

AC - ASPHALT CONSTRUCTION

AC-1 SCOPE

These specifications include general requirements that are applicable to all types of asphalt pavements of the hot mix type irrespective of gradation of aggregate, kind and amount of asphalt material, or pavement use. Deviations from these general requirements will be indicated in the specific requirements for each class.

This work shall consist of one or more courses of asphalt concrete mixture constructed on the prepared foundation in accordance with these specifications and the specified requirements of the class under contract, and in reasonably close conformity with the lines, grades, thicknesses and typical cross-sections shown on the plans or established by the Engineer.

AC-2 MATERIALS

AC-2.1 Crushed Aggregate

The crushed material to be furnished in place as part of the mineral aggregate item shall meet the requirements for Class E Type 1 or Type 2 mix in accordance with SDDOT Standard Specifications (current edition) Sections 880 and other SDDOT section by reference except top lift shall conform to Type 2 and shall not exceed 2 inches in thickness.

A maximum of 20% (by weight) of Recycled Asphalt Pavement (RAP) will be allowed in the asphalt concrete composite mix. RAP stockpiles containing concrete chunks, grass, dirt, wood, metal, coal tar, or other foreign or environmentally restricted materials shall not be used. No other recycled material will be allowed. Representative of RAP samples shall be sent into the laboratory designated by the Engineer for material classification. The laboratory shall provide the following information for RAP: Asphalt Binder Content, gradation and Maximum Specific Gravity.

AC-2.2 Bituminous Material

The asphalt cement shall conform to AASHTO Performance Graded Binder Specifications (MP1). The asphalt bind shall be PG58-28. The ratio of added new asphalt binder to total asphalt binder, including binder from RAP, shall be 70 percent or greater. An anti-stripping agent shall be added to the asphaltic material in an amount to assure adhesion to the aggregate as a surface coating.

AC-3 ASPHALT CONCRETE MIX

AC-3.1 Design

The Contractor at his own expense shall engage an approved testing laboratory to design a job mix that meets the various SDDOT requirements for mix type specified.

The testing laboratory shall also accomplish testing to determine if an anti-stripping agent is needed. The tests shall be made in accordance with standard test methods of the SDDOT to determine Moisture Sensitivity. The asphalt material with anti-stripping agent (if needed) shall be deemed to have the necessary adhesive qualities if the minimum tensile strength ratio for the mixture is 70 percent. Moisture Sensitivity will only be evaluated during the mix design process.

Certified laboratory tests and design reports shall be furnished to the Engineer before the work is started. In lieu of engaging a testing laboratory as described above the Contractor if approved by the Engineer may submit a “job mix” from a similar type project provided the above criteria including gradations are addressed. The final decision rests with the Engineer.

AC-3.2 Requirements

The job-mix established by the testing laboratory shall fix a single percentage of asphalt cement to be added to the aggregate, a single temperature at which the mixture is to be emptied from the plant, and a single temperature at which the mixture is to be delivered on the road.

The following table sets forth the acceptable tolerances for the job-mix formula established.

Asphalt Content	± 0.3%
Temperature of Mixture at Plant	± 20°F.
Temperature of Mixture on Delivery to the Road	+ 30°F. & -20°F.
Asphalt Application Temperature	± 15°F.

Warm mix Asphalt shall be considered an equivalent equal and may be furnished in place of Hot Mix Asphalt.

Warm Mix

Warm mix asphalt may be produced by one or a combination of several asphalt technologies involving asphalt plant foaming processes and equipment, mineral additives, or chemicals. The target mix production temperatures shall be within the range of 185°F to 275°F. Warm mix asphalt technology and processes should be included with the job mix formula.

Plant modifications may include additional plant instrumentation, the installation of asphalt binder foaming systems, and/or warm mix asphalt additive delivery systems, tuning the plant burner, and adjusting the flights in order to operate at lower production temperatures and/or reduced tonnage.

Job mix formula should include the proposed warm mix asphalt technology and/or additive information, technology manufacturer’s estimated recommendation for contractor shall provide documentation of compliance with the manufacturer’s recommendations for

incorporating additives and technologies into the mix. The storage and delivery of additives shall comply with the manufacturer's requirements.

Hot Mix

Hot mix asphalt production shall conform to these specifications.

