

20220816 - Specification Committee Meeting

Specifications Committee Meeting Agenda Special Meeting

Meeting Date

Tuesday, August 16, 2022 @ 1:00pm

Meeting Location: 1334 Smith Street, Charleston, WV in Lower Level Conference

Also meeting virtually via Google Meet video conference. E-mail distribution message includes instruction.

Approved Permanent Specification changes from last Committee meeting (8/3/22)

- **Subsection 102.5.3-Bidding Requirements.** Adds acknowledgement of monetary obligations owned to the state to the form.
- Three specification changes updating NCHRP-350 reference dates, funding source sign, and better organize 636.9.
 - **Section 636, Subsection 636.2-Materials, 636.6.2-Shadow Vehicle, 636.9-Traffic Control Devices, 636.12-Temporary Impact Attenuating Devices, & 636.23.6-Traffic Control Devices**
 - **Subsection 104.13-Funding Source Identification Signs**
 - **Section 715, Subsection 715.9.3-Channelizing Devices, 715.9.3.4-Barricades, 715.9.3.5-Surface Mounted Flexible Tubular Markers, 715.9.6-Portable Sign Stands**
- **Subsection 704.4-Dump Rock Gutter.** The revision clarifies the type of rock for dump rock gutter.
- **Subsection 709.1-Steel Bars for Concrete Reinforcement.** The revision updates plain and deformed bar reinforcement and adds subsections for galvanized and epoxy coated reinforcement.
- **Subsection 401.13-Basis of Payment.** Entire subsection can be removed.
- **Section 403-Crack Sealing in Asphalt Pavement.** Adding Crack Sealing of Asphalt Pavement to the spec book.
- **Section 602-Reinforcing Steel.** The updates the material requirements and adds galvanized steel requirements.
- **Section 625-Rock Socketed Drilled Shaft.** Division's contact information updated and clarify testing on Alternative Project Delivery.
- **Section 642, Subsection 642.1-General, 642.5.1-General, 642.7-Method of Measurement, & 642.9-Pay Items.** Removes sediment dam/pond verbiage and using WVDEP sediment basin in section and clarify method of measurement.
- **Subsection 642.7.1-Temporary Pollution Control, Unit Value Method, & 642.9-Pat Item.** Adding unit value method to the section.
- **Subsection 663.8-Pay Items.** Revising pay item description.
- **Subsection 708.3-Joint and Crack Sealant, Hot-Poured for Concrete and Asphalt Pavements.** Update subsection title to include 'crack' repair.

Approved Project Specific Special Provisions (SP) from last Committee meeting (8/3/22)

- **SP221-Rockfall Mitigation**

- SP 601-Surface Resistivity
- SP 601-FRP
- SP 628-Exploratory Drilling and Sampling

Items removed from Committee Agenda

- None

Old Business-Provisions discussed at last Committee meeting

SECTION	TITLE	DESCRIPTION
410	<p>Section 410-Asphalt Base and Wearing Courses, Percent within Limit (PWL)</p> <p>Champion: Industry and WVDOH</p>	<p>10th time to Committee. Proposed specification change to Section 410. This specification incorporates suggestions is from Industry (these changes are redline copy showing the proposed changes).</p> <p>The bonus structure has been removed from specifications; these changes are redline copy with yellow highlights.</p> <p>No update to the specification.</p> <p>Approval is expected in Special Meeting.</p>
508 720	<p>508.9-Smoothness</p> <p>Section 720-Smoothness Testing</p> <p>B. Whelan</p>	<p>4th time to Committee. Discussed in April, June, & August. Two specification changes removing bonus structure from Section 508 and Section 720.</p> <ol style="list-style-type: none"> 1. Section 508, Subsection 508.9-Smoothness 2. Section 720-Smoothness Testing <p>No update to the specification; they are redline copy showing the revisions.</p> <p>Approval is expected in Special Meeting.</p>
711	<p>711.5.3-Approval, 711.6.1.1-General, 711.22.1-General, 711.22.4-Top Coat, & 711.23-Sample Submission and Approval</p> <p>K. Trent</p>	<p>3rd time to Committee. Discussed in June & August. Proposed specification change to Section 711-Paints, Coating, Oil, and Inks. Update clarifies NTPEP testing & adds subsection on Sample Submission and Approval.</p> <p>Specification updated, per comments at the last meeting; it is redline copy showing the revisions.</p> <p>Approval is expected in Special Meeting.</p>

