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Research

# Minnesota's Experience Using Shingle Scrap in Bituminous Pavements

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The Minnesota Department of Transportation (Mn/DOT) has experimented with the use of shingle scrap in hot mix asphalt (HMA) since 1990. To date, the source of the shingle scrap has been shingle manufacturers exclusively. The manufactured shingle scrap consists primarily of tab punch-outs but also contains some mis-colored and damaged shingles.

Test sections were constructed on the Willard Munger Recreational Trail, T.H. 25 in Mayer, Minnesota and on County State Aid Highway (CSAH) 17, in Scott County, Minnesota. Not only are the test sections performing as well as the control sections, but using shingle scrap reduces the amount of virgin asphalt cement required in a bituminous mix, thus creating the potential for a cost savings when using shingle scrap in HMA.

Based on the performance of these test sections, shingle manufacturing scrap is now an allowable salvage material in hot mix asphalt under Mn/DOT specification 2331.E2e, Recycled Mixture Requirements. This report outlines the history of shingle scrap use in Minnesota, presents laboratory and field performance data and contains the current Mn/DOT specification allowing shingle scrap to be used as a salvage material in HMA pavements.


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# Minnesota's Experience Using Shingle Scrap in Bituminous Pavements

## Final Report

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The bituminous laboratory at the Maplewood Materials Lab, under the direction of Rich Souter.

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## EXECUTIVE SUMMARY

The Minnesota Department of Transportation (Mn/DOT) has experimented with the use of shingle scrap in hot mix asphalt (HMA) since 1990. To date, the source of the shingle scrap has been shingle manufacturers exclusively. The manufactured shingle scrap consists primarily of tab punch-outs but also contains some mis-colored and damaged shingles.

Test sections were constructed on the Willard Munger Recreational Trail, T.H. 25 in Mayer, Minnesota and on Scott County State Aid Highway (CSAH) 17, in Scott County, Minnesota. Not only are the test sections performing as well as the control sections, but using shingle scrap reduces the amount of virgin asphalt cement required in a bituminous mix, thus creating the potential for a cost savings when using shingle scrap in HMA.

Based on the performance of these test sections, shingle manufacturing scrap is now an allowable salvage material in hot mix asphalt under Mn/DOT specification 2331.E2e, Recycled Mixture Requirements. This report outlines the history of shingle scrap use in Minnesota, presents laboratory and field performance data and contains the current Mn/DOT specification allowing shingle scrap to be used as a salvage material in HMA pavements.

# INTRODUCTION

The roofing shingle manufacturers in the Unites States produce an estimated one million tons of shingle scrap annually [1]. This consists primarily of tab punch-outs, but also mis-colored and damaged shingles. In the Twin Cities metropolitan area, there are currently four shingle manufacturers. They generate a combined 45,000 tons of shingle scrap each year, most of which is deposited in landfills.

Since an asphalt shingle contains the same basic ingredients as hot mix asphalt (HMA), that being asphalt, sand and mineral filler, it seems logical to assume that shingles may have a suitable use in the production of HMA. The states of North Carolina, Florida, New Jersey, Texas, Michigan, Pennsylvania and Maryland have all used shingle scrap in bituminous paving mixtures to some extent.

Mn/DOT has experimented with the use of shingle scrap in HMA since 1990. A partnership between the Minnesota Pollution Control Agency (PCA), the Minnesota Department of Natural Resources (DNR) and the Minnesota Department of Transportation (Mn/DOT) was responsible for the first project using shingle scrap in Minnesota. A test section was constructed on the Willard Munger Recreational Trail using 9 percent shingle scrap, by weight of mineral aggregate.

Subsequently, under a grant from the Minnesota Office of Waste Management, the University of Minnesota conducted an in-depth laboratory study to investigate the influence roofing shingles have on asphalt concrete mix properties. This study led to the construction of two more shingle scrap test sections, T.H. 25 in Mayer, MN and Scott County State Aid Highway (CSAH) 17 in Scott County, MN.

To date, the source of the shingle scrap has been shingle manufacturers as opposed to shingles torn off buildings during re-roofing projects. The manufactured shingle scrap consists primarily of tab punch-outs but also contains some mis-colored and damaged shingles. While laboratory tests have been done on both felt and fiberglass shingle scrap, field test sections have been constructed exclusively with felt shingle scrap.

After nearly 6 years of service, the shingle scrap test sections are performing as well as the control sections. In addition, laboratory tests suggest there is little difference between asphalt mixes containing shingle scrap and the control sections. As a result, shingle manufacturing scrap is now a permitted salvage material in hot mix asphalt pavements in Minnesota.

## WILLARD MUNGER RECREATIONAL TRAIL, ST. PAUL, MN

**- 1990 -**

### Background

Mn/DOT's first experiment using shingle scrap in a hot mix asphalt pavement was in 1990 on the Willard Munger recreational trail. The project involved experimenting with both recycled tire rubber and shingle scrap as a way to reduce the need to landfill usable resources. This section of trail was placed on abandoned Soo Line railroad right-of-way. After the in-place track bed was reshaped as needed, a 4-inch thick (100 mm) crushed concrete base was placed and compacted. A 12-foot wide (3.7 m), 2.5-inch thick (64 mm), hot mix asphalt pavement was then placed in one lift and compacted with two steel wheeled rollers. Four test sections were constructed on a 2-mile section (3.2 km) of the trail in St. Paul, Minnesota. Test sections were built using 3 percent rubber, 6 percent rubber, 3 percent rubber with 6 percent shingle scrap and 9 percent shingle scrap, by weight of aggregate.

### Current Pavement Condition

While the rubber sections suffered severe raveling problems and eventually had to be replaced, the shingle scrap section is performing well and still in service at this time. Further details of this project can be found in Mn/DOT report 91-06, "Waste Tire and Shingle Scrap /Bituminous Paving Test Sections on the Willard Munger Recreational Trail Gateway Segment." [2]

