

**KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 1990 EDITION**

SECTION 608

COLD RECYCLED BITUMINOUS CONSTRUCTION (FLY ASH MODIFIED)

Page 339, subsection 608.01. Delete this subsection and replace with the following:

608.01 DESCRIPTION.

This work shall consist of milling asphalt pavement, mixing the reclaimed asphalt pavement (RAP) material with fly ash, water, set retarder and liquid binder (if required), then spreading and compacting the mixture in accordance with these specifications, as shown in the Contract or directed by the Engineer.

BID ITEMS

Cold Recycled Bituminous Material
Emulsified Asphalt (*)
Asphalt Rejuvenating Agent
Fly Ash
Blotter Sand
Water
* Designated Type and Grade

Page 339, subsection 608.02. Change the sieve size in the first paragraph of this subsection from 37.5 mm to 31.5 mm.

Page 339, subsection 608.02. Add the following materials to the third paragraph of this subsection:

Fly Ash
Water

Subsection 2005
Subsection 2402

Page 340, subsection 608.03 (b)(3). Delete the first paragraph of this subsection and replace with the following:

(3) The mixing unit shall have a continuous weighing system for the processed RAP material. This unit shall be coupled with meters to maintain the proper proportion of RAP material, liquid binder and/or water. All water (including water added by the milling machine) introduced into the mix shall be metered. The liquid binder and water pumps shall shut off automatically if delivery of RAP material is stopped.

Page 340, subsection 608.04(a). Delete this subsection and replace with the following:

(a) Milling and Mixing Operation.

The pavement shall be milled to the required depth and width in accordance with the requirements shown in the contract.

The contractor shall provide the Engineer with sufficient quantities of processed RAP materials and fly ash for the purposes of determining the optimum fly ash and moisture content for each mix design required. The materials shall be submitted to the Engineer at least two weeks prior to the intended placement of the fly ash and RAP mixture.

The RAP material shall be processed to the required gradation and thoroughly mixed with the required quantities of fly ash, water, set retarder (if used) and liquid binder (if required) in a pugmill or other device acceptable to the Engineer. The equipment shall be capable of mechanically mixing the RAP, fly ash, water and liquid binder uniformly and in the proper proportions. Water shall be introduced to the mixture through an accurate and reliable meter(s) placed as near the point of delivery as possible. The mixed material shall be deposited into a windrow, paver, or truck without appreciable segregation. Before the mixed material is placed on the milled surface, the milled surface shall be dampened with water. If deposited in a windrow, the Contractor shall have equipment available to equalize the windrow as directed.

The Contractor will use a set retarder. The type and amount of set retarder shall be approved by the Engineer. Set retarder will be added at the rate of one percent by mass of the fly ash, or as approved by the Engineer. Approval will be based on the Contractor's ability to obtain a suitable mix (a mix that has not "set-up" within 30 minutes of the addition of water to the mix).

Page 341, subsection 608.04(b). Delete this subsection and replace with the following:

(b) Paving Operations.

(1) The RAP-fly ash mixture shall be delivered to the paver immediately after mixing the fly ash with the RAP. The recycled material shall be spread and finished, reasonably true to crown and grade, in one or more lifts with a bituminous paver meeting the requirements of Division 150 or other equipment approved by the Engineer.

If the Contractor has to mill the finished surface to obtain a suitable crown and grade, the Engineer may require the weighing of the milled material. The milled material will be replaced on a ton for ton basis with plant mixed bituminous material, at no cost to KDOT. Material milled from bumps (areas less than five meters long and over 25 mm high) need not be weighed and replaced.

(2) The contractor shall schedule his operations so that the elapsed time between the initial mixing of the fly ash with the RAP and the completion of the final rolling pass does not exceed 30 minutes. If the 30 minutes is exceeded on an uncompacted lift, the uncompacted material will be retreated as directed by the Engineer. If the contractor is unable to obtain suitable laydown and compaction and/or comply with the 30 minute time limit, the contractor may submit proposals to the Engineer which may include the use of alternate methods, alternate equipment, set retarding additives and etc.

