

408 RECYCLED ASPHALTIC CONCRETE

Recycled asphaltic concrete is actually a mixture of new aggregates and asphaltic concrete salvaged from an existing pavement. Materials, testing procedures, and construction requirements are quite similar for the various types of asphaltic concrete pavement. For the sake of brevity, most inspection procedures can be found in the "Asphalt Concrete" section of this manual. This subsection of the manual contains additional inspection procedures and contract administration requirements for Specification 408. The differences are brought about by the addition of salvaged pavement to the mix and the fact that 408 is a method specification with an end-product compaction specification for lifts greater than 1-½" thick (40 millimeters).

A self-propelled milling machine designed to break up the pavement into smaller, aggregate-sized pieces usually removes the existing asphaltic concrete. Usually, the pavement is removed for only a fraction of the existing depth, making a trench with undisturbed material on either side and on the bottom. The plans will give details of the depth and width of the trench. The specifications should limit the amount of time the trench will remain open, or limit the length of milled trench ahead of the re-paving. The vertical sides of the trench are a safety hazard to the traveling public because the abrupt drop-off may cause motorists to momentarily lose control. Work out a plan at the pre-paving meeting with the Contractor so that the exposure of these vertical trench edges can be minimized. This sometimes complicates traffic control procedures but in the end it is the best thing for the traveling public.

The salvaged aggregate will come from previously stockpiled material or from material removed from the existing roadway. This will be determined by the contract documents. Crushing and screening are required before the salvaged material can be added to the mix. Any crushed pavement must be fine enough that only a small amount of screening is necessary to remove a superficial quantity of oversize.

The inspection and testing for recycled asphaltic concrete construction differs from new asphaltic concrete construction in a number of ways.

1. The Contractor will select an aggregate source then submit a 300 pound (135 kilogram) sample of new aggregate for tentative approval together with a letter that identifies the aggregate source, asphalt cement source, mineral admixture source and type. A mix design will be made using the Contractor's new material and salvaged asphaltic concrete pavement material obtained by the Resident Engineer.
2. When samples are obtained for the trial mix designs, they need to weigh at least 150 pounds (70 kilograms) for each stockpile. The new mineral aggregate has to be stockpiled in at least three piles with the gradation requirement given in the specifications. The Resident Engineer may approve grading limits for more than three piles. The salvaged asphaltic concrete is required to be placed in two stockpiles for which the grading limits are specified. All the salvaged asphaltic concrete must pass a 1-½ inch (37.5 millimeter) sieve but the milling technique must create a minimum amount of fines.
3. Once the stockpiles have been established, the Resident Engineer may vary the amounts used from proportions set up in the Special Provisions by 10% without the need for a change order. The percent of recycled aggregate used in the mix may also vary (see Subsection 408-3.07)
4. The trial mix design made from these materials will be used by the Contractor to start production. As soon as production has stabilized during the first shift, the mix will be sampled to check the mix design. If all the design criteria are met, the mix being used will be considered the initial mix design. Once there is an approved initial mix design, acceptance at the cold feed will be based on the

average of three consecutive tests.

5. It is important to test the stockpiles daily during stockpile production. As with other asphalt mixes, the successful control of mix properties is often best achieved by strict control of the crushing operation. This is especially important with recycled asphalt because of the inconsistent nature of the recycle materials. During asphalt production the amount of material used from each stockpile may be varied up to 5% from the design percentages without a new mix design.
6. The Department has the right under Subsection 408-4.02 to stop the work after the first day of production if the mix design or gradation criteria are not being consistently met. This allows enough time to formulate a new mix design. Experience has shown that the mix properties of recycled asphalt are highly variable and adjustments to the aggregate proportions are often needed. This is due to the fact that the recycled materials themselves are variable. Recycled materials frequently contain pavements (and thus asphalt cements) of different ages and gradations, as well as part of the underlying material that is unavoidably picked up by the milling and removal operations.

Resident Engineers and Project Supervisors should realize that every recycled project is different because of the unique combinations of recycled materials that are encountered. This uniqueness affects mix properties and thus the inspection requirements for each project. Some recycled asphalts compact very well on one project, but poorly on others. Materials from older pavements may affect flow and stability on the last project but may not be an issue on the current one. In addition, during the life of a project, certain mix properties may fall out of specification as the characteristics of the recycled materials change. ADOT's Inspectors and Project Supervisors may need to be flexible in recycled asphalt plant and pavement inspection because the material cannot be controlled as well as some other types of paving projects.