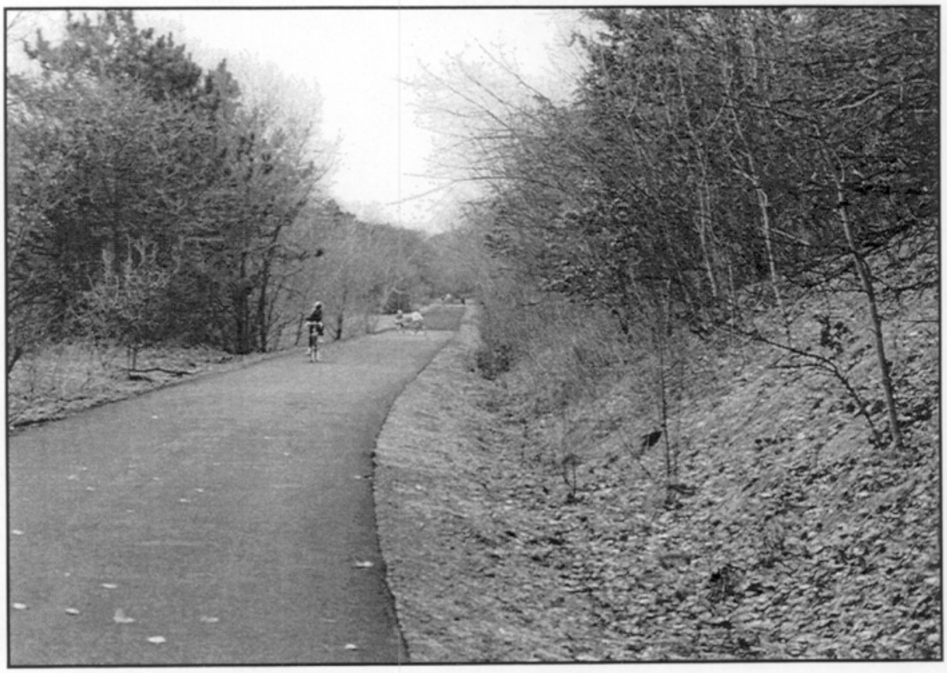

**Figure 1.** Willard Munger Recreational Trail, Gateway Segment

## MINNESOTA T.H. 25, SOUTH OF MAYER, MN

**- 1991 -**

### Background

Continuing from the success of the shingle scrap section on the Willard Munger recreational trail, a cooperative effort to use the idea in the highway environment was undertaken [5]. After reviewing potential sites, Mn/DOT selected an overlay project on T.H. 25 south of Mayer (S.P. 1006-20). The in-place bituminous roadway, which was last overlaid in 1974, exhibited surface oxidation and severe transverse cracks approximately every 10 feet (3 m).

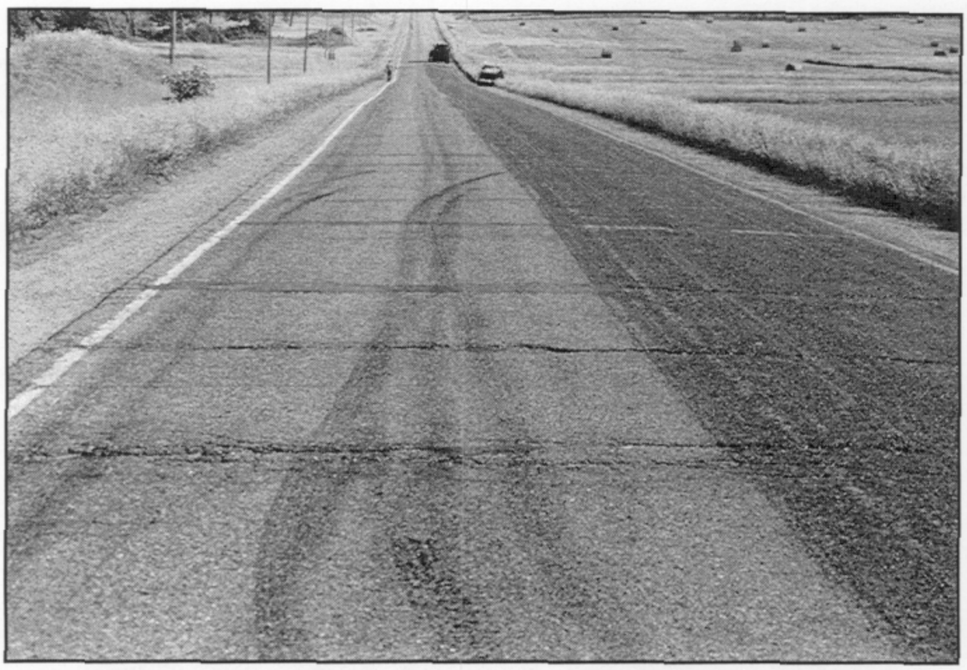

**Figure 2.** Typical Pavement Condition of T.H. 25 Before It Was Overlaid

The design for this project consisted of a 1.5-inch (38 mm) Mn/DOT 2331 Type 31 leveling course followed by a 1-inch (25 mm) Type 41 wearing course. All of the existing potholes on the roadway were patched before the placement of the overlay. Since the project contract had already been awarded to Buffalo Bituminous Inc., a supplemental agreement was negotiated to use the shingle scrap. Considerations included the decrease in asphalt demand, an extra trial mix evaluation and potential delays associated with the experimentation.

For this project, the shingle scrap was considered an allowable salvage material under specification 2331-E2e and all mixes were to be designed to meet present Mn/DOT specifications that provide for salvage material (Type 32 and Type 42 mixtures). Mix designs were done for Buffalo Bituminous by Braun Intertec, Inc. Three different percentages of shingle scrap were used during the trial mix procedure; 3, 5, and 7 percent, by weight of aggregate. Since they provided the most benefit in reducing asphalt demand, the 5 and 7 percent mixes were selected for use on the roadway.

Certainteed, Inc., a shingle manufacturer, agreed to provide and have processed 200 to 400 tons of shingle scrap from its Shakopee, Minnesota, plant. Transport of the shingle scrap, consisting primarily of punch-out tabs, was provided by the Browning-Ferris Corporation. Omann Brothers, Inc. of St. Michael, Minnesota, ground the shingle scrap to create a uniform, usable product. Upon completion of the grinding, Buffalo Bituminous hauled the material to its plant site near Belle Plaine, Minnesota.

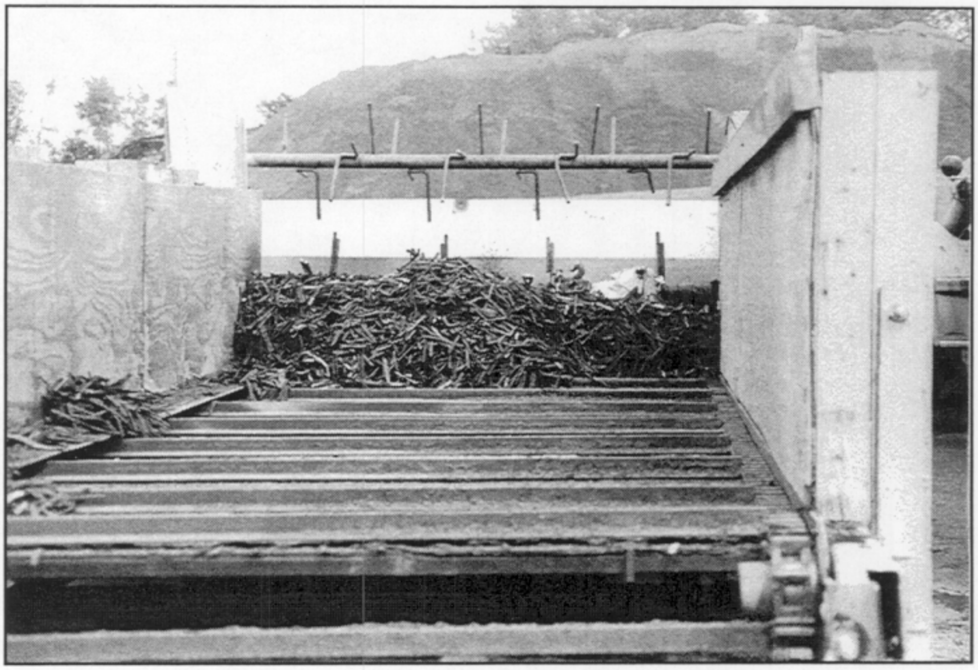

**Figure 3.** Shingle Tab Punch-Outs Ready for Processing

The Omann Brothers grinding creates a uniform product similar to sticky coffee grounds that may congeal in warm weather and create clumps. Some of these clumps did not break down as they passed through a grate, with 8-inch (203 m) openings, placed over the plant's hopper. These clumps were easily chopped up by a worker inside the hopper who kept the material flowing onto the feeder belt.

