CNZ020 Bradley Co. SR 40 Mandatory Pre-bid Meeting

1/21/25

Project Scope and Letting Information

- SR40 from Near Lyles Road SE to Polk County Line
  - 4.70 Miles
  - Cold Plane, Resurface with 411D (PG 70-22) and Pavement Markings
  - Balanced Mix Design
- February 7th, 2025 at 10 AM
  - Prequalification
    - Must attend this meeting, good job…please sign In!
- Completion Date
  - On or Before 9/30/2025
- DBE Goal
  - 7%

Special Provisions

- 109A, 109B (Fuel/Bituminous Adjustments)
- 109ETAS (E-ticketing Asphalt)
- 407DEN (Density)
- 407IC (Intelligent Compaction)
- 411C (Rideability)
  - Waived for BMD test section
- 108B
  - 7 AM to 6 PM

Outline

- Purpose
- Plans
  - Sheet 1
  - Sheet 2B
  - Sheet 2D1
  - Sheet 2D2
  - Sheet 2F
- Questions

Purpose

- Placing 10 Test Sections plus Control
- Most mixtures are specifically prescribed, but will be tested in design and production with Balanced Mix Design (BMD) tests
- Test sections will help validate what test thresholds provide acceptable performance

Sheet 1

Index Of Sheets
SEE SHEET NO. 1A

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

DOES THIS PROJECT QUALIFY FOR UTILITY CHAPTER 88	YES	NO X
WORK ZONE SIGNIFICANCE DETERMINATION		
SIGNIFICANT	YES	NO X

TENN.	YEAR	SHEET NO.
	2025	1
FED. AID PROJ. NO.	NH/HSIP-40(52)	
STATE PROJ. NO.	06S040-F8-004, 06S040-F3-004	

BRADLEY COUNTY

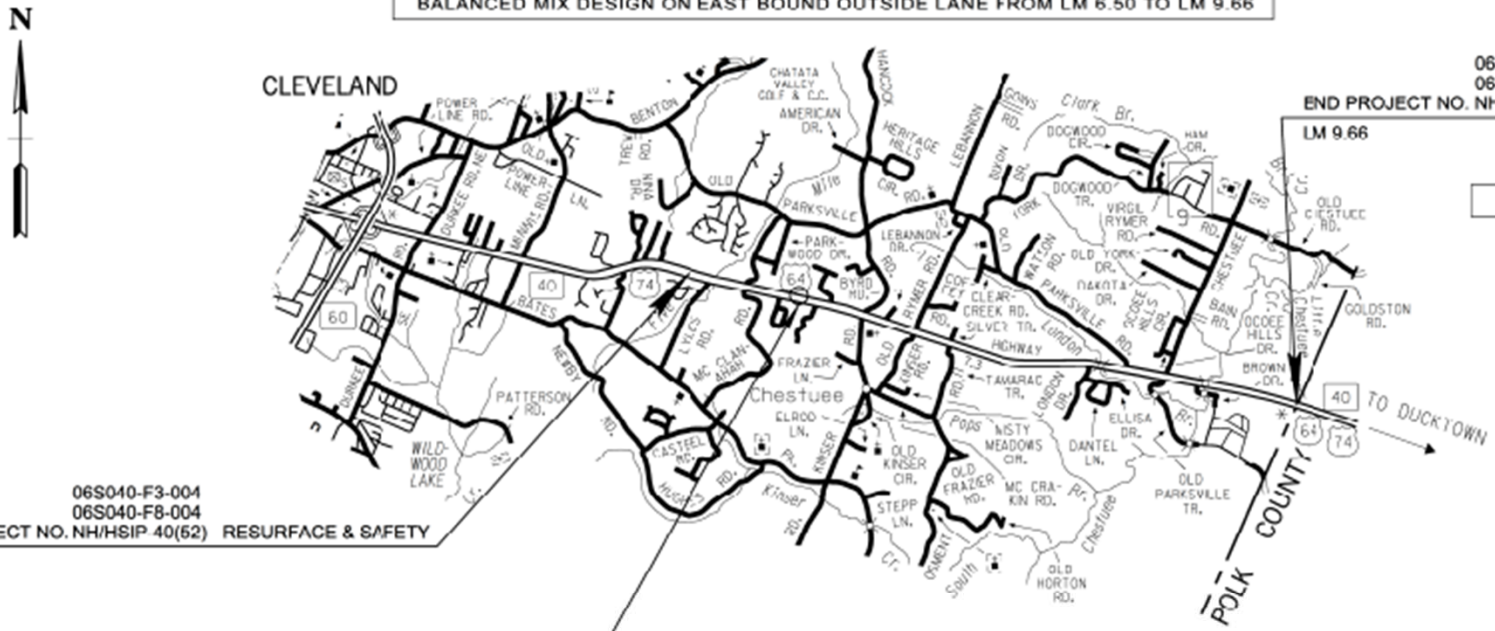
STATE ROUTE 40 (US-64, 74)
FROM NEAR LYLES ROAD SE (LM 4.96)
TO POLK COUNTY LINE (LM 9.66)

