

ITEM 01403.0196 M - ASPHALT CONCRETE - TOP COURSE (IN-LAY)
ITEM 01403.0296 M - ASPHALT CONCRETE - BINDER COURSE (IN-LAY)
ITEM 01403.5096 M - HOT IN-PLACE RECYCLING ASPHALT CONCRETE
ITEM 01403.5196 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - TOP COURSE
ITEM 01403.5396 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - BINDER COURSE
ITEM 01407.0196 M - TACK COAT
ITEM 01490.0196 M - COLD MILLING ASPHALT CONCRETE

DESCRIPTION:

This specification covers the requirements for hot in-place recycling of asphalt concrete (Option A) and cold milling and placing an inlay of hot mix asphalt concrete (Option B). The Contractor must choose only one of the options contained in this specification unless otherwise indicated on the plans.

Option A. This work shall consist of recycling in-place the existing asphaltic pavement in a simultaneous multi-step process of heating, scarifying, remixing with virgin asphalt concrete, reshaping and compacting the asphalt surface. All work under this item shall be in accordance with these specifications and in substantial conformance with the limits shown on the plans or established by the Engineer.

Option B. This work shall consist of cold milling, applying a tack coat and placing an inlay of hot mix asphalt concrete to a depth and of a mix type specified in the contract document.

MATERIALS:

Detailed mix requirements for Rut Avoidance Asphalt Concrete Type 3RA or 6FRA as mentioned below are available from the Regional Materials Engineer.

Option A. The Contractor shall provide an approved mix design and work plan to the Engineer a minimum of ten workdays prior to the planned start of work. The mix design shall include the results of tests performed on 150 mm diameter cores taken by the Contractor. One core will be taken for each two lane kilometers of pavement, with a minimum of six cores taken for each mix design. As a minimum the following information shall be provided with each mix design.

1. Pavement type.
2. Core location.
3. Total core depth and depth to be recycled.
4. The aggregate gradation from the extracted cores for the depth to be recycled.
5. Recovered asphalt content for each core, penetration at 25°C of the recovered asphalt from every third core (minimum of three penetration results for each mix design) and the average value for each test requirement.
6. Amount of virgin asphalt concrete admixture to be added by percentage and by kilograms per square meter.
7. Asphalt content of virgin asphalt concrete admixture.
8. The combined gradation of the average core gradation and virgin asphalt concrete admixture.
9. Plots of the original and combined gradations on form BR81 for top course and form BR82 for binder course.

The virgin asphalt concrete admixture shall meet the requirements as specified in the approved mix design provided by the Contractor. The mix design shall meet the material requirements for Rut Avoidance Asphalt Concrete, Type 3 RA or Rut Avoidance Asphalt Concrete, Type 6F RA. The grade and content of asphalt cement used shall be determined by the Contractor. The use of recycled material will not be allowed.

The mix design shall include the results of tests run on 150 mm diameter cores taken by the Contractor. No 100 mm diameter cores will be allowed. One core will be taken for each two lane kilometers of pavement with a minimum of six cores taken for each mix design. Cores must be uniformly spaced along the length of the project and taken in alternating lanes. If the pavement material changes at some point within the project limits, a separate mix design for that section will be required. Coring of the pavement will be allowed before the project is awarded.

ITEM 01403.0196 M - ASPHALT CONCRETE - TOP COURSE (IN-LAY)
ITEM 01403.0296 M - ASPHALT CONCRETE - BINDER COURSE (IN-LAY)
ITEM 01403.5096 M - HOT IN-PLACE RECYCLING ASPHALT CONCRETE
ITEM 01403.5196 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - TOP COURSE
ITEM 01403.5396 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - BINDER COURSE
ITEM 01407.0196 M - TACK COAT
ITEM 01490.0196 M - COLD MILLING ASPHALT CONCRETE

Prior to coring, the Contractor must apply for a highway work permit from the Resident Maintenance Engineer.

Option B. Materials removed during the cold milling process shall be disposed of in accordance with Section 490, Cold Milling. The cold milling material from this contract may be used as RAP (Reclaimed Asphalt Pavement) in the top course asphalt concrete in-lay. Up to 20% RAP will be allowed to be recycled into the asphalt concrete in-lay. The mix type(s) for the asphalt concrete in-lay shall meet the material requirements for Rut Avoidance Asphalt Concrete, Type 3 RA or Rut Avoidance Asphalt Concrete, Type 6F RA.

Tack Coat shall meet the requirements of Section 407, Tack Coat.

Equipment.

Option A. A minimum of two machines shall be used: a preheater and a recycling machine. The Contractor shall use hot in-place asphalt concrete recycling equipment appearing on the current Materials Bureau Approved List. Detailed requirements and procedures for approval are available from the Materials Bureau.

Option B. The requirements of Section 400, Bituminous Pavements shall apply. Equipment requirements for cold milling shall meet the requirements of Section 490, Cold Milling.

CONSTRUCTION DETAILS:

Option A. Weather and seasonal limitations for the entire in-place recycling operation shall conform to the general requirements outlined in Subsection 401-3.01, Weather and Seasonal Limitations for top course asphalt concrete.

Prior to beginning pavement recycling operations, the pavement surface to be rehabilitated shall be cleaned of all dirt and other objectional materials by blading, brooming or other methods approved by the Engineer.