**Figure 4.** Working Inside Hopper to Breakup Clumps of Shingle Scrap

**Construction Notes**

Plant operations continued without difficulty from this point. However, after the area received some rain, plant operations were slowed to compensate for the added moisture. As required by Mn/DOT specification, mix samples were taken behind the paver and tested at the field lab at the plant. There was some variation in the results, due primarily to variations in the aggregate gradation, but the mixture met specification.

While hauling and placement operations went smoothly on the leveling course, a few clumps and pieces of unground shingle were noted by the paving crew. The ordinary compaction specification was used for density control. Nuclear density gauge readings were lower on the shingle scrap mixes than typical readings on conventional mix. The tight project schedule allowed for no optimization of the shingle scrap mix designs.

Except for rain, which broke out during the first day of paving the wear course, paving went smoothly. Bag samples of each mix were taken and evaluated by the University of Minnesota as part the previously mentioned study it was performing for the Minnesota Office of Waste Management. Core samples of the roadway were also evaluated by the Mn/DOT Materials Research and Engineering Lab.

### Test Section Layout

There are seven (7) sections on T.H. 25, containing various amounts of shingle scrap as shown in Table 1. The site layout and location of the sections are also shown in Figure 5.

**Table 1. T.H. 25 Test Section Description**

| Wearing Course | Binder Course |
|---|---|
| 7% Shingles | Conventional Hot Mix |
| 7% Shingles | 5% Shingles |
| 7% Shingles | 7% Shingles |
| 5% Shingles | 5% Shingles |
| 5% shingles | 7% Shingles |
| 5% Shingles | Conventional Hot Mix |
| Conventional Hot Mix | Conventional Hot Mix |

### Current Pavement Condition

As of December 6, 1995, the mixtures containing shingle scrap are performing at least as well as the control section. No discernable difference exists between any of the shingle scrap sections and the control section. The most visible type of pavement distress is transverse reflective cracking, spaced 30-40 feet (9 - 12 m) apart. Given the condition of the roadway before the overlay, this type of defect was expected. Most of the cracks are currently in the Mn/DOT "slight" category but many are approaching "severe." Nearly every crack has some spalling, especially near the centerline. These sections will continue to be monitored in the future.

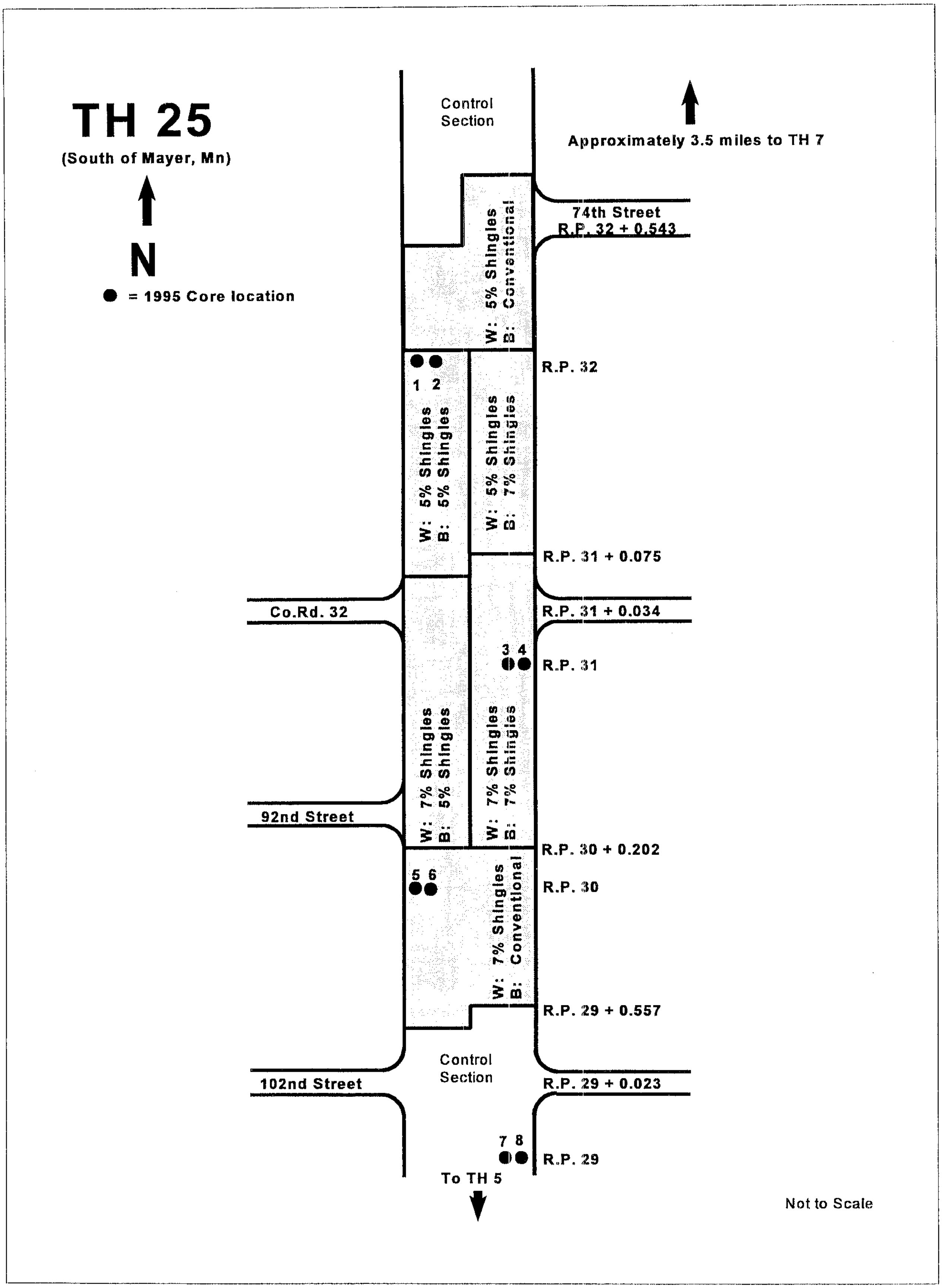


**Figure 5.** Layout of TH 25 Shingle Scrap Test Sections

## SCOTT COUNTY STATE AID HIGHWAY 17

**- 1991 -**

### Background

Based on Mn/DOT's experience with shingle scrap, Scott County also constructed a test section using shingle manufacturing scrap in HMA [6]. State Aid Project (SAP) 70-617-09 is approximately five miles south of the City of Shakopee in Scott County, Minnesota between County State Aid Highway 12 and County Road 82. The location of the test section is shown in Figure 6. This project was a total reconstruction consisting of two 12-foot (3.7 m) driving lanes and two 8-foot (2.4 m) paved shoulders. The pavement cross-section consists of a 2-inch (50 mm) thick Mn/DOT 2331 Type 41 wearing course, a 2-inch (50 mm) Type 41 binder course, a 4-inch (100 mm) Type 32 base course and an 11-inch (280 mm) aggregate base. The prime contractor for the project was Husting & Engstrom, Inc. of Hastings, Minnesota. Bituminous Roadways, Inc. of Faribault, Minnesota was the bituminous paving subcontractor. Shingle scrap was obtained from Certainteed, Inc., and processed by Oman Brothers, the same source and processor for the earlier Mn/DOT projects. The shingle mix was used in the Type 32 base course of the northbound lane between stations 143 + 70 and 170 + 85.

