elev.: 212.0 (Ft.)  

**DEPTH** | **FILL TEST RESULTS** | **LABORATORY** | **PERCENT FINES** | **ATTERBERG LIMITS** | **ELEVATION (Ft.)** |
|———|———|———|———|———|———  
| 2-2-4 | N=6 | 2000 (HP) | 27 | 31-22-9 | 73  
| 1-2-3 | N=5 | 2000 (HP) | 28 |  
| 2-2-3 | N=6 | 5000 (HP) | 29 |  
| 1-1-2 | N=3 | 2000 (HP) | 34 |  

**SILTY LEAN CLAY (CL-ML), with sand, brown, soft to medium stiff**

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger  

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**  
3 ft While Sampling

**Notes:**

Stratification lines are approximate. In-situ, the transition may be gradual.  
Hammer Type: Rope and Cathead

**Exhibit:** A-27

**先进方法:**  
0-10: Solid stem auger

**废弃方法:**  
Boring backfilled with soil cuttings upon completion.

**水位观测:**  
3 ft While Sampling  

**注释:**

地层线为近似。就地而言，过渡可能渐变。  
锤子类型: 绳索和猫头

**附件:** A-27
**BORING LOG NO. B-19**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

---

**LOCATION**  
See Exhibit A-2

Latitude: 34°66'33.96"  
Longitude:  97°6'266.83"

**DEPTH**

**FAT CLAY (CH),** brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>ELEVATION (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>158</td>
<td>0 ft While Drilling</td>
</tr>
<tr>
<td>10.0</td>
<td>198</td>
<td>Boring Terminated at 10 Feet</td>
</tr>
</tbody>
</table>

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TURNOVER (Hp)</th>
<th>WET CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2-3</td>
<td>3000 (HP)</td>
<td>39</td>
<td>78-24-54</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>2-4-5</td>
<td>4000 (HP)</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-5</td>
<td>8000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-6-7</td>
<td>2000 (HP)</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**  
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

---

**WATER LEVEL OBSERVATIONS**

| 0 ft While Drilling |

---

**Hammer Type:** Rope and Cathead

---

**Advanced Method:**  
Boring Started: 1/14/2014  
Boring Completed: 1/14/2014

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.: 35135123**

---

**Exhibit:** A-28

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**
**BORING LOG NO. B-20**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 346552.57°</td>
<td>Longitude: 1769995.45°</td>
</tr>
<tr>
<td>Station: 166+00</td>
<td>Surface Elev.: 208.1 (Ft.)</td>
</tr>
</tbody>
</table>

**DEPTH (Ft.)**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE (PSF)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>5-7-8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=15</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>3-6-7</td>
<td></td>
<td>2000 (HP)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>3-6-6</td>
<td></td>
<td>9000 (HP)</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>3-4-6</td>
<td></td>
<td>6000 (HP)</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**TERRA CON**

Drill Rig: CME 55  
Driller: SP  
Project No.: 35135123  
Exhibit: A-29

Boring Started: 1/15/2014  
Boring Completed: 1/15/2014
LOCATION: Cross Co. Line - Highway 147
Earle, Arkansas

DEPTH (FL)
ELEVATION (FL)

POORLY GRADED GRAVEL WITH SAND (SP), brown and gray,
very loose to medium dense

-with gravel between 0.5 and 2 feet

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
0-10: Solid stem auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Drill Rig: CME 55
Driller: SP
Project No.: 35135123
Exhibit: A-30

Boring Started: 1/15/2014
Boring Completed: 1/15/2014
BORING LOG NO. B-22

PROJECT: CA0101 Highway 147 (Widening) (S)  CLIENT: Buchart Horn, Inc.
MEMPHIS TENNESSEE

SITE: Cross Co. Line - Highway 147
Earle, Arkansas

LOCATION See Exhibit A-2

Station: 182+00

DEPTH

GRAPHIC LOG

Boring could not be drilled because of flooded field.

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method: 0-10: Solid stem auger

Abandonment Method: Boring backfilled with soil cuttings upon completion.

Notes:

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

PROJECT: CA0101 Highway 147 (Widening) (S)

Drill Rig: CME 55
Driller: SP

Boring Started: 1/15/2014
Boring Completed: 1/15/2014

Tech: A-31

25809 I-30 South
BRYANT, ARKANSAS

Project No.: 35135123

WATER LEVEL OBSERVATIONS

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Boring Started: 1/15/2014
Boring Completed: 1/15/2014

Drill Rig: CME 55
Driller: SP

25809 I-30 South
BRYANT, ARKANSAS

Project No.: 35135123

Exhibit: A-31
### BORING LOG NO. B-23

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

#### GRAPHIC LOG

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 346553.97° Long: 1772454.37°</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>ELEVATION (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>199.5</td>
</tr>
</tbody>
</table>

**FAT CLAY (CH), dark brown, medium stiff**

**Split-Spoon Refusal on Apparent Concrete at 2 Feet**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3000 (HP)</td>
<td>66</td>
<td>82-32-50</td>
<td>93</td>
<td></td>
</tr>
</tbody>
</table>

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

**Notes:**

- **Advance Method:** 0-10: Solid stem auger  
- **Abandonment Method:** Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

Boring Started: 1/15/2014  
Boring Completed: 1/15/2014

Drill Rig: CME 55  
Driller: SP

Project No.: 35135123  
Exhibit: A-32
**BORING LOG NO. B-24**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 34°6562.92”  
Longitude: 177°3282.32”

**DEPTH**  
Station: 198+00  
Surface Elev.: 201.3 (ft.)

---

**FAT CLAY (CH),** trace roots, dark to gray, very soft to medium stiff

- **Boring Terminated at 10 Feet**

---

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Rope and Cathead

---

**Advancement Method:**
- 0-10: Solid stem auger

**Abandonment Method:**
- Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

---

**WATER LEVEL OBSERVATIONS**

- 5 ft While Sampling

---

**Terracon**  
25809 I-30 South  
Bryant, Arkansas

**Notes:**

- Boring Started: 1/15/2014  
- Boring Completed: 1/15/2014  
- Drill Rig: CME 55  
- Driller: SP  
- Project No.: 35135123  
- Exhibit: A-33
**BORING LOG NO. B-25**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

---

**LOCATION**  
See Exhibit A-2

Latitude: 346724.38°  
Longitude: 1774084.62°

Station: 206+00  
Surface Elev.: 202.2 (Ft.)

**GRAPHIC LOG**

**FIELD OBSERVATIONS**

**WATER LEVEL OBSERVATIONS**

**FIELD TEST RESULTS**

**LABORATORY TEST RESULTS**

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>PARTICLE SIZE (%</th>
<th>WATER CONTENT (%)</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>2-3-3 N=6</td>
<td>2000 (HP)</td>
<td>36</td>
<td></td>
<td></td>
<td>98</td>
<td>93-30-63</td>
</tr>
<tr>
<td>10.0</td>
<td>2-3-4 N=7</td>
<td>6000 (HP)</td>
<td>45</td>
<td>92</td>
<td>30</td>
<td>37</td>
<td>30-20-9</td>
</tr>
<tr>
<td>10.0</td>
<td>2-4-4 N=8</td>
<td>9000 (HP)</td>
<td>42</td>
<td></td>
<td></td>
<td>42</td>
<td>42-28-6</td>
</tr>
<tr>
<td></td>
<td>4-6-7 N=13</td>
<td>9000 (HP)</td>
<td>37</td>
<td></td>
<td></td>
<td>37</td>
<td>37-25-4</td>
</tr>
</tbody>
</table>

- with fine grained sand below 8.5 feet, brown and grayish-brown

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:  
- 0-10: Solid stem auger

Abandonment Method:  
Boring backfilled with soil cuttings upon completion.

**NOTES:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**DRILLER:** SP  
**DRILL RIG:** CME 55  
**DRILLING METHODS:** Boring completed  
**BORING COMPLETED:** 1/15/2014  
**BORING COMPLETED:** 1/15/2014  
**PROJECT NO.:** 35135123  
**EXHIBIT:** A-34

---

**WATER LEVEL OBSERVATIONS**

**TERRACON**

2809 I-30 South  
Bryant, Arkansas
**BORING LOG NO. B-26**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**LOCATION**  
See Exhibit A-2

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Lat: 34 6553.85°</th>
<th>Long: 177 4958.24°</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-4-4</td>
<td></td>
<td>3-5-6</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>6-7-9</td>
</tr>
<tr>
<td>6.5</td>
<td></td>
<td>4-4-5</td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FAT CLAY (CH),** trace roots, brown and grayish brown, medium stiff to very stiff

**LEAN CLAY (CL),** with sand, brown, stiff

**Boring Terminated at 10 Feet**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Test Result</th>
<th>Water Content</th>
<th>Atterberg Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-4-4 N=8</td>
<td>7000 (HP)</td>
<td>30</td>
<td>54-22-32</td>
</tr>
<tr>
<td></td>
<td>3-5-6 N=11</td>
<td>4000 (HP)</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-7-9 N=16</td>
<td>4000 (HP)</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-4-5 N=9</td>
<td>4000 (HP)</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Advancement Method:**
0-10: Solid stem auger

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Elevation (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-4-4</td>
<td>204</td>
</tr>
<tr>
<td>5</td>
<td>202.5</td>
</tr>
</tbody>
</table>

**Terexco**  
25809 I-30 South  
Bryant, Arkansas

**Boring Started:** 1/15/2014  
**Boring Completed:** 1/15/2014

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.:** 35135123  
**Exhibit:** A-35
### BORING LOG NO. B-27

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**SITE:** Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
**CLIENT:** Memphis, Tennessee

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 34°6517.85°</td>
<td>Longitude: 177°5690.21°</td>
</tr>
</tbody>
</table>

**DEPTH**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>ELEVATION (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>201</td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL),** trace sand, brown, medium stiff to very stiff  
- medium stiff, with fine grained sand below 8.5 feet  
- Boring Terminated at 10 Feet

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ft While Sampling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FIELD TEST RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-9</td>
</tr>
<tr>
<td>N=11</td>
</tr>
<tr>
<td>3000 (HP)</td>
</tr>
<tr>
<td>32</td>
</tr>
<tr>
<td>28-14-14</td>
</tr>
<tr>
<td>82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LABORATORY TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4-8</td>
</tr>
<tr>
<td>N=12</td>
</tr>
<tr>
<td>9000 (HP)</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>6-11-13</td>
</tr>
<tr>
<td>N=24</td>
</tr>
<tr>
<td>9000 (HP)</td>
</tr>
<tr>
<td>19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-3</td>
</tr>
<tr>
<td>N=5</td>
</tr>
<tr>
<td>1000 (HP)</td>
</tr>
<tr>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>31</td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**  
**Hammer Type:** Rope and Cathead  
**Advancement Method:** 0-10: Solid stem auger  
**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**FIELD TEST RESULTS**  
**LABORATORY TESTS**  
**ATTERBERG LIMITS**  
**PERCENT FINES**  
**Notes:**  
**Boring Started:** 1/15/2014  
**Boring Completed:** 1/15/2014  
**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.:** 35135123  
**Exhibit:** A-36
**BORING LOG NO. B-28**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**LOCATION**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Test Result</th>
<th>Water Content (%)</th>
<th>LL-Pl-Pl</th>
<th>Atterberg Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.5</td>
<td>Sandy Silty Clay (CL-ML)</td>
<td>4-6-7 N=13</td>
<td>3000 (HP)</td>
<td>16</td>
<td>22-15-7</td>
<td>70</td>
</tr>
<tr>
<td>10.0</td>
<td>Lean Clay (CL)</td>
<td>2-3-3 N=6</td>
<td>1000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stratification lines are approximate. In-situ, the transition may be gradual.

**Advancement Method:**
0-10: Solid stem auger

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

**BORING**

See Exhibit A-2

**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**GRAPHIC LOG**

Location: See Exhibit A-2  
Latitude: 34°6210.59”  
Longitude: 177°6267.36”

Station: 230+00  
Surface Elev.: 213.2 (ft.)

**DEPTH (FL) ELEVATION (FL)**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Elevation (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>204.5</td>
</tr>
<tr>
<td>8.5</td>
<td>203</td>
</tr>
<tr>
<td>10.0</td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**Hammer Type:** Rope and Cathead

**Notes:**
Project No.: 35135123  
Drill Rig: CME 55  
Driller: SP  
Exhibit: A-37
### Boring Log No. B-29

**Project:** CA0101 Highway 147 (Widening) (S)  
**Client:** Buchart Horn, Inc.  
**Site:** Cross Co. Line - Highway 147  
Earle, Arkansas

#### GRAPHIC LOG

- **Location:** See Exhibit A-2  
  - Latitude: 34°60'91.43"  
  - Longitude: 177°7'181.03"
- **Station:** 238+00  
  - Surface Elev.: 210.9 (Ft.)
- **Depth:**
  - 10.0
  - 201

#### Stratification

- **FAT CLAY (CH),** brown, medium stiff to stiff
- **Boring Terminated at 10 Feet**

#### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>Depth (FL)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY RESULTS</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>3-3-4</td>
<td>4000 (HP)</td>
<td>26</td>
<td>52-19-33</td>
<td>96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-5-4</td>
<td>9000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7-10-14</td>
<td>9000 (HP)</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-4-3</td>
<td>4000 (HP)</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

**Advancement Method:**  
- 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**Notes:**
- See Exhibit A-3 for description of field procedures.  
- See Appendix B for description of laboratory procedures and additional data (if any).  
- See Appendix C for explanation of symbols and abbreviations.

**Drill Rig:** CME 55  
**Driller:** SP  
**Boring Started:** 1/15/2014  
**Boring Completed:** 1/15/2014  
**Project No.:** 35135123  
**Exhibit:** A-38
### BORING LOG NO. B-30

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

#### LOCATION
- **Latitude:** 346081.5°  
- **Longitude:** 1777972.2°

**Station:** 246+00  
**Surface Elev.:** 211.2 (Ft.)

#### GRAPHIC LOG

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVAPE/HP</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>2-3-5 N=8</td>
<td>4000 (HP)</td>
<td>33</td>
<td>44-19-25</td>
<td>91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>3-4-5 N=9</td>
<td>5000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-4-7 N=11</td>
<td>2000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-2-2 N=4</td>
<td>2000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WATER LEVEL OBSERVATIONS**
- **10 ft While Sampling**

#### Notes:

- **Advancement Method:**  
  0-10: Solid stem auger
- **Abandonment Method:**  
  Boring backfilled with soil cuttings upon completion.
- **Hammer Type:** Rope and Cathead

**Exhibit:** A-39

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**CLIENT:** Buchart Horn, Inc.  
**Memphis Tennessee**

**Driller:** SP  
**Boring Started:** 1/16/2014  
**Boring Completed:** 1/16/2014

**Drill Rig:** CME 55  
**Exhibit:** A-39

**Project No.:** 35135123
LEAN CLAY (CL), trace sand, brown and gray, medium stiff to very stiff

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>3-3-3</td>
<td>6000 (HP)</td>
<td>23</td>
<td>41-17-24</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5-6-7</td>
<td>9000 (HP)</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-9-10</td>
<td>5000 (HP)</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-3-3</td>
<td>1000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
0-10: Solid stem auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Boring Started: 1/16/2014
Boring Completed: 1/16/2014

Drill Rig: CME 55
Driller: SP
Project No.: 35135123
Exhibit: A-40
**BORING LOG NO. B-32**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**LOCATION**
- Latitude: 34°59'58.16"
- Longitude: 177°96'16.89"
- Station: 262+00
- Surface Elev.: 210.6 (ft.)

**DEPTH**
- 10.0 ft

**LEAN CLAY (CL), trace sand, brown, very soft to soft**
- with fine-grained sand below 3.5 feet

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>WATER LEVEL</th>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULT</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH (FT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>2-2-2</td>
<td>N=4</td>
<td>5000 (HP)</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>0-0-0</td>
<td>N=WOH</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>1-1-3</td>
<td>N=4</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>2-1-2</td>
<td>N=3</td>
<td></td>
<td>29</td>
</tr>
</tbody>
</table>

**Advancement Method:**
- 0-10: Solid stem auger

**Abandonment Method:**
- Boring backfilled with soil cuttings upon completion.

**Notes:**
- Stratification lines are approximate. In-situ, the transition may be gradual.
- Hammer Type: Rope and Cathead
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**
- 5 ft While Sampling

**TORVANE/HP (psf)**
- 5000

**ATERBEG LIMITS**
- 40-20-20

**PERCENT FINES**
- 89

**Boring Terminated at 10 Feet**
### BORING LOG NO. B-33

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis, Tennessee

---

#### GRAPHIC LOG

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 34°59'64.36&quot;</td>
<td>Longitude: 17°80'381.44&quot;</td>
</tr>
<tr>
<td>Station: 270+00</td>
<td>Surface Elev.: 212.0 (Ft.)</td>
</tr>
</tbody>
</table>

---

#### WATER LEVEL OBSERVATIONS

**LEAN CLAY (CL), brown, soft to very stiff**

- with fine grained sand below 3.5 feet

---

#### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE (HP)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-2-3</td>
<td>N=5</td>
<td>4000 (HP)</td>
<td>26</td>
<td>34-20-14</td>
<td></td>
</tr>
<tr>
<td>3-3-5</td>
<td>N=8</td>
<td>4000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7-9</td>
<td>N=16</td>
<td>1000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1-2</td>
<td>N=3</td>
<td>1000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

---

**Notes:**

- Advancement Method: 0-10: Solid stem auger
- Abandonment Method: Boring backfilled with soil cuttings upon completion.
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

---

**WATER LEVEL OBSERVATIONS**

---

** Hammer Type:** Rope and Cathead

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**Driller:** SP

**Drill Rig:** CME 55

**Boring Started:** 1/16/2014

**Boring Completed:** 1/16/2014

**Project No.:** 35135123

---

**Terracon**

25809 I-30 South
Bryant, Arkansas

**Exhibit:** A-42
**BORING LOG NO. B-34**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**CLIENT:** Buchart Horn, Inc.  
**Location:** Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 34°59'47.77"  
Longitude: 98°17'19.576"

**DEPTH**  
Station: 278+00  
Surface Elev.: 212.5 (ft)

<table>
<thead>
<tr>
<th>ELEVATION (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
</tr>
<tr>
<td>202.5</td>
</tr>
</tbody>
</table>

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2-3-6 N=9</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>3000 (HP)</td>
<td>40-22-18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>2-5-5 N=10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>4000 (HP)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>5-5-6 N=11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3-3-4 N=7</td>
<td>20</td>
</tr>
</tbody>
</table>

**WATER LEVEL OBSERVATIONS**

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

**Notes:**

Project No.: 35135123  
Exhibit: A-43

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**Drill Rig:** CME 55  
**Driller:** SP

**Boring Started:** 1/16/2014  
**Boring Completed:** 1/16/2014
### BORING LOG NO. B-35

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**CLIENT:** Buchart Horn, Inc.  
**LOCATION:** See Exhibit A-2  
**Latitude:** 34°60'70.16"  
**Longitude:** 178°19'86.74"  
**Station:** 286+00  
**Surface Elev.:** 213.2 (FT.)

#### GRAPHIC LOG

<table>
<thead>
<tr>
<th>DEPTH (FT.)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY T야NORE (HP)</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>SILTY LEAN CLAY (CL-ML), with sand, brown, stiff</td>
<td></td>
<td>2-4-7 N=11</td>
<td>4000 (HP)</td>
<td>22</td>
<td>28-21-7</td>
</tr>
<tr>
<td>10.0</td>
<td>POORLY GRADED SAND (SP), trace clay, brown, loose to medium dense</td>
<td></td>
<td>3-5-6 N=11</td>
<td>2000 (HP)</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4-5-7 N=12</td>
<td>5000 (HP)</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-3-3 N=6</td>
<td>3000 (HP)</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>

Stratification lines are approximate. In-situ, the transition may be gradual.

**Advancement Method:** 0-10: Solid stem auger  
**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

- **Boring Terminated at 10 Feet**

---

**Hammer Type:** Rope and Cathead  
**Drill Rig:** CME 55  
**Driller:** SP  
**Boring Started:** 1/16/2014  
**Boring Completed:** 1/16/2014  
**Project No.:** 35135123  
**Exhibit:** A-44
2.0 
**SILTY LEAN CLAY (CL-ML)**, with sand, dark brown, medium stiff

**POORLY GRADED SAND (SP)**, trace clay, brown, loose to medium dense

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Boring Terminated at 10 Feet**

**Cross Co. Line - Highway 147**
Earle, Arkansas

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>GRAPHIC LOG</th>
<th>DEPTH (FT)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST RESULT</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 34°6106.46’  Longitude: 178°2769.67’</td>
<td>Station: 294+00</td>
<td>2.0</td>
<td>2-3-3 N=6</td>
<td>2000 (HP)</td>
<td>22</td>
<td>28-21-7</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-2-5 N=7</td>
<td>6000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4-3-2 N=6</td>
<td>2000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-4-8 N=12</td>
<td></td>
<td></td>
<td></td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- Advancement Method:
  - 0-10: Solid stem auger

- Abandonment Method:
  - Boring backfilled with soil cuttings upon completion.

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

- **8.5 ft While Sampling**

**Hammertime:** Rope and Cathead

**Advance:**

- 0-10: Solid stem auger

**Abandon:**

- Boring backfilled with soil cuttings upon completion.

**Drill Rig:** CME 55

**Driller:** SP

**Project No.: 35135123**

**Exhibit:** A-45

**Boring Started:** 1/16/2014

**Boring Completed:** 1/16/2014
### BORING LOG NO. B-37

**LOCATION**  
See Exhibit A-2

Latitude: 34°61'03.33"  Longitude: 178°35'78.27"

**Station:** 302+00  
**Surface Elev.:** 208.5 (Ft.)

### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>WATER CEMENT</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FAT CLAY (CH),** brown and gray, stiff

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>ELEVATION (FL.)</th>
<th>WATER CONTENT (%</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>205</td>
<td>29</td>
<td>74-32-42</td>
<td>99</td>
</tr>
</tbody>
</table>

**POORLY GRADED SAND (SP),** trace clay, brown, loose

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>ELEVATION (FL.)</th>
<th>WATER CONTENT (%</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5</td>
<td>32</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.8-7</td>
<td>22</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Boring Terminated at 10 Feet

### WATER LEVEL OBSERVATIONS

- **ELEVATION (Ft.):** Surface Elev.: 208.5 (Ft.)

### Advancement Method:
- 0-10: Solid stem auger

### Abandonment Method:
- Boring backfilled with soil cuttings upon completion.

### Hammer Type:
- Rope and Cathead

### Notes:
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

---

**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.:** 35135123  
**Exhibit:** A-46
### BORING LOG NO. B-38

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

#### GRAPHIC LOG

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TESTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>LEAN CLAY (CL), trace sand, brown and gray, stiff</td>
<td>3-6-7 N=13 9000 (HP)</td>
<td>22 36-20-16 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>POORLY GRADED SAND (SP), trace clay, brown</td>
<td>4-6-8 N=14 2000 (HP)</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

#### Advancement Method:
0-10: Solid stem auger

#### Abandonment Method:
Boring backfilled with soil cuttings upon completion.

#### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torvane/HP</td>
<td>Elev.: 209.1 (Ft.)</td>
<td></td>
</tr>
</tbody>
</table>

#### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>Boring Terminated at 10 Feet</td>
</tr>
</tbody>
</table>

**Notes:**
See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**Advancement Method:**
See Exhibit A-3 for description of field procedures.

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

#### EXHIBIT A-2

- See Exhibit A-2 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

#### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>Boring Terminated at 10 Feet</td>
</tr>
</tbody>
</table>

**Notes:**
See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**Advancement Method:**
See Exhibit A-3 for description of field procedures.

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**Water Level Observations**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>Boring Terminated at 10 Feet</td>
</tr>
</tbody>
</table>

**Notes:**
See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**Advancement Method:**
See Exhibit A-3 for description of field procedures.

