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

July 17, 2017

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 100878
Hwy. 49/Hwy. 34 Inters. Impvts. (Marmaduke) (S)
Route 49 Section 2
Green County

Transmitted herewith is the requested Soil Survey test results for the above referenced job. The project consists of constructing a roundabout at the intersection of Highway 49 and Highway 34 in Marmaduke. Samples were obtained in the existing travel lanes and ditch line. An R-Value sample was not obtained due to utility conflicts, an estimated value of less than 5 is appropriate for the soil types within the project limits. There were no paved shoulders within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of highly plastic clay with some sand. Cross sections are not currently available, but it is assumed the construction grade line will closely match that of the existing roadway. The subgrade soils are expected to provide a stable working platform with conventional processing, if the weather is favorable during construction. If soil remediation is needed to allow construction to proceed during adverse weather conditions or if a stable working platform cannot be obtained with normal drying and compactive effort, stabilization with lime is the most appropriate remediation technique. It is recommended that the addition of 4% Lime (by dry weight) mixed to a depth of 16" be used for soil stabilization quantity estimation purposes; however, if the Engineer determines that stabilization is necessary, field trials or local experience may dictate that a stable working platform can be achieved at a lower lime content.

Additional earthwork recommendations will be made upon request when plans are further developed and cross sections are available.

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 Pocahontas.

2. Asphalt Concrete Hot Mix

<table>
<thead>
<tr>
<th>Type</th>
<th>Asphalt Cement %</th>
<th>Mineral Aggregate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Course</td>
<td>5.2</td>
<td>94.8</td>
</tr>
<tr>
<td>Binder Course</td>
<td>4.1</td>
<td>95.9</td>
</tr>
<tr>
<td>Base Course</td>
<td>3.9</td>
<td>96.1</td>
</tr>
</tbody>
</table>

Michael C. Benson
Materials Engineer

MCB:pt:bjj
Attachment
cc: State Constr. Eng. – Master File Copy
    District 10 Engineer
    System Information and Research Div.
    G. C. File
DATE - 07/05/2017
JOB NUMBER - 100878

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 28
DISTRICT NO. - 10

JOB NAME - HWY. 49/HWY. 34 INTERS. IMPVTS. (MARMADUKE)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB LESS THAN 5

REMARKS -

AASHTO TESTS : T190
<table>
<thead>
<tr>
<th>STA.#</th>
<th>LOC.</th>
<th>DEPTH</th>
<th>COLOR</th>
<th>#4</th>
<th>#10</th>
<th>#40</th>
<th>#80</th>
<th>#200</th>
<th>L.L.</th>
<th>P.I.</th>
<th>SOIL CLASS</th>
<th>LAB #: %MOISTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>103+00</td>
<td>06 RT</td>
<td>0-5</td>
<td>BROWN</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td>97</td>
<td>47</td>
<td>27</td>
<td>A-7-6(29)</td>
<td>S380</td>
</tr>
<tr>
<td>108+00</td>
<td>06 LT</td>
<td>0-5</td>
<td>BROWN</td>
<td></td>
<td>92</td>
<td>86</td>
<td>84</td>
<td>83</td>
<td>30</td>
<td>13</td>
<td>A-6(9)</td>
<td>S381</td>
</tr>
<tr>
<td>203+00</td>
<td>15 RT</td>
<td>0-5</td>
<td>BROWN</td>
<td></td>
<td>85</td>
<td>78</td>
<td>73</td>
<td>71</td>
<td>40</td>
<td>21</td>
<td>A-6(13)</td>
<td>S382</td>
</tr>
<tr>
<td>208+00</td>
<td>08 LT</td>
<td>0-5</td>
<td>BROWN</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td>93</td>
<td>33</td>
<td>16</td>
<td>A-6(14)</td>
<td>S383</td>
</tr>
</tbody>
</table>

**Comments:** W=Multiple layers

*Thursday, July 06, 2017*
<table>
<thead>
<tr>
<th>STA.#</th>
<th>LOC.</th>
<th>Type</th>
<th>Thickness</th>
<th>Description</th>
<th>Layer Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>103+00</td>
<td>06 RT</td>
<td>ACHMSC</td>
<td>SAND ASPHALT</td>
<td>6.0W 4.0 2.5</td>
<td>ASPHALT TREATED BASE AGG. BASE CRS CL-7</td>
</tr>
<tr>
<td>108+00</td>
<td>06 LT</td>
<td>ACHMSC</td>
<td>SAND ASPHALT</td>
<td>7.0W 2.5 ---</td>
<td>ASPHALT TREATED BASE AGG. BASE CRS CL-7</td>
</tr>
<tr>
<td>203+00</td>
<td>15 RT</td>
<td>ACHMSC</td>
<td>SAND ASPHALT</td>
<td>2.5W --- ---</td>
<td>ASPHALT TREATED BASE AGG. BASE CRS CL-7</td>
</tr>
<tr>
<td>208+00</td>
<td>08 LT</td>
<td>ACHMSC</td>
<td>SAND ASPHALT</td>
<td>2.5W --- ---</td>
<td>ASPHALT TREATED BASE AGG BASE CRS CL-7</td>
</tr>
</tbody>
</table>

