

605 - SURFACE RECYCLED ASPHALT CONSTRUCTION

SECTION 605

SURFACE RECYCLED ASPHALT CONSTRUCTION

605.1 DESCRIPTION

Construct the hot-in-place recycling of the existing asphalt surface as specified in the Contract Documents. The activities associated with this work include heating the existing pavement, scarifying and/or hot milling the existing surface, adding a rejuvenating agent, mixing, spreading, leveling and compacting the recycled material. This process is referred to as Hot In-Place Recycled Asphalt Pavement (HIR). The term surface recycling and HIR are synonymous in the specification.

BID ITEMS

Surface Recycling (*)
Asphalt Rejuvenating Agent
*Thickness

UNITS

Station
Ton

605.2 MATERIALS

a. Asphalt Rejuvenating Agent (ARA). Provide ARA that complies with **DIVISION 1200**.

b. Contractor Mix Design. When the specified thickness of the HIR is greater than or equal to 2 inches, submit a mix design complying with **TABLE 605-1**.

In the mix design, analyze the mixture at a minimum of 3 different ARA contents starting with 0.5% at the low end. Run the indirect tensile strength test (KT-60) at the lowest ARA content. Run the Asphalt Pavement Analyzer (AASHTO TP-63) at the highest ARA content.

TABLE 605-1: SURFACE RECYCLE MIX DESIGN REQUIREMENTS		
Property	Test Method	Limits
Air Voids at 30 gyrations, (%)	KT-58, KT-15, & KT-39	Report
Tensile Strength, (psi min)	KT-56	75
Retained Strength based on cured stability, (% min)	KT-56	80
Rut Resistance, (mm max)	AASHTO TP-63	8
Thermal Cracking, (°C max)	KT-60	-22

Testing procedures:

- Core the pavement to obtain Reclaimed Asphalt Pavement (RAP) for the mix design.
- Break down the RAP (representing the depth of the HIR) to a maximum particle size of 1 inch.
- The compaction temperature range for KT-58 is 200°F to 250°F.
- Perform all tests on plugs that are compacted to 30 gyrations, thus the air void criteria stated in KT-56 is waived.
- Use procedure III when performing KT-15.

605.3 CONSTRUCTION REQUIREMENTS

a. Pavement Preparation. Before commencing surface recycling, remove all material from the surface of the pavement which would be detrimental to the HIR or would not comply with the design criteria of **subsection 605.2b**.

b. Heating and Scarifying Operations. Use a series of heaters, milling units and/or scarifiers to uniformly heat and recycle the existing pavement to the specified depth. Use equipment complying with **SECTION 155**. Provide adequate provisions for equipment calibration. Remove from the roadway milled or scarified material that can not be placed with a paving unit due to equipment breakdown or malfunction. Bring these removed areas to grade using a HMA approved by the Engineer.

c. Process Control.

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(1) Depth Check. The Engineer will determine the depth per KT-47. The moving average of 3 consecutive tests shall equal or exceed the contract depth. If the 3-point moving average is less than the contract depth, KDOT will assess a price reduction corresponding to the amount of material recycled at the deficient depth. If both KDOT and the Contractor agree that recycling to the contract depth would be detrimental to the project, the unit price will be negotiated for the reduced depth before proceeding with the project.

(2) Temperature Requirements: Maintain the temperature of the HIR, directly behind the paver, between 190°F and 300°F. HIR temperatures taken within 2 feet of each other, transverse to the roadway, shall not vary by more than 30°F. If temperature requirements are not within the 30°F required within 1 hour after the discrepancy is discovered, the HIR train will be stopped and the Engineer and Contractor will determine a course of action to correct the deficiency before the HIR train proceeds.

d. Rejuvenating and Mixing Operations. After heating and scarifying and/or hot milling, uniformly add the ARA and thoroughly mix the HIR. Include all of the previously scarified and/or hot milled material into the mixing operation.

e. Spreading and Compacting Operations. Immediately following heating, scarifying, adding ARA and mixing operations, begin work to fulfill the requirements of one of the following operations:

(1) Operation Number 1.

(a) Spread and finish the rejuvenated mixture with an acceptable paving unit.

(b) Provide density using an approved rolling procedure. The Engineer will determine the initial approved rolling procedure from densities obtained with various roller combinations. Density will be determined by using a nuclear gauge. Use the approved rolling procedure. If there is a significant change in factors affecting density, such as weather or compaction equipment, the Engineer will reevaluate and modify the rolling procedure as required. Stop the HIR operation whenever rolling is not being performed according to the approved rolling procedure.

(c) Maintain the rejuvenated pavement surface until the surface treatment shown in the Contract Documents is completed. Spread blotter sand when directed by the Engineer. When required, apply a tack coat before placing the surface treatment. If a HMA overlay is included in the Contract Documents, start the HMA a maximum of 2 weeks after spreading and compacting the HIR. If a seal coat, asphalt seal, microsurfacing or ultra-thin bonded asphalt surface is included in the Contract Documents, allow the HIR surface to cure before sealing. If the quantity of ARA added is equal to or less than 0.04 gallons per square yard per inch of HIR thickness, cure the surface between 1 and 4 weeks before applying the surface treatment. If the quantity of ARA added is greater than 0.04 gallons per square yard per inch of HIR thickness, cure the surface 2 and 4 weeks before the seal is applied.

(2) Operation Number 2. Use an asphalt paver equipped with automatic grade control to spread and finish the amount specified of the new asphalt surface material. **SECTIONS 601 and 602** apply. If a HMA overlay is included in the contract, place the HMA and surface recycle concurrently or the 2 materials may be blended and laid as 1 lift.

f. Weather and Seasonal Limitations. Construct surface recycling when the surface is dry, and the weather is not foggy or rainy. Construct surface recycling when either the ambient air temperature is equal to or greater than 50°F or the road surface temperature is equal to or greater than 55°F. The above requirements may be waived with written approval from the Engineer.

605.4 MEASUREMENT AND PAYMENT

The Engineer will measure surface recycling by the Station along the centerline of the lanes, regardless of pavement width. No additional measurements will be made for widened sections or irregular areas.

The Engineer will measure asphalt rejuvenating agent by the ton.

Payment for "Surface Recycling" and "Asphalt Rejuvenating Agent" at the contract unit prices is full compensation for the specified work.