### Construction Notes

Plant operations were monitored by Mn/DOT. At start-up, problems occurred when the shingle scrap clogged the feed elevator. This was quickly resolved and no further problems were encountered at the plant during the production of the shingle mixture. The base course was placed in a 4-inch (100 mm) lift using a Barber-Green 260 paver. Compaction was done with an Ingersoll-Rand dual steel vibratory roller and a pneumatic tired roller, which was used for intermediate rolling. The only problem encountered on the roadway was the failure to reach 96 percent of the Marshall density on the control strips, as established by trial mix number 0-91121. A sample of the mixture taken from behind the paver was submitted to Mn/DOT for testing. Laboratory testing showed the mix was 97.7 percent of the trial mix 50-blow Marshall density, with 5.7 percent air voids.

### Current Pavement Condition

This project was reviewed on November 22, 1995. Both of the sections are in excellent condition with minimal transverse cracking. All of the transverse cracks have been routed and sealed with a hot-pour crack sealant and no cracking exists along the longitudinal centerline joint. The transverse cracks are spaced an average of 287 feet (87 m) apart in the shingle scrap section compared with 87 feet (27 m) in the control section. This difference in the amount of transverse cracking maybe attributed more to differences in terrain and soil than to differences in the mixtures. The control section is on a long positive grade while the shingle mix is in a flat area. The location of the Scott CSAH 17 test sections is shown in Figure 6.

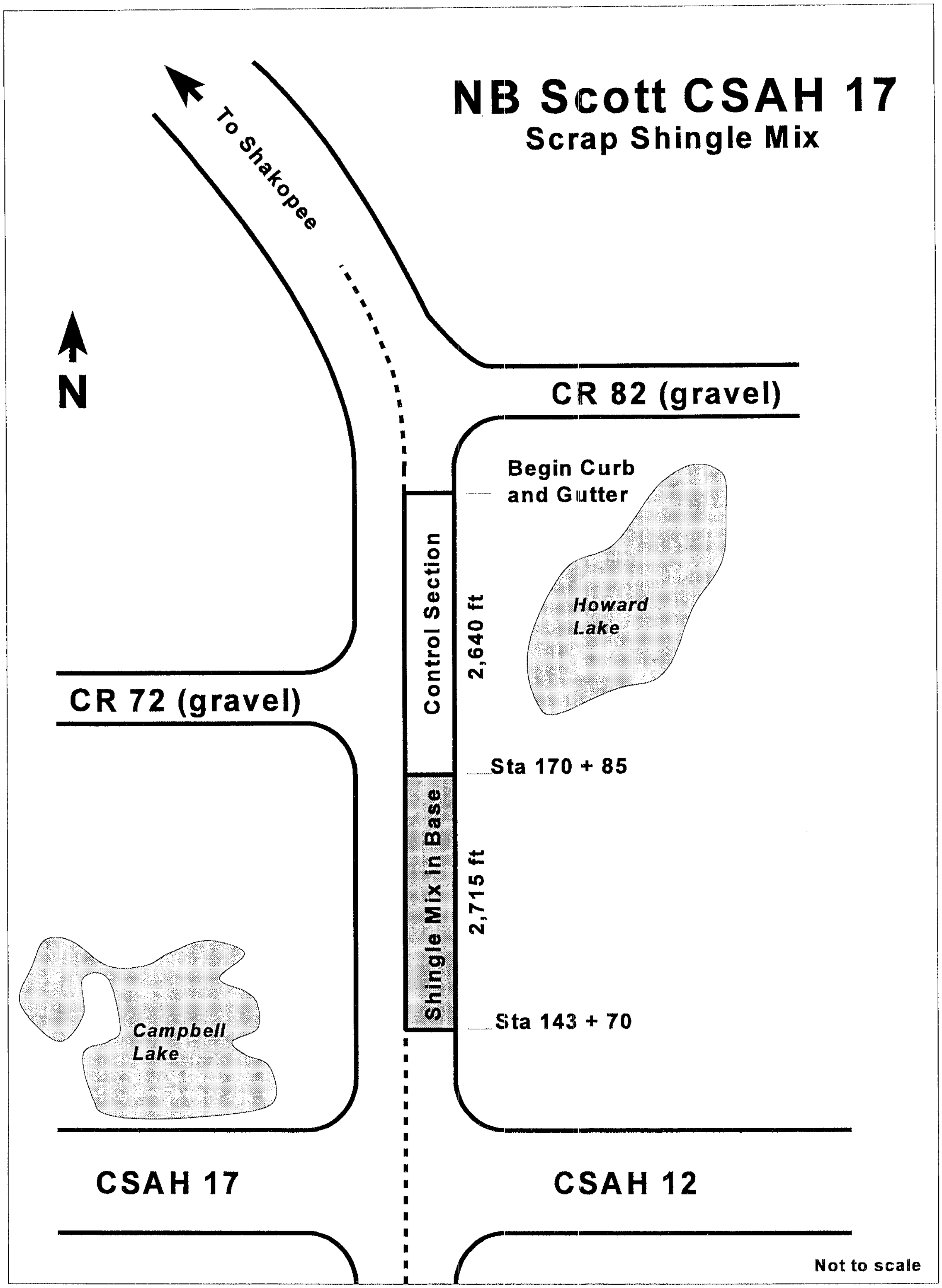


**Figure 6.** Location of Shingle Scrap Test Sections on Scott CSAH 17

## LABORATORY TEST RESULTS OF TEST SECTIONS

Post-construction cores were obtained from all three projects and tested in the laboratory. Cores were obtained from both the control sections and the shingle scrap sections. Extraction-gradations were run on all samples, moisture sensitivity and resilient modulus testing was done on the T.H. 25 samples taken in 1992. Cores from T.H. 25 and Scott CSAH 17 were obtained in 1995 and tested for in-place air voids, A.C. content, A.C. penetration and A.C. viscosity. All of the testing was done by Mn/DOT at its Materials Research and Engineering Lab in Maplewood, Mn.