<p>DBE</p>	<p>SP for DBE</p> <p>S. Johnson</p>	<p>This is an update to previously approved SP. 2nd time to Committee. Discussed in August.</p> <p>Update to the DBE utilization Special Provision used on Federally Funded projects. The revision adds reference to the Civil Rights Compliance Division and updates DBE Participation Plan submission requirements.</p> <p>The provision is redline copy, showing the changes/updates to the existing special provision.</p>
<p>106</p>	<p>106.1-Source of Supply and Quality Requirements</p> <p>D. Simmons</p>	<p>2nd time to Committee. Discussed in August.</p> <p>Proposed specification change to Section 106-Measurement and Payment. Updating the Buy America requirements to correlate with new federal law (Infrastructure Investment and Jobs Act). The revision separates the subsection into state funded and federal funded projects.</p> <p>No update to the specification.</p>
<p>109</p>	<p>109.20-Weight Tickets & 109.20.1-Electronic Ticket Delivery</p> <p>S. Smith</p>	<p>2nd time to Committee. Discussed in August.</p> <p>Proposed specification change to Section 106-Measurement and Payment. The revision adds electronic ticket delivery subsection, mandating e-tickets (in addition to paper tickets) for asphalt, aggregate, and concrete.</p> <p>No update to the specification; it is redline copy showing the revisions.</p> <p>Approval is expected in Special Meeting.</p>
<p>401</p>	<p>Section 401-Asphalt Base, Wearing, and Patching and Leveling Courses</p> <p>S. Jack</p>	<p>2nd time to Committee. Discussed in August.</p> <p>Proposed specification change to Section 401-Asphalt Base, Wearing, and Patching and Leveling Courses. It is a complete section rewrite, updating typos & terminology; removal of thin lift corrections; acceptance testing responsibly to the Division; and bonus structure was removed.</p> <p>The specification change has been vetted through the Asphalt subcommittee and reviewed/discussed at District Materials Quarterly meeting.</p> <p>The specification has been updated, per comments at the last meeting; it is redline copy showing the revisions.</p> <p>Approval is expected in Special Meeting.</p>

623	623.2-Materials & 623.6.5-Combined Aggregate Gradation M. Perrow	1st time to Committee. Proposed specification change to Section 623-Shotcrete. Update adds tolerances and quality assurance sampling requirements to ensure a more uniform concrete mix. No update to the specification; it is redline copy showing the revisions.
661	661.2.3-Retroreflective Sheeting and Matched Components T. Whitmore	1st time to Committee. Proposed specification change to Section 661-Traffic Signs and Delineators. The update clarifies fluorescent yellow sheeting requirements on road signage. No update to the specification; it is redline copy showing the revisions. <i>Approval is expected in Special Meeting.</i>

New Business - New Provisions for Spec Committee

- None

Comments

Comments are requested on these Specifications Changes and Project Specific Special Provisions. Please share your comments by **August 12, 2022**, they help in the decision making process.

Please Send Comments to: DOHSpecifications@wv.gov

Deadline for new items & updates to these provision is **September 9, 2022**.

If you are the 'champion' of any specification changes and/or project specific special provisions currently in the Specification Committee, it is your responsibility to edit/update/modify them in a timely manner per comments and discussion in Spec Committee. *Failure to submit updates may result in removal of item and/or delays.*

Next Meeting

Wednesday, **October 5, 2022 at 9:00 a.m.**

Meeting will be held virtually via Google Meet video conference. E-mail distribution message includes instruction.

