ASPHALT STABILIZATION
(ASPHADUR)
FINAL REPORT
IOWA DOT PROJECT HR-511
FHWA EXPERIMENTAL PROJECT 79-04
Asphalt Stabilization (Asphadur)
Final Report

Introduction

Asphadur (now called 3M Additive 5990) was incorporated into asphaltic concrete on a lane delineation, AC resurfacing, project in Council Bluffs. The experimental feature was included in the eastbound lanes of Interstate 480, beginning at the bridge over the Missouri River and ending at the bridge over North 41st Street. The project was constructed in October 1979.

Objective

The objective of the project was to investigate the manufacturer's claims of improved strength, stability and durability of an asphalt mix.

Construction

The asphaltic concrete was mixed in a Barber Greene batch plant. The Asphadur was added in the pugmill. To successfully incorporate the Asphadur, the mix was heated to 400°F to 410°F. The mix was a 1/2" Type A mix laid 2-inches thick.

The intended asphalt cement content was 5.25% of AC-20 and the Asphadur content was 6% of the asphalt cement. Twelve samples of the mix were taken from the project. The average asphalt cement content was 5.16% and the average Marshall stability was 3925 pounds.
Evaluation

Within two years after construction there was one patch and six square feet of alligator cracking had developed. Most of the joints in the portland cement concrete pavement had reflected through the surface. After three years all the underlying joints and cracks had reflected through the surface and some random cracking was present. After four years of service a large increase in the random cracking and large areas of map cracking were observed. The surface had no rutting or shoving after four years of service.

Conclusions

Asphadur is an effective agent for increasing the stability of asphaltic concrete.

Increased strength and durability were not proven by this project.
REDUCTION OF REFLECTION CRACKS
(Monsanto Bidim Synthetic Fabric)
FINAL REPORT

IOWA DOT PROJECT HR-511

FHWA EXPERIMENTAL PROJECT 79-01
Introduction

A lane delineation project was constructed in the eastbound lanes of Interstate 480 in Council Bluffs. A synthetic fabric, Monsanto Bidim C-28, was placed between the portland cement concrete and two inches of Type A asphaltic concrete resurfacing containing Asphadur. The experimental feature began at the bridge over the Missouri River and ended at the bridge over North 41st Street. The project was constructed in October 1979.

Objective

The objective of this experimental project was to determine the effectiveness of the fabric in reducing reflective cracking in an asphaltic concrete overlay.

Construction

The special provisions for the project specified either Petromat or Bidim C-28 fabric. Due to the high mixing temperature required to incorporate Asphadur into the asphaltic concrete, Bidim C-28 was used. The asphaltic concrete with AC-20 was mixed between 400°F and 410°F and Petromat cannot tolerate a temperature that high.

Cracks wider than 1/4" in the portland cement concrete were filled with asphaltic concrete before placement of the fabric. The surface was tack coated with 0.20 to 0.25 gal/sq yd of AC-20 and the fabric was placed on the coated surface.
During placement of the asphaltic concrete, wrinkles developed when truck wheels slid when being pushed by the laydown machine. The wrinkled fabric was removed and replaced.

Evaluation

Evaluation was by visual observation. Within the first year after construction, 14 cracks had reflected full width and 8 cracks had reflected partial width through the surface. There was one patched area. Two years after construction there were 16 full width cracks, 15 partial width cracks, and six square feet of alligator cracking.

After four years of service all of the joints and cracks including the random cracks have reflected through the surface. There is considerable map cracking in the surface.

Conclusion

The fabric did not prevent reflection cracking through asphaltic concrete containing Asphadur.
Reduction of Reflection Cracks
(Monsanto Bidim Synthetic Fabric)

The project is located on the eastbound lane of I-480 beginning at the east end of the bridge over the Missouri River. The project was resurfaced in 1980 using Monsanto Bidim fabric between the portland cement concrete and the asphaltic concrete containing Asphadur.