RESURFACE & SAFETY
COLD PLANE, RESURFACE 411D, AND PAVEMENT MARKINGS

STATE HIGHWAY NO. 40 F.A.H.S. NO. 64, 74

PROJECT LOCATION
BRIDGE ID. # 06SR0400005 06SR0400006 06SR0400007

BALANCED MIX DESIGN ON EAST BOUND OUTSIDE LANE FROM LM 6.50 TO LM 9.66



06S040-F3-004
06S040-F8-004
BEGIN PROJECT NO. NH/HSIP 40(52) RESURFACE & SAFETY
LM 4.96

06S040-F3-004
06S040-F8-004
END PROJECT NO. NH/HSIP-40(52) RESURFACE & SAFETY
LM 9.66

NO EXCLUSIONS

AUTOMATIC TRAFFIC RECORDER #17 EB & WB
LM 5.72

SCALE: 1"= 2640'
0 0.5 1.0 1.5 MILE

SEALED BY
5-29-2024

APPROVED:
WILL REID, CHIEF ENGINEER
DATE:
APPROVED:
HOWARD H. REY, COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

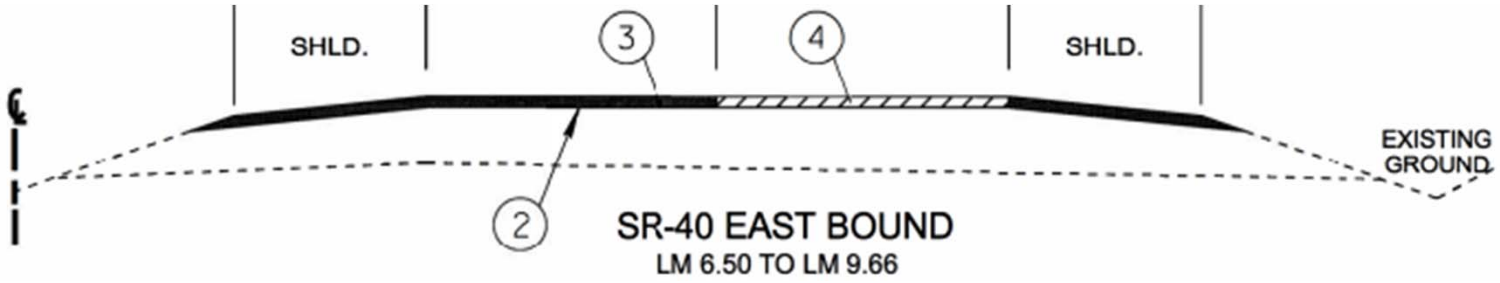
THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED JANUARY 1, 2021 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT.

TDOT PROJECT MANAGER : ANDREW ZAZZARA, P.E.
ENGINEER ON RECORD : JASON M. INGRAM
DESIGNER : DIANE EVITT CHECKED BY : MEGAN WILDES, P.E.
P.E. NO. 98023-4217-04
PIN NO. 124940.00

