

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 030455

FEDERAL AID PROJECT NO. NHPP-0037(37)

DOOLEY CREEK STR. & APPRS. (S)

STATE HIGHWAY 160 SECTION 2

IN LAFAYETTE 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

September 24, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 030455
Dooley Creek Str. & Apprs. (S)
Route 160 Section 2
Lafayette County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of replacing the bridge crossing Dooley Creek on Highway 160. Samples were taken in the existing travel lanes and ditch line.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic clay with sand and gravel. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. There were no slide areas observed within the project limits.

Based on currently available cross sections the construction grade line closely matches that of the existing roadway. The maximum embankment height is approximately 7 feet. Prior to embankment construction all soft unstable organic material in the ditch line should be undercut, anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material utilizing the slope configuration shown in the cross sections.

The proposed cut slopes are acceptable as shown.

Listed below is the additional information requested for use in developing the plans:

1. The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located in the vicinity of Sawyer, OK.

2. Asphalt Concrete Hot Mix

Table with 3 columns: Type, Asphalt Cement %, Mineral Aggregate %. Rows include Surface Course, Binder Course, and Base Course.

Handwritten signature of Michael C. Benson, Materials Engineer

MCB:pt:bjj
Attachment

cc: State Constr. Eng. - Master File Copy
District 3 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 - 08/09/2018
JOB NUMBER - 030455

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 37
DISTRICT NO. - 03

JOB NAME - DOOLEY CREEK STR. & APPRS. (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 5

RESILIENT MODULUS
STA. 104+ 00 6796

REMARKS -

AASHTO TESTS : T190

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

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

| | | | |
|-------------------------|--------------------------------|--------------------------------|-----------|
| Job No. | 030455 | Material Code | SSRVPS |
| Date Sampled: | 7/11/18 | Station No.: | 104+00 |
| Date Tested: | August 7, 2018 | Location: | 18'RT |
| Name of Project: | DOOLEY CREEK STR. & APPRS. (S) | | |
| County: | Code: 37 | Name: | LAFAYETTE |
| Sampled By: | DICKERSON FRAZIER | | |
| Lab No.: | 20181743 | Depth: | 0-5 |
| Sample ID: | RV375 | AASHTO Class: | A-6 (8) |
| LATITUDE: | | Material Type (1 or 2): | 2 |
| | | LONGITUDE: | |

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 | 3.94 |
| 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): | 12.16 |
| Initial Volume, AoLo (cu. in): | 97.52 |

3. Soil Specimen Weight:

| | |
|------------------------------|---------|
| Weight of Wet Soil Used (g): | 3160.70 |
|------------------------------|---------|

4. Soil Properties:

| | |
|-------------------------------|-------|
| Optimum Moisture Content (%): | 14.6 |
| Maximum Dry Density (pcf): | 110.4 |
| 95% of MDD (pcf): | 104.9 |
| In-Situ Moisture Content (%): | N/A |

5. Specimen Properties:

| | |
|-------------------------------------|---------|
| Wet Weight (g): | 3160.70 |
| Compaction Moisture content (%): | 14.9 |
| Compaction Wet Density (pcf): | 123.50 |
| Compaction Dry Density (pcf): | 107.48 |
| Moisture Content After Mr Test (%): | 14.9 |

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

#VALUE!

7. Resilient Modulus, Mr:

9916(Sc)^{-0.24721}(S3)^{0.24107}

8. Comments

9. Tested By:

GW

Date: August 7, 2018

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RECOMPACTED SAMPLES**

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Date Tested: August 7, 2018 **Location:** 18'RT
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County: Code: 37 **Name:** LAFAYETTE
Sampled By: DICKERSON FRAZIER
Lab No.: 20181743
Sample ID: RV375
LATITUDE:
Depth: 0-5
AASHTO Class: A-6 (8)
Material Type (1 or 2): 2
LONGITUDE:

| PARAMETER | Chamber Confining Pressure | Nominal Maximum Axial Stress | Actual Applied | | Actual Applied Max. Axial 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 |
|-------------|----------------------------|------------------------------|----------------------|-------------------------|--------------------------------|-----------------------------|----------------------------------|------------------------------|-------------------------------|---------------------------------|----------------------|--------------------|
| | | | P _{max} lbs | P _{cyclic} lbs | | | | | | | | |
| DESIGNATION | S ₃ psi | S _{cyclic} psi | P _{max} lbs | P _{cyclic} lbs | P _{contact} lbs | P _{contact} lbs | S _{max} psi | S _{cyclic} psi | S _{contact} psi | H _{avg} in | ε _r in/in | M _r psi |
| Sequence 1 | 6.0 | 2.0 | 25.2 | 22.4 | 2.8 | 2.8 | 2.1 | 1.8 | 0.2 | 0.00113 | 0.00014 | 13,122 |
| Sequence 2 | 6.0 | 4.0 | 47.2 | 44.4 | 2.8 | 2.8 | 3.9 | 3.7 | 0.2 | 0.00243 | 0.00030 | 12,035 |
| Sequence 3 | 6.0 | 6.0 | 69.7 | 66.1 | 3.6 | 3.6 | 5.7 | 5.4 | 0.3 | 0.00402 | 0.00050 | 10,852 |
| Sequence 4 | 6.0 | 8.0 | 92.3 | 86.3 | 6.0 | 6.0 | 7.6 | 7.1 | 0.5 | 0.00613 | 0.00076 | 9,285 |
| Sequence 5 | 6.0 | 10.0 | 114.2 | 105.7 | 8.5 | 8.5 | 9.4 | 8.7 | 0.7 | 0.00853 | 0.00106 | 8,175 |
| Sequence 6 | 4.0 | 2.0 | 25.1 | 22.3 | 2.8 | 2.8 | 2.1 | 1.8 | 0.2 | 0.00132 | 0.00016 | 11,114 |
| Sequence 7 | 4.0 | 4.0 | 47.0 | 44.2 | 2.8 | 2.8 | 3.9 | 3.6 | 0.2 | 0.00286 | 0.00036 | 10,202 |
| Sequence 8 | 4.0 | 6.0 | 68.3 | 65.4 | 2.8 | 2.8 | 5.6 | 5.4 | 0.2 | 0.00465 | 0.00058 | 9,278 |
| Sequence 9 | 4.0 | 8.0 | 91.0 | 85.9 | 5.1 | 5.1 | 7.5 | 7.1 | 0.4 | 0.00664 | 0.00083 | 8,529 |
| Sequence 10 | 4.0 | 10.0 | 113.4 | 105.8 | 7.6 | 7.6 | 9.3 | 8.7 | 0.6 | 0.00898 | 0.00112 | 7,772 |
| Sequence 11 | 2.0 | 2.0 | 25.1 | 22.3 | 2.8 | 2.8 | 2.1 | 1.8 | 0.2 | 0.00152 | 0.00019 | 9,699 |
| Sequence 12 | 2.0 | 4.0 | 46.6 | 43.8 | 2.8 | 2.8 | 3.8 | 3.6 | 0.2 | 0.00328 | 0.00041 | 8,815 |
| Sequence 13 | 2.0 | 6.0 | 67.4 | 64.7 | 2.8 | 2.8 | 5.5 | 5.3 | 0.2 | 0.00533 | 0.00066 | 8,005 |
| Sequence 14 | 2.0 | 8.0 | 89.1 | 84.9 | 4.2 | 4.2 | 7.3 | 7.0 | 0.3 | 0.00757 | 0.00094 | 7,397 |
| Sequence 15 | 2.0 | 10.0 | 110.9 | 104.3 | 6.6 | 6.6 | 9.1 | 8.6 | 0.5 | 0.01012 | 0.00126 | 6,796 |

TESTED BY _____ DATE August 7, 2018
 REVIEWED BY _____ DATE _____
 GW _____

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

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

| | | | |
|-------------------------|--------------------------------|--------------------------------|-----------|
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| Lab No.: | 20181743 | Depth: | 0-5 |
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| LATITUDE: | | Material Type (1 or 2): | 2 |
| | | LONGITUDE: | |

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

$$K_1 = 9,916$$

$$K_2 = -0.24721$$

$$K_5 = 0.24107$$

$$R^2 = 0.93$$



