

## Item 8021

# Asphalt Stabilized Base (Materials Only)



### 1. DESCRIPTION

Provide a compacted mixture of aggregate and asphalt binder mixed hot in a mixing plant.

### 2. MATERIALS

Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications. Notify the Engineer of the proposed material sources and of changes to material sources. When a source change occurs, provide the Engineer a new laboratory mixture design.

- 2.1. **Aggregate.** Furnish aggregates that conform to the requirements shown in Table 1. Each source must meet the requirements of Table 1. Stockpile aggregates for each source and type separately. Do not add material to an approved stockpile

Table 1  
Aggregate Quality Requirements

Property	Test Method	Specification Requirement
Wet ball mill, % Max	<a href="#">Tex-116-E</a>	50
Max increase, % passing #40		20
Los Angeles abrasion, <sup>1</sup> % Max	<a href="#">Tex-410-A</a>	50
Liquid limit, Max	<a href="#">Tex-104-E</a>	40
Plasticity index, Max	<a href="#">Tex-106-E</a>	10
Sand equivalent, % Min	<a href="#">Tex-203-F</a>	40
Decantation, <sup>2</sup> % Max	<a href="#">Tex-406-A</a>	5.0
Crushed faces, % Min	<a href="#">Tex-460-A</a>	60

1. Use only when shown on the plans, instead of wet ball mill test.
2. Required only for reclaimed asphalt pavement (RAP) stockpiles and recycled aggregates when more than 30% RAP is allowed.

- 2.2. **Recycled Materials.** Use of RAP and RAS is permitted unless otherwise shown on the plans. Do not exceed the maximum allowable percentages of RAP and RAS shown in Table 2. Determine asphalt content and gradation of the RAP and RAS stockpiles for mixture design purposes in accordance with [Tex-236-F](#). Asphalt binder from RAP and RAS is designated as recycled asphalt binder. When RAP or RAS is used, calculate and ensure that the ratio of the recycled asphalt binder to total binder does not exceed the percentages shown in Table 2 during mixture design and production. During production, use a separate cold feed bin for each stockpile of RAP and RAS.

- 2.2.1. **RAP.** RAP is salvaged, milled, pulverized, broken, or crushed asphalt pavement. Crush or break RAP so that 100% of the particles pass the 2 in. sieve.

Use of Contractor-owned RAP including HMA plant waste is permitted unless otherwise shown on the plans. Department-owned RAP stockpiles are available for the Contractor's use when the stockpile locations are shown on the plans. If Department-owned RAP is available for the Contractor's use, the Contractor may use Contractor-owned fractionated RAP and replace it with an equal quantity of Department-owned RAP. Perform any necessary tests to ensure Contractor- or Department-owned RAP is appropriate for use. The

Department will not perform any tests or assume any liability for the quality of the Department-owned RAP. The Contractor will retain ownership of RAP generated on the project when shown on the plans.

Fractionated RAP is defined as having 2 or more RAP stockpiles, divided into coarse and fine fractions. The coarse RAP stockpile will contain only material retained by processing over a 3/8 in. screen or 1/2 in. screen unless otherwise approved. The fine RAP stockpile will contain only material passing the 3/8 in. screen or 1/2 in. screen unless otherwise approved. The Engineer may allow the Contractor to use an alternate to the 3/8 in. screen or 1/2 in. screen to fractionate the RAP. The maximum percentages of fractionated RAP may be comprised of coarse or fine fractionated RAP or the combination of both coarse and fine fractionated RAP.

Do not use Department- or Contractor-owned RAP contaminated with dirt or other objectionable materials. Do not use Department- or Contractor-owned RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with [Tex-406-A](#), Part I. Determine the plasticity index in accordance with [Tex-106-E](#) if the decantation value exceeds 5%. The decantation and plasticity index requirements do not apply to RAP samples with asphalt removed by extraction or ignition.

2.2.2. **RAS.** Use of post-manufactured RAS or post-consumer RAS (tear-offs) is permitted unless otherwise shown on the plans. RAS is defined as processed asphalt shingle material from manufacturing of asphalt roofing shingles or from re-roofing residential structures. Post-manufactured RAS is processed manufacturer's shingle scrap by-product. Post-consumer RAS is processed shingle scrap removed from residential structures. Comply with all regulatory requirements stipulated for RAS by the TCEQ. RAS may be used separately or in conjunction with RAP.