PROJECT LENGTH 4.70 MILES
TOTAL LANE MILES RESURFACED 20.95 MILES

TRAFFIC DATA	
ADT (2025)	15,980
POSTED SPEED	55 MPH

Sheet 2B – Typical Sections …



PROPOSED PAVEMENT SCHEDULE
(1) COLD PLANING, 1.25" DEPTH @131.25 LBS/SY ITEM 415-01.01 COLD PLANING BITUMINOUS PAVEMENT, TON
(2) TRACKLESS TACK COAT 403-02.01 TRACKLESS TACK COAT (TC), TON SEE 403.05 FOR DETERMINING APPLICATION RATE IN THE FIELD.
(3) SURFACE MIX 1.25" THICK @ APPROX. 132.5 LBS/SY 411-02.10 ACS MIX (PG 70-22) GRADING D, TON
(4) BALANCED MIX DESIGN 1.25" THICK @ APPROX. 132.5 LBS/SY 411-05.02 BMD ACS MIX (BALANCED MIX DESIGN), TON SEE SPECIAL NOTES ON SHEETS 2D1 & 2D2 FOR INFORMATION.

Sheet 2B – Typical Sections …

NOTES

(A) BALANCED MIX DESIGN (BMD), ITEM NO. 411-05.02:

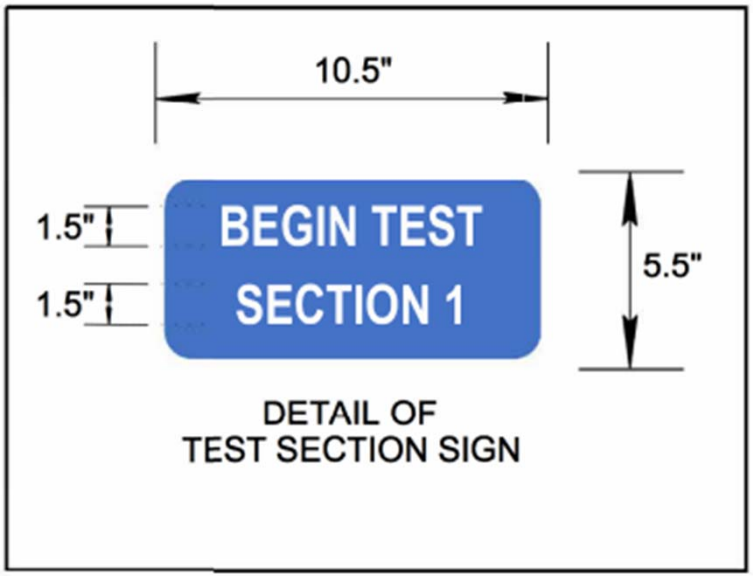
- SHALL BE USED FOR ALL THE DESIGNATED TEST SECTIONS AND BACK-UP SECTIONS.
- ALL TEST SECTIONS WILL BE FOR THE EASTBOUND OUTSIDE LANE (DOES NOT INCLUDE THE 10 FT SHOULDER)
- SMALL PERMANENT SIGNS WILL BE INSTALLED AT THE BEGINNING LOG MILE OF EACH TEST SECTION. (EXAMPLE TEXT ON SIGN "TS 1")
- PLACE A 6" THERMOPLASTIC "BAR/STRIPE" ON THE ADJACENT 10 FT SHOULDER TO SIGNAL THE OFFICIAL START AND STOP LOCATIONS FOR THE DESIGNATED ANALYSIS ZONE OF EACH TEST SECTION
- SEE SHEET 2D1 & 2D2 FOR SR-40 BMD VALIDATION TEST SECTION SPECIAL NOTES.

(B) INTELLIGENT COMPACTION SHALL BE USED.

(C) DELETED.

BMD TEST SECTION LOCATIONS

TEST SECTION NO.	DESCRIPTION	BEGIN LOG MILE	END LOG MILE
1	CONTROL + 0.5%	6.50	6.75
2	CONTROL - 0.5%	6.75	7
3	CONTROL WITH PG64-22	7.00	7.25
4	CONTROL WITH PG76-22	7.25	7.5
5	HIGH NATURAL RIVER SAND	7.50	7.75
6	MEDIUM RAP	7.75	8
7	HIGH RAP	8.00	8.25
8	HIGH RAP WITH RECYCLING AGENT	8.25	8.5
9	HIGH FINE RAP	8.50	8.75
10	CONTRACTOR'S CHOICE BMD	8.75	9.00
11	BACK-UP 1	9.00	9.22
12	BACK-UP 2	9.22	9.44
13	BACK-UP 3	9.44	9.66