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

#### GRAPHIC LOG

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TESTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td>LEAN CLAY (CL), trace sand, brown and gray, stiff</td>
<td>3-6-7 N=13 9000 (HP)</td>
<td>22 36-20-16 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>POORLY GRADED SAND (SP), trace clay, brown</td>
<td>4-6-8 N=14 2000 (HP)</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

#### Advancement Method:
0-10: Solid stem auger

#### Abandonment Method:
Boring backfilled with soil cuttings upon completion.

#### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torvane/HP</td>
<td>Elev.: 209.1 (Ft.)</td>
<td></td>
</tr>
</tbody>
</table>

#### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>Boring Terminated at 10 Feet</td>
</tr>
</tbody>
</table>

**Notes:**
See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**Advancement Method:**
See Exhibit A-3 for description of field procedures.

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.
**BORING LOG NO. B-39**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

### GRAPHIC LOG
- **LOCATION:** See Exhibit A-2  
  - Latitude: 34°05′59.99″  
  - Longitude: 178°51′77.08″
- **DEPTH:**
  - Station: 318+00
  - Surface Elev.: 207.7 (ft.)
- **ELEVATION:**
  - Depth (ft.):
    - 10.0
    - 197.5

### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TURVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS (LL-PL-PI)</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2-3 N=5</td>
<td>4000 (HP)</td>
<td>34</td>
<td>72-22-50</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>2-2-3 N=5</td>
<td>4000 (HP)</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-6 N=10</td>
<td>6000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### WATER LEVEL OBSERVATIONS

- **Depth at Surface Elev.:** 207.7 (ft.)
- **Elevation:**
  - 10.0
  - 197.5

### Notes:
- Stratification lines are approximate. In-situ, the transition may be gradual.
- Hammer Type: Rope and Cathead
- Advancement Method: 0-10: Solid stem auger
- Abandonment Method: Boring backfilled with soil cuttings upon completion.
- See Appendix A for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

### FIELD TEST RESULTS

- **DEPTH:** 10 Feet
- **Boring Terminated at 10 Feet**

### WATER LEVEL OBSERVATIONS

- **Cross Co. Line - Highway 147**
  - **Latitude:** 34°05′59.99″
  - **Longitude:** 178°51′77.08″
- **Station:** 318+00
- **Surface Elev.:** 207.7 (ft.)

### Advancement Method:
- 0-10: Solid stem auger

### Abandonment Method:
- Boring backfilled with soil cuttings upon completion.

### WATER LEVEL OBSERVATIONS

- **Boring Started:** 1/16/2014
- **Boring Completed:** 1/16/2014
- **Drill Rig:** CME 55
- **Driller:** SP
- **Project No.:** 35135123
- **Exhibit:** A-48

**Terracon**
25809 I-30 South  
Bryant, Arkansas

---

**THE BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. **
**GEO SMART LOG NO.WELL 35135123-FINAL SHOULDER SURVEY.GPJ**
Boring could not be drilled because of flooded field.

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
0-10: Solid stem auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:

PROJECT: CA0101 Highway 147 (Widening) (S)  
SITE: Cross Co. Line - Highway 147  
Earle, Arkansas

CLIENT: Buchart Horn, Inc.  
Memphis Tennessee

GRAPHIC LOG

LOCATION
See Exhibit A-2

Station: 326+00

DEPTH

ELEVATION (FT.)

DEPTH (FT.)

WATER LEVEL OBSERVATIONS

LABORATORY TORVANE/HP (psf)

PERCENT FINES

WATER CONTENT (%)

ATTERBERG LIMITS

LL-PL-PI

SAMPLE TYPE

PROJECT:  CA0101 Highway 147 (Widening) (S)

LABORATORY

TORVANE/HP (psf)

PERCENT FINES

WATER CONTENT (%)

ATTERBERG LIMITS

LL-PL-PI

SAMPLE TYPE

PROJECT:

Boring Started: 1/17/2014  
Boring Completed: 1/17/2014

Drill Rig: CME 55  
Driller: SP

Project No.: 35135123  
Exhibit: A-49

25809 I-30 South  
Bryant, Arkansas

This boring log is not valid if separated from original report. Geo Smart Log No. Well 35135123- Final Shoulder Survey.GPJ

See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.
**BORING LOG NO. B-41**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

**LOCATION**  
See Exhibit A-2  
Latitude: 34°59’70.17”  
Longitude: 178°68’08.27”  
Station: 334+00  
Surface Elev.: 205.3 (Ft.)

**GRAPHIC LOG**

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE TEST</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>STRATIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td></td>
<td>2-3-3 N=6</td>
<td>2000 (HP)</td>
<td>31</td>
<td>53-20-33</td>
<td>91</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td>1-2-4 N=6</td>
<td>2000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
<td>3-4-4 N=8</td>
<td>1000 (HP)</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>2-3-3 N=6</td>
<td>2000 (HP)</td>
<td>31</td>
<td>53-20-33</td>
<td>91</td>
</tr>
</tbody>
</table>

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

- 10 ft While Sampling

**NOTES**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**DATE**

- Boring Started: 1/17/2014
- Boring Completed: 1/17/2014

**DRILL RIG:** CME 55  
**DRILLER:** SP

**PROJECT NO.:** 35135123  
**EXHIBIT:** A-50

**25809 I-30 South**  
**Bryant, Arkansas**
**BORING LOG NO. B-42**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**GRAPHIC LOG**  
See Exhibit A-2  
Latitude: 345969.64°  
Longitude: 1787553.33°  
Station: 342+00  
Offset: 20' West

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>DEPTH (FT)</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORSION (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-3</td>
<td>10</td>
<td></td>
<td>3000 (HP)</td>
<td>52</td>
<td>85-31-54</td>
<td>98</td>
</tr>
<tr>
<td>1-2-2</td>
<td>10</td>
<td></td>
<td>3000 (HP)</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3-4</td>
<td>10</td>
<td></td>
<td>1000 (HP)</td>
<td>57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1-2</td>
<td>10</td>
<td></td>
<td>1000 (HP)</td>
<td>41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIELD LEVEL OBSERVATIONS**

- **16 ft While Sampling**

**ADVANCEMENT METHOD:**
- 0-10: Solid stem auger

**ABANDONMENT METHOD:**
- Boring backfilled with soil cuttings upon completion.

**Notes:**
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

- Stratification lines are approximate. In-situ, the transition may be gradual.

- Hammer Type: Rope and Cathead

- Advancement Method:  
  - 0-10: Solid stem auger

- Abandonment Method:  
  - Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

- **16 ft While Sampling**

**Boring Terminated at 10 Feet**

- Boring Started: 1/17/2014  
Boring Completed: 1/17/2014

- Drill Rig: CME 55  
Driller: SP

- Project No.: 35135123  
Exhibit: A-51
**BORING LOG NO. B-43**

**PROJECT: CA0101 Highway 147 (Widening) (S)**

**SITE:** Cross Co. Line - Highway 147

**Earle, Arkansas**

**CLIENT:** Buchart Horn, Inc.

**Memphis Tennessee**

**LOCATION**

See Exhibit A-2

Latitude: 34° 04' 38"  Longitude: 178° 8' 09.9"

Station: 350+00  

Depth: 10.0  

Surface Elev.: 207.4 (Ft.)

**LEAN CLAY (CL), trace sand, brown, medium stiff to very stiff**

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>1-2-2 N=4</td>
<td>3000 (HP)</td>
<td>20</td>
<td>42-19-23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-3-5 N=8</td>
<td>4000 (HP)</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-8-9 N=17</td>
<td>6000 (HP)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-3-5 N=8</td>
<td>3000 (HP)</td>
<td></td>
<td>29</td>
</tr>
</tbody>
</table>

**Graph Log**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

**ADVANCEMENT METHOD:**

0-10: Solid stem auger

**ABANDONMENT METHOD:**

Boring backfilled with soil cuttings upon completion.

**Notes:**

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

**Drill Rig:** CME 55  

**Driller:** SP


**Exhibit:** A-52
**BORING LOG NO. B-44**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**LOCATION**
See Exhibit A-2

Latitude: 34°58.20’ N  Longitude: 98°17.73’ W

Station: 358+00  Surface Elev.: 214.0 ft

**DEEP CLAY (CL), with sand, brown, soft to stiff**

Boring Terminated at 10 Feet

<table>
<thead>
<tr>
<th>DEPTH (FT.)</th>
<th>ELEVATION (FT.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>204</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3-3 N=6</td>
<td>6000 (HP)</td>
<td>17</td>
<td>30-18-12 76</td>
</tr>
<tr>
<td>3-4-6 N=10</td>
<td>3000 (HP)</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>5-5-6 N=11</td>
<td>1000 (HP)</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

**LABORATORY TEST RESULTS**

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-1 N=3</td>
<td>6000 (HP)</td>
<td>17</td>
<td>30-18-12 76</td>
</tr>
</tbody>
</table>

**ADVANCEMENT METHOD:**
0-10: Solid stem auger

**ABANDONMENT METHOD:**
Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

6 ft While Sampling

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**Project No.: 35135123  Exhibit: A-53**
**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**LOCATION**  
See Exhibit A-2

Latitude: 34°57'17"  
Longitude: 178°9'53.91"

Station: 366+00  
Surface Elev.: 215.5 (ft.)

**DEPTH**  
**ELEVATION (ft.)**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORQUE (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-7-7</td>
<td>N=14</td>
<td>6000 (HP)</td>
<td>22</td>
<td>41-19-22</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>4-6-6</td>
<td>N=12</td>
<td>5000 (HP)</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-8-10</td>
<td>N=18</td>
<td>3000 (HP)</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2-3</td>
<td>N=5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**LEAN CLAY (CL), brown, medium stiff to very stiff**

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

10 ft While Sampling

**Hammer Type:** Rope and Cathead

**Stratification lines are approximate. In-situ, the transition may be gradual.**
PROJECT: CA0101 Highway 147 (Widening) (S)  

SITE: Cross Co. Line - Highway 147  
Earle, Arkansas

CLIENT: Buchart Horn, Inc.  
Memphis Tenneessee

LOCATION  See Exhibit A-2
Latitude: 345276.1°  Longitude: 1790714.15°
Station: 374+00  Surface Elev.: 212.7 (Ft.)
DEPTH

LEAN CLAY (CL), brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST (HP)</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.
Hammer Type: Rope and Cathead

Advancement Method:
0-10: Solid stem auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of laboratory procedures and additional data (if any).

Notes:

WATER LEVEL OBSERVATIONS

10 ft While Sampling

Drill Rig: CME 55  Driller: SP
Project No.: 35135123  Exhibit: A-55
LEAN CLAY (CL), with sand, brown, medium stiff

POORLY GRADED SAND (SP), trace clay, brown, loose

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method: 0-10: Solid stem auger

Abandonment Method: Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Boring Started: 1/17/2014

Boring Completed: 1/17/2014

Drill Rig: CME 55

Driller: SP

Project No.: 35135123

Exhibit: A-56
**BORING LOG NO. B-48**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**LOCATION**  
See Exhibit A-2  
Latitude: 344409.89°  Longitude: 1791878.41°  
Station: 390+00  
Surface Elev.: 204.8 (FL)

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST TYPE</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5</td>
<td></td>
<td></td>
<td></td>
<td>4000 (HP)</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td>1000 (HP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000 (HP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000 (HP)</td>
<td></td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL), brown, medium stiff to stiff**

**POORLY GRADED SAND (SP), brown, medium dense**

*Boring Terminated at 10 Feet*

Stratification lines are approximate. In-situ, the transition may be gradual.

**Notes:**

- **Advancement Method:** 0-10: Solid stem auger  
- **Abandonment Method:** Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST TYPE</th>
<th>WATER CONTENT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2-8</td>
<td>1000 (HP)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hammer Type: Rope and Cathead

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee  
**Drill Rig:** CME 55  
**Driller:** SP  
**Exhibit:** A-57  
**Project No.: 35135123**

Boring Started: 1/17/2014  
Boring Completed: 1/17/2014

**Terracon**  
2809 I-30 South  
Bryant, Arkansas
**BORING LOG NO. B-49**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 343751.52°</td>
<td>Longitude: 1792576.28°</td>
</tr>
</tbody>
</table>

**DEPTH**  
Station: 398+00  
Surface Elev.: 214.4 (Ft.)

**FAT CLAY (CH), brown, stiff**

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

**ADVANCEMENT METHOD:**
0-10: Solid stem auger

**ABANDONMENT METHOD:**
Boring backfilled with soil cuttings upon completion.

**PROJECT FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3-5</td>
<td>9000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=8</td>
<td>2000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3-5</td>
<td>9000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=8</td>
<td>2000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drill Rig:** CME 55  
**Driller:** SP  
**Boring Started:** 1/17/2014  
**Boring Completed:** 1/17/2014  
**Project No.: 35135123**  
**Exhibit:** A-58

**TERALCON**
25809 I-30 South  
Bryant, Arkansas
**BOARING LOG NO. B-50**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tenneessee

**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 34°31’58&quot;</td>
<td>Longitude: 17°92’13.26&quot;</td>
</tr>
</tbody>
</table>

**DEPTH**  
- Station: 406+00  
- Surface Elev.: 213.1 (Ft.)

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>2000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL), brown, stiff**

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

**Advancement Method:**  
- 0-10: Solid stem auger

**Abandonment Method:**  
- Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

- **ELEVATION (Ft.):**  
- **Surface Elev.:** 213.1 (Ft.)

**Exhibit:** A-59

**Boring Started:** 1/18/2014  
**Boring Completed:** 1/18/2014

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.:** 35135123
<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TESTS</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>9000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>3000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>3000 (HP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FAT CLAY (CH), brown, stiff**

**POORLY GRADED SAND (SP), trace clay, brown, loose**

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

**LOCATION**
- Latitude: 34°24'50.65"
- Longitude: 179°35'95.17"
- Station: 414+00
- Surface Elev.: 204.9 (Ft.)

**Advancement Method:** 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

---

**Terracon**
2580 I-30 South
Bryant, Arkansas

---

**Notes:**
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.
**BORING LOG NO. B-52**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

---

**LOCATION**  
See Exhibit A-2

**DEPTH**  
Station: 422+00

---

Boring could not be drilled because of flooded field.

---

**Boring Terminated at 10 Feet**

---

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Rope and Cathead

---

**Advancement Method:**  
0-10: Solid stem auger

---

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

---

**Notes:**

---

**WATER LEVEL OBSERVATIONS**

---

**LABORATORY**

---

**PERCENT FINES**

---

**ATERBERG LIMITS**

---

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**Drill Rig:** CME 55  
**Driller:** SP

**Boring Started:** 1/18/2014  
**Boring Completed:** 1/18/2014

---

**25809 I-30 South**  
**Bryant, Arkansas**

---

**Project No.:** 35135123  
**Exhibit:** A-61
**BORING LOG NO. B-53**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**SITE:**  
Cross Co. Line - Highway 147  
Earle, Arkansas

### GRAPHIC LOG

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 341288.21°</td>
<td>Longitude: 1794530.24°</td>
</tr>
<tr>
<td>Station: 430+00</td>
<td>Surface Elev.: 207.3 (ft)</td>
</tr>
</tbody>
</table>

**DEPTH**

<table>
<thead>
<tr>
<th>DEPTH (Ft)</th>
<th>ELEVATION (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>197.5</td>
</tr>
</tbody>
</table>

**FAT CLAY (CH), brown, stiff**

**Boring Terminated at 10 Feet**

- **Field Test Result**:
  - Water Level: 4000 (HP)
  - Torvane: 2000 (HP)
  - Torvane: 2000 (HP)
  - Water Content (%) 1-1-3
  - N=4

Stratification lines are approximate. In-situ, the transition may be gradual.

### Notes:

- **Advancement Method**: 0-10: Solid stem auger
- **Abandonment Method**: Boring backfilled with soil cuttings upon completion.
- **Hammer Type**: Rope and Cathead
- **Drill Rig**: CME 55
- **Driller**: SP
- **Boring Started**: 1/18/2014
- **Boring Completed**: 1/18/2014
- **Project No.**: 35135123
- **Exhibit**: A-62
### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DEPTH (FT)</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAPHIC LOG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9000 (HP)</td>
<td>32-21-11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2000 (HP)</td>
<td>30-22-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-4-7</td>
<td>N=11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5000 (HP)</td>
<td></td>
</tr>
</tbody>
</table>

**WATER LEVEL OBSERVATIONS**

- Water level observations: 8.5 ft while sampling

**Notes:**

- Advancement Method: 0-10: Solid stem auger
- Abandonment Method: Boring backfilled with soil cuttings upon completion.
- Hammer Type: Automatic
- Cross Co. Line - Highway 147
- Earle, Arkansas
- Station: 438+00
- Surface Elev.: 204.9 (ft)
- Boring Terminated at 10 Feet

**PROJECT: CA0101 Highway 147 (Widening) (S)**

**CLIENT:** Buchart Horn, Inc.  Memphis Tenneessee

**SITE:** Cross Co. Line - Highway 147

**LOCATION:** See Exhibit A-2

- Latitude: 34°06'89.4"  Longitude: 179°50'16.04"
- Station: 438+00

**Boring Log No. B-54**

**Surface Elev.: 204.9 (Ft.)**

**ADVANCEMENT METHOD:**

- 0-10: Solid stem auger

**ABANDONMENT METHOD:**

- Boring backfilled with soil cuttings upon completion.

**Boring Started:** 1/18/2014

**Boring Completed:** 1/18/2014

**Drill Rig:** CME 55

**Driller:** SP

**Project No.:** 35135123

**Exhibit:** A-63
**BORING LOG NO. B-55**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 34°00'55.38&quot;</td>
<td>Longitude: 179°55'25.58&quot;</td>
</tr>
<tr>
<td>Station: 446+00</td>
<td></td>
</tr>
<tr>
<td>Surface Elev.: 208.5 (Ft.)</td>
<td></td>
</tr>
<tr>
<td><strong>DEPTH</strong></td>
<td><strong>ELEVATION (Ft.)</strong></td>
</tr>
</tbody>
</table>

1. **FAT CLAY (CH),** trace sand, brown, stiff  
2000 (HP)  
4000 (HP)  
4000 (HP)

3. **POORLY GRADED SAND (SP),** trace clay, brown, medium dense  
198.5

**Boring Terminated at 10 Feet**

<table>
<thead>
<tr>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TESTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORMELO (psf)</td>
<td>WATER CONTENT (%)</td>
</tr>
<tr>
<td>LL-PL-PI</td>
<td>ATTERBERG LIMITS</td>
</tr>
</tbody>
</table>

- **ELEVATION (Ft.): Surface Elev.: 208.5**
- **WATER LEVEL OBSERVATIONS:**
  - **2-4-6**
  - **N=10**

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**Hammer Type:** Automatic

**Notes:**  
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**DRILL RIG:** CME 55  
**DRILLER:** SP

**Boring Started:** 1/18/2014  
**Boring Completed:** 1/18/2014

**Terracon**  
25809 I-30 South  
Bryant, Arkansas

**Project No.:** 35135123  
**Exhibit:** A-64
**BORING LOG NO. B-56**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

---

**LOCATION**
See Exhibit A-2

*Latitude: 33°32’1.61”  Longitude: 179°59’43.13”*

**Station:** 454+00

**GRAPHIC LOG**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td></td>
<td>3000 (HP)</td>
<td>45-21-24</td>
</tr>
<tr>
<td>2-3-4</td>
<td></td>
<td>8000 (HP)</td>
<td></td>
</tr>
<tr>
<td>5-6</td>
<td></td>
<td>9000 (HP)</td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

---

**Notes:**
See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

---

**WATER LEVEL OBSERVATIONS**

---

**Advancement Method:**
0-10: Solid stem auger

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

---

**Drill Rig:** CME 55

**Driller:** SP

**Boring Started:** 1/18/2014
**Boring Completed:** 1/18/2014

**Project No.: 35135123**

---

**Terracon**
25809 I-30 South
Bryant, Arkansas

---

**Hammer Type:** Automatic

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**
**BORING LOG NO. B-57**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

---

**LOCATION**
See Exhibit A-2

- **Latitude:** 33°38'34.98"
- **Longitude:** 17°96'343.9"
- **Station:** 462+00
- **Surface Elev.:** 215.8 (Ft.)

---

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE (HP)</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>2-3-3</td>
<td>H</td>
<td>2000 (HP)</td>
<td>33</td>
<td>36-18-18</td>
<td>77</td>
</tr>
<tr>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td>1-2-3</td>
<td>H</td>
<td>2000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>2-3-5</td>
<td>H</td>
<td>2000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td>3-3-3</td>
<td>H</td>
<td>2000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**ADVANCEMENT METHOD:**
- Solid stem auger

**ABANDONMENT METHOD:**
- Boring backfilled with soil cuttings upon completion.

---

**NOTES:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

---

**Boring Terminated at 10 Feet**

---

**Hammer Type:** Automatic

---

**Water Level Observations**

---

**PROJECT:  CA0101 Highway 147 (Widening) (S)**

---

**Drill Rig:** CME 55
**Driller:** SP

**Project No.:** 35135123
**Exhibit:** A-66

---

**Terracon**
25809 I-30 South
Bryant, Arkansas

---

**Boring Started:** 1/18/2014
**Boring Completed:** 1/18/2014

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**
**BORING LOG NO. B-58**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

---

**LOCATION**  
See Exhibit A-2  
Latitude: 33°8201.75°  
Longitude: 17°96879.38°

Station: 470+00  
Surface Elev.: 213.9 (Ft.)

---

**DEPTH**  
**ELEVATION (Ft.)**

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Torvane (HP)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Atterberg Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>2-2-4</td>
<td>3000 (HP)</td>
<td>36</td>
<td>50-22-28</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>2-2-5</td>
<td>4000 (HP)</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>2-3-3</td>
<td>2000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>4-5-7</td>
<td>2000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Stratification lines are approximate. In-situ, the transition may be gradual.  
**Hammer Type:** Automatic

---

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

---

**FIELD TEST RESULTS**

**SAMPLE TYPE**  
**FIELD TEST RESULT**  
**LABORATORY TORVANE (HP)**  
**WATER CONTENT (%)**  
**ATTERBERG LIMITS**  
**LL-PL-PI**

---

**WATER LEVEL OBSERVATIONS**

---

**Notes:**

---

**Boring Started:** 1/18/2014  
**Boring Completed:** 1/18/2014

---

**Drill Rig:** CME 55  
**Driller:** SP

---

**Project No.:** 35135123  
**Exhibit:** A-67

---

**Terracon**

25009 I-30 South  
Bryant, Arkansas
**BORING LOG NO. B-59**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

---

**LOCATION**
- See Exhibit A-2
- Latitude: 337781.38°
- Longitude: 1797722°
- Station: 478+00

**GRAPHIC LOG**
- Surface Elev.: 212.8 (Ft.)
- Depth: 10.0
- Elevation: 203

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Water Level (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>Surface Elev.: 212.8 (Ft.)</td>
</tr>
</tbody>
</table>

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>Field Test Result</th>
<th>Sample Type</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5-7 N=12</td>
<td>4000 (HP)</td>
<td>73-36-37</td>
<td>83</td>
</tr>
<tr>
<td>2-3-4 N=7</td>
<td>4000 (HP)</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>2-3-6 N=9</td>
<td>6000 (HP)</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>2-3-5 N=8</td>
<td>3000 (HP)</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

**FAT CLAY (CH), brown and gray, stiff**

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Automatic

---

**Advancement Method:**
- 0-10: Solid stem auger

**Abandonment Method:**
- Boring backfilled with soil cuttings upon completion.

**Notes:**
See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

**Drill Rig:** CME 55
**Driller:** SP
**Project No.:** 35135123
**Exhibit:** A-68
**BORING LOG NO. B-60**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

---

**LOCATION**
See Exhibit A-2

Latitude: 33°46'48.44"  Longitude: 179°53'43.09"

Station: 486+00  Surface Elev.: 212.7 (Ft.)