Process the RAS by ambient grinding or granulating such that 100% of the particles pass the 3/8 in. sieve when tested in accordance with [Tex-200-F](#), Part I. Perform a sieve analysis on processed RAS material before extraction (or ignition) of the asphalt.

Add sand meeting the requirements of Table 3 and having a maximum linear shrinkage of 3.0% when tested in accordance with [Tex-107-E](#), or fine RAP, to RAS stockpiles if needed to keep the processed material workable. For any stockpile that contains RAS, the entire stockpile will be considered a RAS stockpile and be limited to no more than 3.0% of the mixture in accordance with Table 2.

Certify compliance of the RAS with [DMS-11000](#), "Evaluating and Using Nonhazardous Recyclable Materials (NRM) Guidelines." If the RAS has not come into contact with any hazardous materials, treat it as an established NRM. Use RAS from shingle sources on the Department's MPL. Before use, remove substantially all materials that are not part of the shingle, such as wood, paper, metal, plastic, and felt paper. Determine the deleterious content of RAS material for mixture design purposes in accordance with [Tex-217-F](#), Part III. Do not use RAS if deleterious materials are more than 0.5% of the stockpiled RAS unless otherwise approved.

Table 2  
Maximum Allowable Amounts of Recycled Binder, RAP, and RAS

Mixture Description & Location	Maximum Ratio of Recycled Binder to Total Binder <sup>1</sup> (%)	Maximum Allowable Recycled Material (%)		
		Unfractionated RAP <sup>2</sup>	Fractionated RAP <sup>3</sup>	RAS <sup>4</sup>
Non-Surface	40.0	20.0	30.0	3.0

3. Combined recycled binder from fractionated RAP and RAS.
4. Do not use in combination with RAS or Fractionated RAP.
5. May replace up to 3.0% fractionated RAP with RAS.
6. May be used separately or as a replacement for no more than 3.0% of the allowable fractionated RAP.

**Table 3**  
**Gradation Requirements for Fine Aggregate**

Sieve Size	% Passing by Weight or Volume
3/8"	100
#8	70–100
#200	0–30

- 2.3. **Asphalt Material.** Furnish PG64-22 asphalt binder that meets requirements of Item 300, "Asphalts, Oils and Emulsions." When more than 30% RAP is allowed and used, ensure that the new binder and recovered binder from the RAP, when blended proportionally, meet the PG64-22 requirements.
- 2.4. **Additives.** When shown on the plans, use the type and rate of additive specified. Other additives that facilitate mixing or improve the quality of the mix may be allowed when approved.

If lime or a liquid antistripping agent is used, add in accordance with Item 301, "Asphalt Antistripping Agents." Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream unless the plant has a baghouse or dust collection system that reintroduces the fines back into the drum.

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### 3. EQUIPMENT

Provide machinery, tools, and equipment in accordance with Item 320, "Equipment for Asphalt Concrete Pavement."

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### 4. PRODUCTION

Produce and haul the specified mixture in accordance with the requirements of this Item.

- 4.1. **Mixture Design.** Use [Tex-126-E](#) and submit a mixture meeting the requirements in Table 4 for the grade shown on the plans. Determine the gradation of the combined aggregates in accordance with [Tex-200-F](#), Part I. Submit the mixture design using the Department-provided template to record and calculate all test data. Obtain approval before beginning production.

**Table 4**  
**Mix Requirements**

Master Gradation Bands <a href="#">Tex-200-F</a> , Part I, % Passing by Weight				
Sieve Size	Grade 1	Grade 2	Grade 3	Grade 4
1-3/4"		100	100	As shown on the plans
1-1/2"	100	90–100		
1"	90–100			
3/8"	45–70			
#4	30–55	25–55		
#40	15–30	15–40	15–40	
Asphalt Content, Min( <a href="#">Tex-236-F</a> )				
	4.0%	4.0%	4.0%	4.0%
Strength Requirements ( <a href="#">Tex-226-F</a> )				
Indirect tensile strength, (dry) psi <sup>1</sup>	85–200	85–200	85–200	85–200

7. <sup>1</sup> At optimum asphalt content.