DETAIL OF
TEST SECTION SIGN

Sheet 2D1 – Special Notes

SR-40 BMD VALIDATION TEST SECTION SPECIAL NOTES

TEST SECTION MIX DESIGNS

THE VALIDATION TEST SECTIONS WILL CONSIST OF 10 DISTINCT MIX DESIGNS AS DETAILED BELOW. THE "CONTROL MIX" FURTHER MENTIONED BELOW WILL REFER TO THE APPROVED PG70-22 D MIX USED THROUGHOUT THE MAJORITY OF THE PROJECT. THE PG70-22 BINDER USED IN THE CONTROL MIX AND ANY TEST SECTION REQUIRING PG70-22 BINDER WILL BE OF SUCH QUALITY THAT IT MEETS THE REQUIREMENTS IN 904.01 OF THE TDOT STANDARD SPECIFICATIONS FOR A PG70-22 AND ALSO WOULD NOT MEET THE REQUIREMENTS FOR A PG76-22.

FOR EACH TEST SECTION MIX DESIGN DESCRIBED BELOW, SUBMIT TO THE TDOT CENTRAL MATERIALS & TESTS LAB THE FOLLOWING:

Sheet 2D1 – Special Notes

(1) JOB MIX FORMULA ON TDOT MIX DESIGN SOFTWARE IN ACCORDANCE WITH 407.03.C. OF THE TDOT STANDARD SPECIFICATIONS

(2) ADDITIONAL LABORATORY TEST RESULTS FOR CRACKING AND RUTTING TESTS DESCRIBED BELOW:

a. **ASTM D8225 IDEAL CRACKING TEST (IDEAL CT) (6" GYRATORY SPECIMENS)**
AN AVERAGE OF 5 SPECIMENS SHALL BE TESTED TO CALCULATE THE AVERAGE CT INDEX FOR THE MIX DESIGN. MIXTURE SPECIMENS SHALL BE AGED AS LOOSE MIX FOR 4 HOURS IN A FORCED DRAFT OVEN AT 135°C.

b. **ASTM D8225 IDEAL CT (6" GYRATORY SPECIMENS, CRITICALLY AGED)**
AN AVERAGE OF 5 SPECIMENS SHALL BE TESTED TO CALCULATE THE AVERAGE CT INDEX FOR THE MIX DESIGN. MIXTURE SPECIMENS SHALL BE AGED AS LOOSE MIX FOR 4 HOURS IN A FORCED DRAFT OVEN AT 135°C FOR SHORT TERM OVEN AGING. THE LOOSE MIX WILL THEN BE AGED FOR AN ADDITIONAL 8 HOURS AT 135°C FOR CRITICAL AGING.

c. **ASTM D8225 IDEAL CT (4" MARSHALL SPECIMENS)**
AN AVERAGE OF 5 SPECIMENS SHALL BE TESTED TO CALCULATE THE AVERAGE CT INDEX FOR THE MIX DESIGN. MIXTURE SPECIMENS SHALL BE AGED AS LOOSE MIX FOR 4 HOURS IN A FORCED DRAFT OVEN AT 135°C. THE TEST METHOD SHALL BE MODIFIED TO TEST 4" DIAMETER SPECIMENS COMPACTED WITH A MARSHALL HAMMER.

d. **AASHTO T324 HAMBURG WHEEL TRACKING TEST (HWTT)**
MIXTURE SPECIMENS SHALL BE AGED AS LOOSE MIX FOR 2 HOURS IN A FORCED DRAFT OVEN AT 135°C. SPECIMEN SHALL BE TESTED AT A TEMPERATURE OF 50°C.

e. **ASTM D8360 IDEAL RUTTING TEST (IDEAL RT)**
MIXTURE SPECIMENS SHALL BE AGED AS LOOSE MIX FOR 2 HOURS IN A FORCED DRAFT OVEN AT 135°C. SPECIMEN SHALL BE TESTED AT A TEMPERATURE OF 50°C.

f. **ASTM D6931 HIGH TEMPERATURE INDIRECT TENSION TEST (HT-IDT) (4" MARSHALL SPECIMENS)**
MIXTURE SPECIMENS SHALL BE AGED AS LOOSE MIX FOR 2 HOURS IN A FORCED DRAFT OVEN AT 135°C. SPECIMEN SHALL BE TESTED AT A TEMPERATURE OF 50°C.

