

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 030525

FEDERAL AID PROJECT NO. NHPP-0037(41)

WALKER CREEK STR. & APPRS. (S)

STATE HIGHWAY 53 SECTION 5

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

AR DOT.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

July 22, 2019

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 030525
Walker Creek Str. & Apprs. (S)
Route 53 Section 5
Lafayette County

Attached is the requested soil survey, strength data, and Resilient Modulus test results for the above referenced job. The project consists of replacing the bridge over Walker Creek with a box culvert. Samples were taken in the existing travel lanes and ditch line.

The subgrade soils consist of sand and low plasticity clayey sand. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction.

The maximum embankment height is approximately five feet. Wet conditions may be encountered based on seasonal conditions. All soft unstable organic material in the ditch line should be undercut prior to embankment construction, anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material utilizing the 3:1 slope configuration shown in the cross sections.

The maximum embankment height for the detour is approximately seven feet. All soft unstable organic material should be undercut prior to construction, anticipated to be no more than two feet. The embankment may be constructed with locally available unspecified material utilizing a 3:1 slope configuration.

The proposed 3:1 cut slopes are acceptable as shown in the currently available cross sections.

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 near Bismarck.
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 - 07/12/2019
JOB NUMBER - 030525

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 43
DISTRICT NO. - 06

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

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 7
RESILIENT MODULUS
STA. 114+00 9181

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.	030525	Material Code	SSRVPS
Date Sampled:	6/19/19	Station No.:	114+00
Date Tested:	July 3, 2019	Location:	18'LT
Name of Project:	WALKER CREEK STR. & APPRS. (S)		
County:	Code: 43	Name:	LONOKE
Sampled By:	FRAZIER / DICKERSON		
Lab No.:	20191926	Depth:	0-5
Sample ID:	RV577	AASHTO Class:	A-4 (0)
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	3.95
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):	3230.40
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4. Soil Properties:

Optimum Moisture Content (%):	12.4
Maximum Dry Density (pcf):	116.8
95% of MDD (pcf):	111.0
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3230.40
Compaction Moisture content (%):	12.4
Compaction Wet Density (pcf):	126.01
Compaction Dry Density (pcf):	112.11
Moisture Content After Mr Test (%):	12.3

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

#VALUE!

7. Resilient Modulus, Mr:

8823(Sc)^{-0.09133(S3)^{0.30804}}

8. Comments

9. Tested By:

_____ GW

Date: July 3, 2019

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

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

Job No. 030525 **Material Code** SSRVPS
Date Sampled: 6/19/19 **Station No.:** 114+00
Date Tested: July 3, 2019 **Location:** 18'LT
Name of Project: WALKER CREEK STR. & APPRS. (S)
County: Code: 43 **Name:** LONOKE
Sampled By: FRAZIER / DICKERSON
Lab No.: 20191926
Sample ID: RV577
LATITUDE:
Depth: 0-5
AASHTO Class: A-4 (0)
Material Type (1 or 2): 2
LONGITUDE:

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied		Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic 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	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	25.1	22.3	2.7	2.1	1.8	0.2	0.00101	0.00013	14,603	
Sequence 2	6.0	4.0	47.3	44.5	2.7	3.9	3.7	0.2	0.00212	0.00026	13,807	
Sequence 3	6.0	6.0	70.1	66.6	3.5	5.8	5.5	0.3	0.00330	0.00041	13,265	
Sequence 4	6.0	8.0	94.1	88.2	5.9	7.7	7.2	0.5	0.00456	0.00057	12,738	
Sequence 5	6.0	10.0	117.9	109.6	8.3	9.7	9.0	0.7	0.00591	0.00074	12,214	
Sequence 6	4.0	2.0	25.0	22.5	2.5	2.1	1.8	0.2	0.00114	0.00014	13,065	
Sequence 7	4.0	4.0	46.8	44.4	2.5	3.8	3.6	0.2	0.00241	0.00030	12,111	
Sequence 8	4.0	6.0	68.3	65.7	2.6	5.6	5.4	0.2	0.00376	0.00047	11,511	
Sequence 9	4.0	8.0	91.9	87.0	4.9	7.5	7.1	0.4	0.00516	0.00064	11,092	
Sequence 10	4.0	10.0	115.7	108.4	7.3	9.5	8.9	0.6	0.00649	0.00081	10,991	
Sequence 11	2.0	2.0	24.7	22.3	2.3	2.0	1.8	0.2	0.00149	0.00019	9,850	
Sequence 12	2.0	4.0	46.1	43.6	2.6	3.8	3.6	0.2	0.00292	0.00036	9,810	
Sequence 13	2.0	6.0	66.9	64.2	2.7	5.5	5.3	0.2	0.00449	0.00056	9,408	
Sequence 14	2.0	8.0	89.5	85.2	4.3	7.3	7.0	0.4	0.00605	0.00075	9,279	
Sequence 15	2.0	10.0	112.4	105.6	6.7	9.2	8.7	0.6	0.00758	0.00094	9,181	

