

ITEM 341

HOT IN-PLACE ASPHALT RECYCLING

- 341.1 Description. This Item shall govern for the process of asphalt surface rehabilitation consisting of repaving the existing asphaltic pavement in a simultaneous multi-step process of heating, scarifying, applying an asphalt rejuvenator, and relaying the old asphaltic surface, and then placing an overlay of new asphaltic concrete over the recycled asphalt pavement. The total thickness of the asphaltic pavement shall be as shown on the construction drawings.
- 341.2 Materials.
- A. The new asphaltic concrete material shall be in accordance with Item 340 "Hot Mix-Hot Laid Asphaltic Concrete". It shall be the Contractor's responsibility to supply the newly added asphaltic concrete. The temperature of the new asphaltic concrete shall be in accordance with Item 340, when delivered to the jobsite.
 - B. The asphalt rejuvenator shall be AES-300RP, Polymer Modified High-Float Emulsion, or equivalent, and shall meet the requirements of Item 300 "Asphalts, Oils, and Emulsions" of the Texas Department of Transportation's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Latest Edition.
- 341.3 Equipment. The machine that heats, scarifies, rejuvenates, and mixes must also lay the recycled asphalt material, as well as the new material. Recycled asphaltic material must be laid within 30 seconds after scarification begins to ensure a hot monolithic bond with the scarified pavement surface.
- A. Heater, Scarifier, Repaver Unit: This machine shall be a self-contained machine specifically designed to re-process upper layers of existing asphaltic pavements. This machine shall be as approved by the Engineer with due consideration being given to proven past performance of the unit for similar work. The heater-scarifier-repaver unit shall consist of at least the following:
 - 1. A heating mechanism capable of heating the asphaltic concrete pavement surface to a temperature high enough to allow for full depth of required scarification of the material without breaking aggregate particles; without charring the pavement; and without producing undesirable pollutants. The heating mechanism shall be so equipped that heat application shall be under an enclosed or shielded hood to prevent damage to outlying grass, shrubs, or trees. In the event of burning of the asphalt or excessive production of pollutants, the Engineer may require that operation be

discontinued. Operations may not be resumed until adjustments have been made to the satisfaction of the Engineer.

2. Scarifying sections shall be equipped with separate automatic height adjustments in order to clear utility manholes and/or other obstructions in the pavement surface. These sections shall be able to penetrate the surface a minimum of 1 inch. The machine must have sufficient power to push scarifiers through the high spots and create a leveled surface conforming to the desired finished profile of the pavement. The machine must be able to scarify pavement sections in depths up to one inch in height.
3. A leveling unit capable of gathering the heated and scarified material into a windrow or otherwise leveling the material in a manner acceptable to the Engineer, and then distributing the material over the width being processed so as to produce a uniform cross-section.
4. A system for adding and blending recycling asphalt rejuvenator, to be applied at a rate determined by laboratory analysis based on laboratory tests on pavement samples. The application rate will be synchronized with the machine speed to provide uniform application and maintain a tolerance of less than 5 percent from the rate determined by laboratory analysis. This rate may be adjusted in the field with the concurrence of the Engineer.
5. A spreading and finishing mechanism capable of producing a surface that will meet the requirements of the typical cross-section, shown by the enclosed drawing and any required surface tests. Automatic screed control, if required, shall meet the requirements of Item 340 "Hot Mix-Hot Laid Asphaltic Concrete".

- B. Rollers: Rollers shall be in accordance with Item 340 "Hot Mix-Hot Laid Asphaltic Concrete".

341.4 Construction Methods.

- A. The pavement surface to be heater scarified shall be cleaned of all deleterious material by blading, brooming or other approved methods, prior to beginning the heater-scarification operation. It shall be the responsibility of the Contractor to protect the adjacent landscape from heat damage. This protection may consist of individual shielding and/or water spray or other methods approved by the Engineer.