The project was visually inspected November 15, 1983, and it appeared that all of the cracks and joints in the p.c.c. have reflected through the asphaltic concrete surface. There is also a large amount of random and map type cracking in the surface. The asphaltic concrete appears to have aged prematurely and with two variables, fabric and Asphadur, it may not be possible to properly evaluate the effectiveness of the fabric.
The project is located on the eastbound lane of I-480 beginning at the east end of the bridge crossing the Missouri River. The project was resurfaced in 1980 using Bidim fabric between the portland cement concrete and the asphaltic concrete resurfacing containing Asphadur.

As of November 15, 1983 there was no rutting or other type surface distortion. It appeared that all of the cracks in the portland cement concrete have reflected through the surface.

There is also considerable random cracking and large areas of map cracking.
Asphalt Stabilization (Asphadur)  
I-480-1(114)0

The project was completed in 1979. The most recent visual inspection, August 24, 1981, did not observe any rutting or other type surface deformation. There were 16 full width cracks, 15 partial width cracks, and an area of about 6 square feet of alligator cracking. There was one patch.
MIX, TYPE AND CLASS: TYPE A SURFACE

INTENDED USE: ASPHALDUR

SIZE 1/2"

COUNTY: POTTAWATTAMIE

CONTRACTOR: DELTA

LOCATION: IN COUNCIL BLUFFS OVER NORTH 41ST STREET

AGG. SOURCES: 1/2" CR. GRAVEL - AVONCA PIT - POTTAW. CO.; SAND - VALLEY, NEBR.; 1/2" COVER AGG. - AVONCA PIT - POTTAW. CO.

JOB MIX FORMULA AGGREGATE PROPORTIONS: 65% AAT9-713, 30% AAT9-715, 5% AAT9-714

1-1/2" 1" 3/4" 1/2" 3/8" NO.4 NO.8 NO.16 NO.30 NO.50 NO.100 NO.200
100 94 66 50 37 24 15 8.2 5.9

TOLERANCE: 98/100 7 7 5 4 2
75 BLOW MARSHALL DENSITY 2 36

ASPHALT SOURCE AND APPROXIMATE VISCOSITY: PHILLIPS - 2020 POISES

PLASTICITY INDEX
% ASPH. IN MIX 4.0 5.0 6.0

NUMBER OF MARSHALL BLOWS 50 50 50

MARSHALL STABILITY - LBS. 2053 2153 2460

FLOW - 0.01 IN. 7 8 10

SP. GR. BY DISPLACEMENT (LAB DENS.) 2.29 2.33 2.37

BULK SP. GR. COND. DRY AGG. 2.702 2.702 2.702

SP. GR. ASPH. @ 77 F. 1.017 1.017 1.017

CALC. SOLID SP. GR. 2.55 2.51 2.47

% VOIDS - CALC. 10.1 7.1 4.0

RICE SP. GR. 2.51 2.47 2.43

% VOIDS - RICE 8.7 5.5 2.4

% WATER ABSORPTION - AGGREGATE 0.44 0.44 0.44

% VOIDS IN THE MINERAL AGGREGATE 18.6 18.1 17.6

% V.M.A. FILLED WITH ASPHALT 45.8 60.7 76.9

CALCULATED ASPH. FILM THICKNESS (MICROWS) 6.2 8.0 9.7

A CONTENT OF 5.25% ASPHALT IS RECOMMENDED TO START THE JOB.

ASPHALDUR SHALL BE ADDED TO THE MIXTURE IN THE AMOUNT OF 6% BY WT.

OF THE ASPHALT.

COPIES:

ASPHALT MIX DESIGN
I-IR-400-1(114)0--14-78, POTTAW.

V. R. SNYDER
R. ZHELQUIST
D. JORDISON
L. ZEARLEY
DETA
C. JONES
D. HINES

SIGNED: BERNARD C. BROWN
TESTING ENGINEER
REDUCTION OF REFLECTIVE CRACKING - I-480-1(114)0
(Monsanto Bidim Synthetic Fabric)

The project was completed and reported in 1979. As of November 1980 there is no visible deformation from shoving or rutting. There are 14 full width and eight partial width reflective cracks. There is also one patch.
Reduction of Reflective Cracking I-480-1(114)0
(Monsanto Bidim Synthetic Fabric)

The project was completed in 1979. It was visually inspected August 24, 1981 and there were 16 full width cracks and 15 partial width cracks. One star crack with 3 rays 2' to 4' long and one area of alligator cracking about 1½' x 4' were observed. There was one patch.
As per your request, the following information was prepared by our inspector, Harley McCoy, regarding the experience gained on this project.

