

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 020656

FEDERAL AID PROJECT NO. NHPP-0021(48)

HWY. 65 ACCESS CHANGE (PICKENS) (S)

STATE HIGHWAY 65 SECTION 17

IN DESHA 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 | I Drive Arkansas.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

August 6, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 020656
Hwy. 65 Access Change (Pickens) (S)
Route 65 Section 17
Desha County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of changing the access on Highway 65 near Pickens. Samples were taken in the inside shoulder and median.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of low plasticity clayey 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. The soft unstable organic material in the median should be undercut prior to embankment construction, anticipated to be no more than two feet. The undercut may be backfilled with locally available unspecified material.

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 near Sweet Home.
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 2 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 - 08/06/2018
JOB NUMBER - 020656

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 21
DISTRICT NO. - 02

JOB NAME - HWY. 65 ACCESS CHANGE (PICKENS) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 20

RESILIENT MODULUS
STA. 110+00 7341

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. | 020656 | Material Code | SSRVPS |
| Date Sampled: | 6/12/18 | Station No.: | 110+00 |
| Date Tested: | July 31, 2018 | Location: | CL |
| Name of Project: | HWY. 65 ACCESS CHANGE (PICKENS)(S) | | |
| County: | Code: 21 | Name: | DESHA |
| Sampled By: | DICKERSON/FRAZIER | | |
| Lab No.: | 20181398 | Depth: | 0-5 |
| Sample ID: | RV337 | 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): | 3146.40 |
|------------------------------|---------|

4. Soil Properties:

| | |
|-------------------------------|-------|
| Optimum Moisture Content (%): | 13.0 |
| Maximum Dry Density (pcf): | 109.8 |
| 95% of MDD (pcf): | 104.3 |
| In-Situ Moisture Content (%): | N/A |

5. Specimen Properties:

| | |
|-------------------------------------|---------|
| Wet Weight (g): | 3146.40 |
| Compaction Moisture content (%): | 13.0 |
| Compaction Wet Density (pcf): | 122.73 |
| Compaction Dry Density (pcf): | 108.61 |
| Moisture Content After Mr Test (%): | 13.1 |

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

7. Resilient Modulus, Mr: 5531(Sc)^{0.02898}(S3)^{0.38993}

8. Comments _____

9. Tested By: GW **Date:** July 31, 2018

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

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

Job No. 020656 **Material Code** SSRVPS
Date Sampled: 6/12/18 **Station No.:** 110+00
Date Tested: July 31, 2018 **Location:** CL
Name of Project: HWY. 65 ACCESS CHANGE (PICKENS)(S)
County: Code: 21 **Name:** DESHA
Sampled By: DICKERSON/FRAZIER
Lab No.: 20181398
Sample ID: RV337
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 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 | 25.3 | 22.6 | 2.7 | 2.1 | 1.9 | 0.2 | 0.00126 | 0.00016 | 11,762 |
| Sequence 2 | 6.0 | 4.0 | 47.9 | 45.1 | 2.8 | 3.9 | 3.7 | 0.2 | 0.00256 | 0.00032 | 11,591 |
| Sequence 3 | 6.0 | 6.0 | 71.2 | 67.6 | 3.7 | 5.8 | 5.5 | 0.3 | 0.00380 | 0.00047 | 11,725 |
| Sequence 4 | 6.0 | 8.0 | 96.1 | 90.0 | 6.1 | 7.9 | 7.4 | 0.5 | 0.00509 | 0.00063 | 11,649 |
| Sequence 5 | 6.0 | 10.0 | 121.1 | 112.5 | 8.6 | 9.9 | 9.2 | 0.7 | 0.00614 | 0.00077 | 12,070 |
| Sequence 6 | 4.0 | 2.0 | 25.2 | 22.4 | 2.8 | 2.1 | 1.8 | 0.2 | 0.00148 | 0.00018 | 9,962 |
| Sequence 7 | 4.0 | 4.0 | 47.4 | 44.5 | 2.8 | 3.9 | 3.7 | 0.2 | 0.00309 | 0.00039 | 9,489 |
| Sequence 8 | 4.0 | 6.0 | 69.8 | 66.9 | 2.9 | 5.7 | 5.5 | 0.2 | 0.00466 | 0.00058 | 9,451 |
| Sequence 9 | 4.0 | 8.0 | 94.6 | 89.3 | 5.2 | 7.8 | 7.3 | 0.4 | 0.00600 | 0.00075 | 9,808 |
| Sequence 10 | 4.0 | 10.0 | 119.5 | 111.9 | 7.6 | 9.8 | 9.2 | 0.6 | 0.00720 | 0.00090 | 10,226 |
| Sequence 11 | 2.0 | 2.0 | 24.9 | 22.0 | 2.8 | 2.0 | 1.8 | 0.2 | 0.00198 | 0.00025 | 7,342 |
| Sequence 12 | 2.0 | 4.0 | 46.6 | 43.8 | 2.8 | 3.8 | 3.6 | 0.2 | 0.00392 | 0.00049 | 7,348 |
| Sequence 13 | 2.0 | 6.0 | 68.3 | 65.5 | 2.8 | 5.6 | 5.4 | 0.2 | 0.00588 | 0.00073 | 7,341 |
| Sequence 14 | 2.0 | 8.0 | 92.2 | 87.9 | 4.3 | 7.6 | 7.2 | 0.3 | 0.00739 | 0.00092 | 7,833 |
| Sequence 15 | 2.0 | 10.0 | 116.3 | 109.6 | 6.7 | 9.5 | 9.0 | 0.5 | 0.00869 | 0.00108 | 8,303 |

