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Frequently Asked Questions Hot Mix Asphalt (HMA) Mix Design

Some of the responses below provide suggestions for contractors. The suggestions for contractors are at the option of the contractor and presented here for the contractors' use to assist them in meeting contract requirements.

➨ Do I have to check the aggregate quality?

The specification contains requirements for aggregate quality. The rated quality of aggregates from sources in the Bituminous Rated Source Quality Catalog (BRSQC) must be checked to verify that it meets the specification requirements. The quality of aggregates from sources outside the BRSQC must be tested and checked.

➨ Do I have to check the PG binder?

The performance grade (PG) binders should come from a source approved by the Construction Division. The 2004 Standard Specifications for hot mix require project testing for asphalt binders. Samples are collected for every sublot; at least one sample should be tested during the project. Test early on the project and save samples for future reference.

➨ How do I blend the aggregate stockpiles to meet the gradation requirements?

The specifications state, "When blending Class A and B aggregates to meet Class A requirement, ensure that at least 50% by weight of the materials on the No. 4 sieve comes from the Class A aggregate source." The blending percentage should be based on trial and error to meet the gradation requirements. The mix designer assumes initial percentages for blending; check the gradation for the blend using the assumed percentages. The mix designer adjusts the percentages, as necessary, to ensure that all gradations for all sieves are within the specification limits.

The TxDOT-provided Excel worksheet, TxMixDe4, referenced in test method, Tex-204-F, can be used to determine blending percentages.

➨ Can I modify the target lab-molded density? Why?

96.0% is the default in the specification. The default target lab-molded density can be modified to 96.5% or 97.0% and must be shown on plans. If you are using a mix with PG 76 xx, modifying the target laboratory density to 96.5 or 97.0 will allow more asphalt in the mix to help the workability, durability and fatigue resistance of the mix.

For mixes with PG 64-xx and 70-xx, more caution should be taken. The target lab-molded density should not be set above 97.0 unless the Hamburg data shows that the mix remains rut resistant.

➨ What can I suggest to the contractor if their mix does not meet the VMA requirements?

If the contractor's mix does not meet the voids in mineral aggregate (VMA) requirements, suggest adjusting the aggregate gradation, especially the percent passing sieve No. 200. High fines will lead to low VMA; increasing the stockpile percentage that provides the most intermediate-sized aggregate will help raise the VMA.

➨ What can I suggest to the contractor if the Hamburg fails?

Several options can be offered to the contractor if the mix fails to pass the Hamburg wheel tracking test:

- Consider the use of lime or liquid as an antistripping agent.
- Use a different PG binder. Sometimes PG binders of the same grade, but different source can make a difference.
- Use a different source of aggregate with higher quality.

or

- Adjust the gradation to provide more intermediate and fine material, especially the size of material passing the No. 200 sieve. Changing the gradation may not result in a significant improvement; therefore, this method is not highly recommended.

Changes are at the contractor's option. However, TxDOT's authority is rejection or approval of the mix as it relates to the specifications.

➨ Should lime or liquid be used as an anti-stripping agent?

The districts, based on their experience, use either lime or liquid. The addition of lime or liquid in some cases can help the mix meet the Hamburg requirements.

➨ What can I suggest to the contractor if the percent passing No. 200 sieve does not meet the specification?

The following options can be offered to the contractor to address this issue:

- If screenings are used, use a stockpile comprised of unwashed screenings. Generally, unwashed screenings allow more material to pass the No. 200 sieve.
- To increase percent passing No. 200 material, use hydrated lime. Hydrated lime consists of all material passing the No. 200 sieve; however, this may be costly.

or

- Include the use of field sand or use a higher stockpile percentage of field sand. (Note: Specifications limit the maximum amount of field sand or any uncrushed fine aggregate allowed [e.g., for Item 340, the maximum is 15%]).

➨ Can RAP be used in hot mix asphalt?

Given today's high asphalt prices, contractors have presented information that shows significant savings when recycled asphalt pavement (RAP) is allowed. RAP is only allowed by a plan note. Use no more than 30% RAP in Type A or Type B mix. For all other mixtures, use no more than 20% RAP. RAP is not allowed in permeable friction course (PFC) mixtures. When using RAP, manage the stockpiles carefully to ensure the uniformity of the RAP.

➨ What can be suggested to contractors if their mix does not meet the stone-on-stone contact?

The stone-on-stone contact is only required when shown on the plans. If the mix does not meet the stone-on-stone contact requirements, adjustments to the aggregate gradations through bin adjustments or through stockpile changes can be used to address the requirement. Adjustments may resolve the problem; however, a higher quality, durable aggregate may be needed.

➨ Where can I find the hot mix design program?

The mix design program is available under the directory X:\SMGR\SM3x\msexceltemplates.

➨ How many gyrations should I use for mix design for CMHB and Superpave?

The number of gyrations for designing these mixtures should be shown on the plans.

For Superpave mixes, the number of gyrations is based on the traffic levels. Lowering the number of gyrations will allow more asphalt in the mix. Contact the Flexible Pavement Branch for guidance on the required number of gyrations.

➨ Should the Cantabro test procedure be used to verify PFC mix design?

The Cantabro test procedure for PFC mixes should be conducted for informational purposes only.

➨ Is the contractor required to create three trial blends for Superpave mix design?

The three trial blends for Superpave mix design are optional. Creating three trial blends is recommended for personnel with limited experience with Superpave mix design.

➨ Do I have to do the Static Creep or Hveem Stability?

The Static Creep and Hveem Stability tests are not required in the new 2004 Specifications. The Static Creep or Hveem Stability tests can be used to evaluate mixes if the Hamburg Wheel Tracking Test is waived. These requirements must be shown on the plans. The Static Creep Test is also recommended to evaluate mixes modified with asphalt-rubber.

Contact Information

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