The Bridge Repair project in Council Bluffs on I-480 included a 2" overlay of approximately 950' of the #B.L. from the east end of the Missouri River Bridge easterly. The mix used was a 1/2 inch Type "A" Surface Course, with Grade AC-20 Asphalt Cement at a basic asphalt content of 5.25%. The mix also included a special polymer additive, Asphadur, added at the rate of 6% of the A.C. content. The Asphadur was pre-weighed according to mix batch size, then added by hand to the mixer at the proper time. Mixing was done according to SP248.

Representatives from 3M were available to the contractor on an advisory basis to help with placement of the Asphadur and to monitor mixing temperatures. The mixing temperature did not seem to be a problem for the contractor. Mix temperatures, on an average, ran on the high side of specification. The following are grade temperatures taken during placement: 380°, 375°, 370°, 395°, 400°, 385°, 388°, 400°, 395°, 400°, 390°, 405°, 385°, 400°. The plant was located approximately 10 miles from the project. The mix was placed over an R.C. 70 tack coat.

The representatives of 3M and an advisor to 3M from Austria were quite concerned about initial rolling of the mat, recommending to apply initial rolling as soon as possible while Asphadur was still in a plastic state. We found, with temperatures on the high side of specifications, that pushing and tearing of the mat occurred if vibration was used on initial pass. Vibration was later eliminated on the initial pass, but used on second and third passes and density requirements were met under this rolling procedure. Adjustment of vibration was also accomplished.

The special provisions stated that either Petromat or Bidim C-28 could be used. Due to high temperature requirements of the mix, Bidim C-28 was used. R. E. Belden, P.E. from Monsanto Textiles Co. at St. Louis, Missouri, stated that the Bidim C-28 had never been exposed to temperatures exceeding 325 under lab testing of material. We exposed the fabric several minutes after the mix had been placed over it and the fabric visibly had no apparent damage due to high temperature of mix, which averaged 390° F.
The fabric was placed over A.C. 20 tack applied at the rate of .20 to .25 per s.y. The contractor did not encounter any problems with placement of the fabric except in handling the very large rolls of material. One area of concern occurred when trucks were dumping mix into the laydown machine hopper. The truck drivers have a tendency to ride their brakes, sometimes, locking the rear dual tires. This caused the tires to skid as the laydown machine moved forward. The fabric was wrinkled in nearly every case to the point it had to be removed and replaced, causing considerable delays. The project plans also required fabric to be placed over expansion joints. All such joints that were covered with fabric failed almost immediately and the product representative recommended that the fabric not be used for this purpose. Some of the random cracks that were covered with fabric were 1/4" or less in width. We attempted to place mix into these cracks prior to placement of fabric to add stability. Due to tackiness of the mix, it was difficult to fill cracks flush with the pavement and a few failures resulted. Representatives from Monsanto stated any crack over 1/4" in width should be filled flush with pavement prior to fabric placement.

Due to heavy A.C. tack coat used with the fabric and R.C. 70 tack coat adjacent to fabric, it is nearly impossible to keep batch truck tires clean. We experienced some picking up of the fabric from sticky tires.

None of the problems enumerated here with either the Asphadur additive or the Bidim C-28 fabric are thought to be serious or the solution insurmountable.

TJM/jmv

cc: James E. Klein
Harley McCoy
WORK PLAN

For

SYNTHETIC FABRICS TO REDUCE REFLECTION CRACKING IN ASPHALT OVERLAYS

I. Introduction

This Work Plan relates to the use of synthetic fabric on Pottawattamie I-IR-480-1140-14-78 to reduce reflection cracking. The first Iowa research on this application was constructed in 1971 and the final report entitled "Prevention of Reflection Cracking in Asphalt Overlays with Structofors, Petromat and Cerex" was distributed in May 1977.