2017 Standard Specification Roads and Bridges & 2022 Supplemental Specifications

Electronic Copy (pdf): The 2017 Standard Specifications Roads & Bridges & 2022 Supplemental Specifications can be viewed, printed, or downloaded from the Specifications Website. A link to the Specifications pages is here:

<http://transportation.wv.gov/highways/contractadmin/specifications>

Print Version: We are out of hard copies of the 2017 Standard Specifications Roads and Bridges. Hard copies of the 2022 Supplemental Specifications are available thru Technical Support Division. An order form for the book is on Specifications Website. A link to the page is here: <http://transportation.wv.gov/highways/contractadmin/specifications>

2022 Specifications Committee

The Specification Committee typically meet every other month; on the first Wednesday. 2022 meetings will be held in February (2/2), April (4/6), June (6/1), August (8/3), October (10/5), and December (12/7).

Calendar subject to change, updates will be given, as needed.

Specifications Committee Website

A copy of the meeting agenda can be found on the Specifications Committee Website <http://transportation.wv.gov/highways/contractadmin/specifications>

Materials Procedures

Material Procedures (MPs) referenced in provisions are available upon request.

For questions regarding the Standard Specifications Road and Bridges, Supplemental Specifications, Project Specific Provisions, or the Specifications Committee please email DOHSpecifications@wv.gov

File Format Structure and Progression of items thru Specifications Committee

The purpose of the below protocol is to provide guidance on the file structure of Proposed Specifications & Project Specific Provisions as they progress thru Specifications Committee. This procedure would facilitate a means of tracking changes from meeting to meeting; as the agenda & provisions are posted publicly online on the Spec Committee website.

TYPES OF PROVISIONS:

There are three standard types of provisions typically discussed in committee:

1. Specification Changes – These are permanent changes to the WVDOT Standard Specifications.
 - Unless inserted into a project proposal, these changes typically go into effect in January (of subsequent year) with the Supplemental Specifications
2. Project Specific Special Provisions (SP) – Are applied to specifically designated projects.
3. Updates to previously approved SP – Changes/edits/updated to SP that have been approved by spec committee.

NEW BUSINESS ITEMS:

New items should be setup & submitted in the following format:

1. Specification Changes – Show as red-line copy (see note)
2. Project Specific Special Provisions (SP) – Will be shown in all black.
3. Updates to approved SP – Shown as red-line copy.

Each item should also include a description with:

- Brief overview of item
- Background info and/or reason for change

NOTE: Red-line copy is a form of editing which indicates removal or addition of text. You can redline a Microsoft Word document by using the built-in “Track Changes” feature or you can manually reline document with font color changes & strike-through.

OLD BUSINESS ITEMS:

Updated provisions that were discussed at the last committee meeting should be setup in the following format:

- Redline copy from prior meeting would not be shown
- Redline copy of new changes/updates (from previous meeting)

PROGRESSION OF ITEMS THRU COMMITTEE AND APPROVAL:

Depending on how important the project and/or comments/discussion of item at previous meeting, then several things can happen in no particular order.

- Few comments/discussion/minor changes...will recommend approval of item at next meeting
- A lot of comments/discussion...will not recommend approval at next meeting; item will be updated and reviewed again at the next meeting.
- SP's in committee may be used in advertised project. Hope to work to address comments & finish approving at subsequent meeting.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 410
ASPHALT BASE AND WEARING COURSES,
PERCENT WITH LIMITS (PWL)

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

410.1-DESCRIPTION:

410.1.1-General: The Contractor shall note that this Section is to be used for Square Yard Paving operations; however, the proposal and / or plans may contain 401 and 402 items to be paid and measured by the Ton (TN). In instances where those items occur, they shall be constructed and measured in accordance with the applicable sections of the West Virginia Division of Highways Standard Specifications Roads and Bridges, current edition, and the Supplemental Specifications current when the contract is let.

Additionally, the following Materials Procedures (MP's) for Square Yard Paving ~~may can~~ be ~~obtained by contacting found on~~ the Materials Control, Soils and Testing (MCS&T) Division website: <https://transportation.wv.gov/highways/mcst/Pages/WVDOH-Materials-Procedures.aspx>.