---

**FAT CLAY (CH), trace roots, brown and grayish brown, soft to stiff**

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>PERCENT FINES</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

---

**ADVANCEMENT METHOD**
0-10: Solid stem auger

**ABANDONMENT METHOD**
Boring backfilled with soil cuttings upon completion.

---

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TEST RESULTS</th>
<th>PERCENT FINES</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WATER LEVEL OBSERVATIONS**

---

---

**NOTES:**

See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

---

**Terracon**

25809 I-30 South
Bryant, Arkansas

Drill Rig: CME 55  Driller: SP

Project No.: 35135123  Exhibit: A-69

Boring Started: 1/19/2014  Boring Completed: 1/19/2014
**BOARING LOG NO. B-61**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 33°7616.7' Longitude: 179°8952.89'</td>
<td></td>
</tr>
<tr>
<td>Station: 494+00 Offset: 10' West</td>
<td></td>
</tr>
<tr>
<td>Surface Elev.: 214.3 (ft.)</td>
<td></td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL), with sand, brown and grayish brown, medium stiff to very stiff**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Water level observations</th>
<th>Field test result</th>
<th>Laboratory test result</th>
<th>Atterberg limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>2-2-2 N=4</td>
<td>5000 (HP)</td>
<td>25</td>
<td>49-21-28</td>
</tr>
<tr>
<td></td>
<td>3-5-6 N=11</td>
<td>9000 (HP)</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-11-12 N=23</td>
<td>6000 (HP)</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-7-9 N=16</td>
<td>5000 (HP)</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Automatic

**Advancement Method:**
0-10: Solid stem auger

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

25809 I-30 South
Bryant, Arkansas

2800 I-30 South
Bryant, Arkansas

**Drill Rig:** CME 55
**Driller:** SP

**Project No.:** 35135123
**Exhibit:** A-70

Boring Started: 1/19/2014
Boring Completed: 1/19/2014
**BORING LOG NO. B-62**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**LOCATION**  
Latitude: 33°46.5'  
Longitude: 180°0057.62'

**DEPTH**  
Station: 502+00  
Surface Elev.: 214.1 (Ft.)

---

**FAT CLAY (CH),** trace roots, gray and brown, medium stiff

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Results</th>
<th>Laboratory Test Results</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5</td>
<td></td>
<td>2-3-4 N=7 2000 (HP)</td>
<td>41 96-26-70 91</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Results</th>
<th>Laboratory Test Results</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>2-3-4 N=7 2000 (HP)</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**LEAN CLAY (CL),** trace sand, gray, stiff

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Results</th>
<th>Laboratory Test Results</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td>5-7-8 N=15 9000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Results</th>
<th>Laboratory Test Results</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>2-4-6 N=10 2000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Boring Terminated at 10 Feet**

---

Stratification lines are approximate. In-situ, the transition may be gradual.  
Hammer Type: Automatic

---

Advancement Method:  
0-10: Solid stem auger

Abandonment Method:  
Boring backfilled with soil cuttings upon completion.

---

**WATER LEVEL OBSERVATIONS**

---

 NOTES:

---

**Boring Started:** 1/19/2014  
**Boring Completed:** 1/19/2014

---

Drill Rig: CME 55  
Driller: SP

---

Project No.: 35135123  
Exhibit: A-71
**BORING LOG NO. B-63**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**LOCATION** See Exhibit A-2
Latitude: 33°7601.7’ Longitude: 180°0764.86’
Station: 510+00
Surface Elev.: 214.3 (Ft.)

---

**DEPTH (FL.):**

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>Boring Terminated at 10 Feet</td>
</tr>
</tbody>
</table>

**FAT CLAY (CH), trace roots, brown and grayish brown, soft to stiff**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1-1</td>
<td>42</td>
<td>92-27-65</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1-2</td>
<td>2000 (HP)</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-5</td>
<td>9000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-5-5</td>
<td>4000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Water Level Observations**

**Water Level Observations**

---

**Advancement Method:** 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**Notes:**

---

**Field Test Results**

---

**Hammer Type:** Automatic

---

**GEO SMART LOG-NO WELL 35135123 - FINAL SHOULDER SURVEY.GPJ**

---

**Boring Started:** 1/19/2014
**Boring Completed:** 1/19/2014

**Drill Rig:** CME 55
**Driller:** SP

**Project No.:** 35135123
**Exhibit:** A-72

---

**Terracon**
25809 I-30 South
Bryant, Arkansas
**BORING LOG NO. B-64**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**  
**CLIENT:** Buchart Horn, Inc.  
**Memphis Tennessee**

**GRAPHIC LOG**  
See Exhibit A-2  
Latitude: 33°46’8.83"  
Longitude: 108°16’78.02’’

**LOCATION**  
Station: 518+00  
Surface Elev.: 215.3 (Ft.)

**DEPTH**  
**ELEVATION (FT.)**

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Elevation (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
<td>207.5</td>
</tr>
<tr>
<td>10.0</td>
<td>205.5</td>
</tr>
</tbody>
</table>

**FAT CLAY (CH)**, trace sand, brown and grayish brown, medium stiff to very stiff

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Torvane (HP)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Finer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3-4</td>
<td>3-4</td>
<td>5000 (HP)</td>
<td>36</td>
<td>83-25-58</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>2-3-14</td>
<td>3-17</td>
<td>4000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-6-9</td>
<td>3-15</td>
<td>5000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**POORLY GRADED SAND (SP)**, brown to grayish brown, loose

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Torvane (HP)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Percent Finer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3-4</td>
<td>3-4</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**FIELD TEST RESULTS**

**WATER LEVEL OBSERVATIONS**

---

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:  
0-10: Solid stem auger

Abandonment Method:  
Boring backfilled with soil cuttings upon completion.

Notes:

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**Hammer Type:** Automatic

** Hammer Rig:**  
CME 55

**Drill Rig:**  
CME 55

**Driller:**  
SP

**Boring Started:** 1/19/2014  
**Boring Completed:** 1/19/2014

**2800 I-30 South**  
Bryant, Arkansas

**Project No.: 35135123**  
**Exhibit:** A-73
**BORING LOG NO. B-65**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

### LOCATION
- See Exhibit A-2
- Latitude: 337008.27°  
- Longitude: 1802324.68°
- Station: 526+00  
- Surface Elev.: 214.5 (Ft.)

### WATER LEVEL OBSERVATIONS
- Depth (Ft.): 8.0  
- Elevation (Ft.): 206.5
- Depth (Ft.): 10.0  
- Elevation (Ft.): 204.5

#### FAT CLAY (CH)
- Trace roots, brown, medium stiff to stiff

#### LEAN CLAY (CL)
- Brown, stiff

**Boring Terminated at 10 Feet**

### FIELD TEST RESULTS
<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY</th>
<th>WATER</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-2-3</td>
<td>5000 (HP)</td>
<td>35</td>
<td>61-22-39</td>
</tr>
<tr>
<td></td>
<td>1-3-3</td>
<td>2000 (HP)</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-7-7</td>
<td>5000 (HP)</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-6-5</td>
<td>6000 (HP)</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

### ADVANCEMENT METHOD
- 0-10: Solid stem auger

### ABANDONMENT METHOD
- Boring backfilled with soil cuttings upon completion.

### NOTES
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

### WATER LEVEL OBSERVATIONS
- Hammer Type: Automatic

---

**Hammer Type:** Automatic

---

**Advancement Method:** 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

---

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.:** 35135123  
**Exhibit:** A-74
### BORING LOG NO. B-66

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 33°6745.43'  
Longitude: 180°3119.91'

**DEPTH**  
Station: 534+00  
Surface Elev.: 214.3 (ft.)

**FAT CLAY (CH), trace roots, brown and grayish brown**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
<td>4-7-10 N=17</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-8-9 N=17</td>
</tr>
<tr>
<td></td>
<td>4-8-10 N=18</td>
</tr>
</tbody>
</table>

**POORLY GRADED SAND (SP), brown to grayish brown, loose**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>4-4-3 N=7</td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**Hammer Type:** Automatic

---

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>FIELD TEST</th>
<th>LABORATORY</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Elev.: 214.3 (Ft.)</td>
<td>9000 (HP)</td>
<td>23</td>
<td>62-21-41 96</td>
</tr>
<tr>
<td></td>
<td>9000 (HP)</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9000 (HP)</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9000 (HP)</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

---

**Notes:**  
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

---

**Terracon**  
25809 I-30 South  
Bryant, Arkansas

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.:** 35135123  
**Exhibit:** A-75

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Boring Started:** 1/19/2014  
**Boring Completed:** 1/19/2014
### BORING LOG NO. B-67

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee  

**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 33°6251.73'  
Longitude: 180°3794.77'  
Station: 542+00  
Surface Elev.: 215.1 (Ft.)

**DEEP**  
**ELEVATION (Ft.)**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TESTS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>2-3-5</td>
<td>2000 (HP)</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-5-5</td>
<td>4000 (HP)</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-7-10</td>
<td>2000 (HP)</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-3-3</td>
<td>4000 (HP)</td>
<td>35</td>
</tr>
</tbody>
</table>

**FAT CLAY (CH),** trace roots, brown and gray, medium stiff to very stiff  

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.  

Hammer Type: Automatic

**Advance Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>FIELD</th>
<th>HYDRAULIC</th>
<th>OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Started:** 1/19/2014  
**Boring Completed:** 1/19/2014  
**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.:** 35135123  
**Exhibit:** A-76
**BORING LOG NO. B-68**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
**Earle, Arkansas**

### LOCATIONS
- **Latitude:** 33°59'19.73"  
- **Longitude:** 90°46'57.26"

**Station:** 550+00  
**Surface Elev.: 215.0 (ft.)**

### GRAPHIC LOG
- **DEPTH**
- **ELEVATION**

#### FAT CLAY (CH)
- With sand, brown and grayish brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-4</td>
<td>4000 (HP)</td>
<td></td>
<td>87-22-65</td>
<td>78</td>
</tr>
<tr>
<td>N=6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-6</td>
<td>9000 (HP)</td>
<td></td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>N=10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8-11</td>
<td>9000 (HP)</td>
<td></td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>N=19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-6-5</td>
<td>5000 (HP)</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>N=11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### LEAN CLAY (CL)
- Brown, stiff to very stiff

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-4</td>
<td>4000 (HP)</td>
<td></td>
<td>87-22-65</td>
<td>78</td>
</tr>
<tr>
<td>N=6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-6</td>
<td>9000 (HP)</td>
<td></td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>N=10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8-11</td>
<td>9000 (HP)</td>
<td></td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>N=19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-6-5</td>
<td>5000 (HP)</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>N=11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.  
Hammer Type: Automatic

**ADVANCEMENT METHOD:**  
- 0-10: Solid stem auger

**ABANDONMENT METHOD:**  
- Boring backfilled with soil cuttings upon completion.

### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELEVATION (Ft.)</strong></td>
</tr>
<tr>
<td><strong>Surface Elev.: 215.0 (Ft.)</strong></td>
</tr>
</tbody>
</table>

**WATER LEVEL OBSERVATIONS**

- Drill Rig: CME 55  
- Driller: SP  
- Project No.: 35135123  
- Exhibit: A-77  
- Boring Started: 1/19/2014  
- Boring Completed: 1/19/2014  
- Site: Cross Co. Line - Highway 147  
- Earle, Arkansas  
- Drill Rig: CME 55  
- Driller: SP  
- Project No.: 35135123  
- Exhibit: A-77
### Boring Log No. B-69

**Project:** CA0101 Highway 147 (Widening) (S)  
**Client:** Buchart Horn, Inc.  
**Site:** Cross Co. Line - Highway 147  
**Location:** See Exhibit A-2

#### Graphical Log
- **Location:** See Exhibit A-2
- **Station:** 558+00
- **Depth:**
  - 10.0

#### Field Test Results
- **Sample Type:**
  - 1-2-5  
  - 1-3-5  
  - 6-6-7  
  - 5-5-6
- **Field Test Result:**
  - 3000 (HP)  
  - 3000 (HP)  
  - 5000 (HP)  
  - 6000 (HP)
- **Water Content (%):**
  - 34  
  - 32  
  - 33  
  - 35
- **Percent Fines:**
  - 82-24-58  
  - 98
- **Stratification lines are approximate. In-situ, the transition may be gradual.**

#### Advancement Method:
- 0-10: Solid stem auger

#### Abandonment Method:
- Boring backfilled with soil cuttings upon completion.

#### Water Level Observations

#### Notes:
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

### Hammer Type: Automatic

**Drill Rig:** CME 55  
**Driller:** SP

**Boring Started:** 1/19/2014  
**Boring Completed:** 1/19/2014  
**Project No.:** 35135123  
**Exhibit:** A-78
**BORING LOG NO. B-70**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

---

### LOCATION

See Exhibit A-2

Latitude: 33°53'12.38"  
Longitude: 180°59'52.48"

Station: 566+00  
Surface Elev.: 215.4 (Ft.)

---

### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TESTS</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>2-2-3</td>
<td>4000 (HP)</td>
<td></td>
<td>21</td>
<td>31-14-17</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>1-2-2</td>
<td>2000 (HP)</td>
<td></td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-5-7</td>
<td>7000 (HP)</td>
<td></td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-5-4</td>
<td>4000 (HP)</td>
<td></td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Automatic

---

**Advancement Method:**  
0-10: Solid stem auger

See Exhibit A-3 for description of field procedures.

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

---

**Notes:**

---

**WATER LEVEL OBSERVATIONS**

---

**Boring Started:** 1/19/2014  
**Boring Completed:** 1/19/2014

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.:** 35135123  
**Exhibit:** A-79

---

**Terracon**  
2580 I-30 South  
Bryant, Arkansas
**BORING LOG NO. B-71**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

### LOCATION

**Latitude:** 33°48'53.78"  **Longitude:** 180°06'53.19"

**Station:** 574+00  **Surface Elev.:** 216.7 (Ft.)

---

**FAT CLAY (CH),** trace roots, brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (Ft.)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>2-2-3 N=5</td>
<td>2000 (HP)</td>
<td>28</td>
<td>51-24-27</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-2-3 N=5</td>
<td>2000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-5-7 N=12</td>
<td>4000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-4-8 N=12</td>
<td>5000 (HP)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

**Advancement Method:** 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

---

### WATER LEVEL OBSERVATIONS

---

**Drill Rig:** CME 55  **Driller:** SP

**Project No.:** 35135123  **Exhibit:** A-80

---

See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

---

Notes:

**Boring Started:** 1/19/2014  **Boring Completed:** 1/19/2014

---

**Terracon**

25809 I-30 South
Bryant, Arkansas

---
### BORING LOG NO. B-72

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**LOCATION**  
See Exhibit A-2  
Latitude: 334571.69°  
Longitude: 1807413.21°

**Boring Terminated at 10 Feet**

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PLI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>2-2-3</td>
<td>N=5</td>
<td>3000 (HP)</td>
<td>28</td>
<td>35-21-14</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1-7</td>
<td>1-2-3</td>
<td>N=5</td>
<td>3000 (HP)</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-5-8</td>
<td>N=13</td>
<td>4000 (HP)</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-1-7</td>
<td>N=8</td>
<td>2000 (HP)</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**  
**Hammer Type:** Automatic

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**

**WATER LEVEL OBSERVATIONS**

- See Exhibit A-3 for description of field procedures.  
- See Appendix B for description of laboratory procedures and additional data (if any).  
- See Appendix C for explanation of symbols and abbreviations.

**Drill Rig:** CME 55  
**Driller:** SP  
**Boring Started:** 1/20/2014  
**Boring Completed:** 1/20/2014  
**Project No.:** 35135123  
**Exhibit:** A-81
**BORING LOG NO. B-73**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 334107.73°  
Longitude: 1808011.76°

**DEPTH (FT.)**

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 10.0        | LEAN CLAY (CL), trace roots, brown, stiff to very stiff | 2-5-5  
N=10 | 6000 (HP) | 24 | 93 |
| 5           | 4-6-8  
N=14 | 7000 (HP) | 24 |
| 10.0        | 7-9-10  
N=19 | 9000 (HP) | 26 |
| 3-3-6       | 3-3-6  
N=9 | 6000 (HP) | 27 |

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.: 35135123**  
**Exhibit:** A-82

**Boring Started:** 1/20/2014  
**Boring Completed:** 1/20/2014
**BORING LOG NO. B-74**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

### GRAPHIC LOG

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>Latitude: 333869.56°</th>
<th>Longitude: 1808804.9°</th>
<th>Station: 598+00</th>
<th>Surface Elev.: 219.1 (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH</td>
<td>2.0</td>
<td>3.0</td>
<td>10.0</td>
<td></td>
</tr>
</tbody>
</table>

### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>217</td>
</tr>
</tbody>
</table>

### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORMELO (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-Pl-Pl</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3-4</td>
<td>N=7</td>
<td>3000 (HP)</td>
<td>24</td>
<td>39-17-22</td>
<td>99</td>
</tr>
<tr>
<td>1-3-2</td>
<td>N=5</td>
<td>3000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3-4</td>
<td>N=7</td>
<td>3000 (HP)</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3-3</td>
<td>N=6</td>
<td>2000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ADVANCEMENT METHOD

- **0-10:** Solid stem auger

### ABANDONMENT METHOD

- Boring backfilled with soil cuttings upon completion.

### WATER LEVEL OBSERVATIONS

- See Exhibit A-3 for description of field procedures.

### Notes:

- See Appendix B for description of laboratory procedures and additional data (if any).

- See Appendix C for explanation of symbols and abbreviations.

---

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.:** 35135123  
**Boring Started:** 1/20/2014  
**Boring Completed:** 1/20/2014

---

**Terracon**  
2580 I-30 South  
Bryant, Arkansas  
Project No.: 35135123  
Exhibit: A-83
SANDY LEAN CLAY (CL), trace roots, brown and grayish brown, medium stiff to stiff

Boring Terminated at 10 Feet

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>LABORATORY RESULTS</th>
<th>FIELD TEST RESULTS</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advection Method: 0-10: Solid stem auger

Abandonment Method: Boring backfilled with soil cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Boring Started: 1/20/2014  Boring Completed: 1/20/2014

Drill Rig: CME 55  Driller: SP

Project No.: 35135123  Exhibit: A-84
BORING LOG NO. B-76

PROJECT: CA0101 Highway 147 (Widening) (S)  

SITE: Cross Co. Line - Highway 147  
     Earle, Arkansas

CLIENT: Buchart Horn, Inc.  
        Memphis Tennessee

LOCATION  See Exhibit A-2
Latitude: 333121.17°  Longitude: 1810275.29°
Station: 614+00  Surface Elev.: 221.7 (Ft.)

DEPTH (Ft.)  ELEVATION (Ft.)  WATER LEVEL OBSERVATIONS

Wisconsin Clay (CL), trace roots, brown, medium stiff to stiff

2-3-3 N=6  3000 (HP)  13  28-16-12

3-3-4 N=7  2000 (HP)  22

3-5-6 N=11  2000 (HP)  25

5-5-6 N=11  6000 (HP)  28

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: 0-10: Solid stem auger
Abandonment Method: Boring backfilled with soil cuttings upon completion.

Notes:

PROJECT:  CA0101 Highway 147 (Widening) (S)
Drill Rig: CME 55  
Driller: SP  
Drilling Started: 1/20/2014  
Drill Rig: CME 55  
Driller: SP  
Drilling Completed: 1/20/2014

Terracon  
25101 I-30 South  
Bryant, Arkansas
Project No.: 35135123  
Exhibit A-85
### BORING LOG NO. B-77

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147 Earle, Arkansas

**LOCATION**  
Latitude: 33°26'30.81"  
Longitude: 181°10'93.26"  
Station: 622+00  
Surface Elev.: 221.0 (Ft.)

**DEPTH**  
Station: 622+00

**LEAN CLAY (CL), trace roots, brown and grayish brown, medium stiff to stiff**

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td>2-3-5 N=8</td>
<td>3000 (HP)</td>
<td>24</td>
<td>32-20-12</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td>3-6-6 N=12</td>
<td>3000 (HP)</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td></td>
<td>3-4-5 N=9</td>
<td>3000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>2-5-5 N=10</td>
<td>4000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

<table>
<thead>
<tr>
<th>ELEVATION (Ft.)</th>
<th>Surface Elev.</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>221.0</td>
<td>221.0</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.: 35135123**  
**Exhibit:** A-86  

**Boring Started:** 1/20/2014  
**Boring Completed:** 1/20/2014
BORING LOG NO. B-78

PROJECT: CA0101 Highway 147 (Widening) (S)

CLIENT: Buchart Horn, Inc.
Memphis Tennessee

SITE: Cross Co. Line - Highway 147
Earle, Arkansas

LOCATION
See Exhibit A-2
Latitude: 332392.71° Longitude: 1811690.62°
Station: 630+00
Surface Elev.: 223.3 (ft.)

DEPTH
ELEVATION (ft.)

LEAN CLAY (CL), trace roots, brown, stiff to very stiff

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Water Level Observation</th>
<th>Sample Type</th>
<th>Field Test Results</th>
<th>Laboratory Test Results</th>
<th>Water Content (%)</th>
<th>Atterberg Limits</th>
<th>Percent Fin</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>8-10-9</td>
<td>N=19</td>
<td>3000 (HP)</td>
<td>20</td>
<td>89</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-7-6</td>
<td>N=13</td>
<td>7000 (HP)</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-7-6</td>
<td>N=13</td>
<td>6000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-4-5</td>
<td>N=9</td>
<td>4000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0-10: Solid stem auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:
See Exhibit A-3 for description of field procedures.

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Drill Rig: CME 55
Driller: SP
Project No.: 35135123
Exhibit: A-87

Boring Started: 1/20/2014
Boring Completed: 1/20/2014
**BORING LOG NO. B-79**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2

Latitude: 33°19'09.14"    Longitude: 181°23'33.85"

Station: 638+00  
Surface Elev.: 222.0 (Ft.)

### Graphic Log

**LEAN CLAY (CL)**, trace roots, brown and grayish brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Water Level Observations</th>
<th>Field Test Result</th>
<th>Laboratory Test Result</th>
<th>Atterberg Limits</th>
<th>Percent Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td></td>
<td>2-4-4 N=8</td>
<td>7000 (HP)</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-3-5 N=8</td>
<td>3000 (HP)</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-4-6 N=10</td>
<td>3000 (HP)</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-2-2 N=4</td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
0-10: Solid stem auger  

Abandonment Method:  
Boring backfilled with soil cuttings upon completion.

**FIELD TEST RESULTS**

**SAMPLE TYPE**  
**WATER CONTENT (%)**  
**PERCENT FINES**  
**LL-PL-PI**

**WATER LEVEL OBSERVATIONS**

- 10 ft While Sampling

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**Boring Started:** 1/20/2014  
**Boring Completed:** 1/20/2014  
**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.: 35135123**  
**Exhibit:** A-88
## Project Information

**Project:** CA0101 Highway 147 (Widening) (S)  
**Client:** Buchart Horn, Inc.  
**Site:** Cross Co. Line - Highway 147  
**Location:** Earle, Arkansas  
**Location:** See Exhibit A-2  
**Latitude:** 331689.91°  
**Longitude:** 1813048.43°  
**Station:** 646+00  
**Surface Elev.:** 222.0 (Ft.)  

## Boring Log

**Sample Type:** LEAN CLAY (CL), trace roots, brown, medium stiff to stiff  
**Advancement Method:**  
- 0-10: Solid stem auger  
**Abandonment Method:**  
- Boring backfilled with soil cuttings upon completion.

### Water Level Observations

- **Elevation (Ft.):** Surface Elev.: 222.0 (Ft.)
- **Boring Terminated at 10 Feet**

### Field Test Results

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Torvane (HP)</th>
<th>Water Content (%)</th>
<th>Atterberg Limits</th>
<th>Percent Finer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3-3 N=6</td>
<td>5000 (HP)</td>
<td>24</td>
<td>31-17-14</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-5 N=9</td>
<td>5000 (HP)</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-5-6 N=11</td>
<td>4000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-2-4 N=6</td>
<td>3000 (HP)</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes

- Advancement Method:  
  - 0-10: Solid stem auger  
- Abandonment Method:  
  - Boring backfilled with soil cuttings upon completion.

### Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Automatic

**Drill Rig:** CME 55  
**Driller:** SP  
**Boring Started:** 1/20/2014  
**Boring Completed:** 1/20/2014  
**Project No.:** 35135123  
**Exhibit:** A-89  

---

**Terracon**  
25809 I-30 South  
Bryant, Arkansas
## BORING LOG NO. B-81

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**CLIENT:** Buchart Horn, Inc.  
**LOCATION** See Exhibit A-2  

### GRAPHIC LOG

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DEPTH</th>
<th>IV</th>
<th>ABBREVIATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEAN CLAY (CL):</strong> trace roots, brown and grayish brown, medium stiff to stiff</td>
<td>10.0</td>
<td>210.5</td>
<td>10.0</td>
<td>210.5</td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4-4</td>
<td>N=8</td>
<td>4000 (HP)</td>
<td>26</td>
<td>32-18-14</td>
<td>96</td>
</tr>
<tr>
<td>2-4-5</td>
<td>N=9</td>
<td>4000 (HP)</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-6</td>
<td>N=10</td>
<td>1000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2-3</td>
<td>N=5</td>
<td>1000 (HP)</td>
<td>47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Advancement Method: Solid stem auger  
- Abandonment Method: Boring backfilled with soil cuttings upon completion.
- Stratification lines are approximate. In-situ, the transition may be gradual.
- Hammer Type: Automatic  

**WATER LEVEL OBSERVATIONS**

- **Boring Started:** 1/21/2014  
- **Boring Completed:** 1/21/2014  
- **Drill Rig:** CME 55  
- **Driller:** SP  
- **Project No.:** 35135123  
- **Exhibit:** A-90
### BORING LOG NO. B-82

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**CLIENT:** Buchart Horn, Inc.  
**LOCATION:** See Exhibit A-2  
**Lat/Lon:** 330833.72°, 1814449.58°  
**Station:** 662+00  
**Surface Elev.:** 222.7 (ft.)  
**DEPTH:** 10.0  
**ELEVATION:** 212.5

#### LEAN CLAY (CL)
- Trace roots, brown and grayish brown, medium stiff to stiff
- Boring Terminated at 10 Feet

<table>
<thead>
<tr>
<th>DEPTH (FT.)</th>
<th>SAMPLE TYPE</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST RESULT</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3-3</td>
<td>N=6</td>
<td>3000 (HP)</td>
<td></td>
<td>31</td>
<td>33-16-17</td>
<td>94</td>
</tr>
<tr>
<td>2-2-5</td>
<td>N=7</td>
<td>3000 (HP)</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4-5</td>
<td>N=9</td>
<td>2000 (HP)</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3-3</td>
<td>N=6</td>
<td>1000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cross Co. Line - Highway 147  
Earle, Arkansas**

**LOCATION:** See Exhibit A-2
**Latitude:** 330833.72°  
**Longitude:** 1814449.58°  
**Station:** 662+00  
**Surface Elev.:** 222.7 (ft.)

**Advancement Method:** 0-10: Solid stem auger  
**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**Notes:**
- See Exhibit A-3 for description of field procedures.  
- See Appendix B for description of laboratory procedures and additional data (if any).  
- See Appendix C for explanation of symbols and abbreviations.

**Drill Rig:** CME 55  
**Driller:** SP  
**Project No.:** 35135123  
**Exhibit:** A-91  
**Boring Started:** 1/21/2014  
**Boring Completed:** 1/21/2014

**Hammer Type:** Automatic

**Terrain:***
- Stratification lines are approximate. In-situ, the transition may be gradual.

---

**WATER LEVEL OBSERVATIONS**

---

**Terracon**

2500th l-30 South  
Bryant, Arkansas

---

---

---
## BORING LOG NO. B-83

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**LOCATION:** Earle, Arkansas

### LEAN CLAY (CL), trace sand, brown and grayish brown, medium stiff to stiff

<table>
<thead>
<tr>
<th>DEPTH (Ft.)</th>
<th>WATER ELEVATION (Ft.)</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-2</td>
<td>3000 (HP)</td>
<td>25</td>
<td>29-15-14</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2-4</td>
<td>2000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-5-6</td>
<td>2000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3-5</td>
<td>4000 (HP)</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Automatic

**LOCATION**  
Latitude: 33°48’2.59"  
Longitude: 91°15’42.8"

**Depth**  
Station: 670+00  
Surface Elev.: 222.5 (Ft.)

**Notes:**

- **Advancement Method:** 0-10: Solid stem auger
- **Abandonment Method:** Boring backfilled with soil cuttings upon completion.
- **Notes:** See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.

### WATER LEVEL OBSERVATIONS

- **Drill Rig:** CME 55  
- **Driller:** SP  
- **Project No.:** 35135123  
- **Exhibit:** A-92
**BORING LOG NO. B-84**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

---

**LOCATION**  See Exhibit A-2  
Latitude: 33°18'44"  Longitude: 181°59'56.02"

**DEPTH**  See Exhibit A-2

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORMELOP (HP)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-2 N=4</td>
<td>2000 (HP)</td>
<td>23</td>
<td>27-13-14</td>
<td>84</td>
</tr>
<tr>
<td>3-4-5 N=9</td>
<td>1000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-4-5 N=9</td>
<td>2000 (HP)</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-2-2 N=4</td>
<td>4000 (HP)</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** Automatic

**Advancement Method:** 0-10: Solid stem auger

**Abandonment Method:** Boring backfilled with soil cuttings upon completion.

**Notes:**

---

**WATER LEVEL OBSERVATIONS**

---

**Terracon**

25809 I-30 South  
Bryant, Arkansas

Drill Rig: CME 55  
Driller: SP

Project No.: 35135123  
Exhibit: A-93
**BORING LOG NO. B-85**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

**LOCATION**  
See Exhibit A-2

Latitude: 32°9908.57'  
Longitude: 181°6594.87'

Station: 686+00  
Surface Elev.: 223.5 (ft.)

**DEPTH**  
Depth (ft.)  
Elevation (ft.)

**LEAN CLAY (CL), trace sand, brown, soft to medium stiff**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TEST RESULT</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-3</td>
<td>N=5</td>
<td>5000 (HP)</td>
<td>33</td>
<td>37-20-17</td>
</tr>
<tr>
<td>1-2-3</td>
<td>N=5</td>
<td>1000 (HP)</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>2-3-4</td>
<td>N=7</td>
<td>1000 (HP)</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>1-1-1</td>
<td>N=2</td>
<td>1000 (HP)</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**  

- **8.5 ft While Sampling**

**Notes:**  
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**Drill Rig:** CME 55  
**Driller:** SP

**Boring Started:** 1/21/2014  
**Boring Completed:** 1/21/2014

**Terrain:**  
Cross Co. Line - Highway 147  
Earle, Arkansas

**Exhibit:** A-94
### Boring Log No. B-86

**Project:** CA0101 Highway 147 (Widening) (S)  
**Client:** Buchart Horn, Inc.  
**Location:** Cross Co. Line - Highway 147  
**Site:** Earle, Arkansas

#### Boring Terminated at 10 Feet

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Water Level Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>214.5</td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**Hammer Type:** Automatic

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Water Test Result</th>
<th>Laboratory Torvane HP (psf)</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4-4</td>
<td>3-4-4</td>
<td>3000 (HP)</td>
<td>21</td>
<td>25-14-11</td>
</tr>
<tr>
<td>1-3-4</td>
<td>1-3-4</td>
<td>6000 (HP)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>4-7-8</td>
<td>4-7-8</td>
<td>4000 (HP)</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>1-1-1</td>
<td>1-1-1</td>
<td>1000 (HP)</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

**Water Level Observations:**  
- 10 ft While Sampling

**Terracon**

25809 I-30 South  
Bryant, Arkansas

- Boring Started: 1/21/2014  
- Boring Completed: 1/21/2014  
- Drill Rig: CME 55  
- Driller: SP  
- Project No.: 35135123  
- Exhibit: A-95
**BORING LOG NO. B-87**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**
- See Exhibit A-2
- Latitude: 32°9139.29"  
- Longitude: 181°8077.68"
- Station: 702+00  
- Surface Elev.: 225.2 (Ft.)

**DEPTH (FL.)**  
- 10.0  
- 5.0  
- 1.0

**LEAN CLAY (CL),** trace roots, brown and gray, soft to very stiff

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULTS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>3-5-6 N=11</td>
<td>3000 (HP)</td>
<td>18</td>
<td>27-16-11</td>
<td>89</td>
</tr>
<tr>
<td>1.0</td>
<td>3-4-5 N=9</td>
<td>4000 (HP)</td>
<td>22</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-6-8 N=14</td>
<td>2000 (HP)</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1-1</td>
<td>1-1-1 N=2</td>
<td></td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.  

**Advancement Method:**  
0-10: Solid stem auger

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.

**Notes:**  
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**
- **8.5 ft While Sampling**

**Thoracan**  
2509 I-30 South  
Bryan, Arkansas

**Boring Started:** 1/22/2014  
**Boring Completed:** 1/22/2014

**Drill Rig:** CME 55  
**Driller:** SP

**Project No.:** 35135123  
**Exhibit:** A-96
## LEAN CLAY (CL), trace roots, brown and grayish brown, medium stiff to stiff

- Depth: 10.0 ft
- Elevation: 213.5 ft

### Boring Terminated at 10 Feet

- Hammer Type: Automatic

### FIELD TEST RESULTS

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATIONS</th>
<th>LABORATORY RESULTS</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4-6 N=10</td>
<td>3000 (HP)</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>3-5-4 N=9</td>
<td>3000 (HP)</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>3-5-7 N=12</td>
<td>3000 (HP)</td>
<td></td>
<td>26</td>
</tr>
</tbody>
</table>

### Advancement Method:
0-10: Solid stem auger

### Abandonment Method:
Boring backfilled with soil cuttings upon completion.

### Notes:
See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

---

**Boring Log No. B-88**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**LOCATION**
See Exhibit A-2
Latitude: 32° 46' 59.4" Longitude: 91° 18' 72.39"
Station: 710+00
Surface Elev.: 223.6 (ft.)

**DEPTH**

**FIELD TEST RESULTS**

- Torvane/HP (psf)
- Percent fines
- Water content (%)
- LL-PL-PI

**LABORATORY RESULTS**

- Sample type
- Field test result
- Water content (%)
- LL-PL-PI

**ATERBERG LIMITS**

**PERCENT FINES**

**WATER LEVEL OBSERVATIONS**

- Boring Started: 1/22/2014
- Boring Completed: 1/22/2014

**Notes:**
See Exhibit A-97 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

**Drill Rig:** CME 55
**Driller:** SP
**Project No.:** 35135123
**Exhibit:** A-97
BORING LOG NO. B-89

PROJECT: CA0101 Highway 147 (Widening) (S)

CLIENT: Buchart Horn, Inc.
Memphis Tennessee

SITE: Cross Co. Line - Highway 147
Earle, Arkansas

LOCATION
See Exhibit A-2

Latitude: 328403.47° Longitude: 1819508.14°

Station: 718+00

GRAPHIC LOG

DEPTH (FT.) WATER LEVEL OBSERVATIONS

4-4-4 N=8 1000 (HP) 19 68

2-4-4 N=8 1000 (HP) 20

7-10-10 N=20 9000 (HP) 18

3.5 214.5

8.5

POORLY GRADED SAND WITH CLAY (SP), brown and gray, loose

10.0 213

16

Boring Terminated at 10 Feet

FIELD TEST RESULTS

SAMPLE TYPE LABORATORY TORVANE/HP % WATER CONTENT (%) ATTERBERG LIMITS LL-PL-PI PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0-10: Solid stem auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS

Drill Rig: CME 55
Driller: SP
Project No.: 35135123
Exhibit: A-98
**BORING LOG NO. B-90**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

**LOCATION**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample Type</th>
<th>Field Test Result</th>
<th>Laboratory Test Result</th>
<th>Water Content (%)</th>
<th>LL-PL-PI</th>
<th>Per Cent Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>2-3-3</td>
<td>N=6</td>
<td>2000 (HP)</td>
<td>16</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>1-2-2</td>
<td>N=4</td>
<td>2000 (HP)</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>1-1-2</td>
<td>N=3</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

**Advancement Method:**

0-10: Solid stem auger

**Abandonment Method:**

Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

- 10 ft While Sampling

**FIELD TEST RESULTS**

- Torvane/HP (psf)
- Percent Fines
- Water Content (%)
- LL-PL-PI

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147
Earle, Arkansas

**LOCATION**

- Latitude: 327942.83°
- Longitude: 1820140.81°
- Station: 726+00
- Surface Elev.: 223.4 (ft.)

**GRAPHIC LOG**

- Boring Terminated at 10 Feet

**Notes:**

- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**Terracon**

25801 I-30 South
Bryant, Arkansas

**Drill Rig:** CME 55
**Driller:** SP
**Project No.: 35135123**
**Exhibit:** A-99

**Boring Started:** 1/22/2014
**Boring Completed:** 1/22/2014
**BORING LOG NO. B-91**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

<table>
<thead>
<tr>
<th>GRAPHIC LOG</th>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORSION REACTION (HP)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCATION</td>
<td>10.0</td>
<td>LEAN CLAY (CL): trace roots, gray and brown, medium stiff to stiff</td>
<td>3-3-5 N=8</td>
<td>8000 (HP)</td>
<td>25</td>
<td>39-18-21</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.0</td>
<td></td>
<td>2-5-6 N=11</td>
<td>9000 (HP)</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.0</td>
<td></td>
<td>7-8-11 N=19</td>
<td>9000 (HP)</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boring Terminated at 10 Feet</td>
<td>4-4-4 N=8</td>
<td>6000 (HP)</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LOCATION**  
See Exhibit A-2  
Latitude: 32°7688.87"  
Longitude: 18°20922.08"

**LOCATION**  
Station: 734+00  
Surface Elev.: 223.5 (FL)

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**FIELD TEST RESULTS**

**WATER LEVEL OBSERVATIONS**

**Notes:**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**DRILL RIG:** CME 55  
**DRILLER:** SP  
**BORING STARTED:** 1/22/2014  
**BORING COMPLETED:** 1/22/2014  
**PROJECT NO:** 35135123  
**EXHIBIT:** A-100

**Exhibit A-3 for description of field procedures.**  
**See Appendix B for description of laboratory procedures and additional data (if any).**  
**See Appendix C for explanation of symbols and abbreviations.**

Hammer Type: Automatic

Stratification lines are approximate. In-situ, the transition may be gradual.
BOBING LOG NO. B-92

PROJECT: CA0101 Highway 147 (Widening) (S)

SITE: Cross Co. Line - Highway 147
Earle, Arkansas

LOCATION
See Exhibit A-2
Latitude: 32°17'45"  Longitude: 82°15'22.88"
Station: 742+00
Surface Elev.: 222.9 (Ft.)

DEPTH  WATER LEVEL ELEVATION (FL)
10.0  213

SANDY LEAN CLAY (CL), trace roots, dark brown and grayish brown, medium stiff to very stiff

Boring Terminated at 10 Feet

FIELD Test Result
SAMPLE TYPE
LAbORATORY TORNEMENT (HP)
WATER CONTENT (%) ATTERBERG LIMITS LL-PL-PI PERCENT FINES
3-10-6 N=16 7000 (HP) 16 30-18-12 63
5-4-4 N=8 3000 (HP) 21
3-3-3 N=8 3000 (HP) 22
2-2-2 N=4 1000 (HP) 32

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0-10: Solid stem auger
Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

PROJECT:  CA0101 Highway 147 (Widening) (S)

Boring Started: 1/22/2014
Boring Completed: 1/22/2014

Drill Rig: CME 55
Driller: SP
Project No.: 35135123
Exhibit: A-101
**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
**SITE LOCATION:** Earle, Arkansas

**BORING LOG NO. B-93**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 32°611.51’</td>
<td>Longitude: 98°2249.96’</td>
</tr>
<tr>
<td>Station: 750+00</td>
<td>Surface Elev.: 225.4 (Ft.)</td>
</tr>
</tbody>
</table>

**DEPTH (Ft.)**

<table>
<thead>
<tr>
<th>WATER LEVEL OBSERVATION</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>PERCENT FINES</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3-3</td>
<td>N=6</td>
<td>4000 (HP)</td>
<td>24</td>
<td>35-15-20</td>
</tr>
<tr>
<td>1-3-5</td>
<td>N=8</td>
<td>4000 (HP)</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>5-5-6</td>
<td>N=11</td>
<td>3000 (HP)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>1-2-2</td>
<td>N=4</td>
<td>1000 (HP)</td>
<td>33</td>
<td></td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL), trace roots, grayish-brown and brown, medium stiff to stiff**

- **Stratification lines are approximate. In-situ, the transition may be gradual.**
- **Hammer Type:** Automatic

**ADVANCEMENT METHOD:** 0-10: Solid stem auger

**ABANDONMENT METHOD:** Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

- **5 ft While Sampling**

**Notes:**
- See Exhibit A-3 for description of field procedures.
- See Appendix B for description of laboratory procedures and additional data (if any).
- See Appendix C for explanation of symbols and abbreviations.

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**Memphis Tenneessee**

**DRILL RIG:** CME 55  
**DRILLER:** SP  
**PROJECT NO.:** 35135123  
**DATE:** January 22, 2014  
**Exhibit:** A-102
**BORING LOG NO. B-94**

**PROJECT:** CA0101 Highway 147 (Widening) (S)

**SITE:** Cross Co. Line - Highway 147 Earle, Arkansas

**CLIENT:** Buchart Horn, Inc. Memphis Tennessee

**LOCATION**
See Exhibit A-2

Latitude: 32°59’51.08” Longitude: 18°22’468.08”

**DEPHT**
Station: 758+00 Surface Elev.: 225.1 (Ft.)

---

**LEAN CLAY (CL), trace roots, brown and grayish-brown, soft to stiff**

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORC (HP)</th>
<th>WATER CONTENT (%)</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>X</td>
<td>5-6-8 N=14</td>
<td>9000 (HP)</td>
<td>16</td>
<td>26-15-11</td>
<td>72</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>5-5-6 N=11</td>
<td>5000 (HP)</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>6-6-6 N=12</td>
<td>4000 (HP)</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1-1</td>
<td>X</td>
<td>1-1-1 N=2</td>
<td>2000 (HP)</td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 10 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

**Advancement Method:**
0-10: Solid stem auger

**Abandonment Method:**
Boring backfilled with soil cuttings upon completion.

**Notes:**
See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**

---

**Terrecon**
25809 I-30 South Bryant, Arkansas

Boring Started: 1/22/2014 Boring Completed: 1/22/2014

Drill Rig: CME 55 Driller: SP

Project No.: 35135123 Exhibit: A-103
**BORING LOG NO. B-95**

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas  
**CLIENT:** Buchart Horn, Inc.  
Memphis Tennessee

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>See Exhibit A-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude: 32°54'47.49&quot;</td>
<td>Longitude: 18°23'01.97&quot;</td>
</tr>
</tbody>
</table>

**DEPTH LEVEL OBSERVATIONS**

- **LEAN CLAY (CL),** trace roots, brown and gray, soft to medium stiff  
  - with sand below 3.5 feet

- **SANDY LEAN CLAY (CL),** brown and grayish-brown, medium stiff

**BORING TERMINATED AT 10 FEET**

**FIELD TEST RESULTS**

<table>
<thead>
<tr>
<th>SAMPLE TYPE</th>
<th>WATER CONTENT (%)</th>
<th>WET LABORATORY TESTS</th>
<th>ATTERBERG LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2-2</td>
<td>4000 (HP)</td>
<td>23</td>
<td>33-21-12</td>
</tr>
<tr>
<td>1-1-2</td>
<td>2000 (HP)</td>
<td>24</td>
<td>33-21-12</td>
</tr>
<tr>
<td>1-2-2</td>
<td>1000 (HP)</td>
<td>26</td>
<td>33-21-12</td>
</tr>
</tbody>
</table>

**ADVANCEMENT METHOD:**  
0-10: Solid stem auger

**ABANDONMENT METHOD:**  
Boring backfilled with soil cuttings upon completion.

**WATER LEVEL OBSERVATIONS**

- **5 ft While Sampling**

**NOTES:**  
See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.

**Hammers:**  
Type: Automatic

**Drill Rig:**  
CME 55

**Boring Started:** 1/22/2014  
**Boring Completed:** 1/22/2014

**Driller:** SP

**Project No.:** 35135123  
**Exhibit:** A-104

**Cross Co. Line - Highway 147**  
Cross Co., Arkansas
### Location

**Cross Co. Line - Highway 147**
**Earle, Arkansas**

**Latitude:** 32°45'26.33"  
**Longitude:** 18°23'30.22"  
**Station:** 774+00  
**Surface Elev.:** 224.1 ft

### Boring Log

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Water Level Observation</th>
<th>FIELD TEST REZULT</th>
<th>LABORATORY TEST</th>
<th>Atterberg Limits</th>
<th>Percent Finers</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>1-1-1</td>
<td>N=2</td>
<td></td>
<td></td>
<td>43</td>
</tr>
</tbody>
</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Hammer Type:** Automatic

### Advancement Method

- 0-10: Solid stem auger

### Abandonment Method

- Boring backfilled with soil cuttings upon completion.

### Additional Observations

- **WATER LEVEL OBSERVATIONS**
  - **8.5 ft While Sampling**

### Notes

- **Notes:**
- **See Exhibit A-3 for description of field procedures.**
- **See Appendix B for description of laboratory procedures and additional data (if any).**
- **See Appendix C for explanation of symbols and abbreviations.**

### Project Details

- **Project No.:** 35135123
- **Exhibit:** A-105
- **Boring Started:** 1/22/2014
- **Boring Completed:** 1/22/2014
- **Drill Rig:** CME 55
- **Driller:** SP
- **Client:** Buchart Horn, Inc.
- **Address:** 2809 I-30 South, Bryant, Arkansas

---

**Lean Clay (CL):** trace roots, brown, soft to stiff

**Boring Terminated at 10 Feet**
### BORING LOG NO. B-97

**PROJECT:** CA0101 Highway 147 (Widening) (S)  
**CLIENT:** Buchart Horn, Inc.  
**SITE:** Cross Co. Line - Highway 147  
Earle, Arkansas

**LOCATION**  
See Exhibit A-2  
Latitude: 32°37'32.51"  
Longitude: 18°23'76.21"  
Station: 782+00  
Surface Elev.: 223.2 (Ft.)

**DEPTH**  

<table>
<thead>
<tr>
<th>DEPTH (FL)</th>
<th>WATER LEVEL OBSERVATIONS</th>
<th>FIELD TEST RESULT</th>
<th>LABORATORY TORVANE/HP (psf)</th>
<th>WATER CONTENT (%)</th>
<th>LL-PL-PI</th>
<th>ATTERBERG LIMITS</th>
<th>PERCENT FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0</td>
<td>N=2</td>
<td>1000 (HP)</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>N=7</td>
<td>2000 (HP)</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-2-2</td>
<td>N=4</td>
<td>4000 (HP)</td>
<td>23</td>
<td>33-21-12</td>
<td>93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4-4</td>
<td>N=8</td>
<td>3000 (HP)</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-3-4</td>
<td>N=7</td>
<td></td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LEAN CLAY (CL), trace roots, brown and grayish-brown, soft to stiff**

**Advancement Method:**  
0-10: Solid stem auger  
See Exhibit A-3 for description of field procedures.

**Abandonment Method:**  
Boring backfilled with soil cuttings upon completion.  
See Appendix B for description of laboratory procedures and additional data (if any).

**Notes:**

- Stratification lines are approximate. In-situ, the transition may be gradual.
- Hammer Type: Automatic
- Advancement Method: 0-10: Solid stem auger
- Abandonment Method: Boring backfilled with soil cuttings upon completion.

**FIELD TEST RESULTS**

- **LL-PL-PI**
- **ATERBERG LIMITS**
- **PERCENT FINES**

**WATER LEVEL OBSERVATIONS**

- **5 ft While Sampling**

---

**Terracon**  
25809 I-30 South  
Bryant, Arkansas

**Project No.: 35135123**  
**Exhibit: A-106**

**Drill Rig:** CME 55  
**Driller:** SP

**Boring Started:** 1/22/2014  
**Boring Completed:** 1/22/2014
Laboratory Testing Description

Samples retrieved during the field exploration were taken to the laboratory for further observation by the project geotechnical engineer and were classified in accordance with the Unified Soil Classification System (USCS) and the AASHTO Classification System described in Appendix C. At that time, the field descriptions were confirmed or modified as necessary and a limited laboratory testing program was formulated.