Sheet 2D1 – Special Notes

(3) MATERIALS FOR MIX DESIGN VERIFICATION:

a. 5 GYRATORY SPECIMENS COMPACTED AT 7±1% VOIDS CONDITIONED IN ACCORDANCE WITH 2.A. FOR IDEAL CT TESTING.

b. 5 GYRATORY SPECIMENS COMPACTED AT 7±1% VOIDS CONDITIONED IN ACCORDANCE WITH 2.B. FOR CRITICALLY AGED IDEAL CT TESTING.

c. 7 GYRATORY SPECIMENS COMPACTED AT 7±1% VOIDS CONDITIONED IN ACCORDANCE WITH 2.D. AND 2.E. FOR HWTT AND IDEAL RT TESTING.

d. 5 MARSHALL SPECIMENS COMPACTED AT 7±1% VOIDS CONDITIONED IN ACCORDANCE WITH 2.C. FOR 4" IDEAL CT TESTING.

e. 3 MARSHALL SPECIMENS COMPACTED AT 7±1% VOIDS CONDITIONED IN ACCORDANCE WITH 2.F. FOR HT-IDT TESTING.

f. 3000 GRAMS OF LOOSE MIX FOR RICE GRAVITY TESTING.

Sheet 2D1 – Special Notes

Test Section 1 – Control Mix + 0.5% Virgin Asphalt Binder – L.M. 6.50 – L.M. 6.75

This mix shall have identical material sources and aggregate/RAP proportions, by weight of aggregate, as the control mix. It will also have 0.5% of virgin PG70-22 binder more than the control mix.

Test Section 2 – Control Mix - 0.5% Virgin Asphalt Binder – L.M. 6.75 – L.M. 7.00

This mix shall have identical material sources and aggregate/RAP proportions, by weight of aggregate, as the control mix. It will also have 0.5% of virgin PG70-22 binder less than the control mix.

Test Section 3 – Control Mix with PG64-22 binder – L.M. 7.00 – L.M. 7.25

This mix shall have identical material sources and aggregate/binder/RAP proportions, by weight of mixture, as the control mix. The binder used will be a PG64-22 binder as specified in 904.04 of the Standard Specifications.

Test Section 4 – Control Mix with PG76-22 binder – L.M. 7.25 – L.M. 7.50

This mix shall have identical material sources and aggregate/binder/RAP proportions, by weight of mixture, as the control mix. The binder used will be a PG76-22 binder as specified in 904.04 of the Standard Specifications.

Test Section 5 – High Natural River Sand – L.M. 7.50 – L.M. 7.75

This mix shall have identical material sources as the control with the exception that the natural sand used will be of a source that has been river dredged and of a rounded shape by nature. The Uncompactacted Voids (Fine Aggregate Angularity), as tested by AASHTO T304, of the natural river sand shall be less than 41%. The natural river sand must be between 35% - 40% of the aggregate blend by total weight of aggregate.

Sheet 2D1 – Special Notes

Test Section 6 – Medium RAP % – L.M. 7.75 – L.M. 8.00

This mix shall have identical material sources as the control mix. The RAP used shall be of the same stockpile as the control mix. The RAP proportions shall be between 20% - 25% of the aggregate blend by total weight of aggregate. The mix shall contain at least 70% virgin binder.

Test Section 7 – High RAP % – L.M. 8.00 – L.M. 8.25

This mix shall have identical material sources as the control mix. The RAP used shall be of the same stockpile as the control mix. The RAP proportions shall be between 35% - 40% of the aggregate blend by total weight of aggregate. The mix shall contain at least 55% virgin binder.

Test Section 8 – High RAP % with Recycling Agent – L.M. 8.25 – L.M. 8.50

This mix shall have identical material sources and proportions by total weight of mixture as Test Section 7. The mix shall also include the use of an asphalt mixture recycling agent (also referred to as a rejuvenator) that has been submitted to the AASHTO PEAS Asphalt Mixture Recycling Agent (AMRA) testing program. The amount of recycling agent used shall be considered as part of the virgin binder content for mix design purposes. Dosage rate of the recycling agent shall be determined as by the recycling agent's manufacturer's recommendation. The recycling agent must be in-line blended with the virgin binder at the asphalt plant unless a tanker is pre-blended at the binder terminal.