### A.C. Contribution of the Shingle Scrap

One of the most compelling reasons to consider using shingle scrap in HMA is to reduce the amount of asphalt cement that must be added at the plant. This is possible because the asphalt in the shingle scrap contributes to the total asphalt cement in the mixture. Extractions were done to determine how much asphalt cement the shingle scrap contributes to the mix. The difference between the extraction results, which represents the total asphalt content, and the asphalt added at the plant equals the asphalt contribution of the shingle scrap. The results of these calculations on all three projects are shown in Table 2. The table shows that the shingle scrap in the wear course mixtures made a greater contribution to the total asphalt content of the mix than did the shingle scrap in the binder course mixtures. The reason the for this is likely due to differences in gradation.

Table 2. Asphalt Cement Contribution of Shingle Scrap[1]

| Type of Mix | Extracted A.C. content | Target A.C. Content from Job Mix Formula | Total A.C. contribution of shingle scrap | A.C. contribution of each percent of shingle scrap |
|---|---|---|---|---|
| **Wearing Course Mixtures (Mn/DOT 2331 Type 42)** | | | | |
| 5% Shingle Scrap (MN T.H. 25) | 6.8% | 5.4% | 1.4% | 0.28% |
| 7% Shingle Scrap (MN T.H. 25) | 7.0% | 5.1% | 1.9% | 0.27% |
| 9% Shingle Scrap (Willard Munger Trail) | 5.7% | 3.0% | 2.7% | 0.30% |
| **Leveling/Base Course Mixtures (Mn/DOT 2231 Type 32)** | | | | |
| 5% Shingle Scrap (MN T.H. 25) | 5.4% | 4.8% | 1.1% | 0.12% |
| 7% Shingle Scrap (MN T.H. 25) | 5.5% | 4.3% | 1.2% | 0.17% |
| 10% Shingle Scrap (Scott CSAH 17) | 6.1% | 3.9% | 2.2% | 0.22% |

[1] Given in percent by weight of mix. The target A.C. content from the Job Mix Formula is assumed to be the amount of A.C. added to the mix at the plant.

**In-place Air Voids**

As shown in Figures 7 and 8, the in-place air voids from all of the test sections are higher than the 4 percent in-place air voids at which Mn/DOT pavements are designed. While this may affect the long term performance of these pavements, the existing pavement condition suggests that this has not caused any problems thus far. The air voids in the T.H. 25 shingle scrap sections are basically the same as the control sections. However, the air voids in the Scott County shingle scrap test section are nearly 30 percent higher than in the control section.

