To: New York State Department of Transportation

ENGINEERING BULLETIN

Title: REPLACEMENT PAGES FOR COMPREHENSIVE PAVEMENT DESIGN MANUAL (CPDM) CHAPTER 6 - PAGES 6-5 THROUGH 6-12 AND APPENDIX 6A

Distribution:
- Manufacturers (18)
- Local Govt. (31)
- Agencies (32)
- Surveyors (33)
- Consultants (34)
- Contractors (39)
- ____________( )

Approved:
/s/Robert L. Sack
Robert L. Sack, P.E.
Deputy Chief Engineer, Research
2/15/08
Date

ADMINISTRATIVE INFORMATION:
- Effective Date. This Engineering Bulletin (EB) is effective upon signature.
- Superseded Issuances. This EB does not supersede any Engineering Instructions or EBs.
- Disposition of Issued Materials. The information transmitted with this EB will be incorporated into a future printing of the Comprehensive Pavement Design Manual (CPDM).

PURPOSE: The purpose of this EB is to transmit replacement pages 6-5 through 6-12, Appendix 6A, and a new Table of Contents for the CPDM. These pages provide revised guidance statewide for selecting appropriate PG Binder for HMA pavements.

TECHNICAL INFORMATION:
- Changes – Refer to the back of the cover page of CPDM Chapter 6 for a general description of the changes.

IMPLEMENTATION:
- Projects that are beyond the amendment deadline for the May 1, 2008 letting – these projects will be revised by the Engineer-in-Charge using guidance to be provided by a future EB.
- For projects that are scheduled for lettings before May 1, 2008 and for which the amendment deadline has not passed - designers should submit an amendment with the appropriate Special Note from CPDM Appendix 6A.
- For projects submitted for the letting of May 1, 2008 or later - designers will submit (with the PS&E) the appropriate Special Note from CPDM Appendix 6A.

TRANSMITTED MATERIALS:
- CPDM Table of Contents, Pages 6-5 to 6-12, and Appendix 6A
- The attached materials have been incorporated into the on line version of the CPDM at https://www.nysdot.gov/portal/page/portal/divisions/engineering/design/dqab/cpdm.
BACKGROUND: In mid-August 2007, the Department began to observe a number of projects that exhibited HMA pavement flushing. On many of these projects, the flushing did not appear until several weeks after paving was completed. In addition, the pavements continued to be soft and pliable. This specific flushing was not attributable to the factors normally associated with conventional flushing. This type of flushing has been termed Atypical Flushing. Projects exhibiting Atypical Flushing were found in Regions 2, 3, and 7. At this time, the common factors associated with projects exhibiting Atypical Flushing appear to be HMA material containing limestone, either as an aggregate blend component or as a constituent in crushed gravel aggregate, and polyphosphoric acid (PPA) modified PG binder (liquid asphalt).

To minimize risks, the Department is prohibiting the use PPA, as part of the modification to PG binder properties for all projects Upstate and limiting the use of PPA modified binder Downstate. PG 64-22 was selected as the standard grade Upstate because it is readily available, addressing potential supply concerns of PG 64-28, and is expected to result in similar pavement performance. In addition, municipalities have been using this grade since PG binder was introduced in NY and using this grade helps minimize HMA producers’ issues with storing multiple grades of binder.

Downstate, PPA modified binders are prohibited for use in mixes containing limestone, limestone as an aggregate blend component, as a constituent in crushed gravel aggregate or in recycled asphalt pavement (RAP). However, PPA modified binders may be used in mixes containing aggregates (including RAP) without any limestone. This restricted allowance conforms to research on Atypical Flushing.

To implement these changes to the binder specification, Table 6-4, Performance Graded Binder Selection, of the CPDM was revised into two tables. This was necessary to provide clear guidance for the use of both Standard PG grades and polymer modified PG binder grades.

Table 6-4a, Performance Graded Binder Selection – Standard Grades, provides guidance for the standard grades while Table 6-4b, Performance Graded Binder – Polymer Modified, provides guidance for the use of polymer modified binder.

