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Local Agency Programs
Hot Mix Asphalt Selection Guidelines

Updated: 01/27/26

The following guidelines have been developed at the request of Local Agency Engineers for use on Local Agency projects. These guidelines have been reviewed and approved by the County Road Association of Michigan Engineering Hot Mix Asphalt (HMA) Sub-Committee. Previous experience and performance shall permit variations from these guidelines as per Section A (Note 5).

Proposed HMA pavement mix design information shall be included within the project package. An HMA Application Table listing proposed HMA design elements is required on the first proposed typical cross section. An HMA Application Special Provision can be provided but is not required if all the HMA information is included on the HMA Application Table or within the project documents.

A. HMA Mixture Type and Binder Selection

Selection is based on present day two-way commercial Average Daily Traffic (ADT). The commercial ADT ranges for each of the mixture types have considered an assumed future traffic growth rate.

Marshall Mixture Type

Com. ADT	Com. ADT 0-300	Com. ADT 301-700
Top	13A/36A	4C
Leveling	13A	3C
Base	13A/3C	2C/3C

Superpave Mixture Type

Com. ADT	Com. ADT 0-300	Com. ADT 301-700	Com. ADT 701-1000	Com. ADT 1001-3400	Com. ADT 3401-9999
Top	5EL/4EL	5EML/4EML	5EML/4EML	5EMH/4EMH	5EMH
Leveling	4EL	4EML	4EML	4EMH	4EMH
Base	4EL/3EL	3EML	3EML	3EMH	3EMH

Binder Grades by Region

Com. ADT	Com. ADT 0-300	Com. ADT 301-700	Com. ADT 701-1000	Com. ADT 1001-3400	Com. ADT 3401-9999
Superior	PG 58-34	PG 58-34	PG 58-34	PG 58-34	NA
All Others	PG 58-28	PG 64-28	PG 64-28	PG 64-28	PG 70-28P

Note 1: To specify a reduced target air void content (3.0%–3.5%) for Top and Leveling courses, the designer must include a note in the HMA Application Table defining the new target. For Base course mixtures, field regress the air void content to 3.0% using liquid asphalt cement, unless otherwise indicated in the HMA Application Table.

Note 2: The mixture type in each traffic category listed in the above table is specifically designed to perform under their respective Commercial ADT. Selecting a mixture type that is specifically designed for a higher Com. ADT than the project being designed may adversely affect performance.

Note 3: One course overlays on composite pavements where the prevention of cold temperature related thermal cracking is not as much of a concern, the cold temperature number of the PG binder may be decreased by one grade to help reduce costs.

Example: For a one course overlay in the Superior Region on a composite project, the recommended PG binder would be a PG58-28 instead of a PG58-34.

Note 4: To address traffic areas that are more susceptible to rutting early in pavements life such as roundabouts, signalized intersections, and other areas of stop/start traffic: use the pay item entitled “HMA, ____, High Stress” (if the full project limits are identified as High Stress, the High Stress designation is not required). The difference between the High Stress HMA Mixture and the typical HMA pay item is the Performance Grade (PG) binder. For High Stress Mixtures, increase the high

temperature binder by one grade and add the polymer. The increase in the high temperature number results in an asphalt binder with improved high temperature stiffness or rutting resistance for both the leveling and top course.

Example: For high-stress applications involving a Type 5EML mixture placed in an intersection, a PG70-28P binder grade is recommended instead of a PG64-28. The following guidelines detail the proper application of High Stress Hot Mix Asphalt:

a. Recommended use of this pay item is 1000 feet on either side of the center of signalized intersections and other areas where stop/start traffic occurs on the mainline, including roundabouts.

b. All HMA road approaches that are adjacent to the High Stress HMA Mixture areas.

Note 5: The guidelines above provide for the selection of HMA and application rates utilizing the Superpave mix design system or Marshall Mix design system. The substitution of another HMA mixture type other than the recommended mixture is acceptable if it has demonstrated performance under similar traffic conditions. If a local agency desires to use an HMA mixture or grade of binder other than what is contained within this guide, they must submit the change in writing. This includes recycled asphalt product (RAP) restrictions. The letter or email must include the mix selection, the justification or reason for the change, successful performance on past projects and a statement that the Local Agency accepts responsibility for the outcome of the performance of the mix selection that is used in lieu of the recommended mixture. Once accepted by the LAP Engineer, this documentation must be saved within the MDOT project files.

B. Application Rates

HMA application rates shown in the table below are the required minimum and maximum rates for each of the specific mixtures. Pavement designs requiring HMA greater than the recommended maximum rate will require multiple lifts of the leveling and/or base mixes.

Marshall Mixture

Mixture Type	36A	13A	2C	3C	4C
Min. lbs/yd^2	110	165	350	220	165
Max. lbs/yd^2	165	275	500	330	275

Superpave Mixture Type

Mixture Type	2E_	3E_	4E_	5E_
Min. lbs/yd^2	435	330	165 (See Note 1)	165
Max. lbs/yd^2	550	410	275	220

Note 1: The minimum pound per square yard (lbs/yd^2) for 4E_ superpave mixtures is different than the 2020 MDOT Standard Specifications for Construction. If less than 220 lbs/yd^{2}is used, a statement on the plans and/or special provisions is required. Suggested Note Language: "The Application Rate minimum of 220 lbs/yd^2 for Mix Number 4 per Table 501-4 of the MDOT 2020 Standard Specifications for Construction does not apply to the 4__ course."

Note 2: Application rate of 110 lbs/yd^2 per 1-inch thickness.

Note 3: When shoulders of 8 ft. or greater are being paved as a separate operation on a project, the following note should be added to the plans near the HMA Application Table:
"For shoulders only, the mix design and/or JMF target value for Air Voids are to be adjusted to 2.5 percent."
If it is not known whether the shoulders will be placed as a separate paving operation, the note should be added.

C: Aggregate Wear Index

(All Projects)

Aggregate Wear Index (AWI) is required for all aggregates used in HMA top course mixtures. The following table identifies the required minimum AWI, based on the present average daily traffic (vehicular and commercial) per lane (ADT/Lane):

ADT/Lane	Minimum AWI
<100	None
100 - 2000	220
>2000	260

D: Alternative Designs

Alternative designs and practices require review and approval from both MDOT and FHWA. The involvement of both agencies may result in extended review timelines. Please note that MDOT LAP is not responsible for any delays associated with the review or approval of alternative designs, including potential loss of funding or the

non-acceptance of any proposed alternative.

Examples of situations requiring MDOT and FHWA review and approval include, but are not limited to:

- Unique special provisions requiring an update to the current MDOT Standard Specifications for Construction.
- Alternative materials, procedures, and processes
- Alternative HMA Quality Assurance (QA) testing and/or acceptance methods
- Pilot project workplans
- Related field changes during construction

E. Non-Motorized Path Mixes

When designing a Non-Motorized Path, recommended HMA Mixes that have historically worked well include:

Superpave mixes:

- HMA, 5E_
- Shared Use Path, HMA Snowmobile Wearing Cse – Special
- Shared Use Path, HMA

Marshall mixes:

- HMA, 13A
- HMA, 36A

Application rates should match those shown on the Application Rate chart included above.

No AWI is required on the top course, however, if the designer wishes, he or she can use the Aggregate Wear Index (AWI) of 220 minimum.

Use PG 58-28 for all mixes, except for HMA, 5E_, which should be PG 64-28.

NOTE: If a local agency desires to use an alternative HMA mix or design on a non-motorized path project, the applicable steps noted above in Section A.5 and D must be followed.

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