



U.S. Department
of Transportation
**Federal Highway
Administration**

Memorandum

Subject: **ACTION:** Recycled Asphalt Shingles Used in Asphalt Pavements

Date: December 11, 2014

In Reply Refer to:
HIAP-20

From: /s/ Walter C. Waidelich, Jr.
Associate Administrator for Infrastructure

To: Federal Lands Highway Division Engineers
Director of Technical Services
Division Administrators

The engineering feasibility of using recycled/reclaimed materials has been demonstrated in research and numerous field projects. Significant advances in technology over the past decade have increased the types of materials in use and the range of their applications. Recycling presents environmental opportunities and challenges, which when appropriately addressed, can maximize the benefits of re-use. In order to foster innovation and future development, the Federal Highway Administration (FHWA) supports research, field trials, and project demonstrations showcasing the findings. The FHWA has a longstanding position that any material used in highway or bridge construction, be it virgin or recycled, shall not adversely affect the performance, safety or the environment of the highway system. This remains a cornerstone in our policy statement.

Our October 20, 2014, memorandum on "Recycled Materials in Asphalt Pavements" noted that an increasing number of State departments of transportation (State DOT) have reported premature cracking in relatively new asphalt pavements. A similarity in many of these pavements is the use of recycled asphalt shingles (RAS) to replace a large portion of the total asphalt binder in new pavements. There have been increased concerns with pavements that contain high levels of RAS (for example 5 percent RAS by weight of the total mix can replace as much as an additional 25 percent of the total binder).

In November 2014, the American Association of State Highway and Transportation Officials' (AASHTO) Subcommittee on Materials (SOM) conducted a survey of State DOTs on the use of RAS. The survey indicates that at least 14 States have a maximum limit for RAS up to 5 percent by weight of total asphalt paving mixture. Most States also have a combination of other limitations, such as using lower percentages of RAS for pavement surfaces, traffic-level limitations, and adjustments to asphalt binder availability. In addition, a number of State DOTs allow RAS tabs only from manufacturing of shingles that are very different than aged RAS taken off a roof for replacement. We also found several States that

have only a limited sample of projects that were recently completed. Finally, we must recognize that the States in warmer climates will most likely have less vulnerability to cracking from brittleness.

State DOTs using or creating specifications for RAS should be aware of the AASHTO standards, particularly PP 78-14 on *Design Considerations When Using Reclaimed Asphalt Shingles in Asphalt Mixtures*. This recent provisional standard limits the RAS asphalt binder availability factor to range from 0.70 to 0.85. In view of the recent AASHTO survey, we highly recommend that State DOTs follow these current design considerations, and where there are performance concerns with the use of RAS as evidenced through premature pavement failures in your State, to require the use of this provisional standard as a minimum for Federal-aid participation. There are many variables in asphalt mix design, production and paving, so performance on the road is the best indicator and should be monitored to determine if a problem exists. Our previous memorandum also referenced studies investigating the appropriate level of total RAS that could be used in an asphalt pavement. We intend to continue working with the AASHTO SOM and the States to establish improved national guidance for the beneficial use of RAS.

We are asking each division office to meet with their respective State DOT by January 30, 2015 to discuss their criteria for the use of RAS in highway pavements. If performance related concerns are identified, divisions must ensure that AASHTO standard PP 78-14 is required for future Federal-aid projects and discuss with their State any other specification or procedural adjustments that may be appropriate to mitigate the risk of premature pavement failures.

If you have any related issues of concern or for further information, contact John Bukowski, Materials and Quality Assurance Team Leader (john.bukowski@dot.gov) or Tom Harman, Pavement and Materials Technical Service Team Manager (tom.harman@dot.gov).