CONTACT: Direct questions regarding this EB to Zoeb Zavery of the Materials Bureau at (518) 485-5277 or via e-mail at zzavery@dot.state.ny.us. General questions may be addressed to Norm Schips of the Design Quality Assurance Bureau at (518) 485-8611 or via e-mail at nschips@dot.state.ny.us.
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<th>Latest Revision</th>
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CHANGES TO CHAPTER 6

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</tr>
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<td>Contents</td>
<td>Appendix 6A added.</td>
</tr>
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| 6-5 to 6-6 | Section 6.2.5, Table 6-4 Performance Graded Binder Selection. The definitions of downstate and upstate previously provided in Table 6-4 have been revised as follows:  
  - Upstate – All other counties not listed under Downstate  
  - Downstate - Orange, Putnam, Rockland, Westchester, Nassau, Suffolk Counties and City of New York  
  In addition, Table 6-4, was revised to create two new tables (Tables 6-4a and 6-4b). This was necessary to provide guidance on the use of standard and polymer modified PG binder grades. Table 6-4a, Performance Graded Binder Selection – Standard Grades, provides guidance for the standard grades while Table 6-4b, Performance Graded Binder – Polymer Modified, provides guidance for the use of polymer modified binder. Project designers will select appropriate PG binder using these tables. |
| 6-7     | Section 6.2.6 Special Note Development. In addition to the above changes, there are additional PG binder requirements that apply to both Upstate and Downstate that must be included as part of the Performance Grade (PG) Binder and Mix Level Special Note. It is important that correct information is included in the Special Note. |
| 6-8 to 6-12 | Pages issued to accommodate shifting of text. No technical changes. |

Appendix 6A  
- Example Note for Upstate Standard PG Binder (i.e., PG 64-22)  
- Example Note for Upstate Polymer Modified PG Binders (i.e., PG 58-34, PG 64-28 and PG 64-22 with elastic recovery requirement)  
- Example Note for Downstate Standard PG Binder (i.e., PG 70-22)  
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6.2.4 **Interpreting HMA Item Numbers**

HMA item numbers vary based upon nominal maximum aggregate size, compaction requirements, coarse aggregate friction requirements, quality adjustment items, and specification revision number except for Permeable Base, True & Leveling, and Shim courses. Figure 6-1 provides a description of how to interpret HMA item numbers.

**Figure 6-1 Item Number Description**

![Diagram of Superpave Item Number Description]

**6.2.5 Performance Graded Binder Selection**

The specific Performance Graded Binder (PG Binder) to be used should be selected using the guidance in this section and Section 6.2.6. The PG Binder, which is used to bind the aggregate together, is selected based on the traffic conditions and environment to which the binder will be subjected to maximize its performance. The environmental effects can be taken into account by looking at geographic location. The Regional Materials Engineer may be consulted prior to a PG Binder selection for assistance in the selection process.
a. Standard PG Binder Grades

Table 6-4a indicates the Standard PG binder grades. These grades should be specified for typical projects whether Upstate or Downstate.

Table 6-4a Performance Graded Binder Selection - Standard

<table>
<thead>
<tr>
<th>Location</th>
<th>Location by Counties</th>
<th>Performance Grade (Spec Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate</td>
<td>All Other Counties Not Listed Under Downstate</td>
<td>64-22(^1) (702-6422)</td>
</tr>
<tr>
<td>Downstate</td>
<td>Orange, Putnam, Rockland, Westchester, Nassau, Suffolk, Counties and City of New York</td>
<td>70-22 (702-7022)</td>
</tr>
</tbody>
</table>

1. For high volume roadways in Dutchess County, PG 70-22 or PG 76-22 may be specified with the concurrence of the Regional materials Engineer.

b. Polymer Modified PG Binder Grades

These PG binders are polymer modified and must meet minimum elastic recovery requirements. A Special Note for these binders, specifying elastic recovery requirements, must be included in the contract. Polymer modified binder grades should only be specified when the project warrants its use. Table 6-4b provides guidance for using these binders. The cost of HMA with polymer modified binder may be $2.00 to $5.00 per ton higher than HMA using a standard grade.