The existing asphalt pavement surface shall be evenly heated, scarified and reworked to the widths and depths shown on the plans. Immediately following the scarifying process, the virgin asphalt concrete admixture shall be added in the amount specified or as directed by the Engineer. The virgin asphalt concrete shall be mixed with the scarified material and the resultant mixture shall be homogenous. The heated oscillating screed shall then pass over the material, leaving the resultant pavement course to the specified line and grade.

Option B. The requirements of section 400, Bituminous Pavements shall apply. Cold Milling shall be in accordance with Section 490, Cold Milling. Tack Coat shall be applied to milled surfaces in accordance with Section 407, Tack Coat.

Compaction.

Option A and Option B. The compaction requirements for Rut Avoidance Asphalt Concrete with In-Place Density Monitoring shall apply and are available from the Regional Materials Engineer.

- ITEM 01403.0196 M - ASPHALT CONCRETE - TOP COURSE (IN-LAY)
- ITEM 01403.0296 M - ASPHALT CONCRETE - BINDER COURSE (IN-LAY)
- ITEM 01403.5096 M - HOT IN-PLACE RECYCLING ASPHALT CONCRETE
- ITEM 01403.5196 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - TOP COURSE
- ITEM 01403.5396 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - BINDER COURSE
- ITEM 01407.0196 M - TACK COAT
- ITEM 01490.0196 M - COLD MILLING ASPHALT CONCRETE

Test Section. The test section requirements for Rut Avoidance Asphalt Concrete with In-Place Density Monitoring shall apply and are available from the Regional Materials Engineer.

Testing.

Option A. The Contractor shall sample, test and supply test results to the Engineer on recycled loose mix samples taken from the project. The testing shall be performed by properly trained personnel in a laboratory approved by the Regional Materials Engineer. The following tests shall be performed on representative recycled loose mix samples.

Air Voids	ASTM D2726 & D2041/AASHTO T209
Penetration	ASTM D5-86/AASHTO T49-93
Aggregate Gradation	NYSDOT Materials Bureau MM5
Asphalt Content	NYSDOT Materials Bureau MM5

A minimum of three samples shall be tested at the start of the project. Any time there is a change to the virgin asphalt concrete or the rate of usage, two samples of the recycled loose mix samples shall be tested. Each day during routine production, one sample shall be taken from each kilometer recycled or fraction thereof. One of these daily samples shall be tested and the remaining samples shall be retained until the acceptance of the project. If, in the opinion of the Engineer, the existing pavement condition changes or the recycled pavement is not satisfactory, additional tests shall be performed as ordered by the Engineer at no cost to the State.

Test results shall be made available to the Engineer in a timely manner. If conditions warrant, the Engineer may stop work until the required test results become available.

Option B. The requirements of Section 401, Plant Mix Pavements-General and Section 402, Quality Control, Asphalt Concrete shall apply.

METHOD OF MEASUREMENT:

Option A. Hot In-Place Recycling Asphalt Concrete shall be measured by the number of square meters of pavement surface to be recycled as described in this specification.

Virgin asphalt concrete admixture when required shall be measured by the number of metric tons placed in accordance with this specification.

Option B. Asphalt concrete shall be measured by the number of metric tons placed in accordance with this specification.

The quantity of tack coat incorporated into the work will be the number of liters of asphalt emulsion measured at 16°C.

Cold milling shall be measured by the square meter in accordance with Subsection 490-4, Method of

ITEM 01403.0196 M - ASPHALT CONCRETE - TOP COURSE (IN-LAY)
ITEM 01403.0296 M - ASPHALT CONCRETE - BINDER COURSE (IN-LAY)
ITEM 01403.5096 M - HOT IN-PLACE RECYCLING ASPHALT CONCRETE
ITEM 01403.5196 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - TOP COURSE
ITEM 01403.5396 M - VIRGIN ASPHALT CONCRETE ADMIXTURE - BINDER COURSE
ITEM 01407.0196 M - TACK COAT
ITEM 01490.0196 M - COLD MILLING ASPHALT CONCRETE

Specification has been
Disapproved

Measurements.

BASIS OF PAYMENT:

Option A. Hot In-Place Recycling Asphalt Concrete. The unit price bid per square meter for this item shall include the cost of furnishing all labor, materials, tools, equipment and incidentals necessary to complete the work including cleaning the existing pavement, all heating and scarifying, mixing, repaving, and compaction of the recycled material.

Virgin Asphalt Concrete Admixture. The unit price bid per metric ton for this item shall include the cost of furnishing the mix design and all materials including asphalt cement and all equipment and labor necessary to complete the work.

Option B. Asphalt Concrete. The unit price for this item shall include the cost of furnishing all materials, equipment and labor necessary to complete the work.

Tack Coat. The unit price for this item shall include the cost of furnishing all materials, equipment and labor necessary to complete the work.

Cold Milling. Payment for this item shall be in accordance with Subsection 490-5, Basis of Payment.

Option A.

<u>ITEM NO.</u>	<u>ITEM DESCRIPTION</u>	<u>PAY UNIT</u>
01403.5096M	Hot In-Place Recycling Asphalt Concrete	m ²
01403.5196M	Virgin Asphalt Concrete Admixture-Top Course	Metric Ton
01403.5396M	Virgin Asphalt Concrete Admixture-Binder Course	Metric Ton

Option B.

01403.0196M	Asphalt Concrete-Top Course (In-Lay)	Metric Ton
01403.0296M	Asphalt Concrete-Binder Course (In-Lay)	Metric Ton
01407.0196M	Tack Coat	Liter
01490.0196M	Cold Milling Asphalt Concrete	m ²