Test Section 9 – High Fine RAP % – L.M. 8.50 – L.M. 8.75

This mix shall have identical material sources as the control mix. The RAP used shall be processed or fractionated and have a maximum particle size of ¼". The RAP proportions shall be between 35% - 40% of the aggregate blend by total weight of aggregate. The mix shall contain at least 55% virgin binder.

Sheet 2D1 – Special Notes

Test Section 10 – Contractor's Choice BMD – L.M. 8.75 – L.M. 9.00

This mix shall not be limited by typical TDOT mixture deign specifications in Sections 411 and 903.11 of the TDOT Standard Specifications. Develop a bituminous mixture composed of aggregate, mineral filler, asphalt cement, and any required other material. Aggregate fractions shall be sized, uniformly graded, and combined in such proportions so that the resulting mixtures will meet the grading and physical properties of the approved Job Mix Formula (JMF). Other materials not specified (such as but not limited to fibers, ground tire rubber, chemical admixtures, etc.) may be utilized to meet the mixture testing criteria with the Department's approval. The Department reserves the right to review a historical documentation and a quality control plan for how any new additive is introduced into the mixture and may refuse the use of any additive at the Department's discretion.

The gradation of the mix shall be controlled only by the below control points. The remainder of the sieves will be established on the JMF for production tolerance purposes.

Required Gradation for Test Section 10

Sieve Size	Total Percent Passing, by Weight
5/8 inch	100
1/2 inch	90-100
3/8 inch	Contractor's JMF Design
No. 4	Contractor's JMF Design
No. 8	Contractor's JMF Design
No. 30	Contractor's JMF Design
No. 50	Contractor's JMF Design
No. 100	Contractor's JMF Design
No. 200	Contractor's JMF Design

Required Performance Related Mix Design Testing for Test Section 10

Minimum CT Index per IDEAL CT (ASTM D8225)	Minimum Passes to 12.5 mm Rutting Depth per Hamburg Wheel Tracking Test (AASHTO T324)	Minimum Passes to Stripping Inflection Point per Hamburg Wheel Tracking Test (AASHTO T324)
100	20,000	15,000

In addition to the applicable portion of 407.03.C, present laboratory data showing the mixture meets the testing criteria in the Table below. Mixture specimens tested in accordance with ASTM D8225 shall be aged as loose mix for 4 hours in a forced draft oven at 135°C. Specimens tested in accordance with AASHTO T324 shall be aged as loose mix for 2 hours in a forced draft oven at 135°C. Mixture specimens tested in accordance with AASHTO T324 shall be tested at a temperature of 50°C.

Sheet 2D1 – Special Notes

Back-up Test Sections – L.M. 9.00 – L.M. 9.66

These sections will be reserved for replacement of test sections as determined by TDOT Materials & Tests. Any portion of the back-up test sections that are not needed for test section replacement will be paved with the control mix and paid under item 411-05.02 BMD ACS Mix (Balanced Mix Design).

Sheet 2D2 – Special Notes

ACCEPTANCE AND VERIFICATION OF TEST SECTIONS

QUALITY ACCEPTANCE FOR THE ASPHALT MIXTURE OF EACH TEST SECTION SHALL BE DONE AS IN ACCORDANCE WITH 407.20 OF THE TDOT STANDARD SPECIFICATIONS, EXCEPT AS NOTED BELOW. EACH TEST SECTION WILL BE CONSIDERED AS 1 LOT FOR EVALUATION OF BOTH THE PLANT MIXTURE AND IN-PLACE DENSITY. THE ASPHALT CEMENT ADJUSTMENT ESTABLISHED IN 407.20.C.1 WILL BE APPLICABLE FOR ALL TEST SECTIONS EXCEPT TEST SECTION 10.

ASPHALT CEMENT CONTENT AND GRADATION

IF THE ACCEPTANCE TEST FALLS OUT OF THE ACCEPTABLE TOLERANCE RANGE FOR A 1.00 PAY FACTOR FOR EITHER ASPHALT CEMENT CONTENT OR GRADATION, THEN THE TEST SECTION WILL BE EVALUATED USING THE PERFORMANCE RELATED VERIFICATION TESTS TO DETERMINE IF THE TEST SECTION WILL BE EITHER:

A. LEFT IN PLACE AT THE APPLICABLE PARTIAL PAYMENT INDICATED IN TABLE 407.20 AND NO ADDITIONAL SECTION PLACED IN A RESERVED BACK-UP TEST SECTION.