TESTED BY _____ DATE July 3, 2019
 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

Job No.	030525	Material Code	SSRVPS	
Date Sampled:	6/19/19	Station No.:	114+00	
Date Tested:	July 3, 2019	Location:	18'LT	
Name of Project:	WALKER CREEK STR. & APPRS. (S)			
County:	Code: 43	Name:	LONOKE	
Sampled By:	FRAZIER / DICKERSON		Depth:	0-5
Lab No.:	20191926	AASHTO Class:	A-4 (0)	
Sample ID:	RV577	Material Type (1 or 2):	2	
LATITUDE:		LONGITUDE:		

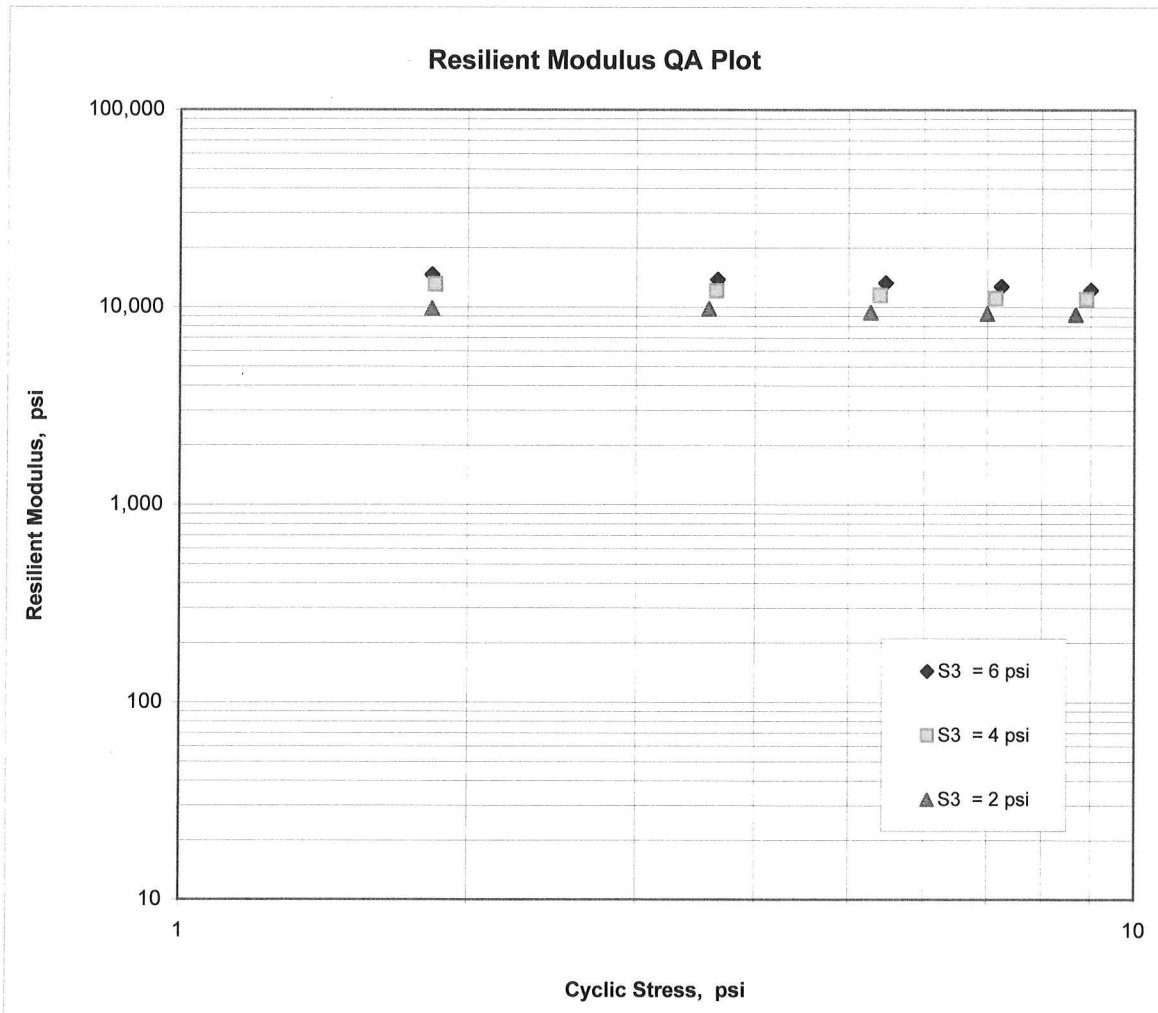
$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$$K_1 = \underline{8,823}$$