- 4.2. **Production Operations.** Produce a new trial batch when the plant or plant location is changed. Take corrective action and receive approval to proceed after any production suspension for non-compliance to the specification.

- 4.2.1. **Storage and Heating of Materials.** Do not heat the asphalt binder above the temperature specified in Item 300, "Asphalts, Oils, and Emulsions," or outside the manufacturer's recommended values. When directed by the Engineer, provide the daily records of asphalt binder and hot-mix asphalt discharge temperatures in accordance with Item 320, "Equipment for Asphalt Concrete Pavement." Unless otherwise approved, do not store hot-mix for more than 12 hr. or for a period less than 12 hr. that affects the quality of the mixture.
- 4.2.2. **Mixing and Discharge of Materials.** Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 350°F. The Department will not pay for any mixture produced at more than 350°F. Control the mixing time and temperature so that substantially all moisture is removed from the mixture before discharging from the plant.
- 4.3. **Hauling Operations.** Before use, clean all truck beds to ensure that the mixture will not become contaminated. When a release agent is necessary, use a release agent on the Department's MPL to coat the truck bed.
- 4.4. **Individual Loads of Asphalt-Stabilized Base.** The Engineer retains the right to reject individual truckloads of asphalt-stabilized base when it is evident that the material quality is unacceptable. When a load is rejected for reasons other than temperature, the Contractor may request that the rejected load be tested. Make this request within 4 hours of rejection. If Department test results are within the operational tolerances listed in Section 4.4.1, "Operational Tolerances," payment will be made for the load. If the Department test results are not within operational tolerances, no payment will be made for the load.
- 4.4.1. **Operational Tolerances.** The gradation of the aggregate must be within the master grading limits for the specified grade except that a tolerance of 2% is allowed on the sieve size for each mixture grade that shows 100% passing in Table 4. Ensure that the asphalt content does not vary by more than 0.5% from the design target.

## 5. MEASUREMENT

- 5.1. Asphalt Stabilized Base will be measured as follows:
- **Asphalt Stabilized Base (Vehicle Pickup).** The ton or any cubic yard in vehicle method.
  - **Asphalt Stabilized Base (Site Delivery).** The ton or any cubic yard method.
- 5.2. **Cubic Yard in Vehicle.** By the cubic yard in vehicles of uniform capacity at the point of delivery.
- 5.3. **Cubic Yard in Drop Off.** By the cubic yard in the final drop off position by the method of average end areas. The Department will stockpile materials for measurement.
- 5.4. **Ton.** By the ton of dry weight in vehicles as delivered or picked up. The dry weight is determined by deducting the weight by deducting the moisture in the material at the time of the weighing from the gross weight of the material. The Engineer will determine the moisture content in the material in accordance with Tex-103-E from samples taken at the time of weighing.
- When material is measured in trucks, the weight of the material will be determined on certified scales, or the Contractor must provide a set of standard platform truck scales at a location approved by the Engineer. Scales must conform to the requirements of Item 520, "Weighing and Measuring Equipment."

When material is measured by the ton, provide a conversion rate to cubic yards on each haul ticket.

## 6. PAYMENT

The materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the types shown below.

- 6.1. **Asphalt Stabilized Base (Vehicle Pickup).** Payment will be made for the grade and binder type specified. For cubic yard measurement, "In Vehicle" will be specified. This price is full compensation for furnishing materials, assistance provided in sampling, loading provided vehicles, furnishing scales and labor for weighing and measuring, and equipment, labor, tools, and incidentals.
- 6.2. **Asphalt Stabilized Base (Site Delivery).** Payment will be made for grade and binder type specified. For cubic yard measurement, "In Vehicle" or "In Stockpile" will be specified. This price is full compensation for furnishing materials, stockpiling, loading, hauling, delivery of materials to the stockpile, furnishing scales and labor for weighing and measuring, and equipment, labor, tools, and incidentals.