**Comments:** W=MULTIPLE LAYERS

**Thursday, July 06, 2017**
DATE - 07/05/17  SEQUENCE NO. - 1
JOB NUMBER - 100878  MATERIAL CODE - SSRVPS
FEDERAL AID NO.- TO BE ASSIGNED  SPEC. YEAR - 2014
PURPOSE - SOIL SURVEY SAMPLE  SUPPLIER ID. - 1
SPEC. REMARKS - NO SPECIFICATION CHECK  COUNTY/STATE - 28
SUPPLIER NAME - STATE  DISTRICT NO. - 10
NAME OF PROJECT - HWY. 49/HWY. 34 INTERS. IMPVTS. (MARMADUKE)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - GREENE, COUNTY  DATE SAMPLED - 05/18/17
SAMPLED BY - THORNTON/TAYLOR  DATE RECEIVED - 05/22/17
SAMPLE FROM - TEST HOLE  DATE TESTED - 06/06/17
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

| LAB NUMBER | 20171678 | 20171679 | 20171680 |
| SAMPLE ID | S380 | S381 | S382 |
| TEST STATUS | INFORMATION ONLY | INFORMATION ONLY | INFORMATION ONLY |
| STATION | 103+00 | 108+00 | 203+00 |
| LOCATION | 06 RT | 06 LT | 15 RT |
| DEPTH IN FEET | 0-5 | 0-5 | 0-5 |
| MAT'L COLOR | BROWN | BROWN | BROWN |
| MAT'L TYPE | | | |
| LATITUDE DEG-MIN-SEC | 36 11 15.60 | 36 11 10.70 | 36 11 12.90 |
| LONGITUDE DEG-MIN-SEC | 90 23 5.70 | 90 23 5.60 | 90 23 8.30 |

% PASSING

<table>
<thead>
<tr>
<th>Size (IN)</th>
<th>2</th>
<th>1 1/2</th>
<th>3/4</th>
<th>3/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>100</td>
<td>96</td>
<td>91</td>
<td>85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (IN)</th>
<th>4</th>
<th>10</th>
<th>20</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>100</td>
<td>64</td>
<td>20</td>
<td>76</td>
</tr>
</tbody>
</table>

LIQUID LIMIT - 47  PLASTICITY INDEX - 27
AASHTO SOIL - A-7-6(29)  UNIFIED SOIL -

% MOISTURE CONTENT - 31.3

<table>
<thead>
<tr>
<th>Material</th>
<th>1.0W</th>
<th>2.0W</th>
<th>3.0W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt</td>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Sand</td>
<td>4.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Agg. Base</td>
<td>7.0</td>
<td>8.0</td>
<td>7.0</td>
</tr>
</tbody>
</table>

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS: T24 T88 T89 T90 T265
DATE - 07/05/17
JOB NUMBER - 100878
FEDERAL AID NO. - TO BE ASSIGNED
PURPOSE - SOIL SURVEY SAMPLE
SPEC. REMARKS - NO SPECIFICATION CHECK
SUPPLIER NAME - STATE
NAME OF PROJECT - HWY. 49/HWY. 34 INTERS. IMPVTS. (MARMADUKE)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - GREENE, COUNTY
SAMPLED BY - THORNTON/TAYLOR
SAMPLE FROM - TEST HOLE
DATE SAMPLED - 05/18/17
DATE RECEIVED - 05/22/17
DATE TESTED - 06/06/17
MATERIAL DESC. - SOIL SURVEY - R VALUE - PAVEMENT SOUNDINGS

LAB NUMBER - 20171681
SAMPLE ID - 8383
TEST STATUS - INFORMATION ONLY
STATION - 208+00
LOCATION - 08 LT
DEPTH IN FEET - 0-5
MAT'L COLOR - BROWN
MAT'L TYPE -
LATITUDE DEG-MIN-SEC - 36 11 13.40
LONGITUDE DEG-MIN-SEC - 90 23 2.10

% PASSING
2 IN. -
1 1/2 IN. -
3/4 IN. -
3/8 IN. -
NO. 4 - 100
NO. 10 -
NO. 40 -
NO. 80 -
NO. 200 - 93

LIQUID LIMIT - 33
PLASTICITY INDEX - 16
AASHTO SOIL - A-6(14)
UNIFIED SOIL -

% MOISTURE CONTENT - 19.2

ACHMSC (IN) - 2.5W
SAND ASPHALT (IN) -
SAND ASPHALT (IN) -
ASPHALT TREATED BASE (IN) -
AGG BASE CRS CL-7 (IN) - 7.0

REMARKS - W=MULTIPLE LAYERS

AASHTO TESTS: T24 T88 T89 T90 T265