- a. MP 401.02.31 QC & Acceptance
- b. MP 401.07.20 Sampling Loose Asphalt Pavement Mixtures
- c. MP 401.07.21 Sampling Compacted Asphalt
- d. MP 401.07.22 Thickness of Asphalt Concrete Using Cores
- e. MP 401.07.23 Bond Strength
- f. MP 401.07.24 Pavement Macrotexture
- g. MP 401.07.25 Evaluation of Asphalt Pavements
- h. MP 401.13.50 Determination of PWL

410.1.2-PWL Paving Description: This work shall consist of constructing one or more courses of asphalt, mixed mechanically in a plant, composed of aggregate and asphalt material designed in accordance with either the Marshall or Superpave Design System as specified in the contract documents, on a prepared foundation in accordance with these specifications and in ~~reasonable~~ reasonably close conformity with the lines, grades, weights or thicknesses, and cross sections shown on the Plans or established by the Engineer.

The unit of measurement for asphalt will be by the ton-~~(megagram)~~, square yard-~~(square meter)~~, or cubic yard-~~(cubic meter)~~.

The work will be accepted in accordance with these Specifications and the applicable requirements of Sections 105, 106, and 109.

410.2-MATERIALS:

The materials shall conform to the following requirements:

MATERIAL	SUBSECTION
Coarse Aggregate	703.1 thru 703.3 ^{Note 1 & Note 2} (See MP 401.02.28 for exceptions and additions required for Superpave Items.)
Fine Aggregate	702.3 (See MP 401.02.28 for additions required for Superpave Items)
Mineral Filler	702.4
Performance Graded Binders	705.5

Note 1 The total shale, coal and other lightweight deleterious material and friable particles shall not exceed 3%.

Note 2 When slag is specified in the contract, the coarse aggregate shall be slag which meets the requirements of 703.3, except as amended in this subsection.

410.2.1-Performance Graded Binder Grade: The standard grade for Performance Graded (PG) binders shall be PG 64S-22, any deviation will be noted in the contract documents. PG 64H-22 shall be used on projects specified with over 20 million ESALs over the design life. PG 64S-22 binder may be used in asphalt placed below the top two lifts in any pavement section, scratch course and patching-and-leveling are not identified as lifts.

CONSTRUCTION METHODS

410.3-GENERAL:

Construction methods to be used in performing the work shall be submitted to the Engineer for review prior to the start of work. This review may require modification of the proposed methods to provide the desired end product. All equipment, tools, machinery, and plant shall be maintained in a satisfactory working condition.

410.4-COMPOSITION OF MIXTURES:

410.4.1-General: The aggregate for use in the designated mixture shall consist of a mixture of aggregate (coarse, fine, reclaimed asphalt pavement (RAP) if desired, or mixture thereof) and mineral filler if required. It shall be the responsibility of the Contractor to determine the percentage of RAP to be used in the mix. The amount and grade of virgin PG Binder to be used in the RAP designs shall be determined in accordance with Materials Procedure (MP) 401.02.24 and MP 401.02.28.

410.4.2-Job Mix Formula: Job Mix Formula (JMF) is the specification for a single mix produced at a single plant. This mix may be specific to a single project or be used on multiple projects if the basic design criteria (design compaction level and PG Binder grade) are the same.

The Contractor shall submit a proposed JMF for each combination of aggregate and asphalt material for each asphalt mixture to be produced. Depending on the design type, the JMF gradations shall be within the tolerances set forth in either Table 410.4.2A or Table 410.4.2B. Marshall mix designs shall be developed in accordance with MP 401.02.22. Superpave mix designs shall be developed in accordance with MP 401.02.28.

Each proposed JMF must be documented on the Division Form T400 or T400SP and the entire JMF package shall be forwarded for review to the District Materials Engineer/Supervisor. After the District reviews the T400/T400SP and JMF package shall then be transmitted to the Materials Control, Soils and Testing Division for final review. If the JMF requires revision, it will be returned to the designer through the District. The T400/T400SP Form shall contain the following information:

- i. Identification of the source and type of materials used in the design.
- ii. The aggregate blend percentages and the percentage for each sieve fraction of aggregate considered the desirable target for that fraction.
- iii. The percentage of virgin asphalt binder to be blended with RAP and the total asphalt binder representing the optimum asphalt content for the JMF submitted, which is to be considered the desirable target percentage.
- iv. The temperature of the completed mixture at the plant which shall be within $\pm 25^{\circ}$ F ($\pm 14^{\circ}$ C) of the median mix temperature established by the temperature-viscosity chart or as recommended by the asphalt supplier.
- v. The ratio (calculated to the nearest one-tenth percent) of the Fines to Asphalt (FA). For Marshall mixes the ratio is defined as the percentage of aggregate passing the No. 200 (75 μ m) sieve, divided by the percentage of asphalt content calculated at the percentage optimum asphalt content of the design. For Superpave mixes the ratio is defined as the percentage of aggregate passing the 75 μ m (No. 200) sieve, divided by the percentage of effective asphalt content calculated at the percentage optimum asphalt content of the design.