$$K_2 = \underline{-0.09133}$$

$$K_5 = \underline{0.30804}$$

$$R^2 = \underline{0.98}$$



JOB: 030525

Arkansas State Highway Transportation Department

JOB NAME: WALKER CREEK STR. & APPRS.(S)

Materials Division

COUNTY NO. 43 DATE TESTED 7/12/2019

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				
114+00	18 LT	0-5	BROWN	91	85	79	77	65	ND	NP	A-4(0)	RV577	
108+00	06 RT	0-5	BROWN	99	97	94	92	79	22	06	A-4(2)	S573	19.3
108+00	18 RT	0-5	BROWN	93	89	84	80	67	ND	NP	A-4(0)	S574	23.3
114+00	06 LT	0-5	BROWN	89	84	79	75	62	22	06	A-4(1)	S575	22.2
114+00	18 LT	0-5	BROWN	98	96	95	93	77	ND	NP	A-4(0)	S576	20.7

comments: W=MULTIPLE LAYERS, X=STRIPPED

Monday, July 15, 2019

JOB: 030525

Arkansas State Highway Transportation Department
Materials Division

DATE TESTED
7/12/2019

JOB NAME: WALKER CREEK STR. & APPRS.(S)

COUNTY NO. 43

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

108+00	06 RT	CS	ACHMSC	AGG.BASE CRS CL-7
		0.25	8.0	8.0
108+00	18 RT	CS	ACHMSC	AGG.BASE CRS CL-7
		---	---	---
114+00	06 LT	CS	ACHMSC	AGG.BASE CRS CL-7
		0.25	7.5WX	---

comments: W=MULTIPLE LAYERS, X=STRIPPED

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 07/12/19	SEQUENCE NO.	- 1
JOB NUMBER	- 030525	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	- 43
SUPPLIER NAME	- STATE	DISTRICT NO.	- 06
NAME OF PROJECT	- WALKER CREEK STR. & APPRS.(S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- LONOKE, COUNTY	DATE SAMPLED	- 06/19/19
SAMPLED BY	- FRAZIER/DICKERSON	DATE RECEIVED	- 06/24/19
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 07/12/19
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20191922	- 20191923	- 20191924
SAMPLE ID	- S573	- S574	- S575
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 108+00	- 108+00	- 114+00
LOCATION	- 06 RT	- 18 RT	- 06 LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 33 11 42.70	- 33 11 42.70	- 33 11 48.70
LONGITUDE DEG-MIN-SEC	- 93 31 54.70	- 93 31 54.60	- 93 31 54.90
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	- 100	- 100
3/8 IN.	- 100	- 97	- 96
NO. 4	- 99	- 93	- 89
NO. 10	- 97	- 89	- 84
NO. 40	- 94	- 84	- 79
NO. 80	- 92	- 80	- 75
NO. 200	- 79	- 67	- 62
LIQUID LIMIT	- 22	- ND	- 22
PLASTICITY INDEX	- 06	- NP	- 06
AASHTO SOIL	- A-4 (2)	- A-4 (0)	- A-4 (1)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 19.3	- 23.3	- 22.2
CS (IN)	- 0.25	- ---	- 0.25
ACHMSC (IN)	- 8.0	- ---	- 7.5WX
AGG.BASE CRS CL-7 (IN)	- 8.0	- ---	- ---
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

