July 1, 2024

GROUND TIRE RUBBER ASPHALT MIXTURES

USING THE DRY METHOD

DESCRIPTION

Work specified in this section consists of the production of various Ground Tire Rubber (GTR) Asphalt Mixtures. GTR asphalt mixtures are required to be composed of the same materials as conventional asphalt mixtures with the exception of adding a ground tire rubber to the finished mix. GTR asphalt mixtures are produced through an asphalt plant and constructed in accordance with applicable Standard Specifications, Supplemental Specifications, and other Special Provisions except as noted herein.

MATERIALS

Asphalt Binder

Use a PG 64-22 meeting the requirements of the 2019 Supplemental Specification for Asphalt Binder and Additives.

Dry Process GTR

Use a treated rubber that consists of 100% recycled tire rubber combined from auto and/or light truck tires that in its finished state consists of a fine ground material. Heavy equipment tires are not permitted. 99.9% of metal found in tires must be removed during the grinding-manufacturing process per ASTM D5603. Use 30 mesh size ambient or cryogenic ground tire rubber at a minimum 10% by weight of neat asphalt binder content. Ensure that the ground tire rubber is chemically treated or blended with a workability additive that prevents clumping in storage and helps to achieve better particle distribution. Any proposed and permitted technologies must be approved for use by the Asphalt Materials Engineer (AME) prior to use." Varying percentage blends of crumb rubber and approved additives may be used, at the discretion of the Asphalt Materials Engineer (AME).

Dry Process GTR: Product Physical Requirements	
GTR Gradation ASTM D 5603 – Class 30	100 % Passing No. 30 Sieve
Specific Gravity ASTM D5603	1.02 – 1.20
Flash Point (AASHTO T 48)	475°F min.
Auto-Ignition Temperature	700°F min.
Solubility in Water	1.0% max.
Recycled Tire Content (finished product)	95% min.
Percent of Fiber by Weight of GTR ASTM D 5603	0.02% max.

Aggregates
Use conventional aggregate materials as stated in SC-M-402, and use SC-M-407 if additional recycled materials are utilized in the GTR asphalt course.

PLANT PRODUCTION

Handling of Dry Process Rubber: Ensure GTR is properly stored in dry storage prior to use and kept covered to ensure equipment can add the rubber into the mix uniformly in the desired dosage per mix type. Ensure GTR moisture does not cause swelling and foaming when introduced into the asphalt plant.

GTR Addition: Introduce GTR into the asphalt plant to achieve a uniformly blended mixture. Ensure that the system is interlocked electronically with the asphalt plant control system. Use a separate automated feed supply system that uniformly introduces and blends the GTR into the mix during production. Ensure that the system includes a means to agitate the GTR particles to prevent clumping, along with a waterproof tarp or other shelter to ensure that no moisture enters the material hopper when not in service. Control the proportion of the GTR accurately to within plus or minus 10% of the GTR required. Verify the feed rate in pounds per minute and equip the system to provide continuous in-process monitoring, consisting of a printout of the feed rate that is printed out at a 20-minute interval. Provide and interlock flow indicators or sensing devices for the GTR system with the plant controls, so that an audible warning alarm sounds if introduction of the GTR fails, or if the output rate is not within the required tolerance for more than 60 seconds. Stop production immediately when no flow of GTR is detected to that ensure mix quality is not compromised. Verify amount of dry process GTR used during production by comparing the amount used with the amount of liquid asphalt binder used daily and record on the daily asphalt plant report.

Finished Mix Storage: Ensure storage silos are heated and insulated to prevent temperature excessive loss. Extended storage of any GTR modified asphalt mixtures will be permitted up to 4 hours maximum.

CONSTRUCTION REQUIREMENTS

Perform all work in accordance with Section 401 of the Standard Specifications and other applicable Supplemental Specifications and Special Provisions except as noted in this specification. Place the GTR modified courses in a manner to prevent segregation, provide the required in-place compaction, and produce a smooth riding surface. Ensure that when the HMA mixture is delivered to the paver, mix temperature is not less 300°F and no greater than 350°F.

ACCEPTANCE CRITERIA

Acceptance of the GTR modified asphalt mixtures will be based on SC-M-400 using the same criteria as the conventional mix type used.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

This work will be measured and paid for as specified in Subsections 401.5 and 401.6 of the Standard Specifications for Highway Construction.