

**Item No. 350S
Heating, Scarifying and Repaving**

350S.1 Description

This item shall govern for Asphaltic Concrete surface rehabilitation, a process that consists of a simultaneous multistep process of softening the existing asphaltic concrete surface with heat, scarifying to the depth shown on the Drawings, and thoroughly remixing, leveling and compacting the material. Scarified material shall be blended with fresh hot asphaltic concrete mixture, and when required with an asphalt recycling agent. The item shall also include the application of temporary lane markers and their removal when no longer needed.

This specification is applicable for projects or work involving either inch-pound or SI units. Within the text, the inch-pound units are given preference followed by SI units shown within parentheses.

350S.2 Submittals

The submittal requirements of this specification item include:

- A. Recommended Recycled Job Mix Formula (type and % of asphaltic material, recycling agent, etc.)
- B. Test results on the recycled mixture (asphalt content, stability, penetration).
- C. Characteristics (i.e. manufacturer, depth of application, speed, etc.) of the proposed heater-scarifier machine.
- D. List of facilities and equipment proposed for blending an asphalt recycling agent during mixing operations.
- E. List of facilities and equipment proposed for spreading and finishing the recycled mixture.
- F. Plan, pattern and equipment proposed for compaction of the recycled mixture.

350S.3 Materials

- A. Recycled Asphaltic Concrete

The Contractor shall establish a Job Mix Formula for the scarified asphalt based on samples obtained by the City from the areas to be repaved. The Contractor shall submit a copy of the mix design to the Engineer or designated representative for review prior to commencing field operations. The Job Mix Formula shall restore the recycled material to the following values:

Item	Test	Values
Asphalt Content	Tex-210-F	5 ± .3
Stability	Tex-208-F	40-55
Penetration	Tex-502-C	55-90

Although the overlay process is integral to the work provided by this specification, the overlay and level-up material requirements, measurement and payment shall be governed by Item 340S, "Hot Mix Asphaltic Concrete Pavement".

B. Binding Agents

1. Recycling Agent

When a rejuvenating or plasticizing agent is required it shall conform to Item No. 351S, "Recycling Agent".

2. Asphaltic Materials

Asphaltic materials shall be SS-1 or CSS-1 and conform to Item No. 301, "Asphalts, Oils and Emulsions".

C. Traffic Tape

Temporary traffic lane tape shall conform to Item No. 864S "Abbreviated Pavement Markings".

350S.4 Equipment

The equipment for heating, scarifying, mixing, placing and finishing shall be approved by the Engineer or designated representative. The equipment shall consist of the following:

A. Heater-Scarifier

The heater-scarifier shall be a self-contained machine specifically designed to reprocess upper layers of existing asphaltic pavements. The heater-scarifier machine shall be self-propelled and capable of heating and scarifying the existing asphalt surface to a minimum depth of 3/4 inch (20 mm), uniformly spraying binding agents onto the scarified material, thoroughly mixing and screeding the scarified and enriched material to the desired longitudinal profile and transverse section.

1. Heating Component

The heating component shall have a radiant heating mechanism capable of heating asphaltic concrete pavements sufficiently to allow scarification of the material to the desired depth without breaking aggregate particles without, overheating, charring or burning the existing asphaltic surface, and without producing undesirable pollutants. The entire heating unit shall be enclosed and vented to contain the heat and prevent damage to trees and shrubs, while meeting the State and Federal air pollution control laws. If excessive smoke is produced or the asphaltic mixture is burned, the Engineer or designated representative may require that operations be discontinued. Operations shall not be resumed until adjustments have been made to the satisfaction of the Engineer or designated representative.

2. Scarifying Component

The scarifying component shall consist of multiple racks of teeth capable of penetrating and loosening the heated existing asphaltic surface of a minimum of 3/4 inch (20 mm). The racks shall be vertically and sectionally adjustable to clear obstructions in the pavement surface. The final scarifying shall be within 1/4 inch (6 mm) of the specified finished pavement cross-section and slope.

3. Blending the Recycling Agent

A system for adding and uniformly blending an asphalt recycling agent during the mixing operation. The system shall be synchronized to provide a uniform application at the specified rate with a tolerance of ± 5 percent from the design rate.

4. Mixing and Distribution

A unit capable of gathering the heated and scarified asphaltic concrete pavement, adding and uniformly mixing the fresh asphaltic concrete, and distributing the blended mixture over the width being processed.