TESTED BY _____ DATE July 31, 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

| | | | |
|------------------|------------------------------------|-------------------------|---------|
| Job No. | 020656 | Material Code | SSRVPS |
| Date Sampled: | 6/12/18 | Station No.: | 110+00 |
| Date Tested: | July 31, 2018 | Location: | CL |
| Name of Project: | HWY. 65 ACCESS CHANGE (PICKENS)(S) | | |
| County: | Code: 21 | Name: | DESHA |
| Sampled By: | DICKERSON/FRAZIER | Depth: | 0-5 |
| Lab No.: | 20181398 | AASHTO Class: | A-4 (0) |
| Sample ID: | RV337 | Material Type (1 or 2): | 2 |
| LATITUDE: | | LONGITUDE: | |

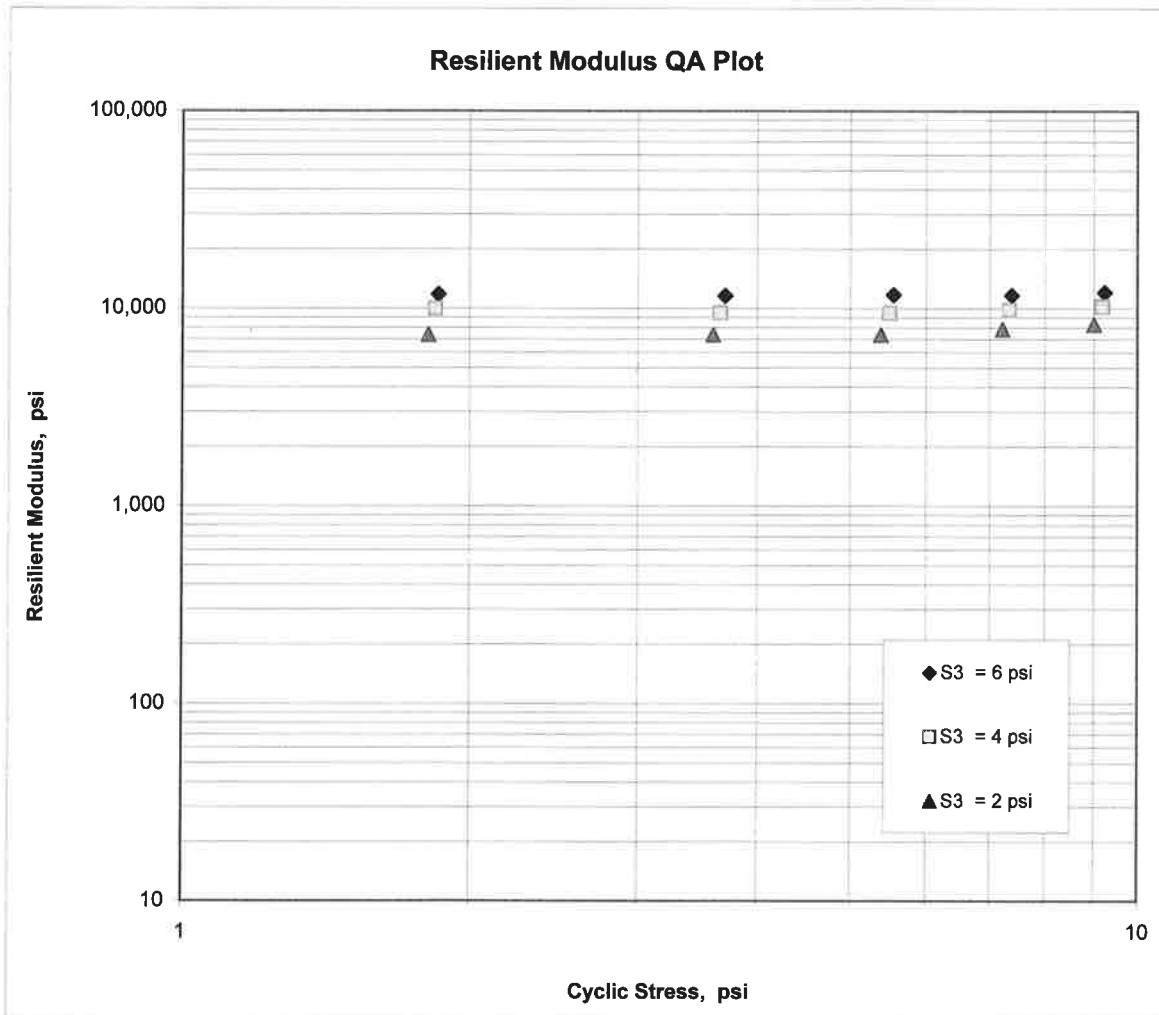
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = 5,531$$

