

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**RECYCLED HOT MIX ASPHALT AND RECYCLED ASPHALT SHINGLES IN
SUPERPAVE MIXTURES**

CFS:KPK

1 of 3

APPR:CJB:JWB:02-26-20

FHWA:APPR:03-02-20

Delete the first paragraph of subsection 501.02.A.2 of the Standard Specifications for Construction in its entirety and replace it with the following:

2. **Recycled Mixtures.** Substitution of reclaimed asphalt pavement (RAP) and/or recycled asphalt shingles (RAS) for part of the new materials required to produce the HMA is acceptable as described in the following subsections. Produce the mixture in accordance with subsection 501.02.C. Inclusion of RAP and/or RAS in the mixture will not change the contract unit price.

Add the following subsection to subsection 501.02.A.2 of the Standard Specifications for Construction.

- c. **Reclaimed Asphalt Pavement, Recycled Asphalt Shingles, and Binder Grade Selection.** The method for determining the binder grade in HMA mixtures incorporating RAP and/or RAS is divided into three categories designated Tier 1, Tier 2 and Tier 3. Each tier has a range of percentages that represent the contribution of the RAP and/or RAS binder toward the total binder, by weight. The tiers identified below apply to Superpave mixtures.

Ensure Superpave mixture types EML, EML High Stress, EMH, EMH High Stress, EH, and EH High Stress used as leveling or top course are limited to a maximum of 27 percent RAP or RAP/RAS binder by weight of the total binder in the mixture.

RAP and/or RAS will not be allowed in Asphalt Stabilized Crack Relief Layer mixtures.

RAS materials must not contribute more than 17 percent by weight of the total binder content for any HMA mixture.

The Contractor may substitute RAP and/or RAS for a portion of the new materials required to produce HMA mixture. RAS are defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from tear-off shingles from residential structures. Use of post-manufacture RAS or post-consumer RAS is permitted. "Post-consumer RAS", or "tear-offs", are processed shingle scrap removed from residential structures. RAS must comply with all regulatory requirements. Ensure RAS is stockpiled separately from other materials and is separated into post-consumer RAS and post-manufacture RAS stockpiles. RAS may be blended with up to 20 percent fine aggregate during processing as shown on the mix design to avoid clumping and allow proper metering of the material from feed bins. Blended RAS and fine aggregate will be

considered the final RAS product and not a fine aggregate product. Process the RAS by ambient grinding or granulating such that 95-100 percent of the particles pass the 3/8 inch size sieve and 90-100 percent of the particles pass the No. 4 sieve.

RAP and/or RAS may be used as a substitute for a portion of the new materials required to produce HMA mixtures in accordance with contract. When using RAS the percent of AC in the RAS will be determined by solvent vacuum extraction and the frequency of QC testing will be one test per 250 tons. Ensure the percentages of RAP and/or RAS are as specified on the Mix Design and Job Mix Formula.

RAS must not contain extraneous waste materials. Ensure extraneous materials including, but not limited to, asbestos, metals, glass, rubber, nails, soil, brick, tars, paper, wood, cellulose mat, and plastics are removed by hand and must not exceed 1.5 percent by weight as determined on material retained on the No. 8 sieve. To conduct deleterious material testing, a representative 500-700 gram sample of processed shingle material is sieved on the No. 8 sieve and any extraneous waste material retained on the No. 8 sieve is picked and weighed. (If RAS is processed to pass the No. 8 Sieve a visual inspection of the raw material may be used to determine if extraneous material exists. Any raw material pile found to have any extraneous material will be rejected. The rejected pile may be used for processing provided the extraneous material is completely removed and re-inspected before further processing.) The frequency of QC testing will be one test per 250 tons of shingles. The percent extraneous is based on the total sample weight. RAS must contain less than the maximum percentage of asbestos fibers based on testing procedures and frequencies established by state or federal environmental regulatory agencies.

Ensure RAP and RAS are stockpiled separately and fed to the plant by separate feed systems capable of metering at the design rate.

- **Tier 1 (0 percent to 17 percent RAP and/or RAS binder by weight of the total binder in the mixture).** No binder grade adjustment is required to compensate for the stiffness of the asphalt binder in RAP and/or RAS. The asphalt binder grade can be selected using a blending chart for high and low temperatures. Supply the blending chart used in determining the binder selection according to *AASHTO M323*.

- **Tier 2 (18 percent to 27 percent RAP or RAP/RAS binder by weight of the total binder in the mixture).** Ensure when incorporating only RAP, the required asphalt binder grade is at least one grade lower for the low temperature than the design binder grade required for the specified project mixture type. Lowering the high temperature of the binder one grade is optional. For example, if the design binder grade for the mixture type is PG 58-22, the required grade for the binder in the HMA mixture containing RAP would be a PG 52-28 or a PG 58-28.

No binder grade change will be required in Tier 2 for all shoulder and temporary road mixtures.

No binder grade change will occur for Tier 2 EL mixtures used as leveling or top course.

When incorporating RAS the asphalt binder grade will be selected using a blending chart for high and low temperatures. The Contractor must supply the blending chart used in determining the binder selection according to *AASHTO M323* and the *HMA Production Manual*.

When incorporating only RAP the asphalt binder grade can also be selected using a blending chart for high and low temperatures. The Contractor must supply the blending chart used in determining the binder selection according to *AASHTO M323*.

- **Tier 3 (≥ 28 percent RAP or RAP/RAS binder by weight of the total binder in the mixture).** The binder grade for the asphalt binder is selected using a blending chart for high and low temperatures. The Contractor must supply the blending chart and the RAP/RAS test data used in determining the binder selection according to *AASHTO M323* and the *HMA Production Manual*.