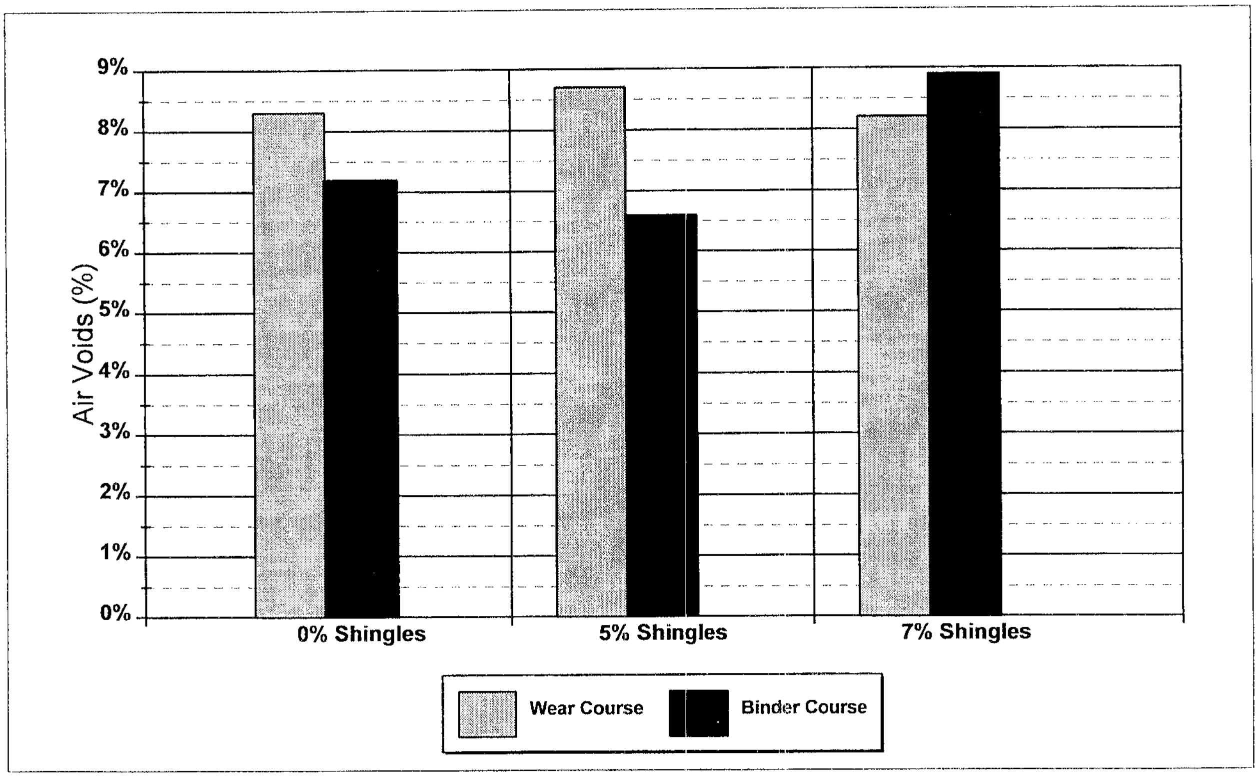


**Figure 7.** In-place Air Voids, T.H. 25

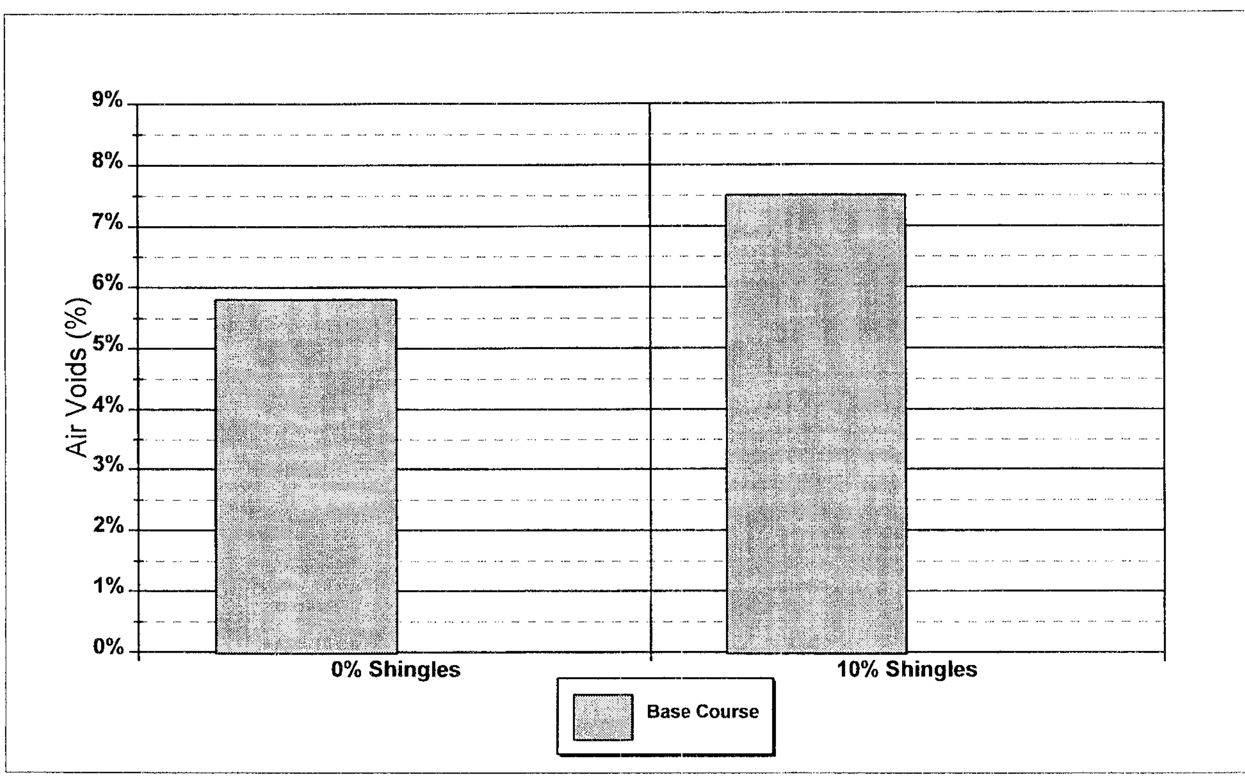


**Figure 8.** In-place Air Voids, Scott CSAH 17

**Penetration of Recovered A.C.**

Because the asphalt cement used to make shingles is much harder than the asphalt used in pavements there was some concern about the resulting stiffness of the shingle scrap mixtures. If the A.C. in a paving mixture is too stiff and brittle, the pavement will crack more frequent than desired, particularly in cold climates. Figure 9 shows that the A.C. in the T.H. 25 shingle scrap sections is harder than in the control sections as expected. Since the amount of cracking on the test sections is essentially the same, the slight increase in A.C. stiffness is not causing a problem at this time. The A.C. penetration from the Scott CSAH 17 test sections is the same for the shingle scrap and control mixtures. This was not expected, especially since this section used the highest percentage of shingle scrap (10%).

