

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 070375

FEDERAL AID PROJECT NO. NHPP-0020(21)

ALSOBROOK SLOUGH STR. & APPRS. (S)

STATE HIGHWAY 8 SECTION 6

IN DALLAS COUNTY

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.



ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Scott E. Bennett, P.E., Director

MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

January 2, 2019

**TO:** Mr. Rick Ellis, Bridge Engineer

**SUBJECT:** Job No. 070375  
Alsobrook Slough Str. & Apprs. (S)  
Dallas County  
Route 8 Section 6

Transmitted herewith are a brief summary of the geology and site conditions, D50 scour analysis, and the logs of the borings conducted for the structure and approaches of the above referenced project. The samples obtained by the Standard Penetration Tests were brought to the laboratory and visually classified by experienced lab personnel to confirm the field identifications.

This project consists of replacing the Highway 8 Bridge, over Alsobrook Slough, between the towns of Manning and Princeton. The new bridge will be constructed on the existing alignment and a temporary detour structure will be constructed south of the existing. Three of the six requested borings were inaccessible due to steep slopes and high water levels in the channel. The three borings that were not obtained were located at: 109+99.5 C.L. Construction, 110+30.5 C.L. Construction, and 110+61.5 C.L. Construction. The three borings that were obtained had to be offset, due to traffic restrictions. The obtained borings are anticipated to represent uniform site conditions and should be adequate to design the proposed prestressed concrete pile foundations.

Embankment analyses included global stability with seismic design consideration utilizing a horizontal acceleration coefficient of 0.131, as provided by Bridge Design. The proposed embankment configuration provides for a satisfactory Factor of Safety for seismic and static conditions. If you have any questions concerning these recommendations, please contact the Geotechnical Section.

  
Michael C. Benson  
Materials Engineer

MCB:rpt:mlg  
cc: State Construction Engineer - Master File Copy  
District 7 Engineer  
G.C. File

**GEOLOGY AND SITE CONDITIONS**  
**Job No. 070375**  
**Alsobrook Slough Str. & Apprs. (S)**  
**Dallas County**  
**Route 8 Section 6**

**Site Conditions**

The existing bridge has seven spans and is constructed of a precast concrete deck with concrete caps on timber pilings and concrete end walls. The guardrail is composed of steel held up by concrete posts. A concrete footing has been poured around bent four with steel pilings placed on both sides of the pier. Some pilings appear to show some rotation. Alsobrook Slough flows in a southerly direction. The area surrounding the bridge is moderately wooded.

**Site Geology**

The proposed bridge locations are located on deposits mapped as Quaternary alluvial deposits. Alluvial deposits are typically composed of gravels, sands, silts, clays, and mixtures of any and/or all of these. The alluvial deposits here are located over the Sparta Formation of the Claiborne Group of Paleogene age.

The Paleogene deposits were encountered between 14.5 to 20.5 feet below ground level. The Sparta at the job site is composed of primarily silty sands down to a depth of 75 to 85 feet below ground level. At this depth, the lithology changes to consist primarily of sandy clay.

**Subsurface Conditions**

Based on the results of the borings, the subsurface stratigraphy may be generalized as follows:

- |                   |   |
|-------------------|---|
| 0 to 25 Feet:     | Varies from moist to wet, very loose to dense, brown and gray <b>sandy silt to silty sand to clayey sand</b> to very soft <b>sandy clay</b> . <b>Gravel</b> was encountered in some samples in this zone. <b>Cobbles and boulders</b> were encountered in two of the borings in the upper five feet of this zone. |
| 25 to 75 Feet:    | Consists of wet, medium dense to very dense, gray to brown <b>silty sand to silt with sand</b> . One sample in this zone contained hard <b>sandy clay</b> .   |
| 75 to 95 Feet:    | Varies from wet, dense to very dense, brown to gray <b>silt with sand to clayey sand</b> to moist, very stiff to hard <b>clay</b> .   |
| 95 to 101.5 Feet: | Consists of moist to wet, hard, brown to gray <b>sandy clay to clay</b> .   |

**D<sub>50</sub> AGGREGATE ANALYSIS  
FOR SCOUR CALCULATIONS**

| <b>Job No. 070375</b> |                |                    |                               |                   |                                  |
|-----------------------|----------------|--------------------|-------------------------------|-------------------|----------------------------------|
| <b>Creek Name</b>     | <b>Station</b> | <b>Sample Type</b> | <b>Location</b>               | <b>Depth (FT)</b> | <b>Aggregate Size (D50) (IN)</b> |
| Alsobrook Slough      | 110+24         | Slough Bank        | 24' Left of Construction C.L. | N/A               | 0.0029                           |