Table 6-4b Performance Graded Binder Selection – Polymer Modified

<table>
<thead>
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<th>Conditions for Use</th>
<th>Location</th>
<th>Performance Grade (Spec Number) (^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple course overlays, reconstruction, or new construction where cold temperature data warrants its use with the concurrence of the Regional Materials Engineer.</td>
<td>Upstate</td>
<td>64-28 (702-6428)</td>
</tr>
<tr>
<td>Multiple course overlays, reconstruction, new construction or roadway segments containing (a) grades in excess of 4.0% or (b) intersections that have traffic control signals (3 light signal) with the concurrence of the Region Materials Engineer.</td>
<td>Upstate</td>
<td>64-22 (702-6422)</td>
</tr>
<tr>
<td>Where the traffic level is greater than 30 million ESALs based on a 20-year design life or the roadway segment contains (a) grades in excess of 4.0% or (b) intersections that have traffic control signals (3 light signal).</td>
<td>Downstate</td>
<td>76-22 (702-7622)</td>
</tr>
</tbody>
</table>

1. Other PG binder grades may be specified in a given location with approval from the Regional Materials Engineer and the Materials Bureau.
6.2.6 Special Note Development

The PG binder grade and the mixture’s design level of “80 kN ESALs” must be conveyed by the designer to the Contractor in the form of a Special Note in the proposal. These notes are specific to the project location, either Upstate or Downstate. The note should read as follows:

PG binder requirements:

“Use a PG XX-XX meeting the requirements of AASHTO M320, Standard Specification for Performance Graded Asphalt Binder for the production of hot mix asphalt mixtures for this project.”

XX-XX is the PG binder grade from the above tables.

In addition, include the following statement for Upstate projects:

“Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.”

For Downstate projects, include the following statement:

“Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited for mixtures containing limestone, limestone as an aggregate blend component, limestone as a constituent in crushed gravel aggregate, or recycled asphalt pavement (RAP) that includes any limestone. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.”

Mixture design requirements:

“The mixture designs must be developed in accordance with the criteria specified in the HMA items that are appropriate for an “Estimated Traffic” level of \[\text{YY Million ESALs}\].”

YY is \(<0.3\), \(<3\), \(<10\), \(<30\), or \(\geq30\) Million ESALs calculated as described in Section 4.5 of the CPDM. For Parkways, use \(<3\) Million ESALs.

Example notes are provided in Appendix 6A.

6.2.7 Gradation Considerations

6.2.7.1 Base Course (402.37YZQR)

The nominal maximum aggregate size for HMA base course is 37.5 mm. When a thinner base course (75 mm or less) is required, the calculated ESALs are less than 3 million, or maintaining traffic on the base course is a concern, 25.0 mm nominal maximum aggregate size mixture may be used as a base course.

6.2.7.2 Binder Course (402.25YZQR, 402.19YZQR)

The choices for nominal maximum aggregate size for HMA binder course are 19.0 mm and 25.0 mm. The 19.0 mm size is preferred when the 20-year ESAL count is less than 10 million but it can also be used when pavement thickness prohibits the use of 25.0 mm size with the concurrence of the Regional Materials Engineer. In addition, 19.0 mm size should be used instead of 25.0 mm.
size when the binder layer will be left open to traffic through the winter season. The 25.0 mm size should be used for pavements with 20 year ESAL counts over 10 million. Larger aggregate sizes require greater lift thicknesses to ensure thorough compaction (refer to Table 6-6).

6.2.7.3 Top Course (402.12YZQR, 402.09YZQR)

The choices for nominal maximum aggregate size for HMA top course are 12.5 mm and 9.5 mm. Typically, the 12.5 mm mixture is more economical. In Regions where gravel aggregates are present or on urban projects where a lot of handwork is necessary, the use of a top course mix with a maximum nominal aggregate size of 9.5 mm may be specified. Designers should be aware of this issue and make sure that the Regional Materials Engineer is consulted to determine the appropriate gradation to specify.