(3) At preplanned stops (i.e. milling machine teeth changes, etc.) the Contractor may increase the quantity of set retarding additive for the uncompacted mix remaining in the paver or the windrow. Increasing the rate of set retarding additive at preplanned stops will extend the allowable 30 minute mixing/completion time limit to 45 minutes.

Page 341, subsection 608.04(c). Delete this subsection and replace with the following:

(c) Compaction and Density Requirements.

(1) Compaction and density requirements for each project shall be a minimum of 97 percent of the target density obtained on a test strip compacted under the following conditions:

(a) The mix temperature of the test strip shall be 4 °C or higher.

(b) At least two test strips shall be completed to determine the target density and optimum sequence of rollers. These test strips will remain in place as part of the completed work.

(c) The depth of the lift shall be representative of the project.

(2) Target density shall be the highest density achieved on the test strip using the rolling procedure approved by the Engineer. The rolling procedure, used on the test strip, shall have a minimum of six (6) roller coverages completed within 30 minutes. The Engineer will use a nuclear meter to establish a density growth curve for each procedure. Rolling shall be discontinued whenever either of the two following conditions are met:

(a) Four consecutive coverages of the roller(s) fail to increase the density 16 kilograms per cubic meter.

(b) 30 minutes has elapsed from the time water was added to the fly ash.

(3) The Contractor shall have, as a minimum, the following self propelled rollers for use on the test strips: a double drum vibratory steel roller and a pneumatic tired roller. The vibratory

roller shall meet the requirements for hot bituminous pavement of subsection 151.03(j) of the Standard Specifications and also have a minimum operating weight of 8165 kilograms and a drum width of not less than 1.68 meters. The vibratory roller may be used in the static mode. The pneumatic tired roller shall weigh at least 22 metric tons and have a minimum tire pressure of 620 kilopascals. The air pressure in each of the pneumatic tires will be within 35 kilopascals of each other. The Contractor shall supply a suitable tire pressure gauge.

(4) When there is a significant change in mix proportions, weather conditions or other controlling factors the Engineer may require construction of another test strip(s) to check target density.

Page 341, subsection 608.04(d). Delete this subsection and replace with the following:

(d) Surface Treatment or Overlay.

(1) While the surface is still moist and within two hours after adding the fly ash and water, a fog or curing seal of emulsified asphalt (diluted CSS-1H, SS-1H or other approved fog or curing seal) shall be applied. If the curing seal is being picked up by vehicles, sand blotting of the fog or curing seal will be required.

(2) Any subsequent surface treatment or overlay designated in the contract shall be accomplished within seven calendar days after completion of all cold recycle in accordance with the applicable sections of the 1990 Standard Specifications unless approved otherwise by the Engineer. If traffic is being carried through construction, the cold recycle shall be covered (with hot mix or a seal coat) within 30 calendar days after placement of the cold recycle.

Page 342, subsection 608.05. Delete this subsection and replace with the following:

608.05 WEATHER LIMITATIONS.

Milling, adding the various ingredients and laydown will be completed when the ambient air temperature is above 4 °C and only on those days when the ambient air temperature is predicted to stay above 0 °C. Also, the weather will not be foggy or rainy. The above requirements may be waived, but only when so directed in writing by the Engineer.

Page 342, subsection 608.06. Delete the second paragraph of this subsection and replace with the following:

Water used in mixing the RAP and fly ash shall be measured by the cubic meter by means of an accurate water meter.

Delete the third paragraph of this subsection and replace with the following:

Emulsified asphalt (including that used as curing seal) and asphalt rejuvenating agent of the type shown in the Contract documents will be measured by the metric ton as provided in Division 100.

Add the following to this subsection:

Fly ash will be measured by the metric ton at the point of usage.

Set Retarder will not be measured separately, but shall be subsidiary to other items of the Contract.

Page 342, subsection 608.07. Add the following to this subsection:

Fly ash shall be paid for at the Contract unit price per metric ton.

Water shall be paid for the Contract unit price set per cubic meter.

12-10-97 C&M (DRW)