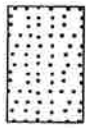
# LEGEND

## SOIL TYPES

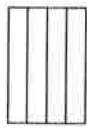
(SHOWN IN SYMBOL COLUMN)  
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



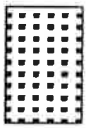
CLAY



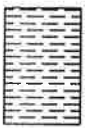
ORGANIC  
MATTER

## ROCK TYPES

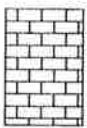
(SHOWN IN SYMBOL COLUMN)



SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY



DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

| GRANULAR SOIL         |              | CLAY                  |              | CLAY-SHALE            |              | SHALE   |             |
|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|---|-------------|
| *N <sub>r</sub> Value | Density      | *N <sub>r</sub> Value | Consistency  | *N <sub>r</sub> Value | Consistency  | *N <sub>r</sub> Value                           | Consistency |
| 0-4                   | Very Loose   | 0-1                   | Very Soft    | 0-1                   | Very Soft    |   |             |
| 5-10                  | Loose        | 2-4                   | Soft         | 2-4                   | Soft         | 31-60   | Soft        |
| 11-30                 | Medium Dense | 5-8                   | Medium Stiff | 5-8                   | Medium Stiff | Over 60   |             |
| 31-50                 | Dense        | 9-15                  | Stiff        | 9-15                  | Stiff        | More than 2'                                    |             |
| Over 50               | Very Dense   | 16-30                 | Very Stiff   | 16-30                 | Very Stiff   | Penetration                                     |             |
|                       |              | 31-60                 | Hard         | 31-60                 | Hard         | in 60 Blows Medium Hard                         |             |
|                       |              | Over 60               | Very Hard    | Over 60               | Very Hard    | Less than 2'<br>Penetration<br>in 60 Blows Hard |             |

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test -- Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value (N<sub>r</sub>) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency (N<sub>60</sub>) can be obtained by multiplying N<sub>r</sub> by the hammer correction factor published on the boring log.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 1  
PAGE 1 OF 3

JOB NO. 070375 Dallas County  
JOB NAME: Alsobrook Slough Str. & Apprs. (S)  
Route 8 Section 6  
STATION: 109+68  
LOCATION: 21' Right of Construction Centerline  
LOGGED BY: Connor Bunton

DATE: Sept 19 and 20, 2018  
TYPE OF DRILLING:  
Hollow Stem Auger - Rotary Wash  
EQUIPMENT: Acker 1779

HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 101.5

| DEPTH<br>FT. | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL                        | SOIL<br>GROUP | PLASTIC<br>LIMIT | % MOIST. | LIQUID<br>LIMIT | DRY WEIGHT | LBS PER CU.FT. | NO. OF BLOWS<br>PER 6-IN. | %<br>T C R | %<br>R Q D |
|--------------|--------|---------|--|---------------|------------------|----------|-----------------|------------|----------------|---------------------------|------------|------------|
|              |        |         | SURFACE ELEVATION: 214.9                       |               |                  |          |                 |            |                |                           |            |            |
| 5            |        | X       | Wet, Very Soft, Gray Sandy Clay                |               |                  |          |                 |            |                | 0<br>0-1                  |            |            |
| 10           |        | X       | Wet, Dense, Light Brown Silty Sand with Gravel |               |                  |          |                 |            |                | 11<br>17-20               |            |            |
| 15           |        | X       | Wet, Medium Dense, Brown Clayey Sand           |               |                  |          |                 |            |                | 5<br>11-14                |            |            |
| 20           |        | X       |  |               |                  |          |                 |            |                | 24<br>28-24               |            |            |
| 25           |        | X       |  |               |                  |          |                 |            |                | 18<br>28-33               |            |            |
| 30           |        | X       | Wet, Very Dense, Brown Silty Sand              |               |                  |          |                 |            |                | 20<br>35-44<br>(10")      |            |            |
| 35           |        | X       |  |               |                  |          |                 |            |                |                           |            |            |