II. Objective

The objective of this project is to determine the performance of the fabric in reducing reflection cracking.

III. Preliminary Investigation

A complete crack and patch survey will be documented just prior to resurfacing.

IV. Construction Records

Placing of the fabric shall be documented by notes and photographs.

V. Post Construction Performance

The performance of the overlay shall be evaluated annually by visual observation. General condition shall be noted and documented. A complete crack and patch survey shall be made three years after construction.

VI. Reporting

A brief summary report covering construction shall be submitted within 90 days after construction. A report in letter form shall be submitted annually during the follow-up period. A final report shall be submitted within three years and six months after construction.
IO W A D E M E N T O F T R A N S P O R T A T I O N
OFFICE OF M A T E R I A L S
ASPHALT CONCRETE MIX DESIGN
LAB LOCATION AMES

MIX, TYPE AND CLASS: TYPE A SURFACE

INTENDED USE: ASPHALDUR

SIZE 1/2" SPEC. NO. 941 & DATE REPORTED 10/16/79

COUNTY POTTAWATTAMIE PROJECT I-IR-480-1(114)0--14-78

CONTRACTOR DELTA

PROJ. LOCATION IN COUNCIL BLUFFS OVER NORTH 41ST STREET

AGG. SOURCES 1/2" CR. GRAVEL - AVoca PIT - POTTAW. CO.; SAND - VALLEY, NEBR.; 1/2" COVER AGG. - AVoca PIT - POTTAW. CO.

JOB MIX FORMULA AGGREGATE PROPORTIONS: 65% AAT9-713, 30% AAT9-715, 5% AAT9-714

--- JOB MIX FORMULA - COMBINED GRADATION ---

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TOLERANCE: 7B/160 7 7 5 4 2

75 BLOW MARSHALL DENSITY 2.36

ASPHALT SOURCE AND APPROXIMATE VISCOSITY PHILLIPS - 2020 POISES

PLASTICITY INDEX 4.0

% ASPH. IN MIX 5.0

NUMBER OF MARSHALL BLOWS 50

MARSHALL STABILITY - LBS. 2053

FLOW - 0.01 IN. 7

SP. GR. BY DISPLACEMENT(LAB DENS.) 2.29

BULK SP. GR. COHAD. DRY AGG. 2.792

SP. GR. ASPH. @ 77 F. 1.017

CALC. SOLID SP. GR. 2.55

% Voids - Calc. 10.1

RICE SP. GR. 7.1

% Voids - Rice 2.47

% WATK ABSORPTION - AGGREGATE 4.44

% Voids IN THE MINERAL AGGREGATE 18.6

% V.I.A. FILLED WITH ASPHALT 45.0

CALCULATED ASPH.FILM THICKNESS(MICRON) 6.2

A CONTENT OF 5.25% ASPHALT IS RECOMMENDED TO START THE JOB.

ASPHALDUR SHALL BE ADDED TO THE MIXTURE IN THE AMOUNT OF 6% BY WT.
OF THE ASPHALDUR.

COPIES:

ASPH. MIX DESIGN
I-IR-480-1(114)0--14-78, POTTAW.
V. R. SLYDER
R. SHEIQUIST
D. JARDISON
L. ZEARLEY
DETA
C. JONES
D. HINES

SIGNED: BERNARD C. BROWN
TESTING ENGINEER
MATERIAL UNCOMPACTED MIX 5.25%  
INTENDED USE TYPE A ASPHALT ASPHALT  
CONTRACTOR DELTA ASPHALT  
PLANT CRESCENT, IA  
UNIT OF MATERIAL ONE BOX  
TESTED BY J. COHN  
DATE SAMPLED 10-17-79  
DATE RECD 10-26-79  
DATE REPORTED 11-6-79

SIEVE ANALYSIS  PERCENT PASSING

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DRY WT. 1474.560  
SUM OF RETAINED WTS. 1473.000