Selected soil samples obtained from the site were tested for the following engineering properties:

- Water content
- Atterberg limits
- Sieve analysis
- Standard Proctor
- Remolded resilient modulus
- One-dimensional consolidation

The laboratory test results are reported on the boring logs and on report forms in this Appendix. They have been used for the geotechnical engineering analyses, and the development pavement recommendations. Laboratory tests were performed in general accordance with the applicable ASTM, local or other accepted standards.
<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Sample No</th>
<th>Depth</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Percent Fines</th>
<th>AASHTO Classification</th>
<th>USCS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>1</td>
<td>0.5-2</td>
<td>50</td>
<td>23</td>
<td>27</td>
<td>81</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-2</td>
<td>1</td>
<td>0.5-2</td>
<td>25</td>
<td>13</td>
<td>12</td>
<td>--</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-3</td>
<td>1</td>
<td>0.5-2</td>
<td>56</td>
<td>22</td>
<td>34</td>
<td>82</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-4</td>
<td>1</td>
<td>0.5-2</td>
<td>49</td>
<td>22</td>
<td>27</td>
<td>82</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-5</td>
<td>1</td>
<td>0.5-2</td>
<td>25</td>
<td>21</td>
<td>4</td>
<td>--</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>B-6</td>
<td>1</td>
<td>0.5-2</td>
<td>27</td>
<td>21</td>
<td>6</td>
<td>77</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>B-7</td>
<td>1</td>
<td>0.5-2</td>
<td>27</td>
<td>20</td>
<td>7</td>
<td>74</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>B-8</td>
<td>1</td>
<td>0.5-2</td>
<td>25</td>
<td>16</td>
<td>9</td>
<td>87</td>
<td>A-4</td>
<td>CL</td>
</tr>
<tr>
<td>B-10</td>
<td>1</td>
<td>0.5-2</td>
<td>30</td>
<td>21</td>
<td>9</td>
<td>86</td>
<td>A-4</td>
<td>CL</td>
</tr>
<tr>
<td>B-11</td>
<td>1</td>
<td>0.5-2</td>
<td>42</td>
<td>20</td>
<td>22</td>
<td>85</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-12</td>
<td>1</td>
<td>0.5-2</td>
<td>27</td>
<td>19</td>
<td>8</td>
<td>83</td>
<td>A-4</td>
<td>CL</td>
</tr>
<tr>
<td>B-13</td>
<td>1</td>
<td>0.5-2</td>
<td>48</td>
<td>18</td>
<td>30</td>
<td>95</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-14</td>
<td>1</td>
<td>0.5-2</td>
<td>27</td>
<td>19</td>
<td>8</td>
<td>93</td>
<td>A-4</td>
<td>CL</td>
</tr>
<tr>
<td>B-16</td>
<td>1</td>
<td>0.5-2</td>
<td>40</td>
<td>18</td>
<td>22</td>
<td>88</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-17</td>
<td>1</td>
<td>0.5-2</td>
<td>37</td>
<td>22</td>
<td>15</td>
<td>72</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-18</td>
<td>1</td>
<td>0.5-2</td>
<td>31</td>
<td>22</td>
<td>9</td>
<td>73</td>
<td>A-4</td>
<td>CL</td>
</tr>
<tr>
<td>B-19</td>
<td>1</td>
<td>0.5-2</td>
<td>78</td>
<td>24</td>
<td>54</td>
<td>98</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-23</td>
<td>1</td>
<td>0.5-2</td>
<td>82</td>
<td>32</td>
<td>50</td>
<td>93</td>
<td>A-7-5</td>
<td>CH</td>
</tr>
<tr>
<td>B-24</td>
<td>1</td>
<td>0.5-2</td>
<td>84</td>
<td>31</td>
<td>53</td>
<td>89</td>
<td>A-7-5</td>
<td>CH</td>
</tr>
<tr>
<td>B-25</td>
<td>1</td>
<td>0.5-2</td>
<td>93</td>
<td>30</td>
<td>63</td>
<td>98</td>
<td>A-7-5</td>
<td>CH</td>
</tr>
<tr>
<td>B-26</td>
<td>1</td>
<td>0.5-2</td>
<td>54</td>
<td>22</td>
<td>32</td>
<td>96</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-27</td>
<td>1</td>
<td>0.5-2</td>
<td>28</td>
<td>14</td>
<td>14</td>
<td>82</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-28</td>
<td>1</td>
<td>0.5-2</td>
<td>22</td>
<td>15</td>
<td>7</td>
<td>70</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>B-29</td>
<td>1</td>
<td>0.5-2</td>
<td>52</td>
<td>19</td>
<td>33</td>
<td>96</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-30</td>
<td>1</td>
<td>0.5-2</td>
<td>44</td>
<td>19</td>
<td>25</td>
<td>91</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-31</td>
<td>1</td>
<td>0.5-2</td>
<td>41</td>
<td>17</td>
<td>24</td>
<td>93</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-32</td>
<td>1</td>
<td>0.5-2</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>89</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-33</td>
<td>1</td>
<td>0.5-2</td>
<td>34</td>
<td>20</td>
<td>14</td>
<td>--</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-34</td>
<td>1</td>
<td>0.5-2</td>
<td>40</td>
<td>22</td>
<td>18</td>
<td>93</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-35</td>
<td>1</td>
<td>0.5-2</td>
<td>28</td>
<td>21</td>
<td>7</td>
<td>72</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>B-36</td>
<td>1</td>
<td>0.5-2</td>
<td>28</td>
<td>21</td>
<td>7</td>
<td>76</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>Boring No.</td>
<td>Sample No</td>
<td>Depth</td>
<td>LL</td>
<td>PL</td>
<td>PI</td>
<td>Percent Fines</td>
<td>AASHTO Classification</td>
<td>USCS Classification</td>
</tr>
<tr>
<td>------------</td>
<td>-----------</td>
<td>-------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>---------------</td>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>B-37</td>
<td>1</td>
<td>0.5-2</td>
<td>74</td>
<td>32</td>
<td>42</td>
<td>99</td>
<td>A-7-5</td>
<td>CH</td>
</tr>
<tr>
<td>B-38</td>
<td>1</td>
<td>0.5-2</td>
<td>36</td>
<td>20</td>
<td>16</td>
<td>92</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-39</td>
<td>1</td>
<td>0.5-2</td>
<td>72</td>
<td>22</td>
<td>50</td>
<td>90</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-41</td>
<td>1</td>
<td>0.5-2</td>
<td>53</td>
<td>20</td>
<td>33</td>
<td>91</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-42</td>
<td>1</td>
<td>0.5-2</td>
<td>85</td>
<td>31</td>
<td>54</td>
<td>98</td>
<td>A-7-5</td>
<td>CH</td>
</tr>
<tr>
<td>B-43</td>
<td>1</td>
<td>0.5-2</td>
<td>42</td>
<td>19</td>
<td>23</td>
<td>93</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-44</td>
<td>1</td>
<td>0.5-2</td>
<td>30</td>
<td>18</td>
<td>12</td>
<td>76</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-45</td>
<td>1</td>
<td>0.5-2</td>
<td>41</td>
<td>19</td>
<td>22</td>
<td>95</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-46</td>
<td>1</td>
<td>0.5-2</td>
<td>25</td>
<td>19</td>
<td>6</td>
<td>--</td>
<td>A-4</td>
<td>CL-ML</td>
</tr>
<tr>
<td>B-47</td>
<td>1</td>
<td>0.5-2</td>
<td>33</td>
<td>18</td>
<td>15</td>
<td>85</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-54</td>
<td>1</td>
<td>0.5-2</td>
<td>32</td>
<td>21</td>
<td>11</td>
<td>--</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-54</td>
<td>3</td>
<td>3.5-5</td>
<td>30</td>
<td>22</td>
<td>8</td>
<td>--</td>
<td>A-4</td>
<td>CL</td>
</tr>
<tr>
<td>B-56</td>
<td>1</td>
<td>0.5-2</td>
<td>45</td>
<td>21</td>
<td>24</td>
<td>--</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-57</td>
<td>1</td>
<td>0.5-2</td>
<td>36</td>
<td>18</td>
<td>18</td>
<td>77</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-58</td>
<td>1</td>
<td>0.5-2</td>
<td>50</td>
<td>22</td>
<td>28</td>
<td>87</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-59</td>
<td>1</td>
<td>0.5-2</td>
<td>73</td>
<td>36</td>
<td>37</td>
<td>83</td>
<td>A-7-5</td>
<td>CH</td>
</tr>
<tr>
<td>B-60</td>
<td>1</td>
<td>0.5-2</td>
<td>82</td>
<td>25</td>
<td>57</td>
<td>--</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-61</td>
<td>1</td>
<td>0.5-2</td>
<td>49</td>
<td>21</td>
<td>28</td>
<td>71</td>
<td>A-7-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-62</td>
<td>1</td>
<td>0.5-2</td>
<td>96</td>
<td>26</td>
<td>70</td>
<td>91</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-63</td>
<td>1</td>
<td>0.5-2</td>
<td>92</td>
<td>27</td>
<td>65</td>
<td>94</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-64</td>
<td>1</td>
<td>0.5-2</td>
<td>83</td>
<td>25</td>
<td>58</td>
<td>89</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-65</td>
<td>1</td>
<td>0.5-2</td>
<td>61</td>
<td>22</td>
<td>39</td>
<td>96</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-66</td>
<td>1</td>
<td>0.5-2</td>
<td>62</td>
<td>21</td>
<td>41</td>
<td>96</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-67</td>
<td>1</td>
<td>0.5-2</td>
<td>52</td>
<td>24</td>
<td>28</td>
<td>94</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-68</td>
<td>1</td>
<td>0.5-2</td>
<td>87</td>
<td>22</td>
<td>65</td>
<td>78</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-69</td>
<td>1</td>
<td>0.5-2</td>
<td>82</td>
<td>24</td>
<td>58</td>
<td>98</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-70</td>
<td>1</td>
<td>0.5-2</td>
<td>31</td>
<td>14</td>
<td>17</td>
<td>89</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-71</td>
<td>1</td>
<td>0.5-2</td>
<td>51</td>
<td>24</td>
<td>27</td>
<td>95</td>
<td>A-7-6</td>
<td>CH</td>
</tr>
<tr>
<td>B-72</td>
<td>1</td>
<td>0.5-2</td>
<td>35</td>
<td>21</td>
<td>14</td>
<td>73</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-74</td>
<td>1</td>
<td>0.5-2</td>
<td>39</td>
<td>17</td>
<td>22</td>
<td>99</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-75</td>
<td>1</td>
<td>0.5-2</td>
<td>30</td>
<td>16</td>
<td>14</td>
<td>60</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>Boring No.</td>
<td>Sample No</td>
<td>Depth</td>
<td>LL</td>
<td>PL</td>
<td>PI</td>
<td>Percent Fines</td>
<td>AASHTO Classification</td>
<td>USCS Classification</td>
</tr>
<tr>
<td>------------</td>
<td>-----------</td>
<td>-------</td>
<td>-----</td>
<td>----</td>
<td>----</td>
<td>---------------</td>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>B-76</td>
<td>1</td>
<td>0.5-2</td>
<td>28</td>
<td>16</td>
<td>12</td>
<td>--</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-77</td>
<td>1</td>
<td>0.5-2</td>
<td>32</td>
<td>20</td>
<td>12</td>
<td>93</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-80</td>
<td>1</td>
<td>0.5-2</td>
<td>31</td>
<td>17</td>
<td>14</td>
<td>90</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-81</td>
<td>1</td>
<td>0.5-2</td>
<td>32</td>
<td>18</td>
<td>14</td>
<td>96</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-82</td>
<td>1</td>
<td>0.5-2</td>
<td>33</td>
<td>16</td>
<td>17</td>
<td>94</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-83</td>
<td>1</td>
<td>0.5-2</td>
<td>29</td>
<td>15</td>
<td>14</td>
<td>88</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-84</td>
<td>1</td>
<td>0.5-2</td>
<td>27</td>
<td>13</td>
<td>14</td>
<td>84</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-85</td>
<td>1</td>
<td>0.5-2</td>
<td>37</td>
<td>20</td>
<td>17</td>
<td>87</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-86</td>
<td>1</td>
<td>0.5-2</td>
<td>25</td>
<td>14</td>
<td>11</td>
<td>86</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-87</td>
<td>1</td>
<td>0.5-2</td>
<td>27</td>
<td>16</td>
<td>11</td>
<td>89</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-91</td>
<td>1</td>
<td>0.5-2</td>
<td>39</td>
<td>18</td>
<td>21</td>
<td>94</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-92</td>
<td>1</td>
<td>0.5-2</td>
<td>30</td>
<td>18</td>
<td>12</td>
<td>63</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-93</td>
<td>1</td>
<td>0.5-2</td>
<td>35</td>
<td>15</td>
<td>20</td>
<td>87</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-94</td>
<td>1</td>
<td>0.5-2</td>
<td>26</td>
<td>15</td>
<td>11</td>
<td>72</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-95</td>
<td>1</td>
<td>0.5-2</td>
<td>33</td>
<td>21</td>
<td>12</td>
<td>92</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-96</td>
<td>1</td>
<td>0.5-2</td>
<td>35</td>
<td>15</td>
<td>20</td>
<td>88</td>
<td>A-6</td>
<td>CL</td>
</tr>
<tr>
<td>B-97</td>
<td>1</td>
<td>0.5-2</td>
<td>33</td>
<td>21</td>
<td>12</td>
<td>93</td>
<td>A-6</td>
<td>CL</td>
</tr>
</tbody>
</table>
### Grain Size Distribution

#### U.S. Sieve Opening in Inches

<table>
<thead>
<tr>
<th>U.S. Sieve Numbers</th>
<th>6</th>
<th>4</th>
<th>3</th>
<th>1.5</th>
<th>1</th>
<th>3/8</th>
<th>3</th>
<th>1/2</th>
<th>3/4</th>
<th>4</th>
<th>6</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrometer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### U.S. Sieve Numbers

- 6: Fine Sand
- 4: Medium Sand
- 3: coarse Sand
- 1.5: coarse Silt
- 1: fine Silt
- 3/8: fine Clay
- 3: coarse Clay
- 1/2: fine Mud
- 3/4: medium Mud
- 4: coarse Mud
- 6: fine Silt
- 10: coarse Silt

### ASTM D422

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>0.5</td>
<td>FAT CLAY with SAND(CH)</td>
<td>23(A-7-6)</td>
<td>50</td>
<td>23</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-3</td>
<td>0.5</td>
<td>FAT CLAY with SAND(CH)</td>
<td>29(A-7-6)</td>
<td>56</td>
<td>22</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-4</td>
<td>0.5</td>
<td>LEAN CLAY with SAND(CL)</td>
<td>23(A-7-6)</td>
<td>49</td>
<td>22</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-6</td>
<td>0.5</td>
<td>SILTY CLAY with SAND(CL-ML)</td>
<td>3(A-4)</td>
<td>27</td>
<td>21</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Percent Finer by Weight

#### COBBLES

- coarse

#### GRAVEL

- fine

#### SAND

- coarse
- medium
- fine

#### SILT OR CLAY

- fine

### Boring Log

- **Boring ID**: B-1, B-3, B-4, B-6
- **Depth**: 0.5
- **USCS Classification**: FAT CLAY with SAND(CH) for B-1, B-3, B-6; LEAN CLAY with SAND(CL) for B-4
- **AASHTO Classification**: 23(A-7-6) for B-1, B-3, B-4; 29(A-7-6) for B-3; 3(A-4) for B-6
- **Percent Finer by Weight**
  - **D<sub>100</sub>**: 2, 2, 2, 2
  - **D<sub>60</sub>**: 100, 100, 100, 100
  - **D<sub>10</sub>**: 60, 60, 60, 60
  - **%Gravel**: 0.0, 0.0, 0.0, 0.0
  - **%Sand**: 19.0, 17.7, 17.8, 22.5
  - **%Silt**: 81.0, 82.2, 82.0, 77.5
  - **%Clay**: 81.0, 82.2, 82.0, 77.5

### Project Information

- **Project Number**: 35135123
- **Site**: Cross Co. Line Highway 147, Arkansas
- **Client**: Buchart Horn, Inc. Memphis, Tennessee
- **Exhibit**: B-1

---

**Laboratory Tests are not valid if separated from original report.**

**Grain Size USCS & AASHTO Combined 35135123.GPJ TERRACON2012.GDT 3/17/14**
<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-17</td>
<td>0.5</td>
<td>LEAN CLAY with SAND (CL)</td>
<td>10 (A-6)</td>
<td>37</td>
<td>22</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-18</td>
<td>0.5</td>
<td>LEAN CLAY with SAND (CL)</td>
<td>5 (A-4)</td>
<td>31</td>
<td>22</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-19</td>
<td>0.5</td>
<td>FAT CLAY (CH)</td>
<td>61 (A-7-6)</td>
<td>78</td>
<td>24</td>
<td>54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-23</td>
<td>0.5</td>
<td>FAT CLAY (CH)</td>
<td>55 (A-7-5)</td>
<td>82</td>
<td>32</td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D₉₀₀</th>
<th>D₆₀</th>
<th>D₁₀</th>
<th>D₁₀₀</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-17</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>27.4</td>
<td>72.5</td>
<td></td>
</tr>
<tr>
<td>B-18</td>
<td>0.5</td>
<td>0.425</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>26.4</td>
<td>73.4</td>
<td></td>
</tr>
<tr>
<td>B-19</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>1.4</td>
<td>98.4</td>
<td></td>
</tr>
<tr>
<td>B-23</td>
<td>0.5</td>
<td>0.425</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>3.9</td>
<td>93.1</td>
<td></td>
</tr>
</tbody>
</table>

**PROJECT:** CA0101 Highway 147 Widening

**SITE:** Cross Co. Line Highway 147, Arkansas
### LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT.

**GRAIN SIZE: USCS & AASHTO COMBINED 35135123 GPJ TERRACON2012.GDT 3/17/14**

#### U.S. SIEVE OPENING IN INCHES

<table>
<thead>
<tr>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>55(A-7-5)</td>
<td>84</td>
<td>31</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>73(A-7-6)</td>
<td>93</td>
<td>28</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>LEAN CLAY with SAND(CL)</td>
<td>34(A-7-6)</td>
<td>54</td>
<td>22</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td>9(A-6)</td>
<td>28</td>
<td>14</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### U.S. SIEVE NUMBERS

<table>
<thead>
<tr>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>55(A-7-5)</td>
<td>84</td>
<td>31</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>73(A-7-6)</td>
<td>93</td>
<td>28</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>LEAN CLAY with SAND(CL)</td>
<td>34(A-7-6)</td>
<td>54</td>
<td>22</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td>9(A-6)</td>
<td>28</td>
<td>14</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### PERCENT FINER BY WEIGHT

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D_100</th>
<th>D_50</th>
<th>D_10</th>
<th>D_0</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-24</td>
<td>0.5</td>
<td>2</td>
<td>0.0</td>
<td>11.2</td>
<td>88.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-25</td>
<td>0.5</td>
<td>0.425</td>
<td>0.0</td>
<td>1.7</td>
<td>97.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-26</td>
<td>0.5</td>
<td>9.5</td>
<td>0.0</td>
<td>2.3</td>
<td>95.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-27</td>
<td>0.5</td>
<td>2</td>
<td>0.0</td>
<td>17.4</td>
<td>82.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PROJECT: CA0101 Highway 147 Widening**

**SITE: Cross Co. Line Highway 147, Arkansas**

**CLIENT: Buchart Horn, Inc.**

**PROJECT NUMBER: 35135123**

**EXHIBIT: B-5**
### Grain Size Distribution

**U.S. Sieve Opening in Inches**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Percentage Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>60</td>
<td>2</td>
</tr>
<tr>
<td>70</td>
<td>1</td>
</tr>
<tr>
<td>80</td>
<td>0.5</td>
</tr>
<tr>
<td>90</td>
<td>0.1</td>
</tr>
<tr>
<td>100</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**U.S. Sieve Numbers**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Percentage Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>60</td>
<td>2</td>
</tr>
<tr>
<td>70</td>
<td>1</td>
</tr>
<tr>
<td>80</td>
<td>0.5</td>
</tr>
<tr>
<td>90</td>
<td>0.1</td>
</tr>
<tr>
<td>100</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**ASTM D422**

**USCS Classification**

- **Cc**: Coarse Clay
- **Cu**: Clayey Silt
- **S**: Sand
- **M**: Silt
- **L**: Loam
- **Cl**: Clay
- **Ck**: Silt clay
- **Ck**: Silt clay
- **Ck**: Silt clay
- **Ck**: Silt clay

**AASHTO Classification**

- **A-4**: Sandy Clay
- **A-7-6**: Sandy Loam
- **A-7-6**: Sandy Loam
- **A-7-6**: Sandy Loam

**Boring ID**

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-28</td>
<td>0.5</td>
<td>Sandy Silty Clay</td>
<td>A-4</td>
<td>22</td>
<td>15</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-29</td>
<td>0.5</td>
<td>Fat Clay</td>
<td>34</td>
<td>52</td>
<td>19</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-30</td>
<td>0.5</td>
<td>Lean Clay</td>
<td>24</td>
<td>44</td>
<td>19</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-31</td>
<td>0.5</td>
<td>Lean Clay</td>
<td>23</td>
<td>41</td>
<td>17</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring ID**

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D&lt;sub&gt;100&lt;/sub&gt;</th>
<th>D&lt;sub&gt;50&lt;/sub&gt;</th>
<th>D&lt;sub&gt;10&lt;/sub&gt;</th>
<th>D&lt;sub&gt;5&lt;/sub&gt;</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-28</td>
<td>0.5</td>
<td>4.75</td>
<td>0.0</td>
<td>26.9</td>
<td>69.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-29</td>
<td>0.5</td>
<td>2</td>
<td>0.0</td>
<td>4.0</td>
<td>95.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-30</td>
<td>0.5</td>
<td>2</td>
<td>0.0</td>
<td>9.1</td>
<td>90.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-31</td>
<td>0.5</td>
<td>2</td>
<td>0.0</td>
<td>6.7</td>
<td>93.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Grain Size Distribution

**ASTM D422**

## U.S. Sieve Opening in Inches

<table>
<thead>
<tr>
<th>0.001</th>
<th>0.01</th>
<th>0.1</th>
<th>1</th>
<th>10</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4</td>
<td>3</td>
<td>1.5</td>
<td>1</td>
<td>3/4</td>
<td>1/2</td>
</tr>
</tbody>
</table>

## U.S. Sieve Numbers

<table>
<thead>
<tr>
<th>4</th>
<th>50</th>
<th>1.5</th>
<th>200</th>
<th>354</th>
<th>68</th>
<th>1014</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>22</td>
<td>21</td>
<td>21</td>
<td>20</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

## Hydrometer

<table>
<thead>
<tr>
<th>0.0</th>
<th>0.0</th>
<th>0.0</th>
<th>1.1</th>
<th>17.4</th>
<th>76.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5</td>
<td>27.1</td>
<td>72.4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Grain Size in Millimeters

<table>
<thead>
<tr>
<th>COBBLES</th>
<th>GRAVEL</th>
<th>SAND</th>
<th>SILT OR CLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>coarse</td>
<td>fine</td>
<td>coarse</td>
<td>medium</td>
</tr>
</tbody>
</table>

## USCS Classification

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-32</td>
<td>0.5</td>
<td>LEAN CLAY (CL)</td>
<td>18(A-6)</td>
</tr>
<tr>
<td>B-34</td>
<td>0.5</td>
<td>LEAN CLAY (CL)</td>
<td>18(A-6)</td>
</tr>
<tr>
<td>B-35</td>
<td>0.5</td>
<td>SILTY CLAY with SAND (CL-ML)</td>
<td>3(A-4)</td>
</tr>
<tr>
<td>B-36</td>
<td>0.5</td>
<td>SILTY CLAY with SAND (CL-ML)</td>
<td>4(A-4)</td>
</tr>
</tbody>
</table>