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 1  
PAGE 2 OF 3

JOB NO. 070375 Dallas County  
JOB NAME: Alsobrook Slough Str. & Apprs. (S)  
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DATE: Sept 19 and 20, 2018  
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Hollow Stem Auger - Rotary Wash  
EQUIPMENT: Acker 1779  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 101.5

| DEPTH<br>FT. | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL                                      | SOIL<br>GROUP | PLASTIC<br>LIMIT | % MOIST. | LIQUID<br>LIMIT | DRY WEIGHT | LBS PER CU.FT. | NO. OF BLOWS<br>PER 6-IN. | % T<br>C<br>R | % R<br>Q<br>D |
|--------------|--------|---------|--|---------------|------------------|----------|-----------------|------------|----------------|---------------------------|---------------|---------------|
|              |        |         | SURFACE ELEVATION: 214.9                                     |               |                  |          |                 |            |                |                           |               |               |
| 40           |        | X       | Wet, Very Dense, Brown Silty Sand with Trace Lignite         |               |                  |          |                 |            |                | 16<br>26-32<br>(7")       |               |               |
| 45           |        | X       | Wet, Medium Dense, Brown Silty Sand                          |               |                  |          |                 |            |                | 10<br>12-16               |               |               |
| 50           |        | X       | Wet, Very Dense, Brown Silty Sand with Trace Pyrite Nodules  |               |                  |          |                 |            |                | 31<br>48-21<br>(10")      |               |               |
| 55           |        | X       | Wet, Very Dense, Brown Clayey Sand with Trace Pyrite Nodules |               |                  |          |                 |            |                | 7<br>25-38                |               |               |
| 60           |        | X       | Wet, Very Dense, Brown Silty Sand                            |               |                  |          |                 |            |                | 20<br>30-26<br>(7")       |               |               |
| 65           |        | X       | Wet, Very Dense, Brown Silty Sand with Trace Lignite         |               |                  |          |                 |            |                | 18<br>42-35<br>(8")       |               |               |
| 70           |        | X       | Wet, Very Dense, Brown Sand with Some Clay                   |               |                  |          |                 |            |                | 26<br>58-16<br>(7")       |               |               |

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 1  
PAGE 3 OF 3

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| DEPTH<br>FT. | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL                    | SOIL<br>GROUP | PLASTIC<br>LIMIT | % MOIST. | LIQUID<br>LIMIT | DRY WEIGHT | LBS PER CU.FT. | NO. OF BLOWS<br>PER 6-IN. | % T C R | % R Q D |
|--------------|--------|---------|--|---------------|------------------|----------|-----------------|------------|----------------|---------------------------|---------|---------|
|              |        |         | SURFACE ELEVATION: 214.9                   |               |                  |          |                 |            |                |                           |         |         |
| 75           |        |         | Wet, Very Dense, Brown Silty Sand          |               |                  |          |                 |            |                | 21<br>48-31<br>(10")      |         |         |
| 80           |        |         | Wet, Very Dense, Brown Sand with Some Clay |               |                  |          |                 |            |                | 19<br>37-40               |         |         |
| 85           |        |         | Moist, Hard, Brown Sandy Clay              |               |                  |          |                 |            |                | 22<br>41-25               |         |         |
| 90           |        |         | Moist, Hard, Brown Clay                    |               |                  |          |                 |            |                | 10<br>13-18               |         |         |
| 95           |        |         |  |               |                  |          |                 |            |                | 11<br>18-18               |         |         |
| 100          |        |         |  |               |                  |          |                 |            |                | 7<br>15-31                |         |         |
|              |        |         | Moist, Hard, Brown Clay                    |               |                  |          |                 |            |                | 15<br>24-21               |         |         |
|              |        |         | Boring Terminated                          |               |                  |          |                 |            |                |                           |         |         |
| 105          |        |         |  |               |                  |          |                 |            |                |                           |         |         |

REMARKS:



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 2  
PAGE 1 OF 3

JOB NO. 070375 Dallas County  
JOB NAME: Alsobrook Slough Str. & Apprs. (S)  
Route 8 Section 6  
STATION: 110+94  
LOCATION: 22' Right of Construction Centerline  
LOGGED BY: Connor Bunton

