

ARKANSAS DEPARTMENT OF TRANSPORTATION



**SUBSURFACE INVESTIGATION**

STATE JOB NO. 100837

FEDERAL AID PROJECT NO. NHPP-9227(69)

I-555/HWY. 49 INTCHNG. IMPVTS. (RED WOLF BLVD.) (JONESBORO) (S)

STATE HIGHWAY I-555 & 49 SECTION 3 & 3

IN CRAIGHEAD 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

February 12, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 100837
I-555/Hwy. 49 Intchng. Impvts. (Red Wolf Blvd.)(Jonesboro)(S)
Routes 555 & 49 Sections 3 & 3
Craighead County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of adding northbound and southbound exit ramps for Highway 49 off Interstate 555. Samples were taken in the shoulder, ditch line and along the new alignment.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of moderately plastic sandy clay. 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.

The proposed new alignment will cross ditches that may contain standing water based on seasonal conditions. The soft organic material in the ditches should be undercut prior to embankment construction, anticipated to be no more than two feet. Additional earthwork recommendations will be made upon request after plans are further developed and cross-sections become 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 of Black Rock.
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 10 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 - 02/09/2018  
JOB NUMBER - 100837

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 16  
DISTRICT NO. - 10

JOB NAME - I555/HWY.49 INTCHNG.IMPVTS.(RED WOLF BLVD) (S)

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

BEGIN JOB - END JOB LESS THAN 5

RESILIENT MODULUS  
STATION - 163+00 6561

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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>	100837	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	1/9/18	<b>Station No.:</b>	163+00
<b>Date Tested:</b>	February 6, 2018	<b>Location:</b>	18'RT
<b>Name of Project:</b>	I555/HWY. 49 INTCHNG. IMPVTS. (RED WOLF BLVD.)		
<b>County:</b>	<b>Code:</b> 16	<b>Name:</b> CRAIGHEAD	
<b>Sampled By:</b>	THORNTON/FRAZIER	<b>Depth:</b>	0-5
<b>Lab No.:</b>	20180038	<b>AASHTO Class:</b>	A-6 (24)
<b>Sample ID:</b>	RV945	<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	3.90
Middle	3.90
Bottom	3.90
Average	3.90
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8
Initial Area, Ao (sq. in):	11.87
Initial Volume, AoLo (cu. in):	94.98

**3. Soil Specimen Weight:**

Weight of Wet Soil Used (g):	3229.50
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**4. Soil Properties:**

Optimum Moisture Content (%):	15.1
Maximum Dry Density (pcf):	112.8
95% of MDD (pcf):	107.2
In-Situ Moisture Content (%):	N/A

**5. Specimen Properties:**

Wet Weight (g):	3229.50
Compaction Moisture content (%):	14.9
Compaction Wet Density (pcf):	129.56
Compaction Dry Density (pcf):	112.75
Moisture Content After Mr Test (%):	14.9

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

#VALUE!