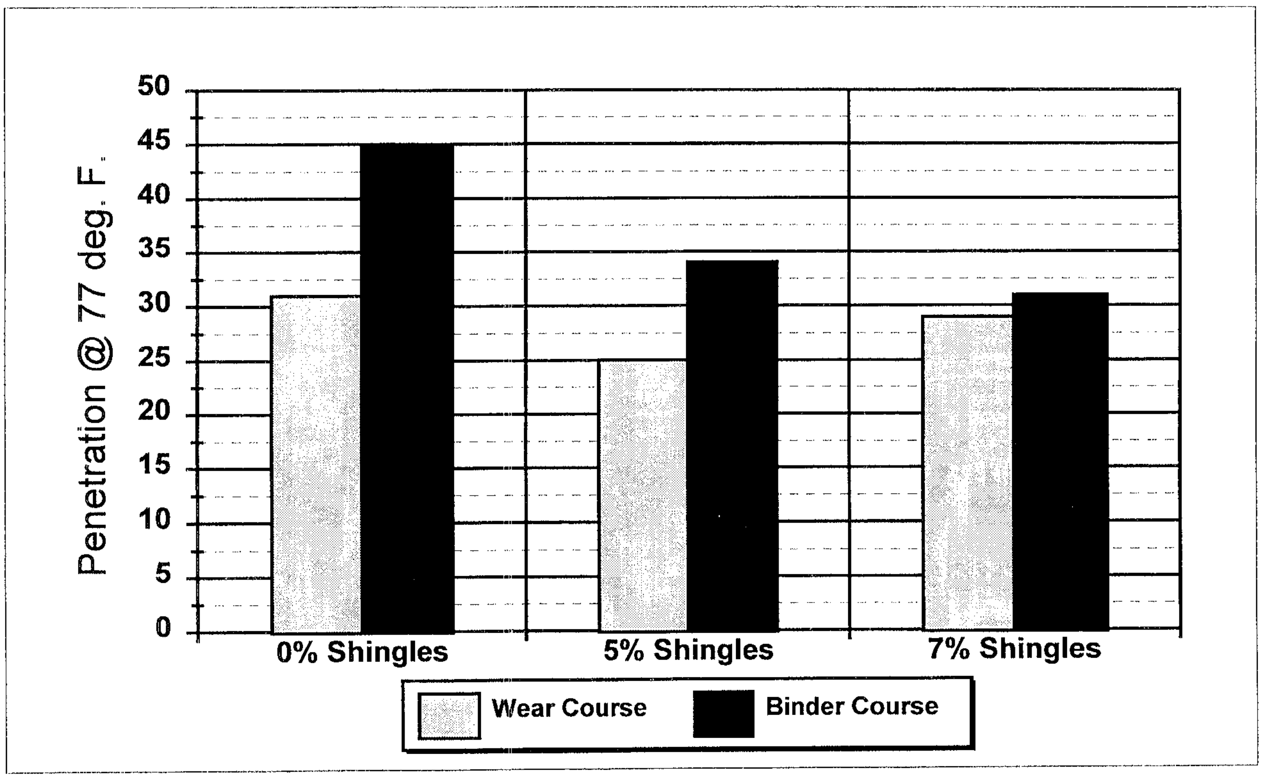


**Figure 9.** Recovered A.C. Penetration, T.H. 25

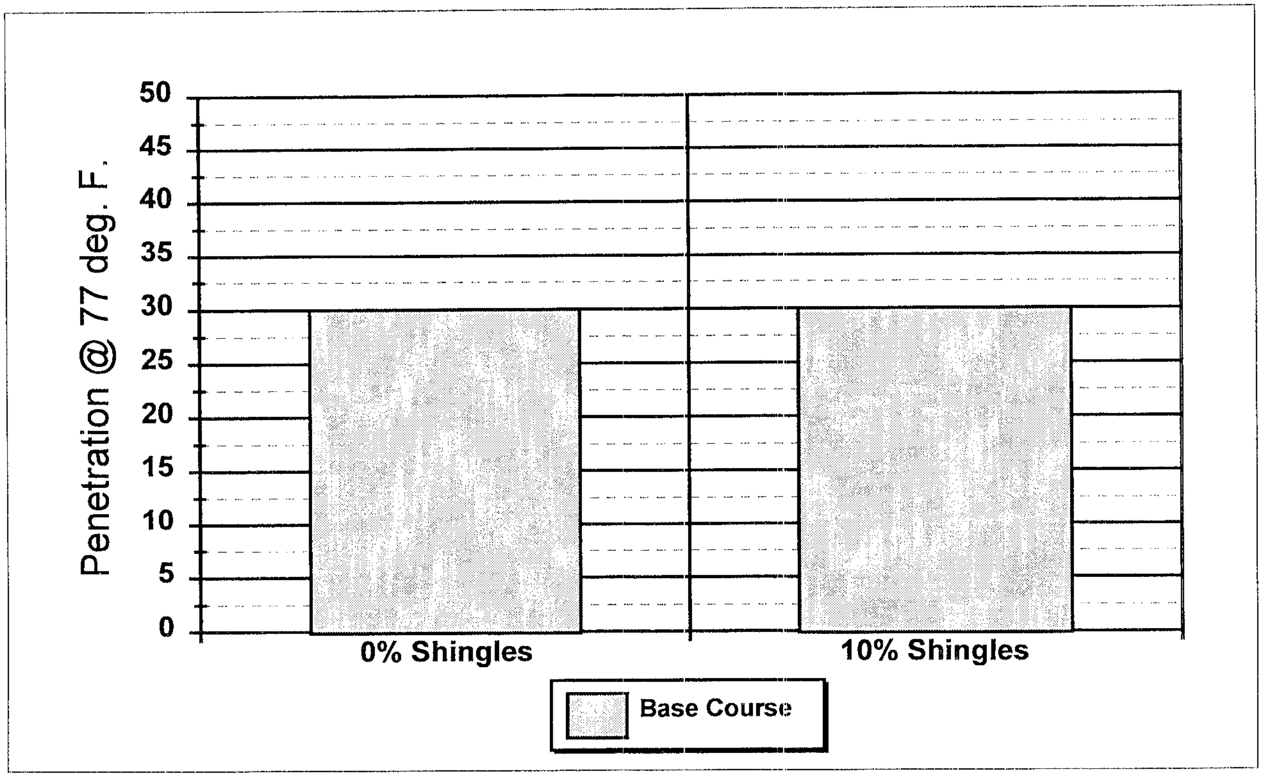


**Figure 10**. Recovered A.C. Penetration, Scott CSAH 17

**Moisture Sensitivity**

The T.H. 25 mixtures were subjected to moisture sensitivity testing to determine the difference in tensile strength between dry and conditioned samples. The ratio of the wet tensile strength to the dry tensile strength, known as the tensile strength retained, or TSR, are shown in Figure 11. As can be seen, no appreciable difference exists in retained strength between the control mixture (no shingles) and the mixtures containing shingles. This suggests that moisture damage to the shingle mixtures should not be any more severe than to the conventional mixture.

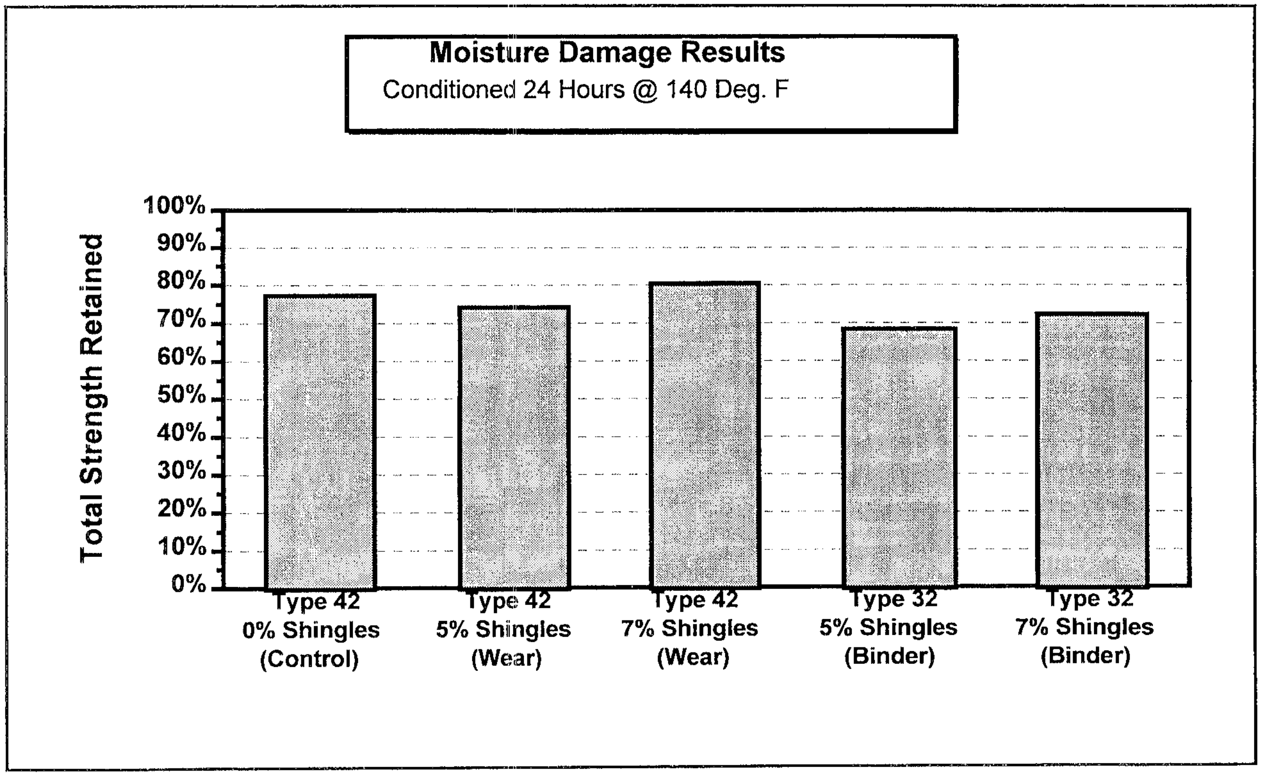


**Figure 11**. Moisture Sensitivity Testing Results for T.H. 25 Project

## CONCLUSIONS

1. While there is little difference between the laboratory results of the shingle and non-shingle mixtures, the in-place air voids are much higher than expected for all of the mix types used on these projects and could lead to raveling/stripping.

2. For the most part, the extracted asphalt cement in the shingle mixtures is harder than the asphalt cement in the control sections. This is expected since the grade of asphalt used in shingle manufacturing is harder than the asphalt typically used in pavements. However, this slight increase in A.C. hardness has not resulted in any added cracking at this time.

3. Each percent of shingle scrap added to HMA contributed between 0.27 and 0.30 percent A.C. to the wearing course mixtures (Mn/DOT 2331 Type 42), by weight of mix.

4. Each percent of shingle scrap used added to HMA contributed between 0.12 and 0.22 percent A.C. to the binder/base course mixtures (Mn/DOT 2331 Type 32), by weight of mix.

5. There will be an economic benefit to using waste shingle scrap in HMA if the cost of incorporating the shingle scrap into the mix is less than the savings that result from the need for less asphalt cement.

6. Based on the T.H. 25 test data, shingle scrap mixtures are expected to be just as resistant to moisture damage as the conventional mixtures.

7. Based on the performance of the test sections and the University of Minnesota's laboratory study, shingle scrap from the shingle manufacturing is now an allowable salvage material under Mn/DOT specification 2331.3E2e. Because of the limited data set on shingle mixtures in Minnesota the maximum amount of shingle scrap allowed is 5 percent, by weight of aggregate. As more data becomes available this may be increased.