DATE: Sept 10, 11, and 12, 2018  
TYPE OF DRILLING:  
Hollow Stem Auger - Rotary Wash  
EQUIPMENT: Acker 1779  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 101.5

| DEPTH<br>FT. | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL                                    | SOIL<br>GROUP | PLASTIC<br>LIMIT | % MOIST. | LIQUID<br>LIMIT | DRY WEIGHT | LBS PER CU.FT. | NO. OF BLOWS<br>PER 6-IN. | %<br>T C R | %<br>R Q D |
|--------------|--------|---------|--|---------------|------------------|----------|-----------------|------------|----------------|---------------------------|------------|------------|
|              |        |         | SURFACE ELEVATION: 216.4                                   |               |                  |          |                 |            |                |                           |            |            |
| 5            |        |         | Sandy Clay with Gravel, Cobbles, and Boulders              | -             |                  |          |                 |            |                |                           |            |            |
| 10           |        |         | Moist, Loose, Brown and Gray Silty Sand with Trace Gravel* | SM            | NP               |          |                 |            |                | 4<br>3-3                  |            |            |
| 15           |        |         | Wet, Medium Dense, Gray Silty Sand with Trace Gravel       | SM            |                  |          |                 |            |                | 3<br>6-12                 |            |            |
| 20           |        |         | Wet, Medium Dense, Gray Sandy Silt                         | ML            | NP               |          |                 |            |                | 8<br>14-16                |            |            |
| 25           |        |         | Wet, Dense, Gray Silty Sand                                | SM            | NP               |          |                 |            |                | 25<br>28-22               |            |            |
| 30           |        |         | Wet, Dense, Gray Silty Sand with Gravel                    | SM            | NP               |          |                 |            |                | 7<br>22-16                |            |            |
| 35           |        |         | Wet, Dense, Gray Silty Sand with Some Lignite              | SM            | NP               |          |                 |            |                | 6<br>9-12                 |            |            |

REMARKS: \* Water level reading at 17 hours was approximately 8' below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. 2  
PAGE 2 OF 3

JOB NO. 070375 Dallas County  
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LOGGED BY: Connor Bunton

DATE: Sept 10, 11, and 12, 2018  
TYPE OF DRILLING:  
Hollow Stem Auger - Rotary Wash  
EQUIPMENT: Acker 1779  
HAMMER CORRECTION FACTOR: N/A

COMPLETION DEPTH: 101.5

| DEPTH<br>FT. | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL                               | SOIL<br>GROUP | PLASTIC<br>LIMIT | % MOIST. | LIQUID<br>LIMIT | DRY WEIGHT | LBS PER CU.FT. | NO. OF BLOWS<br>PER 6-IN. | %<br>T C R | %<br>R Q D |
|--------------|--------|---------|---|---------------|------------------|----------|-----------------|------------|----------------|---------------------------|------------|------------|
|              |        |         | SURFACE ELEVATION: 216.4                              |               |                  |          |                 |            |                |                           |            |            |
| 40           |        | X       | Wet, Hard, Gray Sandy Lean Clay                       | CL            | 21               |          | 29              |            |                | 5<br>10-22                |            |            |
| 45           |        | X       | Wet, Dense, Gray Silty Sand                           | SM            | NP               |          |                 |            |                | 17<br>17-22               |            |            |
| 50           |        | X       | Wet, Dense, Gray Sandy Silt with Trace Pyrite Nodules | ML            | NP               |          |                 |            |                | 6<br>10-28                |            |            |
| 55           |        | X       | Wet, Very Dense, Gray Silty Sand                      | SM            | NP               |          |                 |            |                | 20<br>38-38               |            |            |
| 60           |        | X       | Wet, Very Dense, Gray Silty Sand                      | SM            | NP               |          |                 |            |                | 44<br>34-20               |            |            |
| 65           |        | X       | Wet, Very Dense, Gray Silt with Sand                  | ML            | NP               |          |                 |            |                | 23<br>25-48               |            |            |
| 70           |        | X       | Wet, Very Dense, Gray Silty Sand                      | SM            | NP               |          |                 |            |                | 16<br>32-42               |            |            |

REMARKS: \* Water level reading at 17 hours was approximately 8' below ground level.











| <b>Type</b>    | <b>PG76-22</b>          |                            |
|----------------|-------------------------|----------------------------|
|                | <b>Asphalt Cement %</b> | <b>Mineral Aggregate %</b> |
| Surface Course | 5.2                     | 94.8                       |
| Binder Course  | 3.8                     | 96.2                       |
| Base Course    | 3.6                     | 96.4                       |