## Percent Finer by Weight

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D₉₀</th>
<th>D₉₅</th>
<th>D₁₅</th>
<th>D₅₀</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-32</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>10.5</td>
<td>89.4</td>
<td></td>
</tr>
<tr>
<td>B-34</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>7.3</td>
<td>92.6</td>
<td></td>
</tr>
<tr>
<td>B-35</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>27.1</td>
<td>72.4</td>
<td></td>
</tr>
<tr>
<td>B-36</td>
<td>0.5</td>
<td>9.5</td>
<td></td>
<td></td>
<td></td>
<td>1.1</td>
<td>17.4</td>
<td>76.2</td>
<td></td>
</tr>
</tbody>
</table>

**PROJECT: CA0101 Highway 147 Widening**

**SITE: Cross Co. Line Highway 147, Arkansas**

**CLIENT: Buchart Horn, Inc. Memphis Tennessee**

**PROJECT NUMBER: 35135123**

**EXHIBIT: B-7**
### LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT.

**GRAIN SIZE DISTRIBUTION**

**U.S. SIEVE OPENING IN INCHES**

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>51(A-7-5)</td>
<td>74</td>
<td>32</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
<td>LEAN CLAY(CL)</td>
<td>15(A-6)</td>
<td>36</td>
<td>20</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>50(A-7-6)</td>
<td>72</td>
<td>22</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.5</td>
<td>FAT CLAY(CH)</td>
<td>32(A-7-6)</td>
<td>53</td>
<td>20</td>
<td>33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D₉₀</th>
<th>D₆₀</th>
<th>D₁₀</th>
<th>D₅₀</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
<td>2</td>
<td>10</td>
<td>50</td>
<td>50</td>
<td>0.0</td>
<td>1.2</td>
<td>98.8</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
<td>2</td>
<td>10</td>
<td>50</td>
<td>50</td>
<td>0.0</td>
<td>8.1</td>
<td>91.9</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.5</td>
<td>2</td>
<td>10</td>
<td>50</td>
<td>50</td>
<td>0.0</td>
<td>10.0</td>
<td>89.8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.5</td>
<td>2</td>
<td>10</td>
<td>50</td>
<td>50</td>
<td>0.0</td>
<td>9.1</td>
<td>90.9</td>
<td></td>
</tr>
</tbody>
</table>

**PROJECT:** CA0101 Highway 147 Widening

**SITE:** Cross Co. Line Highway 147, Arkansas

**CLIENT:** Buchart Horn, Inc.
Memphis Tennessee

**PROJECT NUMBER:** 35135123

**EXHIBIT:** B-8
# ASTM D422

## Grain Size Distribution

**U.S. Sieve Opening in Inches**

<table>
<thead>
<tr>
<th></th>
<th>0.001</th>
<th>0.01</th>
<th>0.1</th>
<th>1</th>
<th>10</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## ASTM D422

### USCS Classification
- **Cc**: Coarse Clay
- **Cu**: Fine Clay

### AASHTO Classification
- **B-47**
- **B-57**
- **B-58**
- **B-59**

### Laboratory Tests
- **Percent Finer by Weight**
  - **LL**: Low Limit
  - **PL**: Plastic Limit
  - **PI**: Plastic Index
  - **Cc**: Clay Content
  - **Cu**: Clay Unit

### Grain Size in Millimeters
- **COBBLES**
- **GRAVEL**
- **SAND**
- **SILT OR CLAY**

### Boring ID
- **B-47**
- **B-57**
- **B-58**
- **B-59**

### Project Information
- **Project Number**: 35135123
- **Client**: Buchart Horn, Inc.
- **Site**: Cross Co. Line Highway 147, Arkansas
- **Project**: CA0101 Highway 147 Widening

---

**Note**: Laboratory tests are not valid if separated from original report.
**GRAIN SIZE DISTRIBUTION**

<table>
<thead>
<tr>
<th>Project: CA0101 Highway 147 Widening</th>
<th>SITE: Cross Co. Line Highway 147, Arkansas</th>
</tr>
</thead>
<tbody>
<tr>
<td>getClient: Buchart Horn, Inc.</td>
<td>CLIENT: Buchart Horn, Inc. Bryant, Arkansas</td>
</tr>
<tr>
<td>Project Number: 35135123</td>
<td>EXHIBIT: B-13</td>
</tr>
</tbody>
</table>
### Grain Size Distribution

#### ASTM D422

<table>
<thead>
<tr>
<th>U.S. SIEVE OPENING IN INCHES</th>
<th>U.S. SIEVE NUMBERS</th>
<th>HYDROMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16</td>
<td>2</td>
<td>0.001</td>
</tr>
<tr>
<td>1/8</td>
<td>4</td>
<td>0.01</td>
</tr>
<tr>
<td>3/16</td>
<td>6</td>
<td>0.1</td>
</tr>
<tr>
<td>1/4</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>3/8</td>
<td>10</td>
<td>1.6</td>
</tr>
<tr>
<td>1/2</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td>5/16</td>
<td>14</td>
<td>6.7</td>
</tr>
<tr>
<td>3/16</td>
<td>16</td>
<td>10.5</td>
</tr>
<tr>
<td>1/8</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>1/4</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3/8</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>1/2</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td>5/8</td>
<td>26</td>
<td>60</td>
</tr>
<tr>
<td>3/4</td>
<td>28</td>
<td>80</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>1 1/4</td>
<td>32</td>
<td>140</td>
</tr>
<tr>
<td>1 1/2</td>
<td>34</td>
<td>200</td>
</tr>
</tbody>
</table>

#### USCS Classification

<table>
<thead>
<tr>
<th>COBBLES</th>
<th>GRAVEL</th>
<th>SAND</th>
<th>SILT OR CLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>coarse</td>
<td>fine</td>
<td>coarse</td>
<td>medium</td>
</tr>
</tbody>
</table>

#### Boring ID Details

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-77</td>
<td>0.5</td>
<td>LEAN CLAY (CL)</td>
<td>11(A-6)</td>
<td>32</td>
<td>20</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-78</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-79</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-80</td>
<td>0.5</td>
<td>LEAN CLAY (CL)</td>
<td>12(A-6)</td>
<td>31</td>
<td>17</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Boring ID Details (Percent Finer by Weight)

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D_100</th>
<th>D_50</th>
<th>D_10</th>
<th>D_5</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-77</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>7.4</td>
<td>92.6</td>
<td></td>
</tr>
<tr>
<td>B-78</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>10.5</td>
<td>89.2</td>
<td></td>
</tr>
<tr>
<td>B-79</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>6.7</td>
<td>93.3</td>
<td></td>
</tr>
<tr>
<td>B-80</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>9.6</td>
<td>90.4</td>
<td></td>
</tr>
</tbody>
</table>

---

**Project:** CA0101 Highway 147 Widening  
**Site:** Cross Co. Line Highway 147, Arkansas  
**Client:** Buchart Horn, Inc.  
**Project Number:** 35135123  
**Exhibit:** B-15
**USCS Classification**

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-81</td>
<td>0.5</td>
<td>LEAN CLAY(CL)</td>
<td>13(A-6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-82</td>
<td>0.5</td>
<td>LEAN CLAY(CL)</td>
<td>15(A-6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-83</td>
<td>0.5</td>
<td>LEAN CLAY(CL)</td>
<td>11(A-6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-84</td>
<td>0.5</td>
<td>LEAN CLAY with SAND(CL)</td>
<td>9(A-6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HYDROMETER**

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D$_{100}$</th>
<th>D$_{60}$</th>
<th>D$_{10}$</th>
<th>D$_{5}$</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-81</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>4.4</td>
<td></td>
<td>95.5</td>
</tr>
<tr>
<td>B-82</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>6.3</td>
<td></td>
<td>93.7</td>
</tr>
<tr>
<td>B-83</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>12.2</td>
<td></td>
<td>87.8</td>
</tr>
<tr>
<td>B-84</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0.0</td>
<td>15.8</td>
<td></td>
<td>84.0</td>
</tr>
</tbody>
</table>

**Project:** CA0101 Highway 147 Widening

**Site:** Cross Co. Line Highway 147, Arkansas

**Project Number:** 35135123

**Client:** Buchart Horn, Inc.
Memphis Tennessee

**Exhibit:** B-16
### GRAIN SIZE DISTRIBUTION

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>USCS Classification</th>
<th>AASHTO Classification</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-89</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-90</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-91</td>
<td>0.5</td>
<td>LEAN CLAY(CL)</td>
<td>20(A-6)</td>
<td>39</td>
<td>18</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-92</td>
<td>0.5</td>
<td>SANDY LEAN CLAY(CL)</td>
<td>5(A-6)</td>
<td>30</td>
<td>18</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PERCENT FINER BY WEIGHT

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Depth</th>
<th>D&lt;sub&gt;100&lt;/sub&gt;</th>
<th>D&lt;sub&gt;60&lt;/sub&gt;</th>
<th>D&lt;sub&gt;10&lt;/sub&gt;</th>
<th>D&lt;sub&gt;10&lt;/sub&gt;</th>
<th>%Gravel</th>
<th>%Sand</th>
<th>%Silt</th>
<th>%Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-89</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td>0.0</td>
<td>31.9</td>
<td>68.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-90</td>
<td>0.5</td>
<td>0.425</td>
<td>0.077</td>
<td>0.0</td>
<td>40.0</td>
<td>56.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-91</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td>0.0</td>
<td>5.7</td>
<td>94.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-92</td>
<td>0.5</td>
<td>9.5</td>
<td></td>
<td>3.7</td>
<td>22.5</td>
<td>62.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MATERIAL DESCRIPTION

lean clay with sand

USCS: CL

AASHTO: A-6(9)

Project No.: 35135123  Client: Buchart Horn
Project: Proposed Highway 64 Widening
Remarks:

Source: B-54  Sample No.: S-1  Elev./Depth: 0.5-2 ft

Terracon Consultants, Inc.
Chattanooga, TN
ASTM D2435 CONSOLIDATION TEST

<table>
<thead>
<tr>
<th>Void Ratio</th>
<th>Applied Pressure - psf</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.82</td>
<td>100</td>
</tr>
<tr>
<td>0.80</td>
<td>200</td>
</tr>
<tr>
<td>0.78</td>
<td>500</td>
</tr>
<tr>
<td>0.76</td>
<td>1000</td>
</tr>
<tr>
<td>0.74</td>
<td>2000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Void Ratio</th>
<th>Applied Pressure - psf</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.72</td>
<td>100</td>
</tr>
<tr>
<td>0.68</td>
<td>500</td>
</tr>
<tr>
<td>0.66</td>
<td>1000</td>
</tr>
<tr>
<td>0.64</td>
<td>2000</td>
</tr>
<tr>
<td>0.62</td>
<td>5000</td>
</tr>
</tbody>
</table>

MATERIAL DESCRIPTION

- **USCS**: CL
- **AASHTO**: A-4(6)

- **Project No.**: 35135123
- **Client**: Buchart Horn
- **Project**: Proposed Highway 64 Widening
- **Source**: B-54
- **Sample No.:**: S-3
- **Elev./Depth**: 3.5-5.0 ft

- **Remarks**: A-4(6)

- **Initial Void Ratio**: 0.790
- **Proposed Highway 64 Widening**: Buchart Horn
- **Terracon Consultants, Inc.**: Chattanooga, TN
### ASTM D2435 CONSOLIDATION TEST

<table>
<thead>
<tr>
<th>Applied Pressure - psf</th>
<th>Void Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1.0399</td>
</tr>
<tr>
<td>200</td>
<td>1.0324</td>
</tr>
<tr>
<td>500</td>
<td>1.0249</td>
</tr>
<tr>
<td>1000</td>
<td>1.0174</td>
</tr>
<tr>
<td>2000</td>
<td>1.0099</td>
</tr>
<tr>
<td>4000</td>
<td>1.0024</td>
</tr>
</tbody>
</table>

**MATERIAL DESCRIPTION**

<table>
<thead>
<tr>
<th>Natural Saturation</th>
<th>Moisture</th>
<th>Dry Dens. (pcf)</th>
<th>LL</th>
<th>Pl</th>
<th>Sp. Gr.</th>
<th>Overburden (psf)</th>
<th>P_c (psf)</th>
<th>C_c</th>
<th>C_r</th>
<th>Initial Void Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>96.6 %</td>
<td>37.0 %</td>
<td>82.8</td>
<td>45</td>
<td>24</td>
<td>2.7</td>
<td>1785</td>
<td>0.13</td>
<td>0.03</td>
<td>1.035</td>
<td></td>
</tr>
</tbody>
</table>

**Project No.** 35135123  **Client:** Buchart Horn  **Project:** Proposed Highway 64 Widening

**Remarks:** Swell Pressure of 264 psf

**Source:** B-56  **Sample No.:** S-1  **Elev./Depth:** 0.5-2.0 ft

**Terracon Consultants, Inc.**  **Chattanooga, TN**
Laboratory Compaction Characteristics of Soil

Client Name: Buchart Horn  
Project Name: AHTD Job No. CA0101  
Location: Cross County Line - Highway 147 (Widening)(S)  

Source Material: Bulk 1 - B 28 + B 59  
Sample Description:  

Material Designation: CH  
Sample date:  
Test Method: Method A  
Test Procedure: ASSHTO T-99  
Sample Preparation: Dry  
Rammer: X Mechanical  
Reviewed by: RAS  

TEST RESULTS  
Maximum Dry Unit Wt.: 97.8 pcf  
Optimum Water Content: 23.5 %  
Liquid Limit: 57  
Plastic Limit: 22  
Plasticity Index: 35  
% passing # 200 sieve: 86.3  
AASHTO Class. A-7-6 USCS: CH  

Zero air voids for specific gravity of 2.70
### Resilient Modulus Testing - AASHTO T 307-99 English Units

<table>
<thead>
<tr>
<th>Soil Map Unit:</th>
<th>AIA</th>
<th>Soil Symbol:</th>
<th>A-7-6(32)/CH</th>
<th>Weight of Wet Soil (lb)</th>
<th>6.36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (in.)</td>
<td>12-60</td>
<td>Compaction Method</td>
<td>Static</td>
<td>Initial Sample Diameter (in)</td>
<td>3.94</td>
</tr>
<tr>
<td>Max. Dry Density (pcf)</td>
<td>97.5</td>
<td>Initial Sample Height (in)</td>
<td>7.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opt. Moisture Content (%)</td>
<td>23.5</td>
<td>Initial Sample Area (in²)</td>
<td>12.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside Mold Diameter (in)</td>
<td>3.94</td>
<td>Sample Volume (in³)</td>
<td>95.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compacted Moisture Content(%)</td>
<td>23.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wet Density (pcf)</td>
<td>114.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry Density (pcf)</td>
<td>92.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chamber Confining Pressure (Sₐ)</th>
<th>Nominal Maximum Axial Stress (Sₙ)</th>
<th>Actual Applied Max. Axial Load (Pmax)</th>
<th>Actual Applied Cyclic Load (Pc)</th>
<th>Actual Applied Max. Axial Stress (Sₙ)</th>
<th>Actual Applied Cyclic Stress (Sₙ)</th>
<th>Actual Applied Contact Stress (Sₙ)</th>
<th>Recov. Def. LVDT #1 Reading (H₁)</th>
<th>Recov. Def. LVDT #2 Reading (H₂)</th>
<th>Average Recov. Def. LVDT 1 and 2 (Havg)</th>
<th>Resilient Strain (Eₙ)</th>
<th>Resilient Modulus (Mₐ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.01</td>
<td>2.00</td>
<td>23.6</td>
<td>20.8</td>
<td>2.9</td>
<td>1.94</td>
<td>1.70</td>
<td>0.235</td>
<td>0.0008</td>
<td>0.0009</td>
<td>0.00008</td>
<td>16,628</td>
</tr>
<tr>
<td>6.01</td>
<td>4.00</td>
<td>47.6</td>
<td>42.4</td>
<td>5.2</td>
<td>3.91</td>
<td>3.48</td>
<td>0.428</td>
<td>0.0016</td>
<td>0.0018</td>
<td>0.00016</td>
<td>16,581</td>
</tr>
<tr>
<td>6.00</td>
<td>6.00</td>
<td>72.0</td>
<td>64.1</td>
<td>7.9</td>
<td>5.91</td>
<td>5.26</td>
<td>0.648</td>
<td>0.0025</td>
<td>0.0028</td>
<td>0.00025</td>
<td>15,811</td>
</tr>
<tr>
<td>6.01</td>
<td>8.00</td>
<td>96.5</td>
<td>86.2</td>
<td>10.3</td>
<td>7.92</td>
<td>7.08</td>
<td>0.844</td>
<td>0.0035</td>
<td>0.0039</td>
<td>0.00039</td>
<td>15,041</td>
</tr>
<tr>
<td>6.01</td>
<td>10.00</td>
<td>121.0</td>
<td>108.1</td>
<td>12.9</td>
<td>9.93</td>
<td>8.88</td>
<td>1.058</td>
<td>0.0047</td>
<td>0.0052</td>
<td>0.00047</td>
<td>14,950</td>
</tr>
<tr>
<td>4.00</td>
<td>2.00</td>
<td>23.9</td>
<td>20.9</td>
<td>3.0</td>
<td>1.96</td>
<td>1.72</td>
<td>0.246</td>
<td>0.0008</td>
<td>0.0009</td>
<td>0.00008</td>
<td>15,876</td>
</tr>
<tr>
<td>4.01</td>
<td>4.00</td>
<td>48.1</td>
<td>42.6</td>
<td>5.4</td>
<td>3.95</td>
<td>3.50</td>
<td>0.447</td>
<td>0.0017</td>
<td>0.0019</td>
<td>0.00017</td>
<td>15,714</td>
</tr>
<tr>
<td>4.01</td>
<td>6.00</td>
<td>72.4</td>
<td>64.8</td>
<td>7.7</td>
<td>5.95</td>
<td>5.32</td>
<td>0.630</td>
<td>0.0026</td>
<td>0.0029</td>
<td>0.00026</td>
<td>15,270</td>
</tr>
<tr>
<td>4.02</td>
<td>8.00</td>
<td>96.7</td>
<td>86.5</td>
<td>10.2</td>
<td>7.94</td>
<td>7.10</td>
<td>0.840</td>
<td>0.0036</td>
<td>0.0040</td>
<td>0.00040</td>
<td>14,612</td>
</tr>
<tr>
<td>4.02</td>
<td>10.00</td>
<td>120.9</td>
<td>108.2</td>
<td>12.8</td>
<td>9.93</td>
<td>8.88</td>
<td>1.048</td>
<td>0.0047</td>
<td>0.0053</td>
<td>0.00053</td>
<td>13,942</td>
</tr>
<tr>
<td>2.03</td>
<td>2.00</td>
<td>24.0</td>
<td>21.1</td>
<td>2.9</td>
<td>1.97</td>
<td>1.73</td>
<td>0.237</td>
<td>0.0009</td>
<td>0.0010</td>
<td>0.00010</td>
<td>14,366</td>
</tr>
<tr>
<td>2.00</td>
<td>4.00</td>
<td>48.1</td>
<td>42.8</td>
<td>5.3</td>
<td>3.95</td>
<td>3.52</td>
<td>0.435</td>
<td>0.0018</td>
<td>0.0020</td>
<td>0.00020</td>
<td>14,574</td>
</tr>
<tr>
<td>2.01</td>
<td>6.00</td>
<td>72.5</td>
<td>64.9</td>
<td>7.6</td>
<td>5.96</td>
<td>5.33</td>
<td>0.625</td>
<td>0.0028</td>
<td>0.0032</td>
<td>0.00032</td>
<td>14,106</td>
</tr>
<tr>
<td>1.98</td>
<td>8.00</td>
<td>96.9</td>
<td>86.7</td>
<td>10.2</td>
<td>7.96</td>
<td>7.12</td>
<td>0.838</td>
<td>0.0038</td>
<td>0.0043</td>
<td>0.00043</td>
<td>13,821</td>
</tr>
<tr>
<td>2.02</td>
<td>10.00</td>
<td>121.2</td>
<td>108.5</td>
<td>12.7</td>
<td>9.95</td>
<td>8.91</td>
<td>1.040</td>
<td>0.0050</td>
<td>0.0056</td>
<td>0.00056</td>
<td>13,355</td>
</tr>
</tbody>
</table>
### Resilient Modulus Testing - AASHTO T 307-99 English Units

**Report Date:** 17-Mar-14  
**Lab No.:** B28 & B59 Bulk 1_OMC+2  
**Project No.:** 35135123

#### Soil Map Unit: AIA  
**Soil Symbol:** A-7-6(32)/CH  
**Weight of Wet Soil (lb):** 6.36

<table>
<thead>
<tr>
<th>Depth (in.)</th>
<th>12-60</th>
<th>Initial Sample Diameter (in)</th>
<th>3.94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compaction Method</td>
<td>Static</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Dry Density (pcf)</td>
<td>97.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opt. Moisture Content (%)</td>
<td>23.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside Mold Diameter (in)</td>
<td>3.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Symbol:</td>
<td>Weight of Wet Soil (lb)</td>
<td>Initial Sample Diameter (in)</td>
<td></td>
</tr>
<tr>
<td>Inside Sample Diameter (in)</td>
<td>Wet Density (pcf)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Density (pcf)</td>
<td>Depth (in.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Sample Height (in)</td>
<td>Final Sample Height (in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Sample Area (in²)</td>
<td>Final Sample Weight (lb)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Volume (in³)</td>
<td>Final Moisture Content (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compact Moisture Content (%)</td>
<td>Accumulated Strain (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Density (pcf)</td>
<td>Percent Passing No. 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Density (pcf)</td>
<td>Percent Passing No. 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid Limit</td>
<td>Plasticity Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Resilient Modulus Testing Data

| Chamber | Nominal Maximum Axial Stress (S<sub>cyclic</sub>) | Actual Applied Max. Axial Load (P<sub>max</sub>) | Actual Applied Cyclic Load (P<sub>cyclic</sub>) | Actual Applied Max. Axial Stress (S<sub>max</sub>) | Actual Applied Cyclic Stress (S<sub>cyclic</sub>) | Actual Applied Contact Stress (S<sub>contact</sub>) | Recovery Def. LVDT #1 Reading (H<sub>1</sub>) | Recovery Def. LVDT #2 Reading (H<sub>2</sub>) | Average Recovery Def. LVDT 1 and 2 (H<sub>avg</sub>) | Resilient Strain (E<sub>r</sub>) | Resilient Modulus (M<sub>r</sub>) |
|---------|---------------------------------|----------------|----------------|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 5.99    | 2.00                            | 23.3           | 19.4           | 3.9                             | 1.91           | 1.59           | 0.321           | 0.0009         | 0.0010         | 0.0009         | 0.000120       | 13,224         |
| 6.01    | 4.00                            | 46.8           | 40.6           | 6.1                             | 3.84           | 3.34           | 0.505           | 0.0020         | 0.0021         | 0.0021         | 0.000262       | 12,709         |
| 5.99    | 6.00                            | 71.4           | 62.2           | 9.2                             | 5.87           | 5.11           | 0.758           | 0.0033         | 0.0037         | 0.0035         | 0.000443       | 11,518         |
| 6.00    | 8.00                            | 96.1           | 84.8           | 11.4                            | 7.90           | 6.96           | 0.932           | 0.0053         | 0.0057         | 0.0055         | 0.000700       | 9,948          |
| 6.01    | 10.00                           | 120.7          | 106.9          | 13.8                            | 9.92           | 8.78           | 1.133           | 0.0080         | 0.0084         | 0.0082         | 0.001037       | 8,471          |
| 4.00    | 2.00                            | 23.8           | 19.6           | 4.2                             | 1.96           | 1.61           | 0.344           | 0.0010         | 0.0010         | 0.0010         | 0.000129       | 12,514         |
| 3.99    | 4.00                            | 47.9           | 41.3           | 6.6                             | 3.93           | 3.39           | 0.542           | 0.0022         | 0.0023         | 0.0022         | 0.000284       | 11,959         |
| 4.00    | 6.00                            | 71.9           | 62.9           | 9.1                             | 5.91           | 5.16           | 0.744           | 0.0036         | 0.0038         | 0.0037         | 0.000470       | 10,975         |
| 3.99    | 8.00                            | 96.2           | 84.8           | 11.4                            | 7.90           | 6.97           | 0.933           | 0.0056         | 0.0057         | 0.0057         | 0.000718       | 9,703          |
| 4.02    | 10.00                           | 120.1          | 106.6          | 13.5                            | 9.86           | 8.75           | 1.109           | 0.0080         | 0.0082         | 0.0081         | 0.001024       | 8,549          |
| 2.02    | 2.00                            | 23.7           | 19.6           | 4.1                             | 1.95           | 1.61           | 0.341           | 0.0011         | 0.0011         | 0.0011         | 0.000137       | 11,691         |
| 2.00    | 4.00                            | 47.6           | 41.4           | 6.2                             | 3.91           | 3.40           | 0.511           | 0.0023         | 0.0024         | 0.0024         | 0.000300       | 11,326         |
| 1.98    | 6.00                            | 71.7           | 63.1           | 8.6                             | 5.89           | 5.18           | 0.707           | 0.0038         | 0.0039         | 0.0039         | 0.000492       | 10,525         |
| 1.98    | 8.00                            | 96.2           | 85.3           | 10.9                            | 7.90           | 7.00           | 0.896           | 0.0058         | 0.0058         | 0.0058         | 0.000738       | 9,493          |
| 2.01    | 10.00                           | 120.4          | 106.9          | 13.4                            | 9.88           | 8.78           | 1.103           | 0.0081         | 0.0082         | 0.0082         | 0.001035       | 8,483          |
Laboratory Compaction Characteristics of Soil

