

ITEM - HOT IN-PLACE RECYCLE – Remix Process (Special)**Description:**

This work consists of hot in-place recycling by the remixing method of the existing asphalt pavement with heat, to a depth of X inches, as detailed on the Project Plans, adding virgin asphaltic concrete, and thoroughly remixing and leveling the remixed material. The remixing method shall be a multi-step process of cleaning, heating, milling, adding a rejuvenating or recycling agent, adding virgin asphaltic concrete if required by the mix design, pugmill mixing, leveling, and screeding in a single pass of the equipment, followed by compaction of the remixed asphaltic concrete pavement.

The rehabilitated layer shall conform to the lines, grades, thicknesses and typical cross section shown on the plans.

Materials:

The virgin asphaltic concrete to be added shall meet the requirements of Section * of the Specifications. The finished asphaltic concrete pavement shall be a homogeneous layer composed of hot in-place recycled asphalt pavement, rejuvenating or recycling agent, and virgin asphaltic concrete.

The rejuvenating or recycling agent shall meet the requirements of Section 1005 of the specifications. The contractor shall select the type of rejuvenating or recycling agent to be used as part of development of the mix design.

Asphaltic Concrete Mix Design Criteria:

Mix designs shall be developed by the contractor. Any coring of the roadway required to determine the recycled job mix formula will be the responsibility of the contractor. The mix design shall be submitted by the contractor and approved by the Engineer at least one week prior to the hot-in-place recycling operation.

Construction Requirements:

Hot in-place recycling shall not take place when the roadway surface is wet or when the surface temperature is less than 65°F.

Equipment:

Hot in-place recycling shall be accomplished using the following equipment:

Preheating mechanisms consisting of clusters of heaters, which radiate thermal energy into the existing asphalt pavement to the required penetration depth without breaking

aggregate particles, charring the existing asphalt pavement, or producing undesirable pollutants. The heating mechanism shall be so equipped that the heat application shall be under totally insulated enclosed hoods.

A self-propelled processing unit containing the following:

A recycling machine equipped with additional heaters conforming to the same requirements as the pre-heaters.

Either a single or multiple milling units. The milling unit/s shall be capable of loosening the existing asphalt pavement to the specified recycling depth as detailed on the Project Plans, without degrading the aggregates.

A controlled system for adding and uniformly blending a rejuvenating or recycling agent at a predetermined rate with the reclaimed mix during the remixing and leveling operation. The application rate for the added material shall be synchronized with the machine speed to provide uniform application. The actual rate used may be adjusted as determined by the Engineer.

A blending unit consisting of a twin shafted pugmill capable of thoroughly mixing the milled materials, rejuvenating or recycling agent and virgin asphaltic concrete at the pugmill so as to produce a uniform mixture.

A unit capable of augering the heated and loosened material into a windrow at the center of the machine prior to intake into the blending unit.

A leveling unit to redistribute the remixed material over the width being processed and finished, so as to produce a uniform cross section and surface.

Rollers capable of achieving the specified density requirements.

Construction Methods. Heating and remixing shall proceed as follows:

Prior to commencing hot in-place recycling operations, the pavement shall be cleaned of all loose material. Power brooms shall be used, supplemented when necessary by hand brooming and such other tools as required to bring the surface to a clean, suitable condition, free of deleterious material.

The pavement surface shall be evenly heated, milled, and remixed to the widths and depths shown on the plans. Heating shall be controlled to assure uniform heat penetration without overheating, coking, or sooting of the asphalt and aggregate. The rejuvenating or recycling agent shall be applied uniformly to the reclaimed material prior to remixing in the pugmill. The rate of application will be approved by the Engineer based upon the Contractor's proposed mix

design. The reclaimed material, rejuvenating agent, and virgin asphaltic concrete shall be uniformly mixed to produce a consistent homogenous product.

The heating operation shall extend at least 4 inches beyond the width of remixing on both sides. When a pass is made adjacent to a previously placed mat, the longitudinal seam shall extend at least 2 inches into the previously placed mat. The temperature of the milled material shall not exceed 320°F when measured immediately behind the milling machine. The milled material shall be picked up and mixed in a blending unit and then distributed and leveled by an activated screed assembly. The temperature of the remixed material shall not be less than 235°F directly behind the screed.

The leveling machine must be capable of screeding the full width of remixed material. Leveling shall be accomplished to produce a uniform cross section as shown on the plans.

The remixed asphaltic concrete pavement shall be compacted immediately after it has been distributed and leveled. The temperature of the pavement during compaction shall not be less than 180°F unless otherwise approved.

Compaction shall be in accordance with subsection 409-3.02 of the Standard Specifications.

The Contractor shall protect the area adjacent to the work from heat damage. All damages to this area resulting from heat damage shall be repaired or replaced at the Contractor's expense. The Engineer may require the Contractor to furnish fire-fighting equipment at the Contractor's expense.

The Contractor shall meet all local, county, state, and federal air pollution regulations. All costs and extra work necessary to comply with air pollution regulations shall be at the Contractor's expense.

Milling will be deemed to be acceptable when the average measured depth for the full width of the milling/scarification is a nominal **X** inches, as detailed on the Project Plans, or as determined by the Engineer. The Engineer will randomly verify thickness of milling throughout the day's production.

Due to the varying properties of the existing asphalt pavement, the following adjustments shall be made if required and as directed:

- (a) Depth of milling may be varied.
- (b) Application rate for recycling agent or other asphaltic material may be adjusted as necessary to maintain a uniform mixture.

- (c) Application rate for virgin asphaltic concrete (* lbs per SY) may be adjusted to maintain the design depth of combined recycled and virgin asphaltic concrete pavement.

Acceptance:

Hot-in-Place recycle (Heating and Remixing) and asphaltic concrete will be accepted complete in place, if, in the judgment of the Engineer, it reasonably conforms to the requirements specified herein. Material that is not acceptable and is rejected shall be replaced to the satisfaction of the Engineer and at no expense to the Department.

Method of Measurement:

Hot in-place recycling will be measured by the actual number of square yards that are completed and accepted.

Virgin asphaltic concrete will be measured by the ton for the asphaltic concrete actually used, which will include the weight of mineral aggregate, asphalt cement and any necessary mineral admixture.

The rejuvenating or recycling agent will be measured by the ton for the rejuvenating or recycling agent actually used.

Basis of Payment:

The accepted quantities of hot in-place recycling will be paid at the contract unit price per square yard. Payment shall include cleaning the existing pavement surface, hot in-place recycling and compaction.

Virgin asphaltic concrete material will be measured and paid for in accordance with Section * of the Specifications.

The rejuvenating or recycling agent and other bituminous materials not included in the virgin asphaltic concrete item will be measured and paid for by the Ton

DESIGNER:

* To be supplied by the Bituminous Engineer.