Michael C. Benson  
Materials Engineer

MCB:pt:bjj  
Attachment

cc: State Constr. Eng. – Master File Copy  
District 7 Engineer  
System Information and Research Div.  
G. C. File



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION  
MICHAEL BENSON, MATERIALS ENGINEER  
\*\*\* SOIL SURVEY STRENGTH TEST REPORT \*\*\*

DATE - 12/06/2017  
JOB NUMBER - 070375

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 20  
DISTRICT NO. - 07

JOB NAME - ALSOBROOK SLOUGH STR. & APPRS.(S)

\*\*\*\*\*  
\* STATION LIMITS R-VALUE AT 240 psi \*  
\*\*\*\*\*

BEGIN JOB - END JOB 20

RESILIENT MODULUS  
STA. 106 + 00 8433

-----  
REMARKS -

AASHTO TESTS : T190

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS  
RECOMPACTED SAMPLES**

|                         |                                    |                                |               |     |
|-------------------------|------------------------------------|--------------------------------|---------------|-----|
| <b>Job No.</b>          | 070375                             | <b>Material Code</b>           | SSRVPS        |     |
| <b>Date Sampled:</b>    | 11/20/17                           | <b>Station No.:</b>            | 106+00        |     |
| <b>Date Tested:</b>     | November 30, 2017                  | <b>Location:</b>               | 15'RT         |     |
| <b>Name of Project:</b> | ALSOBROOK SLOUGH STR. & APPRS. (S) |                                |               |     |
| <b>County:</b>          | <b>Code:</b> 20                    | <b>Name:</b>                   | DALLAS        |     |
| <b>Sampled By:</b>      | FRAZIER/BOUIE/JORDAN               |                                | <b>Depth:</b> | 0-5 |
| <b>Lab No.:</b>         | 20173461                           | <b>AASHTO Class:</b>           | A-2-4 (0)     |     |
| <b>Sample ID:</b>       | RV692                              | <b>Material Type (1 or 2):</b> | 2             |     |
| <b>LATITUDE:</b>        |                                    | <b>LONGITUDE:</b>              |               |     |

**1. Testing Information:**

|  |    |
|--|----|
| Preconditioning - Permanent Strain > 5% (Y=Yes or N= No) | N  |
| Testing - Permanent Strain > 5% (Y=Yes or N=No)          | N  |
| Number of Load Sequences Completed (0-15)                | 15 |

**2. Specimen Information:**

|  |       |
|--|-------|
| Specimen Diameter (in):                |       |
| Top                                    | 3.95  |
| Middle                                 | 3.95  |
| Bottom                                 | 3.95  |
| Average                                | 3.95  |
| Membrane Thickness (in):               | 0.01  |
| Height of Specimen, Cap and Base (in): | 8.02  |
| Height of Cap and Base (in):           | 0.00  |
| Initial Length, Lo (in):               | 8.02  |
| Initial Area, Ao (sq. in):             | 12.18 |
| Initial Volume, AoLo (cu. in):         | 97.68 |

**3. Soil Specimen Weight:**

|                              |         |
|------------------------------|---------|
| Weight of Wet Soil Used (g): | 3393.70 |
|------------------------------|---------|

**4. Soil Properties:**

|                               |       |
|-------------------------------|-------|
| Optimum Moisture Content (%): | 10.4  |
| Maximum Dry Density (pcf):    | 122.6 |
| 95% of MDD (pcf):             | 116.5 |
| In-Situ Moisture Content (%): | N/A   |

**5. Specimen Properties:**

|                                     |         |
|-------------------------------------|---------|
| Wet Weight (g):                     | 3393.70 |
| Compaction Moisture content (%):    | 10.4    |
| Compaction Wet Density (pcf):       | 132.38  |
| Compaction Dry Density (pcf):       | 119.91  |
| Moisture Content After Mr Test (%): | 10.2    |

**6. Quick Shear Test (Y=Yes, N=No, N/A=Not Applicable):**

#VALUE!