TABLE 410.4.2A
Design Aggregate Gradation Requirements for Marshall Mix Designs

Type of Mix	Base-I	Base-II (Patch & Level)	Wearing IV	Wearing-I (Scratch-I)	Wearing-III (Scratch-III)
	Nominal Maximum Size				
Sieve Size	1 ½ in (37.5 mm)	¾ in (19 mm)	¾ in (19 mm)	3/8 in (9.5 mm)	No. 4 (4.75 mm)
2 in (50 mm)	100	–	–	–	–
1 ½ in (37.5 mm)	90-100	–	–	–	–
1 in (25 mm)	90 max	100	100	–	–
¾ in (19 mm)	–	90-100	90-100	–	–
½ in (12.5 mm)	–	90 max	90 max	100	–
3/8 in (9.5 mm)	–	–	–	85-100	100
No. 4 (4.75 mm)	–	–	47 min	80 max	90-100
No. 8 (2.36 mm)	15-36	20-50	20-50	30-55	90 max
No. 16 (1.18 mm)	–	–	–	–	40-65
No. 30 (600 μ m)	–	–	–	–	–
No. 50 (300 μ m)	–	–	–	–	–
No. 200 (75 μ m)	1-6	2-8	2-8	2-9	3-11

TABLE 410.4.2B
Design Aggregate Gradation Requirements for Superpave Mix Designs

Type of Mix	37.5	25	19 ^{Note 1} (Patch & Level)	12.5	9.5 (Scratch)	4.75 (Scratch)
Sieve Size	Nominal Maximum Size					
	37.5 mm (1 ½ inch)	25 mm (1 inch)	19 mm (¾ inch)	12.5 mm (½ inch)	9.5 mm (⅜ inch)	4.75 (No. 4)
50 mm (2")	100	–	–	–	–	–
37.5 mm (1½")	90-100	100	–	–	–	–
25 mm (1")	90 max	90-100	100	–	–	–
19 mm (¾")	–	90 max	90-100	100	–	–
12.5 mm (½")	–	–	90 max	90-100	100	100
9.5 mm (⅜")	–	–	–	90 max	90-100	95-100
4.75 mm (No.4)	–	–	–	–	90 max	90-100
2.36 mm (No.8)	15-41	19-45	23- 49	28-58	32-67	
1.18 mm (No.16)	–	–	–	–	–	30-60
600 µm (No.30)	–	–	–	–	–	–
300 µm (No. 50)	–	–	–	–	–	–
75 µm (No.200)	0-6	1-7	2-8	2-10	2-10	6-12

Note 1 When a 19 mm mix is specified for use as a heavy-duty surface mix, it shall be designed as a fine graded mix with the additional requirement of a minimum of 47% passing the 4.75 mm (No.4) screen.

If it becomes necessary to change aggregate sources, a new mix design shall be developed and submitted for approval. When using neat (unmodified) PG Binders, the binder grade must always remain the same for each design, however the binder source may be changed without requiring a new mix design given that the replacement binder is provided from an approved source. If a source change results in the use of an additive enhanced modified binder of the same grade, a new mix design will be required.

If a modified binder source is changed or if the modification process is changed, a new mix design shall be developed and submitted for approval. A source change to a new location with the original manufacturer/supplier and the original modification process will not require a new mix design.

At no time shall different grades of PG Binders be mixed together in the same storage tank. When it is necessary to switch to a new binder grade the tank shall be drawn down as far as possible, normally to the top of heating coils, before refilling with the new binder. The new binder shall be circulated thoroughly before restarting production.