6.2.8 Compaction Monitoring

Proper in-place density of HMA pavements is an essential component of pavement performance. NYSDOT uses four different compaction specifications to ensure proper density is achieved. The type of compaction specification depends first on the functional classification of the road, then the traffic volume, and last, the amount of material needed (less than 2000 Mg or not), or the calculated ESALs (less than 0.3 million or not).

On roadways with full or partial control of access, regardless of the traffic volume, location (upstate or downstate), the HMA quantity, the calculated ESALs, or vibratory sensitivity, the compaction would be determined by a direct method, such as coring, to verify the density. On urban roadways with no control of access, it is reasonable to use indirect methods, such as nuclear density gauge readings to evaluate density.

Since the method of monitoring the density is part of the specification for the item, the designer needs to include this decision in selecting which item to specify. See Tables 6-1 and 6-2 to select the appropriate item number except for 80 Series Compaction Method.

6.2.8.1 50 Series Compaction Method (402.XX5ZQR)

This method requires a Contractor takes cores daily to monitor pavement density. The results of these cores are used for incentive/disincentive payment. This compaction method should be specified on all full or partially controlled access roadways and applies only to Binder and Top courses.

6.2.8.2 60 Series Compaction Method (402.XX6ZQR)

This method requires a Contractor to monitor pavement density using a nuclear density gauge. The Project Target Density (PTD) for monitoring pavement density is established using pavement cores and gauge readings from a test section. This compaction method should be specified on all roadways that are not fully or partially controlled access or when the HMA quantity for the Top course is greater than or equal to 2000 Mg for the Top course layer. This method should be used for the Base, Binder, and Top courses.
6.2.8.3 70 Series Compaction Method (402.XX7ZQR)

This method requires a Contractor to monitor pavement density using a nuclear density gauge. The PTD for monitoring pavement density is established by peaking the nuclear gauge on a test section. This compaction method should be used for the Base, Binder, Top, and True & Leveling courses. The criteria for specifying this method is when:

- the HMA quantity for the Top course is less than 2000 Mg regardless of other layer quantities or,
- a nominal thickness for True and Leveling course is specified in the contract documents or
- when the calculated ESALs are <0.3 million.

6.2.8.4 80 Series Compaction Method (402.XX8ZQR)

This method requires a Contractor to compact the pavement by applying the number of passes specified in Table 402-5 of Section 402 of the Standard Specifications. The items for this method are not shown in Tables 6.1 and 6.2. However, this method should be specified for miscellaneous placements, shoulders, bridge approaches (regardless of the project location), True & Leveling, Shim, etc., where the distance of HMA placement does not permit the construction of a test section. All item numbers for this compaction method will be 402.XX8ZQR.

6.2.9 Friction Aggregate Requirements

HMA pavement friction is controlled primarily by the coarse aggregate component of the surface course. Department specifications allow only those coarse aggregate types found to provide design friction under design traffic conditions.

6.2.9.1 Mainline Pavement Surface Layer

The friction aggregate requirements for HMA pavements are dependent on each project’s specific design parameters. Friction requirements are designated by the fourth digit of the pay item extension. Depending on a projects design parameters coarse aggregate in the surface course, HMA must meet F1, F2 or F3 requirements. Use Tables 6.1 and 6.2 to select the proper aggregate requirements for each project. For short placements using 80 series item numbers, i.e., bridge approaches, an appropriate fourth digit designating proper friction must be selected. The aggregate requirements for the entire project are dictated by that segment within the project with the most stringent requirements.

6.2.9.2 Flexible Shoulders, Miscellaneous Placements and Subsurface Layers

HMA for flexible shoulders, miscellaneous placements: driveways, culvert inverts, etc., and subsurface layers require coarse aggregate meeting F9 requirements. F9 requirements are specified by placing a 9 in the fourth digit of the pay item extension, see Figure 6.1.