**7. Resilient Modulus, Mr:**

9183(Sc)^-0.24407(S3)^0.26565

**8. Comments**

\_\_\_\_\_

\_\_\_\_\_

**9. Tested By:**

GW

**Date:** February 6, 2018

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

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

**Job No.** 100837 **Material Code** SSRVPS  
**Date Sampled:** 1/9/18 **Station No.:** 163+00  
**Date Tested:** February 6, 2018 **Location:** 18RT  
**Name of Project:** I555/HWY. 49 INTCHNG. IMPVTS. (RED WOLF BLVD.)  
**County:** Code: 16 **Name:** CRAIGHEAD  
**Sampled By:** THORNTON/FRAZIER **Depth:** 0-5  
**Lab No.:** 20180038 **AASHTO Class:** A-6 (24)  
**Sample ID:** RV945 **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
Sequence 1	6.0	2.0	24.7	22.1	2.6	2.1	1.9	0.2	0.00119	0.00015	12,535
Sequence 2	6.0	4.0	46.3	43.7	2.7	3.9	3.7	0.2	0.00251	0.00031	11,741
Sequence 3	6.0	6.0	68.0	64.7	3.3	5.7	5.5	0.3	0.00417	0.00052	10,453
Sequence 4	6.0	8.0	90.4	84.7	5.7	7.6	7.1	0.5	0.00627	0.00078	9,098
Sequence 5	6.0	10.0	112.3	104.3	8.0	9.5	8.8	0.7	0.00867	0.00108	8,104
Sequence 6	4.0	2.0	24.5	21.8	2.7	2.1	1.8	0.2	0.00134	0.00017	10,950
Sequence 7	4.0	4.0	45.8	43.2	2.7	3.9	3.6	0.2	0.00300	0.00037	9,707
Sequence 8	4.0	6.0	66.3	63.5	2.7	5.6	5.4	0.2	0.00485	0.00061	8,831
Sequence 9	4.0	8.0	88.8	84.0	4.8	7.5	7.1	0.4	0.00703	0.00088	8,052
Sequence 10	4.0	10.0	110.8	103.6	7.2	9.3	8.7	0.6	0.00930	0.00116	7,509
Sequence 11	2.0	2.0	24.5	21.8	2.8	2.1	1.8	0.2	0.00160	0.00020	9,175
Sequence 12	2.0	4.0	45.3	42.6	2.7	3.8	3.6	0.2	0.00344	0.00043	8,349
Sequence 13	2.0	6.0	65.5	62.7	2.8	5.5	5.3	0.2	0.00562	0.00070	7,508
Sequence 14	2.0	8.0	86.5	82.5	4.0	7.3	6.9	0.3	0.00794	0.00099	7,004
Sequence 15	2.0	10.0	108.3	101.9	6.4	9.1	8.6	0.5	0.01047	0.00131	6,561

TESTED BY \_\_\_\_\_ DATE February 6, 2018  
 REVIEWED BY \_\_\_\_\_ DATE \_\_\_\_\_

**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>	100837	<b>Material Code</b>	SSRVPS
<b>Date Sampled:</b>	1/9/18	<b>Station No.:</b>	163+00
<b>Date Tested:</b>	February 6, 2018	<b>Location:</b>	18'RT
<b>Name of Project:</b>	I555/HWY. 49 INTCHNG. IMPVTS. (RED WOLF BLVD.)		
<b>County:</b>	<b>Code:</b> 16	<b>Name:</b>	CRAIGHEAD
<b>Sampled By:</b>	THORNTON/FRAZIER	<b>Depth:</b>	0-5
<b>Lab No.:</b>	20180038	<b>AASHTO Class:</b>	A-6 (24)
<b>Sample ID:</b>	RV945	<b>Material Type (1 or 2):</b>	2
<b>LATITUDE:</b>		<b>LONGITUDE:</b>	