**7. Resilient Modulus, Mr:**

7961(Sc)^-0.13355(S3)^0.43565

**8. Comments**

\_\_\_\_\_

\_\_\_\_\_

**9. Tested By:**

GW

**Date:** November 30, 2017

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS  
RECOMPACTED SAMPLES**

**Job No.** 070375 **Material Code** SSRVPS  
**Date Sampled:** 11/20/17 **Station No.:** 106+00  
**Date Tested:** November 30, 2017 **Location:** 15'RT

**Name of Project:** ALSOBROOK SLOUGH STR. & APPRS. (S)  
**County:** Code: 20 **Name:** DALLAS

**Sampled By:** FRAZIER/BOUJE/JORDAN **Depth:** 0-5  
**Lab No.:** 20173461 **AASHTO Class:** A-2-4 (0)  
**Sample ID:** RV692 **Material Type (1 or 2):** 2  
**LATITUDE:** **LONGITUDE:**

| PARAMETER   | Chamber Confining Pressure | Nominal Maximum Axial Stress | Actual Applied Max. Axial Load | Actual Applied Cyclic Load | Actual Applied Contact Load | Actual Applied Max. Axial Stress | Actual Applied Cyclic Stress | Actual Applied Contact Stress | Average Recov Def. LVDT 1 and 2 | Resilient Strain        | Resilient Modulus     |
|-------------|----------------------------|------------------------------|--------------------------------|----------------------------|-----------------------------|----------------------------------|------------------------------|-------------------------------|---------------------------------|-------------------------|-----------------------|
|             | S <sub>3</sub><br>psi      | S <sub>cyclic</sub><br>psi   | P <sub>max</sub><br>lbs        | P <sub>cyclic</sub><br>lbs | P <sub>contact</sub><br>lbs | S <sub>max</sub><br>psi          | S <sub>cyclic</sub><br>psi   | S <sub>contact</sub><br>psi   | H <sub>avg</sub><br>in          | ε <sub>r</sub><br>in/in | M <sub>r</sub><br>psi |
| Sequence 1  | 6.0                        | 2.0                          | 25.2                           | 22.4                       | 2.8                         | 2.1                              | 1.8                          | 0.2                           | 0.00093                         | 0.00012                 | 15,935                |
| Sequence 2  | 6.0                        | 4.0                          | 47.4                           | 44.6                       | 2.8                         | 3.9                              | 3.7                          | 0.2                           | 0.00193                         | 0.00024                 | 15,193                |
| Sequence 3  | 6.0                        | 6.0                          | 70.2                           | 66.6                       | 3.6                         | 5.8                              | 5.5                          | 0.3                           | 0.00309                         | 0.00039                 | 14,184                |
| Sequence 4  | 6.0                        | 8.0                          | 94.4                           | 88.5                       | 5.9                         | 7.8                              | 7.3                          | 0.5                           | 0.00440                         | 0.00055                 | 13,235                |
| Sequence 5  | 6.0                        | 10.0                         | 118.5                          | 110.2                      | 8.3                         | 9.7                              | 9.0                          | 0.7                           | 0.00563                         | 0.00070                 | 12,881                |
| Sequence 6  | 4.0                        | 2.0                          | 25.0                           | 22.4                       | 2.6                         | 2.1                              | 1.8                          | 0.2                           | 0.00107                         | 0.00013                 | 13,748                |
| Sequence 7  | 4.0                        | 4.0                          | 46.7                           | 44.0                       | 2.6                         | 3.8                              | 3.6                          | 0.2                           | 0.00242                         | 0.00030                 | 11,964                |
| Sequence 8  | 4.0                        | 6.0                          | 68.0                           | 65.3                       | 2.7                         | 5.6                              | 5.4                          | 0.2                           | 0.00386                         | 0.00048                 | 11,136                |
| Sequence 9  | 4.0                        | 8.0                          | 92.1                           | 87.0                       | 5.0                         | 7.6                              | 7.1                          | 0.4                           | 0.00520                         | 0.00065                 | 11,018                |
| Sequence 10 | 4.0                        | 10.0                         | 115.9                          | 108.5                      | 7.4                         | 9.5                              | 8.9                          | 0.6                           | 0.00663                         | 0.00083                 | 10,777                |
| Sequence 11 | 2.0                        | 2.0                          | 24.4                           | 21.8                       | 2.6                         | 2.0                              | 1.8                          | 0.2                           | 0.00142                         | 0.00018                 | 10,058                |
| Sequence 12 | 2.0                        | 4.0                          | 45.1                           | 42.5                       | 2.6                         | 3.7                              | 3.5                          | 0.2                           | 0.00318                         | 0.00040                 | 8,798                 |
| Sequence 13 | 2.0                        | 6.0                          | 65.8                           | 63.0                       | 2.7                         | 5.4                              | 5.2                          | 0.2                           | 0.00492                         | 0.00061                 | 8,433                 |
| Sequence 14 | 2.0                        | 8.0                          | 88.3                           | 84.1                       | 4.2                         | 7.3                              | 6.9                          | 0.3                           | 0.00655                         | 0.00082                 | 8,458                 |
| Sequence 15 | 2.0                        | 10.0                         | 111.6                          | 105.0                      | 6.6                         | 9.2                              | 8.6                          | 0.5                           | 0.00806                         | 0.00101                 | 8,580                 |