6.2.10 Quality Adjustment Items

NYSDOT began making payment adjustments for the quality of HMA in 1990 for in-place density and in 1996 for plant production. These payment adjustments were based on the density of the finished pavement and/or the production quality of HMA material. For Portland Cement Concrete (PCC), NYSDOT began making payment adjustment on pavement smoothness beginning 2001. The payment adjustment will be made by Quality Adjustment Factors using a pay unit called a
Quality Unit.

All the quality units are paid at a predetermined Index Price. The HMA Index Prices have been created based on HMA weighted average bid prices. One index price is used for all HMA quality adjustment items in a contract and applies for the duration of the contract. Index prices will be established and updated by an Engineering Bulletin annually and preprinted in the contract documents.

In order to simplify the Contractor’s accounting procedures, separate quality payment items were created for each of the possible quality payment adjustments: plant production, pavement density, longitudinal joint density (future), and pavement smoothness (future). All quality adjustments will be paid under the appropriate quality adjustment item number in the contract documents and are listed in Table 6-5. To estimate the quality units for each quality payment item, the following formula should be used:

\[ \text{Quality Units} = (\text{Max. Quality Adjustment Factor} - 1.00) \times \text{Appropriate HMA Tons} \]

Currently, the maximum QAF for both plant production and pavement density is 1.05.

Table 6-5 Description of Quality Adjustment Items

<table>
<thead>
<tr>
<th>Quality Adjustment Items</th>
<th>Apply Quality Adjustments to the following Items:</th>
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<tbody>
<tr>
<td>402._ _ _ 1_ M =</td>
<td>Plant Production Quality Adjustment¹</td>
</tr>
<tr>
<td></td>
<td>All asphalt items paid by the metric ton except for ice retardant asphalt.</td>
</tr>
<tr>
<td>402._ _ _ 2_ M =</td>
<td>Pavement Density Quality Adjustment</td>
</tr>
<tr>
<td></td>
<td>Only apply to Superpave 50 series items.²</td>
</tr>
<tr>
<td>402._ _ _ 3_ M =</td>
<td>Longitudinal Joint Density Quality Adjustment</td>
</tr>
<tr>
<td></td>
<td>Not for general use at this time.²</td>
</tr>
<tr>
<td>402._ _ _ 4_ M =</td>
<td>Pavement Smoothness Quality Adjustment</td>
</tr>
<tr>
<td></td>
<td>Not for general use at this time.³</td>
</tr>
</tbody>
</table>

1. The Quality Units for plant production adjustments are computed from the total tonnage of HMA in the contract.

2. The Quality Units for pavement density and longitudinal joint density adjustments are computed from the top and binder course tonnage on the traveled lanes and ramps longer than 400 m. Shoulders, tapers, maintenance crossovers, etc., are not subject to QAFs. When calculating the tonnage eligible for quality adjustment, refer to the core item's Method of Measurement.

3. The Quality Units for pavement smoothness adjustments are computed from the top course tonnage on the traveled lanes and ramps longer than 400 m. Shoulders, tapers, maintenance crossovers, etc., are not subject to QAFs. When calculating the tonnage eligible for quality adjustment, refer to the core item's Method of Measurement.

6.2.11 Lift Thickness Limitations

In general, minimum lift thicknesses are established by the nominal maximum size of the aggregate that is to be compacted. Maximum lift thicknesses are set to ensure that the full thickness of the lift is adequately compacted. If the required course thickness of a given item exceeds the maximum permissible lift thickness, then multiple lifts are to be used to obtain the required course thickness. Table 6-6 lists the minimum and maximum lift thicknesses for the various nominal maximum aggregate sizes. Note that the lift thickness for multiple lifts is to be 2/12/08
indicated on the typical section drawings for the project.