410.4.2.1-Warm Mix Asphalt: When the Contractor chooses to use an approved asphalt design to be produced as warm-mix asphalt (WMA) using the water injection system, the temperature of the completed mixture at the plant may be lowered to an established range that has previously been determined through trial production. The allowable temperature range specified on the approved T400 mix design form shall be adjusted accordingly when producing WMA. In addition, all references to the minimum compaction temperatures in Sections 410.10.3 and 410.10.4 of this specification, may be

waived if it can be established that additional density can be obtained at lower temperatures without damaging the pavement. All testing requirements established for Hot Mix Asphalt mix designs and quality assurance/quality control testing shall also apply to WMA.

410.5-TESTING:

410.5.1-Test Methods:

MP 700.00.06	Aggregate Sampling Procedures
AASHTO T168	Sampling Hot-Mix Asphalt
AASHTO T11	Materials Finer than No. 200 (75 µm) Sieve in Mineral Aggregates by Washing
AASHTO T27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T30	Mechanical Analysis of Extracted Aggregate
AASHTO T164	Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
AASHTO T308	Asphalt Content of HMA by the Ignition Method (Test Method A)
AASHTO T245	Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
ASTM D5581	Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (For Base-I Marshall designs only)
AASHTO T166	Bulk Specific Gravity of Compacted Bituminous Mixtures
AASHTO T209	Maximum Specific Gravity of Bituminous Paving Mixtures
AASHTO T312	Determining the Density of HMA Specimens by Means of the Superpave Gyrotory Compactor
AASHTO T331	Bulk Specific Gravity and Density of Compacted HMA Using Automatic Vacuum Sealing Method
ASTM D7227	Rapid Drying of Compacted Asphalt Specimens Using Vacuum Drying Apparatus
MP 401.02.31	Quality Control and Acceptance of Asphaltic Mixtures
MP 401.07.20	Sampling Loose Asphaltic Mixtures in the Field
MP 401.07.21	Sampling Compacted Asphaltic Mixtures in the Field
MP 401.07.22	Measuring Thickness of Asphalt Pavement using Drilled Cores
MP 401.07.23	Measuring Bond Strength of Cored Specimens
MP 401.07.24	Measuring Asphaltic Pavement Macrottexture
MP 401.07.25	Evaluation of Pavement with Substandard Properties
MP 401.13.50	Determination of Percent Within Limits

410.6-CONTRACTORS QUALITY CONTROL:

410.6.1-Quality Control Testing: Quality control of the asphalt pavement is the responsibility of the Contractor. The Contractor shall maintain equipment and qualified personnel including at least one certified Asphalt Plant Technician at each plant. The technician shall be in charge of all plant quality control activities such as mix proportioning and adjustment and all sampling and testing activities necessary to maintain the various properties of asphalt within the limits of the specification.

The Contractor shall maintain necessary equipment and qualified personnel including at least one certified Asphalt Field and Compaction Technician at each project during paving operations. Additionally, a certified Asphalt Field and Compaction Technician with certification to perform nuclear density testing of asphalt pavements shall perform all testing

necessary to assure compaction of the asphalt meets specification requirements. ~~Compaction Technicians may serve as Asphalt Field and Compaction Technicians for asphalt compaction testing until December 31, 2017.~~

410.6.2-Job Mix Formula Field Verification: For each JMF, a mix design field verification shall be conducted during the first days of plant production. For Marshall and Superpave designs, the verification shall be in accordance with the guidelines established in MP 401.02.31. The field verification is for the purpose of demonstrating that the JMF can be produced within the specified tolerances set forth in the MP 401.02.31. If the mix cannot be produce within these requirements, a new mix design will be required.

410.6.3-Quality Control Testing Requirements: After the JMF design field verification has been successfully completed, sampling frequency and test requirements for quality control shall be as set forth in MP 401.02.31 for Marshall and Superpave designs. If the Division determines that a mix cannot be consistently produced within the tolerance limits of the specified design properties, approval of the mix may be revoked and the contractor will be required to provide a new mix design.