% AGGREGATE BY EXTRACTION 94.700  
% BITUMEN BY EXTRACTION 5.300  
SPECIFIC GRAVITY 2.320  
MARSHALL STABILITY 3375.000  
MARSHALL FLOW 0.01 IN. 9.000  
FINE MATERIAL CAKED UP AND WOULD NOT PASS SIEVES, RESULTING IN LOW - 200

COPIES TO:

ASPH. CONCRETE  
WILL SNYDER  
TOM MCDONALD

IR-480-I-(114)0--44-78, POTAWATAMI

BY BERNARD C. BROWN  
TESTING ENGINEER
IOWA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
AMES LABORATORY  
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL  ASPHALT MIX UNCOMPACTED 5.25%  LAB NO  ABC9-478  
INTENDED USE  TYPE A SURFACE WITH ASPHALDUR  
PROJECT NO  I-IR-480-1(114)0--14-78  COUNTY  POTTAWATTAMIE  
CONTRACTOR  DELTA ASPHALT  CONTRACT NO  
PLANT CRESSENT, IOWA  
UNIT OF MATERIAL  12 BOXES OF MIX  
SENDER NO  4JC9-126  
SAMPLE BY  J. CONN  
DATE SAMPLED  10-17-79  DATE RECD  11-26-79  DATE REPORTED  12-3-79

SIEVE ANALYSIS  PERCENT PASSING

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SUM OF RETAINED WTS.  1189.500

% AGGREGATE BY EXTRACTION  94.700  
% BITUMEN BY EXTRACTION  5.300  
SPECIFIC GRAVITY  2.320  
MARSHALL STABILITY  4030.000  
MARSHALL FLOW 0.01 IN.  9.000

COPIES TO:

ASPH. CONCRETE  
VAN SNYDER  
TOM MCDONALD  
R. SHELQUIST  
L. ZEARLEY  
---I-IR-480-1(114)0--14-78, POTTAWATTAMIE --- BY  BERNARD C. BROWN
IOWA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
AMES LABORATORY  
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL  ASPHALT MIX UNCOMPACTED 5.25%  
LAB NO  ABC9-479
INTENDED USE  TYPE A SURFACE WITH ASPHALTUR
PROJECT NO  I-IR-480-11(114)0--14-78  
COUNTY  POTTAWATTAMIE
CONTRACTOR  DELTA ASPHALT  
REQUESTED BY  A CONTRACT NO
PLANT  CRESCENT, IOWA
UNIT OF MATERIAL  12 BOXES OF MIX
SENDER NO  4JC9-126
SAMPLED BY  J. CONN
DATE SAMPLED  10-17-79  
DATE RECEIVED  11-26-79  
DATE REPORTED  12-4-79

SIEVE ANALYSIS  PERCENT PASSING

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% AGGREGATE BY EXTRACTION  94.900
% BITUMEN BY EXTRACTION  5.100
SPECIFIC GRAVITY  2.300
MARSHALL STABILITY  4093.000
MARSHALL FLOW 0.01 IN.  9.000

COPIES TO:

ASPH. CONCRETE
VAN SNYDER
TOM MCDONALD
R. SHELCUIT
L. ZEALREY

I-IR-480-11(114)0--14-78, POTTAWATTAMIE  BY  BERNARD C. BROWN

MELS NO. 110-000945
IOWA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS
AMES LABORATORY
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL ASPHALT MIX UNCOMPACTED 5.25%
INTENDED USE TYPE A SURFACE WITH ASPHADUR
PROJECT NO I-IR-480-1(114)0--14-78
CONTRACTOR DELTA ASPHALT
PRODUCER DELTA ASPHALT
PLANT CRESCENT, IA
UNIT OF MATERIAL 12 BOXES OF MIX
SENDER NO 4JC9-126
SAMPLED BY J. CONN
DATE SAMPLED 10-17-79 DATE RECD 11-26-79 DATE REPORTED 12-4-79

SIEVE ANALYSIS PERCENT PASSING

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SUM OF RETAINED WTS. 1436.500

% AGGREGATE BY EXTRACTION 95.100
% BITUMEN BY EXTRACTION 4.900
SPECIFIC GRAVITY 2.320
MARSHALL STABILITY 3815.000
MARSHALL FLOW 0.01 IN. 9.000