TESTED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

GW

November 30, 2017

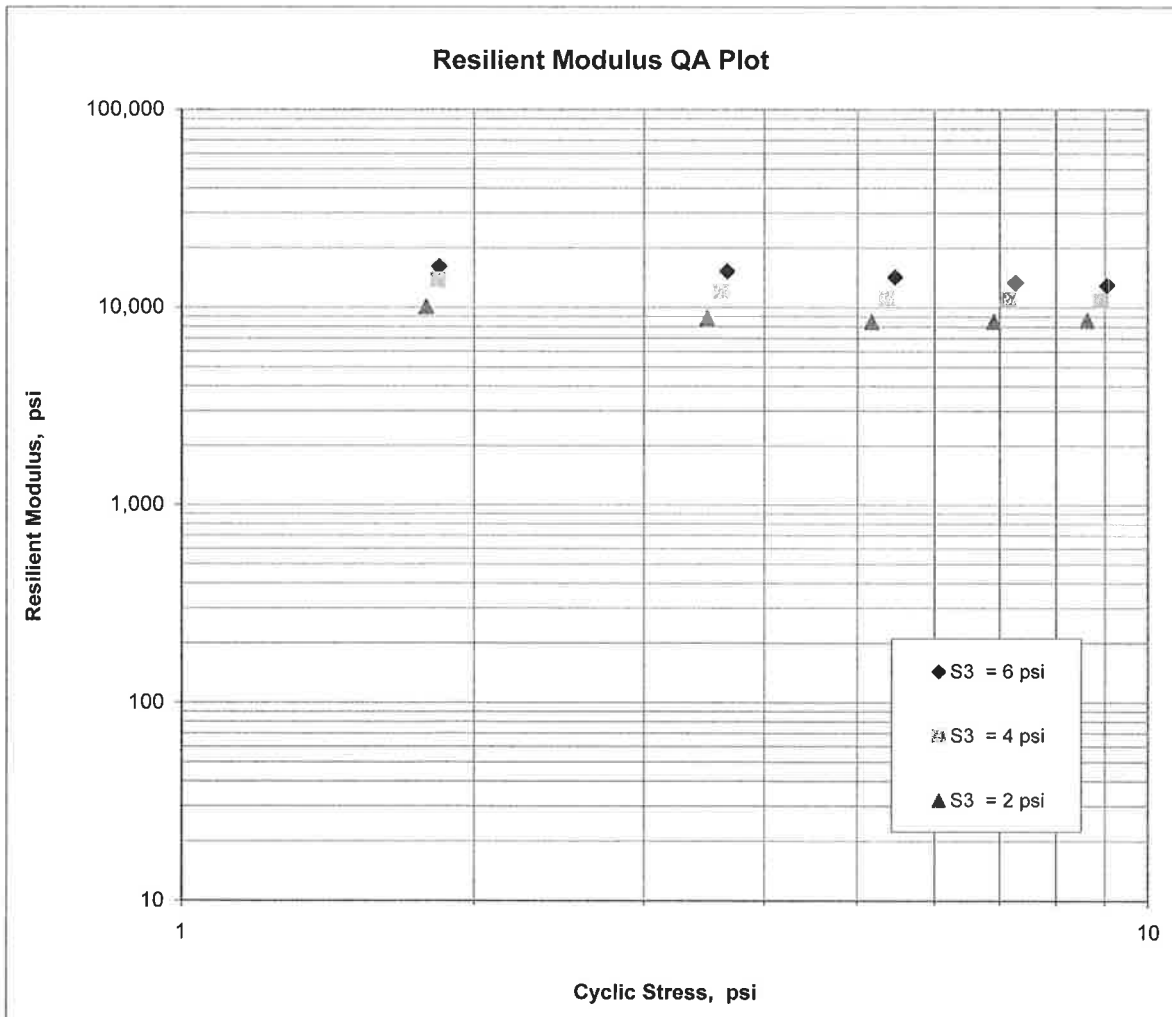
**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS  
RECOMPACTED / THINWALL TUBE SAMPLES**