**Table 6-6 Limits on Permissible Lift Thicknesses**

<table>
<thead>
<tr>
<th>Maximum Nominal Aggregate Size (mm)</th>
<th>Minimum Lift Thickness (mm)</th>
<th>Maximum Lift Thickness (mm)</th>
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<tbody>
<tr>
<td>37.5</td>
<td>75</td>
<td>125</td>
</tr>
<tr>
<td>25.0</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td>19.0</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>12.5</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>9.5</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

### 6.2.12 Truing and Leveling (402.01Y901, where Y =7 or 8)

Truing and Leveling (T&L) should be used at spot locations to remove irregularities in the old pavement, fill and patch holes, correct variations in banked pavement, establish pavement crowns, establish the proper cross-slope and grade and for the terminations of the overlay as noted in section 5.4.2 of this manual. When a T&L course is required, it should be indicated on the typical sections in the plans with a specific aggregate size mixture since there is no specific T&L material. When a mixture is not specified, the selection of the appropriate mixture will be left to the discretion of the Contractor depending on the thickness needed for the T&L course. This course will be of variable thickness and its material composition will be adjusted in accordance with the thickness required.

When choosing compaction method for T&L, the item with 70 Series method should be used when a nominal thickness to be placed is specified in the contract. However, a T&L item with 80 Series method should be used when T&L is specified to correct the grade and slope of the pavement section. These items are recommended to be used for all Functional Classifications and require aggregates meeting F9 requirements.

Note that T&L is not to be used as a substitute for a lift of an overlay by specifying full width applications of a given minimum thickness. When corrections are needed over the length of the project, an “initial asphalt paving” course of the minimum thickness and the appropriate type to correct the transverse slope is to be specified.

### 6.2.13 Vibratory Compaction Procedure

When the HMA is compacted using vibratory compaction equipment, there is a potential for damage to sensitive structures, such as weak, old masonry structures that are in close proximity to the work or underlying utilities, etc. To determine if an area may have structures or utilities that could be damaged by vibratory compaction, the State Highway Maintenance supervisors, utility companies, and local highway maintenance officials should be consulted. When a section within the project limits is vibratory sensitive and has the potential of damage, it should be compacted using non-vibratory (static) compaction equipment. In that case, the limits of this section should be indicated in the plans. When the entire project is vibratory sensitive, a Special Note should be included in the proposal indicating that vibratory compaction should not be used for the project.
6.2.14 **Handwork**

When a project requires the HMA mixture to be placed with a lot of handwork, consideration should be given to the use of 9.5 mm mixture with the concurrence of the Regional Materials Engineer. The 9.5 mm mixture is suited for this purpose because of a smaller stone size and generally, a well-graded aggregate mixture. In addition, this mixture can easily be placed and compacted with hand tampers or other small compaction equipments.

6.2.15 **Tack Coat**

In the past, tack coat was used only when HMA was placed on existing Portland Cement Concrete (PCC), on milled surfaces or on existing HMA pavement. Experience has shown it is also beneficial to use tack coat between lifts of new HMA. Tack coat enhances the bond between HMA lifts. This is particularly important for HMA mixtures which have lower binder contents than previously used. Contact surfaces between all HMA pavement lifts will therefore be tack coated in accordance with Section 407 - Tack Coat prior to placing HMA mixture. The only exception to this is the surface of permeable base course. The application rates in Table 6-7 should be used to estimate the quantity of tack coat required.

<table>
<thead>
<tr>
<th>Surface Type</th>
<th>Application Rate(L/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Hot Mix Asphalt</td>
<td>0.14 - 0.18</td>
</tr>
<tr>
<td>Milled Surfaces</td>
<td>0.21 - 0.25</td>
</tr>
<tr>
<td>Existing Hot Mix Asphalt</td>
<td>0.21 - 0.25</td>
</tr>
<tr>
<td>Portland Cement Concrete</td>
<td>0.17 - 0.30</td>
</tr>
<tr>
<td>Vertical Surfaces (curbs, concrete drainage structures and appurtenances)</td>
<td>0.27 - 0.32</td>
</tr>
</tbody>
</table>
EXAMPLE SPECIAL NOTE FOR UPSTATE STANDARD PG BINDER

SPECIAL NOTE

PG BINDER AND MIX DESIGN LEVEL

Requirements of this note apply to all Section 402 Hot Mix Asphalt (HMA) items in this contract.