5. Spreading and Finishing Component

The spreading and finishing component shall be self-propelled or integral to the power train of the heater-scarifier. It shall have electronic screed control capability and shall produce a high quality, smooth surface conforming to the requirements of the typical cross section and Specification Item No. 340, "Hot Mix Asphaltic Concrete Pavement".

6. Pugmill

An onboard pugmill, if required on the Drawings.

B. Rollers

Equipment shall conform to the requirements of Item No. 230S, "Rolling (Flat Wheel)" and Item No. 232S, "Rolling (Pneumatic Wheel)". One flat steel wheel roller and one pneumatic roller, at a minimum, shall be used to compact the materials.

350S.5 Construction

The work provided by this specification shall be performed when the air temperature is a minimum of 50°F (10°C) and rising and the pavement surface temperature is 50°F (10°C) or higher. The air temperature shall be taken in the shade away from artificial heat.

The area to be resurfaced shall be cleaned of all dirt and objectionable material by blading, brooming or other approved methods, prior to beginning heater-scarification operations. Level-up operations shall be completed as directed by the Engineer or designated representative. The existing asphaltic pavement surface shall be evenly heated, scarified and reworked to the widths and depths shown on the Drawings or a minimum depth of 3/4 inch (20 mm). Heating shall be controlled to assure uniform heat penetration without causing differential softening of the pavement. Charring of the asphalt will not be permitted.

The scarified material shall be gathered, mixed and distributed to the desired longitudinal profile and transverse section. The asphalt recycling agent, when required, shall be applied uniformly to the scarified material prior to mixing and leveling unless otherwise approved by the Engineer or designated representative. The rate of application shall be as selected by the Engineer or designated representative based on laboratory tests on pavement samples. The required amount of fresh hot mix asphaltic concrete shall be added and thoroughly mixed with the scarified material, and the blend shall be leveled and compacted.

All work under this item shall be in conformity with the typical sections shown on the Drawings and to the lines and grades as established by the Engineer or designated representative.

The heated and scarified material shall have a temperature between 225°F (110°C) and 265°F (130°C) as measured immediately behind the scarifier.

There shall be no burning of trees, shrubs, or other landscaping adjacent to the pavement. It shall be the responsibility of the Contractor to protect the adjacent landscape from heat damage.

Application of the binding agent shall be adjusted in areas with level-up material. Under no circumstances shall the scarifying penetrate into an existing flexible base course. The overlay HMAC shall be placed on the scarified material while the road surface temperature is still above 200°F (93°C). The recycled material and overlay course shall be rolled simultaneously. The overlay course shall be compacted to the specified thickness and applicable density in accordance with Item No. 340, "Hot Mix Asphaltic Concrete Pavement". In order to insure a full thickness welded mat at longitudinal seams, 4 inches (100 mm) of the newly laid adjoining mat shall be heated so that a minimum of 2 inches (50 mm) can be cut back.

The varying properties of existing asphalt pavements, as encountered in the field may dictate that the depth of scarification, binding agent rate of application or the overlay thickness be adjusted, as required or directed by the Engineer or designated representative, to maintain the design depth of combined recycled and new hot mix.

Compaction shall begin before the material temperature drops below 190°F (90°C). All rolling shall be completed before the mixture temperature drops below 175°F (80°C) unless determined by the Engineer or designated representative that a higher minimum temperature is required for proper compaction.

Rolling shall be continued until desired compaction is obtained and all roller marks are eliminated. A minimum of one (1) tandem roller and one (1) pneumatic-tire roller shall be provided for each work site unless otherwise directed by the Engineer or designated representative.

The Contractor may, with permission from the Engineer or designated representative, operate other compacting equipment that will produce equivalent compaction as the specified equipment. If the substituted compaction equipment fails to produce the compaction expected of the specified equipment, as determined by the Engineer or designated representative, its use shall be discontinued.

The edges of the pavement along curbs, headers and similar structures, and all places not accessible to the roller, or locations at which thorough compaction is not possible, shall be thoroughly compacted with tamps.

Temporary lane marking shall be placed as soon as surface temperature permits. All marking shall conform to the Texas Manual of Uniform Traffic Control Devices for Street and Highways. Unless otherwise specified or directed by the Engineer or designated representative, the placement pattern shall be 24 inches (600 mm) of tape at 80 foot (24 meter) intervals parallel to the flow of traffic. All temporary lane marking tape shall be removed by the Contractor when no longer needed.