AC-4 CONSTRUCTION METHODS

AC-4.1 Weather and Seasonal Limitations

The mat course shall be constructed only between May 1 and October 15 and operations shall be carried on only when the base surface is dry when the atmospheric temperature is above 50 degrees F. and rising, when the weather is not foggy or rainy. The temperature and seasonal requirements may be waived, with the approval of the Engineer.

AC-4.2 Equipment

In general the central mixing plant for mixing the mineral aggregate and asphalt for mat shall meet the minimum requirements for plants as noted in the SDDOT 2004 Edition of "Standard Specifications for Roads and Bridges".

Self-propelled pavers shall be equipped with an activated screed or activated strike-off assembly. The paver shall provide an accurate, smooth, uniform textured spread, and a preliminary compaction of the mixture.

Rollers for compacting the asphalt concrete shall be self-propelled and equipped with a satisfactory water sprinkling system to prevent pickup on the tires or rolls. The number and weight of rollers furnished shall be sufficient to compact the mix to a minimum of ninety-two percent (92%) relative density of the Theoretical Maximum Specific Gravity prepared in accordance with the methods contained in the South Dakota Department of Transportation Materials Manual (SDDOT MM) test number SD312.

AC-4.3 Spreading, Laying, Compacting, and Finishing

The mixture shall be spread and laid by means of one or more self-propelled mechanical spreaders satisfactory to the Engineer which will accurately spread lifts to the thickness as indicated on the plans. An adequate allowance for compaction as determined by the Engineer shall be made in the depth of spread. Tack is required between lifts and is incidental to various asphalt concrete bid items.

The "temperature of mixture on delivery to the road" shall be interpreted as the temperature of the mix just prior to its being placed in the paver hopper. Laydown operation shall commence at the farthest point from the haul road access and progress continuously toward the haul road access unless otherwise ordered by the Engineer. Loaded dump trucks will not be

permitted to travel over mix already placed until it has been thoroughly compacted and the surface has cooled sufficiently to resist marking or distortion.

Breakdown rolling of the mat shall proceed with steel faced rollers as soon as the rollers can safely get on the mat. Additional compaction will be obtained with pneumatic rollers until no further deflection shows under the roller. Finish rolling with steel faced rollers shall continue until the surface is of uniform texture and true to cross-section.

The surface shall be tested by means of a 10-foot straightedge laid parallel to the centerline of the project, and irregularities in excess of one-quarter (1/4) inch shall be corrected during the final compaction, by loosening the surface mixture or by adding new mixture. The Contractor shall provide competent men who are capable of performing the work incidental to the correction of irregularities. One such workman shall, under direction of the Engineer, give special attention to the straightedging of the surface.

AC-4.4 Sampling and Testing

During the progress of the work the Contractor shall provide written certification from material suppliers that the material furnished and placed meets or exceeds these specifications on a form provided by the City.

When included in bid items, the Contractor shall employ a testing laboratory approved by the Engineer to be paid for on a bid item basis to 1) determined field density of the asphalt mix by obtaining the Theoretical Maximum Specific Gravity according to the SDDOT MM test number SD312 and; 2) to collect, test, and document information for each of two cores according to the SDDOT MM test number SD315. These tests shall be considered a single set of tests for bidding purposes. Unless otherwise specified, these tests shall be provided at an estimated rate of one (1) per lift per 1000 tons of asphalt concrete mix. The above referenced tests shall be defined as a single set of density tests for preparing unit prices for bid items.

The Contractor shall provide the Engineer additional information that may be provided by the material supplier including the daily sieve analysis and asphalt cement content.

When test results indicate non-compliance with the specifications the Engineer reserves the right to request additional testing at the Contractor's expense to determine material compliance.

All material testing costs to include Contractor's convenience testing be paid in full by the Contractor.

Copies of all tests shall be promptly provided to the Engineer.

Lack of strict adherence to this section may result in withholding of payment, including but not limited to, the cost of testing but may also cause for further reduction in payment due to Contractor as determined by the Engineer.

AC-5 MEASUREMENT AND PAYMENT

The amount of composite asphalt concrete mix placed in accordance with the specifications will be measured and paid for at the contract unit price per ton. Payment shall be full compensation for all labor, equipment, and materials necessary to satisfactorily complete the item.