$$K_2 = 0.02898$$

$$K_5 = 0.38993$$

$$R^2 = 0.97$$



JOB: 020656

Arkansas State Highway Transportation Department

JOB NAME: HWY. 65 ACCESS CHANGE (PICKENS)(S)

Materials Division

COUNTY NO. 21 DATE TESTED 7/25/2018

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 | | | | |
| 110+00 | CL | 0-5 | BROWN | 100 | 99 | 98 | 85 | 75 | ND | NP | A-4 (0) | RV337 | |
| 107+00 | 27 RT | 0-5 | BROWN | 94 | 92 | 90 | 86 | 76 | 23 | 6 | A-4 (2) | S334 | 21 |
| 110+00 | CL | 0-5 | BROWN | 100 | 99 | 97 | 87 | 64 | ND | NP | A-4 (0) | S335 | 16.8 |
| 116+00 | 21 RT | 0-5 | GRAY | 100 | | | | 94 | 20 | 2 | A-4 (0) | S336 | 22.5 |

comments: W=MULTIPLE LAYERS

Tuesday, August 07, 2018

JOB: 020656

Arkansas State Highway Transportation Department

DATE TESTED

JOB NAME: HWY. 65 ACCESS CHANGE (PICKENS)(S)

Materials Division

7/25/2018

COUNTY NO. 21

Michael Benson, Materials Engineer

STA.# LOC.

PAVEMENT SOUNDINGS

| | | | | |
|--------|-------|-----------------|-----------------|----------------------------|
| 107+00 | 27 RT | ACHMSC 2.25W | ACHMBC --- | AGG. BASE CRS. CL-7 8.0 |
| 110+00 | CL | ACHMSC --- | ACHMBC --- | AGG. BASE CRS. CL-7 --- |
| 116+00 | 21 RT | ACHMSC 4.0 | ACHMBC 11.25 | AGG. BASE CRS. CL-7 --- |

comments: W=MULTIPLE LAYERS

Tuesday, August 07, 2018

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

MICHAEL BENSON, MATERIALS ENGINEER

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

| | | | |
|------------------|---|---------------|------------|
| DATE | - 07/25/18 | SEQUENCE NO. | - 1 |
| JOB NUMBER | - 020656 | 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 | - 21 |
| SUPPLIER NAME | - STATE | DISTRICT NO. | - 02 |
| NAME OF PROJECT | - HWY. 65 ACCESS CHANGE (PICKENS) (S) | | |
| PROJECT ENGINEER | - NOT APPLICABLE | | |
| PIT/QUARRY | - ARKANSAS | | |
| LOCATION | - DESHA, COUNTY | DATE SAMPLED | - 06/12/18 |
| SAMPLED BY | - DICKERSON/FRAZIER | DATE RECEIVED | - 06/21/18 |
| SAMPLE FROM | - TEST HOLE | DATE TESTED | - 07/25/18 |
| MATERIAL DESC. | - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS | | |

| | | | |
|--------------------------|--------------------|--------------------|--------------------|
| LAB NUMBER | - 20181395 | - 20181396 | - 20181397 |
| SAMPLE ID | - S334 | - S335 | - S336 |
| TEST STATUS | - INFORMATION ONLY | - INFORMATION ONLY | - INFORMATION ONLY |
| STATION | - 107+00 | - 110+00 | - 116+00 |
| LOCATION | - 27 RT | - CL | - 21 RT |
| DEPTH IN FEET | - 0-5 | - 0-5 | - 0-5 |
| MAT'L COLOR | - BROWN | - BROWN | - GRAY |
| MAT'L TYPE | - | - | - |
| LATITUDE DEG-MIN-SEC | - 33 50 42.70 | - 33 50 45.70 | - 33 50 51.30 |
| LONGITUDE DEG-MIN-SEC | - 91 28 33.70 | - 91 28 34.50 | - 91 28 35.40 |
| % PASSING | 2 IN. - | - | - |
| | 1 1/2 IN. - | - | - |
| | 3/4 IN. - 100 | - | - |
| | 3/8 IN. - 97 | - | - |
| | NO. 4 - 94 | - 100 | - 100 |
| | NO. 10 - 92 | - 99 | - |
| | NO. 40 - 90 | - 97 | - |
| | NO. 80 - 86 | - 87 | - |
| | NO. 200 - 76 | - 64 | - 94 |
| LIQUID LIMIT | - 23 | - ND | - 20 |
| PLASTICITY INDEX | - 6 | - NP | - 2 |
| AASHTO SOIL | - A-4 (2) | - A-4 (0) | - A-4 (0) |
| UNIFIED SOIL | - | - | - |
| % MOISTURE CONTENT | - 21.0 | - 16.8 | - 22.5 |
| ACHMSC (IN) | - 2.25W | - --- | - 4.0 |
| ACHMBC (IN) | - --- | - --- | - 11.25 |
| AGG. BASE CRS. CL-7 (IN) | - 8.0 | - --- | - --- |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |
| | - | - | - |

REMARKS - W=MULTIPLE LAYERS

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

MICHAEL BENSON, MATERIALS ENGINEER

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

| | | | |
|--|--------------------------|---------------|------------|
| DATE | - 07/25/18 | SEQUENCE NO. | - 1 |
| JOB NUMBER | - 020656 | 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 | - 21 |
| SUPPLIER NAME | - STATE | DISTRICT NO. | - 02 |
| NAME OF PROJECT - HWY. 65 ACCESS CHANGE (PICKENS) (S) | | | |
| PROJECT ENGINEER - NOT APPLICABLE | | | |
| PIT/QUARRY - ARKANSAS | | | |
| LOCATION | - DESHA, COUNTY | DATE SAMPLED | - 06/12/18 |
| SAMPLED BY | - DICKERSON/FRAZIER | DATE RECEIVED | - 06/21/18 |
| SAMPLE FROM | - TEST HOLE | DATE TESTED | - 07/25/18 |
| MATERIAL DESC. - SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS | | | |

| | | | | |
|-----------------------|---------|------------------|-----|---|
| LAB NUMBER | - | 20181398 | - | - |
| SAMPLE ID | - | RV337 | - | - |
| TEST STATUS | - | INFORMATION ONLY | - | - |
| STATION | - | 110+00 | - | - |
| LOCATION | - | CL | - | - |
| DEPTH IN FEET | - | 0-5 | - | - |
| MAT'L COLOR | - | BROWN | - | - |
| MAT'L TYPE | - | | - | - |
| LATITUDE DEG-MIN-SEC | - | 33 50 45.70 | - | - |
| LONGITUDE DEG-MIN-SEC | - | 91 28 34.50 | - | - |
| % PASSING | 2 | IN. | - | - |
| | 1 1/2 | IN. | - | - |
| | 3/4 | IN. | - | - |
| | 3/8 | IN. | - | - |
| | NO. 4 | - | 100 | - |
| | NO. 10 | - | 99 | - |
| | NO. 40 | - | 98 | - |
| | NO. 80 | - | 85 | - |
| | NO. 200 | - | 75 | - |
| LIQUID LIMIT | - | ND | - | - |
| PLASTICITY INDEX | - | NP | - | - |
| AASHTO SOIL | - | A-4 (0) | - | - |
| UNIFIED SOIL | - | | - | - |
| % MOISTURE CONTENT | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |
| | - | | - | - |

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