410.7-ACCEPTANCE TESTING:

410.7.1-Acceptance Testing of Asphalt: For Interstates and divided National Highway System (NHS) Highways, material from the paving of the traveled lanes and shoulders will be accepted in the field on a lot-by-lot basis. Lots will be established cumulatively and will be specific for each JMF. Each lot consists of five equal sublots (n=5). A completed subplot will have cores obtained for Pavement Density, and Bond Strength and a Loose Mixture sample for gradation and asphalt content. Samples for mat density and bond strength shall also be used to measure lift thickness prior to any preparation for density or bond strength. All field samples shall be obtained from locations determined as per MP 401.07.20 and MP 401.07.21.

A normal lot size is 2,500 tons with five, 500-ton sublots (n=5), unless operational conditions or project size dictate otherwise. If operational conditions or project size dictate, readjustment of the lot will be made as specified in Table 410.7.1. When lots are adjusted, all sublots shall be of equal size. Breakdowns or stoppages of short periods due to such causes as weather or equipment failure will not be considered as reason to adjust the lot size. The original lot will be continued when work resumes after stoppages of less than 5 days. If a lot is terminated due to a stoppage of 5 days or more, adjust the lot size and number of sublots as specified in Table 410.7.1.

For two lane and non-divided NHS Routes, refer to Section 410.13.7.1.

TABLE 410.7.1

Re-adjustment of Lot Size and Associated Number of Sublots Remaining Quantity Following Last Full Lot	Action
Less than 500 tons without a combination of one mixture acceptance sample and one density core	Quantity combined with the previous lot, (n=5)
Less than 500 tons with a combination of one mixture acceptance sample and one density core	One new subplot defined and quantity combined with the previous lot, (n=6)
500 tons to less than 1,000 tons without a combination of two mixture acceptance samples and two density cores	One new subplot defined and quantity combined with the previous lot, (n=6)
500 tons to less than 1,000 tons with a combination of two mixture acceptance samples and two density cores	Two new sublots defined and quantity combined with the previous lot, (n=7)
1,000 tons to less than 1,500 tons without a combination of three mixture acceptance samples and three density cores	Two new sublots defined and quantity combined with the previous lot, (n=7)
1,000 tons to less than 1,500 tons with a combination of three mixture acceptance samples and three density cores	New lot defined, (n=3)
1,500 tons to less than 2,000 tons without a combination of four mixture acceptance samples and four density cores	New lot defined, (n=3)
1,500 tons to less than 2,000 tons with a combination of four mixture acceptance samples and four density cores	New lot defined, (n=4)
2,000 tons to less than 2,500 tons without a combination of five mixture acceptance samples and five density cores	New lot defined, (n=4)
2,000 tons to less than 2,500 tons with a combination of five mixture acceptance samples and five density cores	New lot defined, (n=5)

Immediately after each sample is taken, it shall be identified by labeling or otherwise with the following information:

1. Contract ID
2. State Project Number
3. Sample Type (density, bond, loose, etc.)
4. Pavement Course (surface, base)
5. Lot Number
6. Sublot Number
7. Date
8. Sampled By

A sample labeling standard is shown in MP 401.07.20 Sampling of Loose Asphaltic Pavement Mixtures and MP 401.07.21. Upon fully identifying, marking, or labeling, and securing, samples shall be transported to the District Materials Laboratory for testing unless otherwise indicated in the proposal.

410.7.1.1-Mixture Acceptance Samples. The Inspector will select sample locations in each subplot according to MP 401.07.20 Sampling of Loose Asphaltic Pavement Mixtures. The Inspector or in the presence of the Inspector, one loose mixture sample shall be obtained for each subplot. This sample is to be taken directly from the uncompacted mixture and immediately processed in accordance with the MP.

410.7.1.2-Compaction: Compaction testing for mat density shall be performed for all traveled lanes, ramps and shoulders. Work will be evaluated based on an Upper Specification Limit (USL) of ~~97.0-98.0~~ and a Lower Specification Limit (LSL) of 91.5 for all mats within travel lanes. Acceptance of mat density shall be in accordance with 410.13.3.