8. All three test sections are performing well at this time. They will continue to be monitored by Mn/DOT.

## REFERENCES


1. Newcomb, D., et al., "Influence of Roofing Shingles on asphalt Concrete Mixture Properties," Minnesota Department of Transportation, MN/RC 93-09, 1993.

2. Turgeon, C., "Waste Tire and Shingle Scrap/Bituminous Paving Test Sections on the Willard Munger Recreational Trail Gateway Segment," Minnesota Department of Transportation, Interim Report, 1991.

3. Minnesota Department of Transportation, "Supplemental Specifications to the 1988 Standard Specifications for Construction," 1994, pp.130-132.

4. Minnesota Department of Transportation, "Standard Specifications for Construction," 1995, pp.261-263.

5. Turgeon, C., "Mn/DOT Physical Research Contact Report, T.H. 25 Shingle Scrap Project", Minnesota Department of Transportation.

6. Scott County Highway Department, "CSAH 17 Construction and Lab Report"

# APPENDIX A.

# Mn/DOT SPECIFICATIONS FOR SALVAGE MATERIAL IN HMA [4]

**2331.E2e** **Recycled Mixture Requirements**

(1) If the Contractor produces recycled bituminous mixture(s) (Type 32, 42, or 48), the mixture(s) shall consist of a combination of any of the following: virgin aggregate, salvaged aggregate or crushed concrete, and salvaged asphaltic material. Recycled bituminous mixtures (Type 32), produced in accordance with the provisions herein may be substituted for all Type 31 mixtures. Recycled bituminous mixtures (Type 42), produced in accordance with the provisions herein may be substituted for all Type 41 mixtures. Recycled bituminous mixtures (Type 48), produced in accordance with the provisions herein may be substituted for all Type 47 mixtures. For documentation purposes, recycled mixtures shall be identified as Type 32, 42 or 48 mixtures.

(2) The minimum total asphalt content, minimum new asphalt content, and the extracted gradation requirements shall be verified based upon production sampling and testing.

(3) Salvaged material (salvaged aggregates, crushed concrete, or salvaged asphaltic pavement) containing any objectionable materials; i.e., road tar, metal, glass, wood, plastic, brick, rubber, fabric or any other material having similar characteristics will not be permitted for use in recycled bituminous mixture(s).

(4) Salvage materials may be incorporated into recycled mixtures in accordance with Table 2331-3.

## TABLE 2331-3
## ALLOWABLE SALVAGE MATERIAL FOR RECYCLING
### Maximum Percentage Permitted

| Salvage Material Type | Type 32 Mixtures | | |
|---|---|---|---|
| | Non Wear | Shoulder Wear | Wear |
| Salvage Aggregate | 100 | 100 | 100 |
| Salvage Asphaltic Pavement | 50 | 50 | 30 |
| Crushed Concrete | 50 | 0 | 0 |
| Salvage Asphaltic Pavement and Crushed Concrete (combination thereof) (A) | 85 | 0 | 0 |
| Scrap Shingles (C) | 5 | 5 | 5 |
| Salvage Asphaltic Pavement and Scrap Shingles (C) (combination thereof) (B) | 50 | 50 | 30 |

| Salvage Material Type | Type 42 Mixtures | | |
|---|---|---|---|
| | Base | Binder & Level | Wear |
| Salvage Aggregate | 100 | 100 | 100 |
| Salvage Asphaltic Pavement | 50 | 30 | 30 |
| Crushed Concrete | 0 | 0 | 0 |
| Salvage Asphaltic Pavement and Crushed Concrete (combination thereof) (A) | 0 | 0 | 0 |
| Scrap Shingles (C) | 5 | 5 | 5 |
| Salvage Asphaltic Pavement and Scrap Shingles (C) (combination thereof) (B) | 50 | 30 | 30 |

(A) Neither component shall exceed 50 percent of the total aggregate by weight.
(B) The scrap shingle component shall not exceed 5 percent
(C) Scrap shingles allowed only when approved by the Engineer. Specifications on file with the Bituminous Engineer

| Salvage Material Type | Type 48 Mixtures | | |
|---|---|---|---|
| | Base | Binder & Level | Wear |
| Salvage Aggregate | 100 | 100 | 100 |
| Salvage Asphaltic Pavement | 50 | 50 | 30 |

(5) Penetration grade 120/150 asphalt cement shall be used for mixture containing salvage asphaltic aggregate. For mixture containing no salvage asphaltic aggregate, the penetration grade shall be the same for virgin mixtures.

(6) Types 32, 42 and 48 virgin and non-asphaltic salvaged aggregate shall meet the quality and crushing requirements of 3139 for Type 31,41, and 47 mixture aggregate, respectively.

(7) All salvaged asphaltic pavement materials to be incorporated into Type 32 recycled mixture shall be sized so that no particle is greater than 75 mm in any dimension. The final recycled mixture loaded into transport vehicles at the plant shall have no particle exceeding the maximum aggregate size required under this Specification and 3139 for Type 31 mixtures.

(8) All salvaged asphaltic pavement materials that are to be incorporated in Type 42 or 48 recycled mixtures shall be sized so that no particle is greater than 19 mm in any dimension. The final recycled mixture loaded into transport vehicles at the plant shall have no particle exceeding the maximum aggregate size required under this Specification and 3139 for Type 41 or 47 mixtures, respectively.

(9) All salvaged aggregate shall be stockpiled uniformly to limit variation in mixture properties.

## Scrap Shingle Certification Sheet
## *Manufacturer*

**S.P. No:** ____________________ **Project:** ________________________________________

**The Manufacturer of Shingle Scrap:**

Name: ________________________________________________________________

Address: ________________________________________________________________

________________________________________________________________

Contact: ________________________________________________________________

Phone: ________________________________________________________________

We the undersigned, certify that a portion of the shingle scrap to be used on this project, was supplied directly from one of our manufacturing plants to the processor listed below and is shingle manufacturing waste material. We certify that this, material is not tear-off or re-roof material which has been previously used. We also certify that the material supplied to the processor consisted of only organic and/or fiberglass shingles and contains no asbestos or other hazardous material.

________________________________________________________________

Name of Processor Shingle Scrap Was Supplied To

________________________________________________________________

Address

________________________________________________________________

Manufacturer of Shingle Material Date

## Scrap Shingle Certification Sheet
## *Processor*

**S.P. No:** ____________________ **Project:**________________________________________

Name: __________________________________________________________________

Address: __________________________________________________________________

__________________________________________________________________

Contact: __________________________________________________________________

Phone: __________________________________________________________________

We the undersigned, certify that the all of the shingle scrap to be used on this project came from a shingle manufacturing facility or facilities and is not tear-off or re-roof material. We certify that this shingle s scrap material contains only shingles, no other material was added or introduced to this shingle scrap.

__________________________________________________________________________

Processor of Shingle Scrap Material Date

**Note:** Processor must submit certification from ***all*** manufacturing facilities which provided or will provide shingle scrap material to be used on this project.

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