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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	- 07/12/19	SEQUENCE NO.	- 2
JOB NUMBER	- 030525	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	- 43
SUPPLIER NAME	- STATE	DISTRICT NO.	- 06
NAME OF PROJECT	- WALKER CREEK STR. & APPRS.(S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- LONOKE, COUNTY	DATE SAMPLED	- 06/19/19
SAMPLED BY	- FRAZIER/DICKERSON	DATE RECEIVED	- 06/24/19
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 07/12/19
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	-	20191925	-	-
SAMPLE ID	-	S576	-	-
TEST STATUS	-	INFORMATION ONLY	-	-
STATION	-	114+00	-	-
LOCATION	-	18 LT	-	-
DEPTH IN FEET	-	0-5	-	-
MAT'L COLOR	-	BROWN	-	-
MAT'L TYPE	-		-	-
LATITUDE DEG-MIN-SEC	-	33 11 48.70	-	-
LONGITUDE DEG-MIN-SEC	-	93 31 55.00	-	-
% PASSING	2	IN.	-	-
	1 1/2	IN.	-	-
	3/4	IN.	-	-
	3/8	IN.	-	100
	NO. 4		-	98
	NO. 10		-	96
	NO. 40		-	95
	NO. 80		-	93
	NO. 200		-	77
LIQUID LIMIT	-	ND	-	-
PLASTICITY INDEX	-	NP	-	-
AASHTO SOIL	-	A-4(0)	-	-
UNIFIED SOIL	-		-	-
% MOISTURE CONTENT	-	20.7	-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

AASHTO TESTS : T24 T88 T89 T90 T265

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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 07/15/19	SEQUENCE NO.	- 1
JOB NUMBER	- 030525	MATERIAL CODE	- RV
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 43
SUPPLIER NAME	- STATE	DISTRICT NO.	- 06
NAME OF PROJECT - WALKER CREEK STR. & APPRS.(S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 06/19/19
LOCATION	- LONOKE, COUNTY	DATE RECEIVED	- 06/24/19
SAMPLED BY	- FRAZIER/DICKERSON	DATE TESTED	- 07/12/19
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE	ACTUAL RESULTS	

LAB NUMBER	-	20191926	-	-
SAMPLE ID	-	RV577	-	-
TEST STATUS	-	INFORMATION ONLY	-	-
STATION	-	114+00	-	-
LOCATION	-	18 LT	-	-
DEPTH IN FEET	-	0-5	-	-
MAT'L COLOR	-	BROWN	-	-
MAT'L TYPE	-		-	-
LATITUDE DEG-MIN-SEC	-	33 11 48.70	-	-
LONGITUDE DEG-MIN-SEC	-	93 31 55.00	-	-
% PASSING	2	IN.	-	-
	1 1/2	IN.	-	-
	3/4	IN.	-	100
	3/8	IN.	-	98
	NO. 4		-	91
	NO. 10		-	85
	NO. 40		-	79
	NO. 80		-	77
	NO. 200		-	65
LIQUID LIMIT	-	ND	-	-
PLASTICITY INDEX	-	NP	-	-
AASHTO SOIL	-	A-4 (0)	-	-
UNIFIED SOIL	-		-	-
% MOISTURE CONTENT	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED
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AASHTO TESTS : T24 T88 T89 T90 T265
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