- B. The existing asphaltic pavement shall be evenly heated, scarified, mixed and re-laid to the minimum depth shown on the construction drawings, by a continuously moving heater-scarifier-repaver unit. It shall be controlled to assure uniform heat penetration without causing differential burning of the surface. Charring of the asphalt will not be permitted. Under no circumstances shall the scarifying penetrate into the existing flexible base course.
- C. The heated material shall have a temperature in a range between 225° F. and 265° F. as measured immediately behind the heater-scarifier. The Contractor will regulate the temperature within these limitations, and the mixture shall not vary from this selected temperature more than 25° F. Temperature measurement methods shall be in accordance with Item 340 "Hot Mix-Hot Laid Asphaltic Concrete".
- D. Rejuvenator shall be applied during the mixing operation. The rate of application for the rejuvenator shall be provided according to the geotechnical lab results based on existing road surface material tests.
- E. The new asphaltic concrete shall be placed (laid) over the in-place hot scarified material. The in-place material shall have a residual temperature of at least 190° F. Again temperature measurement methods shall be in accordance with Item 340 "Hot Mix-Hot Laid Asphaltic Concrete".
- F. New asphaltic concrete pavement overlay shall be placed over the hot re-laid recycled asphaltic material. The hot re-laid asphaltic concrete shall have a temperature of at least 190° F. when the new asphaltic material is placed over it.
- G. Hot mix asphaltic concrete shall be placed and spread using a vibratory screed, and, unless otherwise directed by the Engineer, an automatic longitudinal screed control system shall be required.
- H. To the varying properties of the existing asphalt pavement, the following adjustments shall be made, as required, as directed by the Engineer.
 - 1. Depth of scarification may be varied.
 - 2. Rate of asphalt rejuvenator may be varied as necessary to maintain a uniform mixture. A laboratory will have determined the recommended rate of rejuvenator application prior to the execution of the project.
 - 3. The amount of new asphaltic material required may be adjusted as necessary to maintain the total design depth of recycled material and new asphaltic concrete pavement.

341.5 Sampling. Minimum of one sample of the hot in place recycled material shall be taken per day.

341.6 General Requirements. The work under this Item will not be allowed when the air temperature is not in accordance with Item 340 "Hot Mix-Hot Laid Asphaltic Concrete".

Quality Assurance:

The rolling pattern shall be established daily/road as outlined in TxDOT's Test Procedure Tex-207-F, Part IV, and densities and compaction verified as outlined in Test Procedure Tex-207-F, Part III, at minimum for every 100 feet.

The new Hot Mix-Hot Laid Asphaltic Concrete mixture overlay shall be sampled and tested as per requirements of Item 340 "Hot Mix-Hot Laid Asphaltic Concrete".

The recycled material shall be sampled at a frequency of one sample for every 3,500 square yards of recycled area or minimum of one sample per day for a recycled area of greater than 700 square yards, and the following tests should be performed on the recycled material:

Tests	Designation
Extraction and Gradation	Tex-210-F & Tex-200-F
Absorb Recovery	Tex-211-F
Penetration	ASTM D5
Viscosity	ASTM D2170

341.7 Measurements. The asphalt recycling process as described above will be measured by the square yard of material, in place.

The new Hot Mix-Hot Laid Asphaltic Concrete overlay material, meeting the requirements of Item 340 "Hot Mix-Hot Laid Asphaltic Concrete", shall be paid for by the ton of material, in place.

The rejuvenating agent shall be paid for by the gallon of material, blended with the existing asphaltic material.

341.8 Payment. The work performed and the materials furnished as prescribed by this Item and measured as outlined above, shall be paid for as follows:

The recycling work shall be paid for by the square yard, which price shall be full compensation for all surface cleaning, heating and scarifying, and relaying the blended asphaltic concrete mixture as well as rolling and finishing, for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.

Payment for new asphaltic concrete shall be by the ton of material furnished, delivered and in place for "Hot Mix-Hot Laid Asphaltic Concrete" which price shall be full compensation for furnishing all material, for all freight involved, for all heating, mixing, hauling, placing

asphaltic concrete mixture, rolling and finishing, for all manipulations, labor, tools, equipment and incidentals necessary to complete the work. Payment for the rejuvenating agent shall be by the gallon. The unit price quoted for this Item shall be full compensation for furnishing, delivering and properly mixing the rejuvenating agents in the recycling process and for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.

Payment for the test that determines the rate of application for the rejuvenator shall be paid for per each test. The Contractor shall hire a geotechnical lab to provide these tests as soon as bid award notification is made so the rate of application for the rejuvenator shall be available at the Pre-Construction Meeting.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires other Standard Specifications

Item 340 "Hot Mix-Hot Laid Asphaltic Concrete"

END OF ITEM 341