350S.6 Measurement

Asphalt "Heating, Scarifying and Repaving" as described above shall be measured by the square yard (square meter: 1 square meter equals 1.196 square yards) of surface area of completed and accepted work. The asphalt recycling agent or asphaltic material will be included in the unit price bid for Item No. 350S, "Heating, Scarifying and Repaving", unless included as a separate pay item in the contract. When included for payment, it shall be

measured in gallons (liters: 1 liter equals 0.264 gallons). Temporary traffic tape and placement shall be included in the unit price bid for this item.

350S.7 Payment

This item will be paid for at the contract unit bid price for "Heating, Scarifying and Repaving" as provided. The price shall include full compensation for all work including all labor, equipment, materials, heating, scarifying, mixing, rolling, temporary traffic tape and incidentals necessary to complete the work.

The binding agents will be included in the unit price bid for the item of construction in which this item is used, unless included in the contract as a separate item. When included for payment the binding agent will be paid for at the unit price bid for "Recycling Agent" or "Asphaltic Materials", (SS-1 or CSS-1) as indicated.

Payment will be made under the following:

Pay Item No. 350S: Heating, Scarifying and Repaving Per Square Yard.

Payment, when included as a contract pay item, will be made under:

Pay Item No. 350S-CS: Asphaltic Materials, Per Gallon.
Pay Item No. 350S-R: Recycling Agent, Per Gallon.
Pay Item No. 350S-SS: Asphaltic Materials, Per Gallon.

End

<i>SPECIFIC SPECIFIC</i> CROSS REFERENCE MATERIALS
Specification Item 350S "Heating, Scarifying and Repaving Asphaltic Concrete"

City of Austin Standard Specifications

<u>Designation</u>	<u>Description</u>
Item No. 230S	Rolling (Flat Wheel)
Item No. 232S	Rolling (Pneumatic Tire)
Item No. 301S	Asphalts, Oils and Emulsions
Item No. 340S	Hot Mix Asphaltic Concrete Pavement
Item No. 351S	Recycling Agent
Item No. 864S	Abbreviated Pavement Markings

Texas Department of Transportation: Manual of Testing

<u>Designation</u>	<u>Description</u>
Tex-208-F	Test for Stabilometer Value of Bituminous Mixtures
Tex-210-F	Determination of Asphalt Content of Bituminous Mixtures by Extraction
Tex-502-C	Test for Penetration Test of Bituminous Mixtures

Texas Manual for Uniform Traffic Control Devices

<i>RELATED RELATED</i> CROSS REFERENCE MATERIALS
Specification Item 350S "Heating, Scarifying and Repaving"

City of Austin Standard Specifications

<u>Designation</u>	<u>Description</u>
Item No. 206S	Asphalt Stabilized Base

Item No. 210S	Flexible Base
Item No. 306S	Prime Coat
Item No. 307S	Tack Coat
Item No. 310S	Emulsified Asphalt Treatment
Item No. 311S	Emulsified Asphalt Repaving
Item No. 312S	Seal Coat
Item No. 320S	Two Course Surface Treatment
Item No. 341S	Paving Fabric
Item No. 350S	Heating, Scarifying and Repaving
Item No. 642S	Silt Fence (SF)

City of Austin Standard Details

<u>Designation</u>	<u>Description</u>
1000S-10	Local Street Sections
1000S-11(1)	Residential and Neighborhood collector Street Sections
1000S-11(2)	Industrial and Collector Street Sections
1000S-12(1)	Primary Collector Street Sections
1000S-12(2)	Primary Arterial Street Sections
1000S-13(1)	Minor Arterial Street Sections (4 Lanes)
1000S-13(2)	Minor Arterial Street Sections- (4 Lanes divided)
1000S-14	Major Arterial Street

Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges

<u>Designation</u>	<u>Description</u>
Item 300	Asphalts, Oils and Emulsions
Item 301	Asphalt Antistripping Agents
Item 310	Prime Coat (Cutback Asphaltic Materials)
Item 314	Emulsified Asphalt Treatment
Item 345	Asphalt Stabilized Base (Plant Mixed)
Item 354	Planing and/or Texturing Pavement
Item 358	Asphaltic Concrete Surface Rehabilitation