Client Name: Buchart Horn
Project Name: AHTD Job No. CA0101
Location: Cross County Line - Highway 147 (Widening)(S)

Source Material: B 7+ B 94
Sample Description: Light Brown Clay with sand

Material Designation: CL-ML
Sample date: __________
Test Method: Method A
Test Procedure: ASSHTO T-99
Sample Preparation: Dry
Rammer: X Mechanical Manual

Liquid Limit: 27
Plastic Limit: 21
Plasticity Index: 6
% passing #200 sieve: 72.8
AASHTO Class: A-4(3)
USCS: CL-ML

Reviewed by: RAS

Zero air voids for specific gravity of 2.70

TEST RESULTS

<table>
<thead>
<tr>
<th>Water Content, %</th>
<th>Dry Unit Weight, pcf</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>98</td>
</tr>
<tr>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>14</td>
<td>102</td>
</tr>
<tr>
<td>16</td>
<td>104</td>
</tr>
<tr>
<td>18</td>
<td>106</td>
</tr>
<tr>
<td>20</td>
<td>108</td>
</tr>
<tr>
<td>22</td>
<td>110</td>
</tr>
<tr>
<td>24</td>
<td>112</td>
</tr>
<tr>
<td>26</td>
<td>114</td>
</tr>
</tbody>
</table>

Maximum Dry Unit Wt.: 111.7 pcf
Optimum Water Content: 15.4 %
Resilient Modulus Testing - AASHTO T 307-99 English Units

<table>
<thead>
<tr>
<th>Soil Map Unit:</th>
<th>DsA/DsU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Symbol:</td>
<td>A-4(3)/CL-ML</td>
</tr>
<tr>
<td>Depth (in.)</td>
<td>12.60</td>
</tr>
<tr>
<td>Compaction Method</td>
<td>Static</td>
</tr>
<tr>
<td>Max. Dry Density (pcf)</td>
<td>111.7</td>
</tr>
<tr>
<td>Opt. Moisture Content (%)</td>
<td>15.4</td>
</tr>
<tr>
<td>Inside Mold Diameter (in)</td>
<td>3.94</td>
</tr>
<tr>
<td>Weight of Wet Soil (lb)</td>
<td>6.79</td>
</tr>
<tr>
<td>Initial Sample Diameter (in)</td>
<td>3.94</td>
</tr>
<tr>
<td>Initial Sample Height (in)</td>
<td>7.89</td>
</tr>
<tr>
<td>Initial Sample Area (in²)</td>
<td>12.18</td>
</tr>
<tr>
<td>Sample Volume (in³)</td>
<td>96.17</td>
</tr>
<tr>
<td>Compacted Moisture Content (%)</td>
<td>15.5</td>
</tr>
<tr>
<td>Wet Density (pcf)</td>
<td>122.0</td>
</tr>
<tr>
<td>Dry Density (pcf)</td>
<td>105.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chamber Confining Pressure</th>
<th>Nominal Maximum Axial Stress (S_cyclic)</th>
<th>Actual Applied Max. Axial Load (P_max)</th>
<th>Actual Applied Cyclic Load (P_cyclic)</th>
<th>Actual Applied Contact Load (P_contact)</th>
<th>Actual Applied Max. Axial Stress (S_max)</th>
<th>Actual Applied Cyclic Stress (S_cyclic)</th>
<th>Actual Applied Contact Stress (S_contact)</th>
<th>Recovery Def. LVDT #1 Reading (H₁)</th>
<th>Recovery Def. LVDT #2 Reading (H₂)</th>
<th>Average Recovery LVDT 1 and 2 (H_avg)</th>
<th>Resilient Strain (E_r)</th>
<th>Resilient Modulus (M_r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.99</td>
<td>2.00</td>
<td>23.0</td>
<td>20.4</td>
<td>2.5</td>
<td>1.89</td>
<td>1.68</td>
<td>0.209</td>
<td>0.0012</td>
<td>0.0013</td>
<td>0.0013</td>
<td>0.000159</td>
<td>10.578</td>
</tr>
<tr>
<td>6.00</td>
<td>4.00</td>
<td>46.6</td>
<td>41.8</td>
<td>4.8</td>
<td>3.83</td>
<td>3.43</td>
<td>0.396</td>
<td>0.0027</td>
<td>0.0029</td>
<td>0.0028</td>
<td>0.000352</td>
<td>9.746</td>
</tr>
<tr>
<td>6.00</td>
<td>6.00</td>
<td>71.0</td>
<td>63.5</td>
<td>7.5</td>
<td>5.83</td>
<td>5.21</td>
<td>0.617</td>
<td>0.0045</td>
<td>0.0047</td>
<td>0.0046</td>
<td>0.000582</td>
<td>8.954</td>
</tr>
<tr>
<td>6.00</td>
<td>8.00</td>
<td>95.7</td>
<td>85.8</td>
<td>9.9</td>
<td>7.86</td>
<td>7.05</td>
<td>0.813</td>
<td>0.0064</td>
<td>0.0069</td>
<td>0.0066</td>
<td>0.000842</td>
<td>8.372</td>
</tr>
<tr>
<td>6.01</td>
<td>10.00</td>
<td>120.0</td>
<td>107.5</td>
<td>12.4</td>
<td>9.85</td>
<td>8.83</td>
<td>1.020</td>
<td>0.0083</td>
<td>0.0089</td>
<td>0.0086</td>
<td>0.001088</td>
<td>8.111</td>
</tr>
<tr>
<td>4.01</td>
<td>2.00</td>
<td>23.2</td>
<td>20.6</td>
<td>2.6</td>
<td>1.90</td>
<td>1.69</td>
<td>0.210</td>
<td>0.0014</td>
<td>0.0015</td>
<td>0.0014</td>
<td>0.000184</td>
<td>9.219</td>
</tr>
<tr>
<td>4.00</td>
<td>4.00</td>
<td>47.2</td>
<td>42.2</td>
<td>5.0</td>
<td>3.88</td>
<td>3.47</td>
<td>0.409</td>
<td>0.0033</td>
<td>0.0035</td>
<td>0.0034</td>
<td>0.000429</td>
<td>8.075</td>
</tr>
<tr>
<td>4.02</td>
<td>6.00</td>
<td>71.5</td>
<td>64.3</td>
<td>7.2</td>
<td>5.87</td>
<td>5.28</td>
<td>0.591</td>
<td>0.0055</td>
<td>0.0058</td>
<td>0.0056</td>
<td>0.000712</td>
<td>7.415</td>
</tr>
<tr>
<td>4.01</td>
<td>8.00</td>
<td>95.9</td>
<td>86.1</td>
<td>9.8</td>
<td>7.88</td>
<td>7.07</td>
<td>0.807</td>
<td>0.0077</td>
<td>0.0081</td>
<td>0.0079</td>
<td>0.000998</td>
<td>7.082</td>
</tr>
<tr>
<td>4.01</td>
<td>10.00</td>
<td>120.1</td>
<td>107.7</td>
<td>12.4</td>
<td>9.86</td>
<td>8.84</td>
<td>1.015</td>
<td>0.0097</td>
<td>0.0103</td>
<td>0.0100</td>
<td>0.001263</td>
<td>7.002</td>
</tr>
<tr>
<td>2.03</td>
<td>2.00</td>
<td>23.2</td>
<td>20.6</td>
<td>2.6</td>
<td>1.91</td>
<td>1.69</td>
<td>0.215</td>
<td>0.0018</td>
<td>0.0019</td>
<td>0.0018</td>
<td>0.000232</td>
<td>7.304</td>
</tr>
<tr>
<td>2.00</td>
<td>4.00</td>
<td>47.3</td>
<td>42.1</td>
<td>5.2</td>
<td>3.88</td>
<td>3.45</td>
<td>0.425</td>
<td>0.0042</td>
<td>0.0044</td>
<td>0.0043</td>
<td>0.000543</td>
<td>6.362</td>
</tr>
<tr>
<td>2.03</td>
<td>6.00</td>
<td>71.4</td>
<td>64.1</td>
<td>7.4</td>
<td>5.86</td>
<td>5.26</td>
<td>0.604</td>
<td>0.0069</td>
<td>0.0072</td>
<td>0.0071</td>
<td>0.000894</td>
<td>5.881</td>
</tr>
<tr>
<td>2.04</td>
<td>8.00</td>
<td>95.7</td>
<td>85.8</td>
<td>9.9</td>
<td>7.86</td>
<td>7.04</td>
<td>0.812</td>
<td>0.0093</td>
<td>0.0099</td>
<td>0.0096</td>
<td>0.001216</td>
<td>5.791</td>
</tr>
<tr>
<td>2.01</td>
<td>10.00</td>
<td>120.0</td>
<td>107.6</td>
<td>12.4</td>
<td>9.85</td>
<td>8.83</td>
<td>1.022</td>
<td>0.0117</td>
<td>0.0124</td>
<td>0.0120</td>
<td>0.001525</td>
<td>5.790</td>
</tr>
</tbody>
</table>
Resilient Modulus Testing - AASHTO T 307-99 English Units

<table>
<thead>
<tr>
<th>Soil Map Unit:</th>
<th>DsA/DsU</th>
<th>Soil Symbol:</th>
<th>A-4(3)/CL-ML</th>
<th>Weight of Wet Soil (lb)</th>
<th>6.91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (in.)</td>
<td>12-60</td>
<td>Initial Sample Diameter (in)</td>
<td>3.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compaction Method</td>
<td>Static</td>
<td>Initial Sample Height (in)</td>
<td>7.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Dry Density (pcf)</td>
<td>111.7</td>
<td>Initial Sample Area (in²)</td>
<td>12.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opt. Moisture Content (%)</td>
<td>15.4</td>
<td>Sample Volume (in³)</td>
<td>95.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside Mold Diameter (in)</td>
<td>3.94</td>
<td>Compacted Moisture Content (%)</td>
<td>17.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wet Density (pcf)</td>
<td>124.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry Density (pcf)</td>
<td>105.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Soil Symbol: Weight of Wet Soil (lb)
Initial Sample Diameter (in)
Wet Density (pcf)
Dry Density (pcf)
Inside Mold Diameter (in)
Depth (in.)
Compaction Method
Max. Dry Density (pcf)
Opt. Moisture Content (%)

<table>
<thead>
<tr>
<th>Chamber Confining Pressure (Sₐ)</th>
<th>Nominal Maximum Axial Stress (S_cyclic)</th>
<th>Actual Applied Axial Load (P_max)</th>
<th>Actual Applied Cyclic Load (P_cycle)</th>
<th>Actual Applied Max. Axial Stress (S_max)</th>
<th>Actual Applied Cyclic Stress (S_cycle)</th>
<th>Actual Applied Contact Stress (S_contact)</th>
<th>Recov. Def. LVDT #1 Reading (H₁)</th>
<th>Recov. Def. LVDT #2 Reading (H₂)</th>
<th>Average Recov. Def. LVDT 1 and 2 (H_avg)</th>
<th>Resilient Strain (Eᵣ)</th>
<th>Resilient Modulus (M_r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.00</td>
<td>2.00</td>
<td>22.7</td>
<td>19.4</td>
<td>3.2</td>
<td>1.86</td>
<td>1.59</td>
<td>0.267</td>
<td>0.0013</td>
<td>0.0013</td>
<td>0.0013</td>
<td>0.000162</td>
</tr>
<tr>
<td>6.00</td>
<td>4.00</td>
<td>46.9</td>
<td>41.5</td>
<td>5.4</td>
<td>3.86</td>
<td>3.41</td>
<td>0.446</td>
<td>0.0029</td>
<td>0.0029</td>
<td>0.0029</td>
<td>0.000369</td>
</tr>
<tr>
<td>5.99</td>
<td>6.00</td>
<td>71.5</td>
<td>63.3</td>
<td>8.2</td>
<td>5.87</td>
<td>5.20</td>
<td>0.670</td>
<td>0.0049</td>
<td>0.0047</td>
<td>0.0048</td>
<td>0.000606</td>
</tr>
<tr>
<td>6.00</td>
<td>8.00</td>
<td>95.9</td>
<td>85.4</td>
<td>10.5</td>
<td>7.87</td>
<td>7.01</td>
<td>0.865</td>
<td>0.0070</td>
<td>0.0067</td>
<td>0.0069</td>
<td>0.000873</td>
</tr>
<tr>
<td>6.01</td>
<td>10.00</td>
<td>120.4</td>
<td>107.3</td>
<td>13.2</td>
<td>9.89</td>
<td>8.81</td>
<td>1.081</td>
<td>0.0090</td>
<td>0.0087</td>
<td>0.0088</td>
<td>0.001121</td>
</tr>
<tr>
<td>4.02</td>
<td>2.00</td>
<td>23.6</td>
<td>20.6</td>
<td>3.0</td>
<td>1.94</td>
<td>1.69</td>
<td>0.244</td>
<td>0.0016</td>
<td>0.0015</td>
<td>0.0016</td>
<td>0.000203</td>
</tr>
<tr>
<td>4.00</td>
<td>4.00</td>
<td>47.6</td>
<td>42.5</td>
<td>5.2</td>
<td>3.91</td>
<td>3.49</td>
<td>0.427</td>
<td>0.0038</td>
<td>0.0036</td>
<td>0.0037</td>
<td>0.000472</td>
</tr>
<tr>
<td>4.01</td>
<td>6.00</td>
<td>72.0</td>
<td>64.0</td>
<td>7.9</td>
<td>5.91</td>
<td>5.26</td>
<td>0.651</td>
<td>0.0063</td>
<td>0.0058</td>
<td>0.0060</td>
<td>0.000768</td>
</tr>
<tr>
<td>4.01</td>
<td>8.00</td>
<td>96.5</td>
<td>86.0</td>
<td>10.4</td>
<td>7.92</td>
<td>7.07</td>
<td>0.857</td>
<td>0.0086</td>
<td>0.0081</td>
<td>0.0084</td>
<td>0.001061</td>
</tr>
<tr>
<td>3.99</td>
<td>10.00</td>
<td>120.3</td>
<td>107.5</td>
<td>12.8</td>
<td>9.88</td>
<td>8.83</td>
<td>1.054</td>
<td>0.0107</td>
<td>0.0102</td>
<td>0.0105</td>
<td>0.001329</td>
</tr>
<tr>
<td>2.00</td>
<td>2.00</td>
<td>23.7</td>
<td>20.4</td>
<td>3.2</td>
<td>1.94</td>
<td>1.68</td>
<td>0.266</td>
<td>0.0020</td>
<td>0.0020</td>
<td>0.0020</td>
<td>0.000257</td>
</tr>
<tr>
<td>2.05</td>
<td>4.00</td>
<td>47.9</td>
<td>42.3</td>
<td>5.5</td>
<td>3.93</td>
<td>3.48</td>
<td>0.455</td>
<td>0.0052</td>
<td>0.0047</td>
<td>0.0049</td>
<td>0.000624</td>
</tr>
<tr>
<td>2.02</td>
<td>6.00</td>
<td>72.2</td>
<td>64.5</td>
<td>7.7</td>
<td>5.93</td>
<td>5.30</td>
<td>0.634</td>
<td>0.0082</td>
<td>0.0076</td>
<td>0.0079</td>
<td>0.001001</td>
</tr>
<tr>
<td>1.99</td>
<td>8.00</td>
<td>96.4</td>
<td>86.2</td>
<td>10.3</td>
<td>7.92</td>
<td>7.08</td>
<td>0.843</td>
<td>0.0107</td>
<td>0.0102</td>
<td>0.0105</td>
<td>0.001331</td>
</tr>
<tr>
<td>2.00</td>
<td>10.00</td>
<td>120.5</td>
<td>107.6</td>
<td>13.0</td>
<td>9.90</td>
<td>8.83</td>
<td>1.066</td>
<td>0.0130</td>
<td>0.0128</td>
<td>0.0129</td>
<td>0.001637</td>
</tr>
</tbody>
</table>
Laboratory Compaction Characteristics of Soil

Client Name: Buchart Horn
Project Name: AHTD Job No. CA0101
Location: Cross County Line - Highway 147 (Widening)(S)

Source Material: Bulk 3 - B 11 + B 83
Sample Description: Light Brown

Material Designation: CL-ML
Test Method: Method A
Test Procedure: ASSHTO T-99
Sample Preparation: Dry
Rammer: X Mechanical

TEST RESULTS

Maximum Dry Unit Wt.: 109.9 pcf
Optimum Water Content: 16.2 %
Liquid Limit: 27
Plastic Limit: 22
Plasticity Index: 5
% passing # 200 sieve: 76
AASHTO Class: A-4 (2)
USCS: CL-ML
Reviewed by: RAS

Zero air voids for specific gravity of 2.70
### Resilient Modulus Testing - AASHTO T 307-99 English Units

**Soil Map Unit:** DuA/DuU  
**Soil Symbol:** A-4(2)/ CL-ML  
**Weight of Wet Soil (lb):** 6.72  
**Depth (in.):** 12-60  
**Compaction Method:** Static  
**Max. Dry Density (pcf):** 109.9  
**Opt. Moisture Content (%):** 16.2  
**Inside Mold Diameter (in):** 3.94  

<table>
<thead>
<tr>
<th>Chamber Confining Pressure ($S_0$) psi</th>
<th>Nominal Maximum Axial Stress ($S_{max}$) psi</th>
<th>Actual Applied Max. Axial Load ($P_{max}$) lb</th>
<th>Actual Applied Cyclic Load ($P_{cyclic}$) lb</th>
<th>Actual Applied Contact Load ($P_{contact}$) lb</th>
<th>Actual Applied Max. Axial Stress ($S_{max}$) psi</th>
<th>Actual Applied Cyclic Stress ($S_{cyclic}$) psi</th>
<th>Actual Applied Contact Stress ($S_{contact}$) psi</th>
<th>Recov. Def. LVDT #1 Reading ($H_1$) in</th>
<th>Recov. Def. LVDT #2 Reading ($H_2$) in</th>
<th>Average Recov. Def. LVDT 1 and 2 ($H_{avg}$) in</th>
<th>Resilient Strain ($E_r$) in/in</th>
<th>Resilient Modulus ($M_r$) psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.01</td>
<td>2.00</td>
<td>23.4</td>
<td>20.8</td>
<td>2.6</td>
<td>1.92</td>
<td>1.71</td>
<td>0.211</td>
<td>0.0012</td>
<td>0.0002</td>
<td>0.0002</td>
<td>0.000158</td>
<td>10.818</td>
</tr>
<tr>
<td>6.01</td>
<td>4.00</td>
<td>47.5</td>
<td>42.5</td>
<td>5.0</td>
<td>3.90</td>
<td>3.49</td>
<td>0.410</td>
<td>0.0027</td>
<td>0.0002</td>
<td>0.0002</td>
<td>0.000351</td>
<td>9.929</td>
</tr>
<tr>
<td>6.01</td>
<td>6.00</td>
<td>71.7</td>
<td>64.2</td>
<td>7.5</td>
<td>5.88</td>
<td>5.27</td>
<td>0.612</td>
<td>0.0044</td>
<td>0.0004</td>
<td>0.0004</td>
<td>0.000580</td>
<td>9.085</td>
</tr>
<tr>
<td>6.00</td>
<td>8.00</td>
<td>96.3</td>
<td>86.3</td>
<td>10.0</td>
<td>7.91</td>
<td>7.09</td>
<td>0.824</td>
<td>0.0064</td>
<td>0.0006</td>
<td>0.0006</td>
<td>0.000842</td>
<td>8.414</td>
</tr>
<tr>
<td>6.00</td>
<td>10.00</td>
<td>121.0</td>
<td>108.0</td>
<td>12.9</td>
<td>9.93</td>
<td>8.87</td>
<td>1.062</td>
<td>0.0083</td>
<td>0.0008</td>
<td>0.0008</td>
<td>0.001086</td>
<td>8.166</td>
</tr>
<tr>
<td>4.03</td>
<td>2.00</td>
<td>23.6</td>
<td>20.9</td>
<td>2.7</td>
<td>1.94</td>
<td>1.71</td>
<td>0.222</td>
<td>0.0014</td>
<td>0.00014</td>
<td>0.00014</td>
<td>0.000180</td>
<td>9.517</td>
</tr>
<tr>
<td>4.02</td>
<td>4.00</td>
<td>47.8</td>
<td>42.4</td>
<td>5.4</td>
<td>3.93</td>
<td>3.48</td>
<td>0.446</td>
<td>0.0033</td>
<td>0.00033</td>
<td>0.00033</td>
<td>0.000422</td>
<td>8.258</td>
</tr>
<tr>
<td>4.03</td>
<td>6.00</td>
<td>72.2</td>
<td>64.2</td>
<td>8.0</td>
<td>5.93</td>
<td>5.27</td>
<td>0.653</td>
<td>0.0054</td>
<td>0.00054</td>
<td>0.00054</td>
<td>0.000703</td>
<td>7.501</td>
</tr>
<tr>
<td>4.00</td>
<td>8.00</td>
<td>96.5</td>
<td>86.0</td>
<td>10.5</td>
<td>7.92</td>
<td>7.06</td>
<td>0.861</td>
<td>0.0076</td>
<td>0.00076</td>
<td>0.00076</td>
<td>0.000987</td>
<td>7.151</td>
</tr>
<tr>
<td>4.02</td>
<td>10.00</td>
<td>120.9</td>
<td>107.9</td>
<td>13.0</td>
<td>9.92</td>
<td>8.86</td>
<td>1.069</td>
<td>0.0096</td>
<td>0.00101</td>
<td>0.00099</td>
<td>0.001250</td>
<td>7.083</td>
</tr>
<tr>
<td>2.02</td>
<td>2.00</td>
<td>23.5</td>
<td>20.2</td>
<td>3.2</td>
<td>1.93</td>
<td>1.66</td>
<td>0.264</td>
<td>0.0017</td>
<td>0.00017</td>
<td>0.00017</td>
<td>0.000215</td>
<td>7.734</td>
</tr>
<tr>
<td>2.01</td>
<td>4.00</td>
<td>47.7</td>
<td>42.2</td>
<td>5.5</td>
<td>3.92</td>
<td>3.47</td>
<td>0.454</td>
<td>0.0041</td>
<td>0.00041</td>
<td>0.00041</td>
<td>0.000526</td>
<td>6.583</td>
</tr>
<tr>
<td>2.02</td>
<td>6.00</td>
<td>72.2</td>
<td>64.2</td>
<td>8.0</td>
<td>5.92</td>
<td>5.27</td>
<td>0.653</td>
<td>0.0068</td>
<td>0.00068</td>
<td>0.00068</td>
<td>0.000880</td>
<td>5.986</td>
</tr>
<tr>
<td>2.02</td>
<td>8.00</td>
<td>96.4</td>
<td>85.9</td>
<td>10.5</td>
<td>7.91</td>
<td>7.05</td>
<td>0.863</td>
<td>0.0093</td>
<td>0.00093</td>
<td>0.00093</td>
<td>0.001204</td>
<td>5.858</td>
</tr>
<tr>
<td>2.01</td>
<td>10.00</td>
<td>120.7</td>
<td>107.8</td>
<td>12.8</td>
<td>9.91</td>
<td>8.85</td>
<td>1.054</td>
<td>0.0116</td>
<td>0.0122</td>
<td>0.0119</td>
<td>0.001512</td>
<td>5.853</td>
</tr>
</tbody>
</table>
### Resilient Modulus Testing - AASHTO T 307-99 English Units