PG BINDER

Use a PG 64-22 meeting the requirements of AASHTO M320, Standard Specification for Performance Graded Asphalt Binder for the production of HMA mixtures for this project.

Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.

MIX DESIGN

The mixture designs must be developed in accordance with the criteria specified in the HMA items that are appropriate for an “Estimated Traffic” level of YY Million ESALs.
EXAMPLE SPECIAL NOTE FOR UPSTATE POLYMER MODIFIED PG BINDERS

SPECIAL NOTE

PG BINDER AND MIX DESIGN LEVEL

Requirements of this note apply to all Section 402 Hot Mix Asphalt (HMA) items in this contract.

PG BINDER

Use a polymer modified Performance Graded (PG) Binder PG XX-XX for the production of HMA mixtures for this project. The PG Binder shall meet the requirements of AASHTO M320, Standard Specification for Performance Graded Asphalt Binder and Elastic Recovery requirements as shown in the table below:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elastic Recovery using ASTM D6084-04, Testing</td>
<td>60% minimum</td>
</tr>
</tbody>
</table>

Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.

MIX DESIGN

The mixture designs must be developed in accordance with the criteria specified in the HMA items that are appropriate for an “Estimated Traffic” level of YY “Million ESALs.”

Note: The PG binder for this project will be modified using polymer additives to meet the requirements stated above. Handling of the HMA shall be discussed at pre-construction and pre-paving meetings.
EXAMPLE SPECIAL NOTE FOR DOWNSTATE STANDARD PG BINDER

SPECIAL NOTE

PG BINDER AND MIX DESIGN LEVEL

Requirements of this note apply to all Section 402 Hot Mix Asphalt (HMA) items in this contract.

PG BINDER

Use a PG 70-22 meeting the requirements of AASHTO M320, Standard Specification for Performance Graded Asphalt Binder for the production of HMA mixtures for this project.

Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited for mixtures containing limestone, limestone as an aggregate blend component, limestone as a constituent in crushed gravel aggregate, or recycled asphalt pavement (RAP) that includes any limestone. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.

MIX DESIGN

The mixture designs must be developed in accordance with the criteria specified in the HMA items that are appropriate for an “Estimated Traffic” level of YY Million ESALs.
EXAMPLE SPECIAL NOTE FOR DOWNSTATE POLYMER MODIFIED PG BINDER

SPECIAL NOTE

PG BINDER AND MIX DESIGN LEVEL

Requirements of this note apply to all Section 402 Hot Mix Asphalt (HMA) items in this contract.

PG BINDER

Use a polymer modified Performance Graded (PG) Binder PG 76-22 for the production of HMA mixtures for this project. The PG Binder shall meet the requirements of AASHTO M320, Standard Specification for Performance Graded Asphalt Binder and Elastic Recovery requirements as shown in the table below:

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elastic Recovery using ASTM D6084-04, Testing Procedure A, at 25°C</td>
<td>60% minimum</td>
</tr>
</tbody>
</table>

Use of polyphosphoric acid (PPA) to modify the PG binder properties is prohibited for mixtures containing limestone, limestone as an aggregate blend component, limestone as a constituent in crushed gravel aggregate, or recycled asphalt pavement (RAP) that includes any limestone. This prohibition also applies to the use of PPA as a cross-linking agent for polymer modification.

MIX DESIGN

The mixture designs must be developed in accordance with the criteria specified in the HMA items that are appropriate for an “Estimated Traffic” level of YY “Million ESALs.”

Note: The PG binder for this project will be modified using polymer additives to meet the requirements stated above. Handling of the HMA shall be discussed at pre-construction and pre-paving meetings.