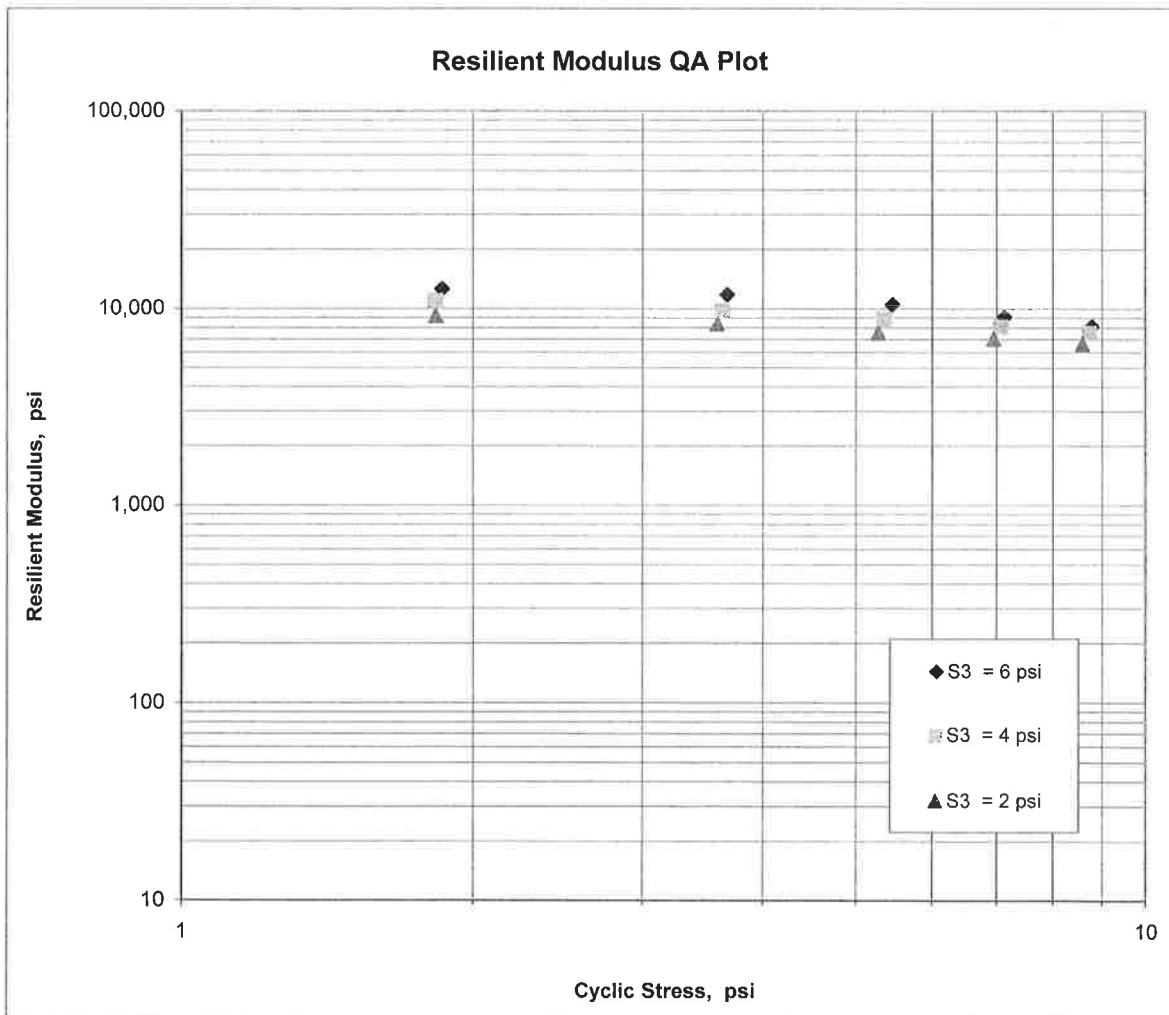
$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$$K_1 = 9,183$$