B. LEFT IN PLACE AT THE APPLICABLE PARTIAL PAYMENT INDICATED IN TABLE 407.20 AND PLACE AN ADDITIONAL SECTION IN A RESERVED BACK-UP TEST SECTION.

C. REMOVE AND REPLACE AT NO COST TO THE DEPARTMENT.

Sheet 2D2 – Special Notes

IN-PLACE DENSITY

DENSITY OF THE TEST SECTIONS SHALL BE DETERMINED USING SP407DEN WITH EACH TEST SECTION BEING CONSIDERED AS 1 LOT. IF THE IN-PLACE DENSITY OF THE MAT IS LESS THAN 93.0% OR GREATER THAN 95.0%, THEN THE SECTION WILL BE ACCEPTED IN ACCORDANCE WITH SP407DEN ON THE BASIS OF DENSITY; THE SECTION WILL ALSO BE EVALUATED TO DETERMINE IF THE TEST SECTION WILL BE PLACED AGAIN IN A RESERVED BACK-UP SECTION.

VERIFICATION TESTS

EACH TEST SECTION WILL BE RANDOMLY SAMPLED WITHIN PRODUCTION TO VERIFY THE RESULTS OF THE PERFORMANCE RELATED TESTS FROM THE MIX DESIGN PROCESS. THE FIRST 2 LOADED TRUCKS OF EACH MIX TYPE WILL BE EXCLUDED FROM THE RANDOM SAMPLING TO ALLOW THE PLANT TO ACHIEVE A STEADY STATE OF PRODUCTION. THESE VERIFICATION RESULTS WILL BE USED TO DETERMINE IF A TEST SECTION WILL NEED TO BE REPLACED IN A BACK-UP TEST SECTION.

THE VERIFICATION TESTS WILL INCLUDE:

1. **ASTM D8225 IDEAL CT (6" GYRATORY SPECIMENS)**
2. **ASTM D8225 IDEAL CT (4" MARSHALL SPECIMENS)**
3. **ASTM D8360 IDEAL RUTTING TEST (IDEAL RT)**
4. **ASTM D6931 HIGH TEMPERATURE INDIRECT TENSION TEST (HT-IDT) (4" MARSHALL SPECIMENS)**
5. **AASHTO T324 HWTT (FOR INFORMATION ONLY)**

THE SPECIMENS FOR THESE TESTS WILL NOT GO THROUGH SHORT TERM OVEN AGING. THE INTENT IS TO COMPACT THESE VERIFICATION TEST SPECIMENS IMMEDIATELY FOLLOWING SAMPLING WHILE STILL AT COMPACTION TEMPERATURES. IF IT IS DEEMED NECESSARY TO HAVE TO REHEAT SPECIMENS BACK TO COMPACTION TEMPERATURE THAT WILL BE NOTED ON THE RESULTS.

Sheet 2F Tabulated Quantities

BMD TEST SECTION TABULATION				
TEST SECTION NO.	DESCRIPTION	BEGIN LOG MILE	END LOG MILE	411-05.02 BMD MIX TON
1	CONTROL + 0.5%	6.50	6.75	116.6
2	CONTROL - 0.5%	6.75	7.00	116.6
3	CONTROL WITH PG64-22	7.00	7.25	116.6
4	CONTROL WITH PG76-22	7.25	7.5	116.6
5	HIGH NATURAL RIVER SAND	7.50	7.75	116.6
6	MEDIUM RAP	7.75	8.00	116.6
7	HIGH RAP	8.00	8.25	116.6
8	HIGH RAP WITH RECYCLING AGENT	8.25	8.50	116.6
9	HIGH FINE RAP	8.50	8.75	116.6
10	CONTRACTOR'S CHOICE BMD	8.75	9.00	116.6
11	BACK-UP 1	9.00	9.22	102.6
12	BACK-UP 2	9.22	9.44	102.6
13	BACK-UP 3	9.44	9.66	102.6
TOTAL BMD TEST SECTION TONNAGE				1473.8

Questions?