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A-4(2)/ CL-ML</td>
<td>6.85</td>
<td>Static</td>
<td>109.9</td>
<td>16.2</td>
<td>3.94</td>
<td>12-60</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Laboratory Compaction Characteristics of Soil

Client Name: Buchart Horn  
Project Name: AHTD Job No. CA0101  
Location: Cross County Line - Highway 147 (Widening)(S)

Source Material: Bulk 4 B 63  
Sample Description: Light Brown

Material Designation: CH  
Sample date:  
Test Method: Method A  
Test Procedure: ASSHTO T-99  
Sample Preparation: Dry  
Rammer: X Mechanical  Manual

TEST RESULTS

Maximum Dry Unit Wt.: 102.8 pcf  
Optimum Water Content: 20.1 %

Liquid Limit: 49  Plastic Limit: 20
Plasticity Index: 29
% passing # 200 sieve: 86
AASHTO Class: A-7-6 (26)  USCS: CH

Reviewed by: RAS

Zero air voids for specific gravity of 2.70
Resilient Modulus Testing - AASHTO T 307-99 English Units

| Soil Map Unit: | ShA |
| Soil Symbol: | A-7-6(26)/CH |
| Depth (in.): | 12-60 |
| Compaction Method: | Static |
| Max. Dry Density (pcf): | 102.8 |
| Opt. Moisture Content (%): | 20.1 |
| Inside Mold Diameter (in): | 3.94 |

| Test Date: | February 13, 2014 |
| Final Sample Height (in): | 7.9 |
| Final Sample Wet Weight (lb): | 6.50 |
| Final Moisture Content (%): | 20.2 |
| Accumulated Strain (%): | 0.03 |

| Percent Passing No. 10: | 100 |
| Percent Passing No. 200: | 86.0 |
| Liquid Limit: | 49 |
| Plasticity Index: | 29 |

| Chamber Confining Pressure (S₀) | Nominal Maximum Axial Stress (S_cyclic) | Actual Applied Max. Axial Load (P_max) | Actual Applied Cyclic Load (P_cyclic) | Actual Applied Max. Axial Stress (S_max) | Actual Applied Cyclic Stress (S_cyclic) | Actual Applied Contact Stress (S_contact) | Recov. Def. LVDT #1 Reading (H₁) | Recov. Def. LVDT #2 Reading (H₂) | Average Recov. Def. LVDT 1 and 2 (H_avg) | Resilient Strain (Eᵣ) | Resilient Modulus (Mᵣ) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.00 | 2.00 | 23.8 | 20.5 | 3.3 | 1.96 | 1.69 | 0.271 | 0.0010 | 0.0010 | 0.0010 | 0.000121 | 13,900 |
| 6.01 | 4.00 | 47.8 | 42.2 | 5.5 | 3.93 | 3.47 | 0.456 | 0.0020 | 0.0020 | 0.0020 | 0.000255 | 13,608 |
| 5.99 | 6.00 | 72.2 | 63.8 | 8.3 | 5.93 | 5.25 | 0.683 | 0.0032 | 0.0033 | 0.0032 | 0.000412 | 12,717 |
| 6.00 | 8.00 | 96.7 | 85.9 | 10.8 | 7.94 | 7.06 | 0.887 | 0.0046 | 0.0048 | 0.0047 | 0.000600 | 11,763 |
| 6.00 | 10.00 | 120.8 | 107.3 | 13.4 | 9.92 | 8.82 | 1.104 | 0.0064 | 0.0066 | 0.0065 | 0.000820 | 10,750 |
| 3.99 | 2.00 | 23.8 | 20.4 | 3.4 | 1.95 | 1.68 | 0.276 | 0.0010 | 0.0010 | 0.0010 | 0.000132 | 12,674 |
| 4.02 | 6.00 | 47.9 | 42.0 | 5.8 | 3.93 | 3.45 | 0.480 | 0.0022 | 0.0022 | 0.0022 | 0.000278 | 12,402 |
| 4.02 | 6.00 | 72.3 | 64.2 | 8.1 | 5.94 | 5.28 | 0.665 | 0.0034 | 0.0035 | 0.0035 | 0.000444 | 11,893 |
| 4.02 | 8.00 | 96.6 | 85.9 | 10.6 | 7.93 | 7.06 | 0.874 | 0.0048 | 0.0050 | 0.0049 | 0.000625 | 11,286 |
| 4.01 | 10.00 | 120.8 | 107.5 | 13.3 | 9.93 | 8.83 | 1.095 | 0.0064 | 0.0067 | 0.0066 | 0.000833 | 10,604 |
| 1.99 | 2.00 | 23.6 | 20.3 | 3.2 | 1.94 | 1.67 | 0.265 | 0.0012 | 0.0013 | 0.0012 | 0.0000157 | 10,646 |
| 2.02 | 4.00 | 47.8 | 42.0 | 5.8 | 3.93 | 3.45 | 0.477 | 0.0025 | 0.0025 | 0.0025 | 0.000318 | 10,857 |
| 1.99 | 6.00 | 72.1 | 64.0 | 8.1 | 5.93 | 5.26 | 0.665 | 0.0038 | 0.0039 | 0.0039 | 0.000490 | 10,732 |
| 1.99 | 8.00 | 96.6 | 86.0 | 10.5 | 7.93 | 7.07 | 0.864 | 0.0053 | 0.0054 | 0.0053 | 0.000677 | 10,438 |
| 2.00 | 10.00 | 120.8 | 107.6 | 13.2 | 9.92 | 8.84 | 1.085 | 0.0068 | 0.0070 | 0.0069 | 0.000879 | 10,056 |
### Resilient Modulus Testing - AASHTO T 307-99 English Units

- **Soil Map Unit:** ShA
- **Soil Symbol:** A-7-6(26)/CH
- **Weight of Wet Soil (lb):** 6.61
- **Initial Sample Diameter (in):** 3.93
- **Initial Sample Height (in):** 7.87
- **Initial Sample Area (in²):** 12.15
- **Sample Volume (in³):** 95.66
- **Compacted Moisture Content (%):** 22.5
- **Wet Density (pcf):** 119.4
- **Dry Density (pcf):** 97.5
- **Percent Passing No. 10:** 100
- **Percent Passing No. 200:** 86.0
- **Liquid Limit:** 49
- **Plasticity Index:** 29

#### Table: Test Results

<table>
<thead>
<tr>
<th>Chamber Confining Pressure (S₀)</th>
<th>Nominal Maximum Axial Stress (S_cyclic) (P_max)</th>
<th>Actual Applied Max. Axial Load (P_cyclic)</th>
<th>Actual Applied Contact Load (P_contact)</th>
<th>Actual Applied Max. Axial Stress (S_max) (P_max)</th>
<th>Actual Applied Cyclic Stress (S_cyclic)</th>
<th>Actual Applied Contact Stress (S_contact)</th>
<th>Recov. Def. LVDT #1 Reading (H₁)</th>
<th>Recov. Def. LVDT #2 Reading (H₂)</th>
<th>Average Recov. Def. LVDT 1 and 2 (H_avg)</th>
<th>Resilient Strain (Cᵣ)</th>
<th>Resilient Modulus (Mᵣ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.00</td>
<td>2.00</td>
<td>23.9</td>
<td>20.2</td>
<td>3.7</td>
<td>1.97</td>
<td>1.67</td>
<td>0.303</td>
<td>0.0012</td>
<td>0.0012</td>
<td>0.000152</td>
<td>10,976</td>
</tr>
<tr>
<td>6.00</td>
<td>4.00</td>
<td>48.3</td>
<td>42.2</td>
<td>6.0</td>
<td>3.97</td>
<td>3.47</td>
<td>0.498</td>
<td>0.0026</td>
<td>0.0027</td>
<td>0.000339</td>
<td>10,253</td>
</tr>
<tr>
<td>6.00</td>
<td>6.00</td>
<td>72.6</td>
<td>64.0</td>
<td>8.6</td>
<td>5.98</td>
<td>5.27</td>
<td>0.709</td>
<td>0.0045</td>
<td>0.0046</td>
<td>0.000581</td>
<td>9,067</td>
</tr>
<tr>
<td>6.00</td>
<td>8.00</td>
<td>97.1</td>
<td>86.1</td>
<td>11.0</td>
<td>7.99</td>
<td>7.08</td>
<td>0.908</td>
<td>0.0071</td>
<td>0.0073</td>
<td>0.000911</td>
<td>7,770</td>
</tr>
<tr>
<td>6.00</td>
<td>10.00</td>
<td>121.3</td>
<td>107.7</td>
<td>13.6</td>
<td>9.98</td>
<td>8.86</td>
<td>1.117</td>
<td>0.0102</td>
<td>0.0104</td>
<td>0.001309</td>
<td>6,769</td>
</tr>
<tr>
<td>3.99</td>
<td>2.00</td>
<td>24.0</td>
<td>20.5</td>
<td>3.5</td>
<td>1.97</td>
<td>1.68</td>
<td>0.287</td>
<td>0.0013</td>
<td>0.0014</td>
<td>0.000168</td>
<td>10,032</td>
</tr>
<tr>
<td>4.01</td>
<td>4.00</td>
<td>48.2</td>
<td>42.3</td>
<td>5.9</td>
<td>3.97</td>
<td>3.48</td>
<td>0.484</td>
<td>0.0029</td>
<td>0.0030</td>
<td>0.000376</td>
<td>9,267</td>
</tr>
<tr>
<td>4.02</td>
<td>6.00</td>
<td>72.7</td>
<td>63.8</td>
<td>8.8</td>
<td>5.98</td>
<td>5.25</td>
<td>0.725</td>
<td>0.0049</td>
<td>0.0050</td>
<td>0.000629</td>
<td>8,345</td>
</tr>
<tr>
<td>4.02</td>
<td>8.00</td>
<td>97.0</td>
<td>86.1</td>
<td>10.9</td>
<td>7.98</td>
<td>7.09</td>
<td>0.894</td>
<td>0.0074</td>
<td>0.0075</td>
<td>0.000948</td>
<td>7,478</td>
</tr>
<tr>
<td>4.00</td>
<td>10.00</td>
<td>121.1</td>
<td>107.9</td>
<td>13.3</td>
<td>9.97</td>
<td>8.88</td>
<td>1.091</td>
<td>0.0102</td>
<td>0.0105</td>
<td>0.001315</td>
<td>6,748</td>
</tr>
<tr>
<td>2.00</td>
<td>2.00</td>
<td>23.8</td>
<td>20.4</td>
<td>3.4</td>
<td>1.96</td>
<td>1.68</td>
<td>0.283</td>
<td>0.0014</td>
<td>0.0015</td>
<td>0.000186</td>
<td>9,007</td>
</tr>
<tr>
<td>1.99</td>
<td>4.00</td>
<td>48.4</td>
<td>42.5</td>
<td>5.9</td>
<td>3.98</td>
<td>3.49</td>
<td>0.485</td>
<td>0.0031</td>
<td>0.0032</td>
<td>0.000411</td>
<td>8,495</td>
</tr>
<tr>
<td>1.99</td>
<td>6.00</td>
<td>72.6</td>
<td>64.1</td>
<td>8.5</td>
<td>5.97</td>
<td>5.27</td>
<td>0.699</td>
<td>0.0052</td>
<td>0.0053</td>
<td>0.000675</td>
<td>7,812</td>
</tr>
<tr>
<td>2.00</td>
<td>8.00</td>
<td>97.2</td>
<td>86.3</td>
<td>10.9</td>
<td>8.00</td>
<td>7.10</td>
<td>0.895</td>
<td>0.0077</td>
<td>0.0079</td>
<td>0.000990</td>
<td>7,176</td>
</tr>
<tr>
<td>1.99</td>
<td>10.00</td>
<td>121.1</td>
<td>107.9</td>
<td>13.2</td>
<td>9.96</td>
<td>8.88</td>
<td>1.085</td>
<td>0.0105</td>
<td>0.0108</td>
<td>0.001353</td>
<td>6,560</td>
</tr>
</tbody>
</table>
APPENDIX C
SUPPORTING DOCUMENTS
**EXPLANATION OF BORING LOG INFORMATION**

**DESCRIPTION OF SYMBOLS AND ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Sampling</th>
<th>Water Level</th>
<th>Field Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auger</td>
<td>▼ Water Initially Encountered</td>
<td>(HP) Hand Penetrometer</td>
</tr>
<tr>
<td>Split Spoon</td>
<td>▼ Water Level After a Specified Period of Time</td>
<td>(T) Torvane</td>
</tr>
<tr>
<td>Shelby Tube</td>
<td>▼ Water Level After a Specified Period of Time</td>
<td>(b/f) Standard Penetration Test (blows per foot)</td>
</tr>
<tr>
<td>Macro Core</td>
<td></td>
<td>(PID) Photo-Ionization Detector</td>
</tr>
<tr>
<td>Ring Sampler</td>
<td></td>
<td>(OVA) Organic Vapor Analyzer</td>
</tr>
<tr>
<td>Rock Core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grab Sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Recovery</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WATER LEVEL**

<table>
<thead>
<tr>
<th>Sampling Method</th>
<th>Water Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auger</td>
<td>8 - 15</td>
</tr>
<tr>
<td>Split Spoon</td>
<td>10 - 18</td>
</tr>
<tr>
<td>Shelby Tube</td>
<td>15 - 30</td>
</tr>
<tr>
<td>Macro Core</td>
<td>19 - 42</td>
</tr>
<tr>
<td>Ring Sampler</td>
<td>20 - 42</td>
</tr>
<tr>
<td>Rock Core</td>
<td>25 - 50</td>
</tr>
<tr>
<td>Grab Sample</td>
<td>30 - 50</td>
</tr>
<tr>
<td>No Recovery</td>
<td></td>
</tr>
</tbody>
</table>

**DESCRIPTIVE SOIL CLASSIFICATION**

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

**LOCATION AND ELEVATION NOTES**

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

**RELATIVE DENSITY OF COARSE-GRAINED SOILS**

(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance. Includes gravels, sands and silts.

<table>
<thead>
<tr>
<th>STRENGTH TERMS</th>
<th>Standard Penetration or N-Value Blows/Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>0 - 3</td>
</tr>
<tr>
<td>Loose</td>
<td>4 - 9</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>10 - 29</td>
</tr>
<tr>
<td>Dense</td>
<td>30 - 50</td>
</tr>
<tr>
<td>Very Dense</td>
<td>&gt; 50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consistency</th>
<th>Unconfined Compressive Strength, Qu, psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Soft</td>
<td>less than 500</td>
</tr>
<tr>
<td>Soft</td>
<td>500 to 1,000</td>
</tr>
<tr>
<td>Medium-Stiff</td>
<td>1,000 to 2,000</td>
</tr>
<tr>
<td>Stiff</td>
<td>2,000 to 4,000</td>
</tr>
<tr>
<td>Very Stiff</td>
<td>4,000 to 8,000</td>
</tr>
<tr>
<td>Hard</td>
<td>&gt; 8,000</td>
</tr>
</tbody>
</table>

**CONSISTENCY OF FINE-GRAINED SOILS**

(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance.

<table>
<thead>
<tr>
<th>Plasticity Index</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-plastic</td>
</tr>
<tr>
<td>1 - 10</td>
<td>Low</td>
</tr>
<tr>
<td>11 - 30</td>
<td>Medium</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>High</td>
</tr>
</tbody>
</table>

**RELATIVE PROPORTIONS OF SAND AND GRAVEL**

<table>
<thead>
<tr>
<th>Descriptive Term(s)</th>
<th>Percent of Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace</td>
<td>&lt; 15</td>
</tr>
<tr>
<td>With Modifier</td>
<td>15 - 29</td>
</tr>
<tr>
<td>Modifier</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>

**GRAIN SIZE TERMINOLOGY**

<table>
<thead>
<tr>
<th>Particle Size</th>
<th>Major Component of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 12 in. (300 mm)</td>
<td>Boulders</td>
</tr>
<tr>
<td>12 in. to 3 in. (300 mm to 75 mm)</td>
<td>Cobbles</td>
</tr>
<tr>
<td>3 in. to #4 sieve (75 mm to 4.75 mm)</td>
<td>Gravel</td>
</tr>
<tr>
<td>#4 to #200 sieve (4.75 mm to 0.075 mm)</td>
<td>Sand</td>
</tr>
<tr>
<td>Passing #200 sieve (0.075 mm)</td>
<td>Silt or Clay</td>
</tr>
</tbody>
</table>

**RELATIVE PROPORTIONS OF FINES**

<table>
<thead>
<tr>
<th>Descriptive Term(s)</th>
<th>Percent of Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>With Modifier</td>
<td>5 - 12</td>
</tr>
<tr>
<td>Modifier</td>
<td>&gt; 12</td>
</tr>
</tbody>
</table>

**PLASTICITY DESCRIPTION**

<table>
<thead>
<tr>
<th>Particle Size</th>
<th>Plasticity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-plastic</td>
<td>0</td>
</tr>
<tr>
<td>Low</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Medium</td>
<td>11 - 30</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>
### UNIFIED SOIL CLASSIFICATION SYSTEM

**Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests**

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Group Symbol</th>
<th>Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gravels:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 50% retained on No. 200 sieve</td>
<td>Cu = 4 and/or 1 and Ce = 3</td>
<td>GW Well-graded gravel</td>
</tr>
<tr>
<td>More than 50% coarse fraction retained on No. 4 sieve</td>
<td>Cu = 4 and/or 1 and Ce = 3</td>
<td>GP Poorly graded gravel</td>
</tr>
<tr>
<td>More than 12% fines</td>
<td>Fines classify as ML or MH</td>
<td>GM Silty gravel</td>
</tr>
<tr>
<td>Gravels with Fines:</td>
<td>Fines classify as CL or CH</td>
<td>GC Clayey gravel</td>
</tr>
<tr>
<td><strong>Sands:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% or more of coarse fraction passes No. 4 sieve</td>
<td>Cu = 6 and/or 1 and Ce = 3</td>
<td>SW Well-graded sand</td>
</tr>
<tr>
<td>More than 12% fines</td>
<td>Fines classify as ML or MH</td>
<td>SM Silty sand</td>
</tr>
<tr>
<td>Sands with Fines:</td>
<td>Fines classify as CL or CH</td>
<td>SC Clayey sand</td>
</tr>
<tr>
<td><strong>Sands with Fines:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 12% fines</td>
<td>Fines classify as ML or MH</td>
<td>SM Silty sand</td>
</tr>
<tr>
<td>Gravels with 5 to 12% fines</td>
<td>GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.</td>
<td></td>
</tr>
<tr>
<td>Sands with 5 to 12% fines</td>
<td>SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.</td>
<td></td>
</tr>
</tbody>
</table>

**Silts and Clays:**

| Inorganic: | PI plots on or above “A” line | CL Lean clay |
| Organic: | PI plots below “A” line | ML Silt |
| **Organic:** | | |
| Liquid limit - oven dried | OL Organic clay |
| Liquid limit - not dried | Organic silt |
| **PI:** | | |
| PI plots on or above “A” line | CH Fat clay |
| PI plots below “A” line | MH Elastic Silt |
| **Organic:** | | |
| Liquid limit - oven dried | OH Organic clay |
| Liquid limit - not dried | Organic silt |

**Highly Organic Soils:**

| PI plots on or above “A” line | PT Peat |
| PI plots below “A” line | |

**Equations**

\[ \text{Cu} = \frac{D_{60}/D_{10}}{D_{10} \times D_{60}} \]

**Notes**

- A Based on the material passing the 3-in. (75-mm) sieve
- B If field sample contained cobbles or boulders, or both, add “with cobbles or boulders, or both” to group name.
- C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
- D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
- E If soil contains 15% sand, add “with sand” to group name.
- F If fines classify as GM, use dual symbol GC-GM, or SC-SM.
- G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
# AASHTO Soil Classification System

<table>
<thead>
<tr>
<th>General classification</th>
<th>Silt-clay materials (more than 35% of total sample passing No. 200)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>A-7</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-7.5</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-7.6</strong></td>
</tr>
<tr>
<td><strong>Group classification</strong></td>
<td><strong>A-4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-5</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-6</strong></td>
</tr>
</tbody>
</table>

**Sieve analysis (percent passing)**

<table>
<thead>
<tr>
<th></th>
<th>No. 10</th>
<th>No. 40</th>
<th>No. 200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36 min.</td>
<td>36 min.</td>
<td>36 min.</td>
</tr>
</tbody>
</table>

**Characteristics of fraction passing No. 40**

<table>
<thead>
<tr>
<th></th>
<th>40 max.</th>
<th>41 min.</th>
<th>40 max.</th>
<th>41 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasticity index</td>
<td>10 max.</td>
<td>10 max.</td>
<td>11 min.</td>
<td>11 min.</td>
</tr>
</tbody>
</table>

**Usual types of significant constituent materials**

- Silty soils
- Clayey soils

**General subgrade rating**

- Fair to Poor

*For A-7.5, PL ≤ LL - 30
'For A-7.6, PL > LL - 30

<table>
<thead>
<tr>
<th>General classification</th>
<th>Granular materials (35% or less of total sample passing No. 200)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>A-1</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-1-a</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-1-b</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-3</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-2-4</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-2-5</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-2-6</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A-2-7</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>50 max.</th>
<th>50 max.</th>
<th>51 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieve analysis (percent passing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 40</td>
<td>30 max.</td>
<td>51 min.</td>
<td></td>
</tr>
<tr>
<td>No. 200</td>
<td>15 max.</td>
<td>25 max.</td>
<td>10 max.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>40 max.</th>
<th>41 min.</th>
<th>40 max.</th>
<th>41 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid limit</td>
<td>40 max.</td>
<td>41 min.</td>
<td>40 max.</td>
<td>41 min.</td>
</tr>
<tr>
<td>Plasticity index</td>
<td>10 max.</td>
<td>10 max.</td>
<td>11 min.</td>
<td>11 min.</td>
</tr>
</tbody>
</table>

**Usual types of significant constituent materials**

- Stone fragments, gravel, and sand
- Fine sand
- Silty or clayey gravel and sand

**General subgrade rating**

- Excellent to Good
APPENDIX D
Photographic Log
Box 1: Borings B-1 to B-3

Box 2: Boring B-4 to B-6
Box 3: Borings B-7 to B-10

Box 4: Borings B-11 to B-13
Box 5: Borings B-14 to B-17

Box 6: Borings B-18 to B-20
Box 7: Borings B-21 to B-24

Box 8: Borings B-25 to B-27
Box 9: Borings B-28 to B-30

Box 10: Borings B-31 to B-33
Shoulder Survey Report
AHTD Job No. CA0101, Cross County Line - Highway 147 (Widening) (S)
August 21, 2014 ■ Terracon Project No. 35135123

Box 11: Borings B-34 to B-36

Box 12: Borings B-37 to B-39
Box 13: Borings B-41 to B-43

Box 14: Borings B-44 to B-46
Shoulder Survey Report
AHTD Job No. CA0101, Cross County Line - Highway 147 (Widening) (S)
August 21, 2014 ■ Terracon Project No. 35135123

Box 15: Borings B-47 to B-49

Box 16: Borings B-50 to B-53
Box 17: Borings B-54 to B-56

Box 18: Borings B-57 to B-59
Box 19: Borings B-60 to B-62

Box 20: Borings B-63 to B-65
Box 21: Borings B-66 to B-69

Box 22: Borings B-69 to B-71
Box 23: Borings B-72 to B-74

Box 24: Borings B-75 to B-77
Box 25: Borings B-78 to B-80

Box 26: Borings B-81 to B-83
Box 27: Borings B-84 to B-86

Box 28: Borings B-87 to B-89
Box 29: Borings B-90 to B-92

Box 30: Borings B-93 to B-95
Box 31: Borings B-96 to B-97