$$K_2 = -0.24407$$

$$K_5 = 0.26565$$

$$R^2 = 0.95$$



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
 MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 02/09/18	SEQUENCE NO.	- 1
JOB NUMBER	- 100837	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	- 16
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT	- I555/HWY.49 INTCHNG.IMPVTs.(RED WOLF BLVD) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CRAIGHEAD COUNTY	DATE SAMPLED	- 01/09/17
SAMPLED BY	- THORNTON/FRAZIER	DATE RECEIVED	- 01/12/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 02/09/18
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	20180032	20180033	20180034
SAMPLE ID	- S939	- S940	- S941
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 163+00	- 163+00	- 163+75
LOCATION	- 15 RT	- 18 RT	- CL
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BR/GR	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 48 26.20	- 35 48 26.30	- 35 48 23.50
LONGITUDE DEG-MIN-SEC	- 90 40 5.50	- 90 40 5.30	- 90 40 6.10
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	- 100	-
	3/8 IN. - 95	- 96	-
	NO. 4 - 70	- 92	- 100
	NO. 10 - 55	- 89	-
	NO. 40 - 42	- 75	-
	NO. 80 - 36	- 71	-
	NO. 200 - 33	- 70	- 97
LIQUID LIMIT	- 33	- 39	- 31
PLASTICITY INDEX	- 18	- 23	- 10
AASHTO SOIL	- A-2-6(1)	- A-6(14)	- A-4(10)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 19.3	- 18.0	- 20.5
ACHMSC	(IN) - 2.5	- ---	- ---
AGG. BASE CRS CL-7	(IN) - 6.0	- ---	- ---
-	-	-	-
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-	-	-	-
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REMARKS -  
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AASHTO TESTS : T24 T88 T89 T90 T265  
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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE - 02/09/18 SEQUENCE NO. - 2  
JOB NUMBER - 100837 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 - 16  
SUPPLIER NAME - STATE DISTRICT NO. - 10  
NAME OF PROJECT - I555/HWY.49 INTCHNG.IMPVTS.(RED WOLF BLVD) (S)  
PROJECT ENGINEER - NOT APPLICABLE  
PIT/QUARRY - ARKANSAS  
LOCATION - CRAIGHEAD COUNTY DATE SAMPLED - 01/09/17  
SAMPLED BY - THORNTON/FRAZIER DATE RECEIVED - 01/12/18  
SAMPLE FROM - TEST HOLE DATE TESTED - 02/09/18  
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	-	20180035	-	20180036	-	20180037
SAMPLE ID	-	S942	-	S943	-	S944
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-	INFORMATION ONLY
STATION	-	171+00	-	170+00	-	170+00
LOCATION	-	CL	-	15 LT	-	18 LT
DEPTH IN FEET	-	0-5	-	0-5	-	0-5
MAT'L COLOR	-	BROWN	-	BR/GR	-	BR/GR
MAT'L TYPE	-		-		-	
LATITUDE DEG-MIN-SEC	-	35 48 28.50	-	35 48 24.70	-	35 48 24.70
LONGITUDE DEG-MIN-SEC	-	90 40 12.40	-	90 40 13.60	-	90 40 13.80
% PASSING	2	IN.	-		-	
	1 1/2	IN.	-	100	-	
	3/4	IN.	-	94	-	100
	3/8	IN.	-	92	-	97
	NO. 4		-	88	-	92
	NO. 10		-	84	-	89
	NO. 40		-	76	-	81
	NO. 80		-	70	-	70
	NO. 200	94	-	69	-	68
LIQUID LIMIT	-	44	-	29	-	32
PLASTICITY INDEX	-	26	-	12	-	16
AASHTO SOIL	-	A-7-6(26)	-	A-6(6)	-	A-6(8)
UNIFIED SOIL	-		-		-	
% MOISTURE CONTENT	-	25.7	-	21.0	-	19.6
ACHMSC (IN)	-	---	-	2.25	-	---
AGG. BASE CRS CL-7 (IN)	-	---	-	6.0	-	---
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REMARKS -  
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AASHTO TESTS : T24 T88 T89 T90 T265  
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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
 MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 02/09/18	SEQUENCE NO.	- 1
JOB NUMBER	- 100837	MATERIAL CODE	- SSRV
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 16
SUPPLIER NAME	- STATE	DISTRICT NO.	- 10
NAME OF PROJECT	- I555/HWY.49 INTCHNG.IMPVTS. (RED WOLF BLVD) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CRAIGHEAD COUNTY	DATE SAMPLED	= 01/09/18
SAMPLED BY	- THORNTON/FRAZIER	DATE RECEIVED	= 01/12/18
SAMPLE FROM	- TESTHOLE	DATE TESTED	= 02/09/18
MATERIAL DESC.	- SOIL SURVEY - R VALUE		
LAB NUMBER	- 20180038	-	-
SAMPLE ID	- RV945	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 163+00	-	-
LOCATION	- 18'RT	-	-
DEPTH IN FEET	- 0-5	-	-
MAT'L COLOR	- BR/GR	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 48 26.30	-	-
LONGITUDE DEG-MIN-SEC	- 90 40 5.30	-	-
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. -	-	-
	NO. 4 - 100	-	-
	NO. 10 -	-	-
	NO. 40 -	-	-
	NO. 80 -	-	-
	NO. 200 - 99	-	-
LIQUID LIMIT	- 40	-	-
PLASTICITY INDEX	- 23	-	-
AASHTO SOIL	- A-6(24)	-	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
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REMARKS -  
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AASHTO TESTS : T24 T88 T89 T90 T265