COPIES TO:

ASPH. CONCRETE
VAN SNYDER
TOM MCDONALD
R. SHELQUIST
L. ZEARLEY
IOWA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
AMES LABORATORY  
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL  ASPHALT MIX UNCOMPACTED 5.25%  
INTENDED USE  TYPE A SURFACE WITH ASPHALTUR  
PROJECT NO  I-IR-480-1(114)0--14-78  
CONTRACTOR  DELTA ASPHALT  
PRODUCER  DELTA ASPHALT  
PLANT  CRESCENT, IOWA  
UNIT OF MATERIAL  12 BOXES OF MIX  
SENDERS NO  4JC9-126  
SAMPLED BY  J. CONN  
DATE SAMPLED  10-17-79  
DATE RECD  11-26-79  
DATE REPORTED  12-3-79

SIEVE ANALYSIS PERCENT PASSING

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SUM OF RETAINED WTS.  1450.500

% AGGREGATE BY EXTRACTION  94.400
% BITUMEN BY EXTRACTION  5.600
SPECIFIC GRAVITY  2.310
MARSHALL STABILITY  3688.000
MARSHALL FLOW 0.01 IN.  8.000

COPIES TO:

ASPH. CONCRETE  
VAN SNYDER  
TOM MCDONALD  
R. SHELQUIST  
L. ZEARLEY  
I-IR-480-1(114)0--14-78. POTAWATTAMIE BY HERBERT F. BROOK

LAB NO  ABC9-481  
COUNTY  POTAWATTAMIE  
PROJECT NO  I-IR-480-1(114)0--14-78  
CONTRACTOR  DELTA ASPHALT  
PRODUCER  DELTA ASPHALT  
PLANT  CRESCENT, IOWA  
UNIT OF MATERIAL  12 BOXES OF MIX  
SENDERS NO  4JC9-126  
SAMPLED BY  J. CONN  
DATE SAMPLED  10-17-79  
DATE RECD  11-26-79  
DATE REPORTED  12-3-79

SIEVE ANALYSIS PERCENT PASSING

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SUM OF RETAINED WTS.  1450.500

% AGGREGATE BY EXTRACTION  94.400
% BITUMEN BY EXTRACTION  5.600
SPECIFIC GRAVITY  2.310
MARSHALL STABILITY  3688.000
MARSHALL FLOW 0.01 IN.  8.000

COPIES TO:

ASPH. CONCRETE  
VAN SNYDER  
TOM MCDONALD  
R. SHELQUIST  
L. ZEARLEY  
I-IR-480-1(114)0--14-78. POTAWATTAMIE BY HERBERT F. BROOK
IOWA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS
AMES LABORATORY
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL ASPHALT MIX UNCOMPACTED 5.25%  LAB NO  ABC9-482
INTENDED USE TYPE A SURFACE WITH ASPHALT
PROJECT NO I-IR-480-1(114)0--14-78  COUNTY POTTAWATTAMIE
CONTRACTOR DELTA ASPHALT  CONTRACT NO
PLANT CRESCENT, IOWA
UNIT OF MATERIAL 12 BOXES OF MIX
SENDERS NO  4JC9-126
SAMPLED BY J. CONN
DATE SAMPLED 10-17-79  DATE RECD 11-26-79  DATE REPORTED 12-3-79

SIEVE ANALYSIS PERCENT PASSING

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DRY WT. 1441.500
SUM OF RETAINED WTS. 1441.500

% AGGREGATE BY EXTRACTION 95.000
% BITUMEN BY EXTRACTION 5.000
SPECIFIC GRAVITY 2.350
MARSHALL STABILITY 3898.000
MARSHALL FLOW 0.01 IN. 10.000

COPIES TO:

ASPH. CONCRETE
VAN SNYDER
TOM MCDONALD
R. SHELQUIST
L. ZEARLEY

I-IR-480-1(114)0--14-78. POTTAWATTAMIE  BY  BERNARD C. BROWN
# IOWA DEPARTMENT OF TRANSPORTATION

**OFFICE OF MATERIALS**

**AMES LABORATORY**

**TEST REPORT - BITUMINOUS MATERIALS**

**MATERIAL** ASPHALT MIX UNCOMPACTED 5.25%  
**LAB NO** ABC9-483

**INTENDED USE** TYPE A SURFACE WITH ASPHALTUR

**PROJECT NO** I-IR-480-1(114)0--14-78  
**COUNTY** POTTAWATAMIE

**CONTRACTOR** DELTA ASPHALT

**PRODUCER** DELTA ASPHALT

**PLANT** CRESCENT, IOWA

**UNIT OF MATERIAL** 12 BOXES OF MIX

**SENDERS NO** 4JC9-126

**SAMPLED BY** J. CONN

**DATE SAMPLED** 10-17-79  
**DATE RECD** 11-26-79  
**DATE REPORTED** 12-3-79

### SIEVE ANALYSIS

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**DRY WT.** 1453.500  
**SUM OF RETAINED WTS.** 1452.500

**% AGGREGATE BY EXTRACTION** 94.900  
**% BITUMEN BY EXTRACTION** 5.100  
**SPECIFIC GRAVITY** 2.330  
**MARSHALL STABILITY** 3608.000  
**MARSHALL FLOW 0.01 IN.** 9.000

---

**COPIES TO:**

ASPH. CONCRETE  
VAN SNYDER  
TOM MCDONALD  
R. SHELVIST  
L. ZEARLEY
IOWA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS
AMES LABORATORY
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL: ASPHALT MIX UNCOMPACTED 5.25%
INTENDED USE: TYPE A SURFACE WITH ASPHADUR
PROJECT NO.: I-IR-480-1(114)0--14-78
CONTRACTOR: DELTA ASPHALT
PRODUCER: DELTA ASPHALT
PLANT: CRESTON, IOWA
UNIT OF MATERIAL: 12 BOXES OF MIX
SENDERS NO.: 4JCH-126
SAMPLED BY: J. CONN
DATE SAMPLED: 10-17-79
DATE RECD: 11-26-79
DATE REPORTED: 12-3-79

SIEVE ANALYSIS PERCENT PASSING

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DRY WT.: 1435.000
SUM OF RETAINED WTS.: 1435.500

% AGGREGATE BY EXTRACTION: 94.800
% BITUMEN BY EXTRACTION: 5.200
SPECIFIC GRAVITY: 2.300
MARSHALL STABILITY: 3930.000
MARSHALL FLOW: 0.01 IN.

COPIES TO:

ASPH. CONCRETE
VAN SNYDER
TOM MCDONALD
R. SHELQUIST
L. ZEARLEY

I-IR-480-1(114)0--14-78, POTAWAHTAMIE COUNTY

By

BENEDICT W. BROWN
IOWA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
AMES LABORATORY  
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL: ASPHALT MIX UNCOMPACTED 5.25%  
LAB NO: ABC9-485
INTENDED USE: TYPE A SURFACE WITH ASPHALT  
PROJECT NO: I-IR-480-1(114)0--14-78  
COUNTY: POTAWATOMIE
CONTRACTOR: DELTA ASPHALT  
CONTRACT NO:
PRODUCER: DELTA ASPHALT
PLANT: CRESSENT, IOWA
UNIT OF MATERIAL: 12 BOXES OF MIX
SAMPLED BY: J. CONN
DATE SAMPLED: 10-17-79  
DATE RECD: 11-26-79  
DATE REPORTED: 12-3-79

SIEVE ANALYSIS PERCENT PASSING

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DRY WT.: 1441,000
SUM OF RETAINED WTS.: 1438,500

% AGGREGATE BY EXTRACTION: 94.900
% BITUMEN BY EXTRACTION: 5.100
SPECIFIC GRAVITY: 2.340
MARSHALL STABILITY: 4058.000
MARSHALL FLOW @.01 IN.: 9.000

COPIES TO:

ASPH. CONCRETE
VAN SNYDER
TOM MCDONALD
L. ZEARLEY
I-IR-480-1(114)0--14-78, POTAWATOMIE
P. SHELQUIST

BY: P. SHELQUIST
IOWA DEPARTMENT OF TRANSPORTATION  
OFFICE OF MATERIALS  
AMES LABORATORY  
TEST REPORT - BITUMINOUS MATERIALS

MATERIAL  ASPHALT MIX UNCOMPACTED 5.25%  
LAB NO  ABC9-486  
INTENDED USE  TYPE A SURFACE WITH ASPHALT  
PROJECT NO  I-IR-480-1(114)0--14-78  
COUNTY  POTAWATTAMIE  
CONTRACTOR  DELTA ASPHALT  
PLANT  CRESCENT, IOWA  
UNIT OF MATERIAL  12 BOXES OF MIX  
SENDERS NO  4JC9-126  
SAMPLED BY  J. CONN  
DATE SAMPLD  10-17-79  
DATE REC'D  11-26-79  
DATE REPORTED  12-4-79

SIEVE ANALYSIS  PERCENT PASSING

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DRY WT.  1439.000  
SUM OF RETAINED WTS.  1436.500

% AGGREGATE BY EXTRACTION  94.700  
% BITUMEN BY EXTRACTION  5.300  
SPECIFIC GRAVITY  2.340  
MARSHALL STABILITY  4225.000  
MARSHALL FLOW 7.99 IN.  9.000

COPIES TO:

ASPH. CONCRETE  
VAN SNYDER  
TOM MCDONALD  
R. SHELQUIST  
L. ZEARLEY  
I-IR-480-1(114)0--14-78, POTAWATTAMIE  
BY  BERNARD C. BROWN
# Iowa Department of Transportation
## Office of Materials
### Ames Laboratory

**Test Report - Bituminous Materials**

**Material** Asphalt Mix Uncompacted 5.25%
**Lab No** ABC9-487
**Intended Use** Type A Surface with Asphaldu
**Project No** I-IR-480-1(114)0-14-78
**Contractor** Delta Asphalt
**Plant** Crescent, Iowa
**Unit of Material** 12 Boxes of Mix
**Senders No** 4JC9-126
**Sampled by** J. Conn
**Date Sampled** 10-17-79
**Date Recd** 11-26-79
**Date Reported** 12-4-79

## Sieve Analysis Percent Passing

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Dry Wt. 1440.500
Sum of Retained Wts. 1438.000

% Aggregate by Extraction 95.000
% Bitumen by Extraction 5.000
Specific Gravity 2.320
Marshall Stability 4238.000
Marshall Flow 0.01 In. 7.000

**Copies To:**

Asph. Concrete
Van Snyder
Tom McDonald
R. Shequist
L. Zearley

I-IR-480-1(114)0-14-78, Pottawattamie by Bernard C. Brown
MATERIAL = ASPHALT MIX UNCOMPACTED 5.25%  LAB NO ABC9-468
INTENDED USE = TYPE A SURFACE WITH ASPHALDUR
PROJECT NO = I-IR-480-1 (114)0--14-78  COUNTY = POTAWATTAMIE
CONTRACTOR = DELTA ASPHALT  CONTRACT NO =
PRODUCER = DELTA ASPHALT  PLANT = CRESCENT, IOWA
UNIT OF MATERIAL = 12 BOXES OF MIX
SENDERS NO = 4JC9-126
SAMPLED BY = J. CONN
DATE SAMPLED = 10-17-79  DATE RECD = 11-26-79  DATE REPORTED = 12-4-79

SIEVE ANALYSIS  PERCENT PASSING

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DRY WT. = 1445.000  SUM OF RETAINED WTS. = 1442.500

% AGGREGATE BY EXTRACTION = 94.900
% BITUMEN BY EXTRACTION = 5.100
SPECIFIC GRAVITY = 2.370
MARSHALL STABILITY = 4142.000
MARSHALL FLOW 0.01 IN. = 10.000

COPIES TO:

ASPH. CONCRETE
VAN SNYDER
TOM MCDONALD
R. SHEQUIGHT
L. ZEARLEY

I-IR-480-1 (114)0--14-78, POTAWATTAMIE       BY    BERNARD C. BROWN