|                         |                                    |                                |           |
|-------------------------|------------------------------------|--------------------------------|-----------|
| <b>Job No.</b>          | 070375                             | <b>Material Code</b>           | SSRVPS    |
| <b>Date Sampled:</b>    | 11/20/17                           | <b>Station No.:</b>            | 106+00    |
| <b>Date Tested:</b>     | November 30, 2017                  | <b>Location:</b>               | 15'RT     |
| <b>Name of Project:</b> | ALSOBROOK SLOUGH STR. & APPRS. (S) |                                |           |
| <b>County:</b>          | <b>Code:</b> 20                    | <b>Name:</b>                   | DALLAS    |
| <b>Sampled By:</b>      | FRAZIER/BOUIE/JORDAN               |                                |           |
| <b>Lab No.:</b>         | 20173461                           | <b>Depth:</b>                  | 0-5       |
| <b>Sample ID:</b>       | RV692                              | <b>AASHTO Class:</b>           | A-2-4 (0) |
| <b>LATITUDE:</b>        |                                    | <b>Material Type (1 or 2):</b> | 2         |
|                         |                                    | <b>LONGITUDE:</b>              |           |

$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

|                  |                 |
|------------------|-----------------|
| K1 =             | <u>7,961</u>    |
| K2 =             | <u>-0.13355</u> |
| K5 =             | <u>0.43565</u>  |
| R <sup>2</sup> = | <u>0.98</u>     |



**JOB: 070375**

*Arkansas State Highway Transportation Department*

**JOB NAME: ALSOBROOK SLOUGH STR. & APPRS.(S)**

*Materials Division*

**COUNTY NO. 20 DATE TESTED 11/29/2017**

*Michael Benson, Materials Engineer*

| STA.#  | LOC. | DEPTH | COLOR |    |     |     |     |      | L.L. | P.I. | SOIL CLASS | LAB #: | %MOISTURE |
|--------|------|-------|-------|----|-----|-----|-----|------|------|------|------------|--------|-----------|
|        |      |       |       | #4 | #10 | #40 | #80 | #200 |      |      |            |        |           |
|        |      |       |       | S  | I   | E   | V   | E    | S    |      |            |        |           |
| 106+00 | 15RT | 0-5   | RD/BR | 69 | 58  | 50  | 37  | 27   | ND   | NP   | A-2-4(0)   | RV692  |           |
| 106+00 | 05RT | 0-5   | BR/GR | 94 | 85  | 76  | 59  | 44   | 19   | 6    | A-4(0)     | S688   | 11        |
| 106+00 | 15RT | 0-5   | RD/BR | 57 | 49  | 42  | 31  | 23   | 21   | 7    | A-2-4(0)   | S689   | 18.5      |
| 115+00 | 05LT | 0-5   | BROWN | 95 | 91  | 87  | 78  | 57   | 23   | 9    | A-4(2)     | S690   | 17.8      |
| 115+00 | 15LT | 0-5   | BROWN | 92 | 89  | 86  | 71  | 45   | ND   | NP   | A-4(0)     | S691   | 12        |

*comments:* W=MULTIPLE LAYERS

Thursday, December 07, 2017

**JOB:** 070375  
**JOB NAME:** ALSOBROOK SLOUGH STR. & APPRS.(S)

**Arkansas State Highway Transportation Department**  
**Materials Division**

**Michael Benson, Materials Engineer**

**DATE TESTED**  
11/29/2017

**COUNTY NO.** 20

**STA.# LOC.** **PAVEMENT SOUNDINGS**

|        |      |                |                |                           |
|--------|------|----------------|----------------|---------------------------|
| 106+00 | 05RT | ACHMSC<br>6.0W | ACHMBC<br>1.25 | AGG. BASE CRS CL-5<br>7.0 |
| 106+00 | 15RT | ACHMSC         | ACHMBC         | AGG. BASE CRS CL-5        |
| 115+00 | 05LT | ACHMSC<br>7.0W | ACHMBC<br>1.25 | AGG. BASE CRS CL-5<br>6.0 |

**comments:** W=MULTIPLE LAYERS