Maximum density values that are supplied by the asphalt producer shall be verified by the District Materials staff by determining the theoretical maximum specific gravity in accordance with AASHTO T209 Theoretical Maximum Specific Gravity (Gmm). This verification of Gmm shall be conducted once per lot for all mixes, or one in each five reported values from the asphalt producer. This Gmm value must be within 0.024 of the asphalt producer's daily average. Any deviation of greater shall warrant special evaluation. Joint density testing is required. The joint density shall be evaluated based on a Lower Specification Limit (LSL) of 89% of a maximum density established by averaging the maximum densities for the paved mats adjacent to the constructed longitudinal joint. The joint density requirement shall only apply to the surface lift of the pavement structure. Lots for joint density shall also be established cumulatively and laid out as per the applicable provisions within MP 401.07.21.

A normal lot size for evaluation of joint density is 10,000 linear feet of constructed joint with five, 2000 foot long sublots, unless operational conditions or project size dictate otherwise. Lots for joint density determined to be 4000 feet in length or less shall be incorporated into the previous full lot. If the length is 2000 feet or less, then one sample shall be taken, and the lot be evaluated with six equal subplotssamples (n=6). If the length is greater than 2000 feet, then ~~and~~ two samples shall be taken, and the lot be evaluated with seven ~~samples-equal sublots~~ (n=7). Lots for joint density that are greater than 4000 feet in length shall have samples taken representative of each 2000-foot long subplot or portion thereof.

Acceptance for joint density shall be as per 410.13.4.

Patching-and-leveling and scratch courses shall not be included in determining the total new pavement thickness to be tested for compaction. When asphalt is placed in areas that require a non-uniform thickness or is tapered to a thin edge, the method of acceptance testing shall be determined by the Engineer. Acceptance testing is not required on areas in which a full-size roller is restricted from compacting the mat properly. These areas shall be compacted to the satisfaction of the Engineer.

410.7.1.3-Shoulders and Ramps: As per MP 401.07.21, shoulders and ramp areas that are constructed simultaneously with the mainline are not included in the sampling plan. However, these simultaneously constructed shoulder and ramp areas shall be included in the lot of the adjacent mainline for the purposes of penalty ~~and bonus~~ calculations for compaction and mixture properties.

Shoulders that are constructed independently of the mainline shall be tested as per MP 401.07.21. However, compaction penalty calculations for these independently constructed shoulders shall not apply.

410.7.1.4-Thickness: Thickness testing shall be performed on all traveled lanes, ramps and independently constructed shoulders.

Cores obtained for mat density and bond strength will both be measured for thickness as per MP 410.07.22 Measurement for Thickness of Asphalt Pavement Using Drilled Cores, prior to those subsequent analyses. The core measurements which represent the thickness of the sampling units shall be analyzed to determine the average value of the pavement thickness. Pavement Thickness (T) shall include all of the pavement layers as specified excluding any patch and level course and scratch courses. This value will be used to determine the degree of compliance with the provisions and to develop certain factors to be used in the derivation of equitable deductions as set forth in Section 410.13.5, in the event the provisions of this Specification are not met.

410.7.1.5-Bond Strength: Bond Strength Testing shall be conducted to ensure the creation of a monolithic layered pavement; this is typically achieved by the application of a tack coat between pavement layers. Any tack coats applied by the Contractor shall be applied in accordance with Section 408.

Bond Testing shall be performed on all surface layers beginning with the existing pavement layer and then all intermediate pavement layers called for in the proposal and plans, this testing shall be performed on all traveled lanes and shoulders. Bond Testing is not required for pavement layers placed on top of a granular type layer (aggregate base, rubblized concrete, macadam, etc.).

If an asphalt pavement layer is to be placed atop a concrete surface, Bond Strength testing is not required however, a tack coat shall be applied in accordance with Section 408 to ensure complete coverage of the surface and to the satisfaction of the Engineer.

Core bond strength shall exceed a minimum of 100 psi when tested in accordance to MP 410.07.23 Guide to Determining Interface Bond Shear Strength.

410.7.2-Surface Tolerance: Shall be in accordance with Section 720 on the finished mat.

410.7.3-Pattern Segregation: Pattern segregation is continuous or repeated areas of non-uniform distribution of coarse and fine aggregate particles in the finished mat. The Division will address pattern segregation as follows:

410.7.3.1-Evaluating Pattern Segregation: If the Engineer observes pattern segregation that may result in defective pavement, then:

- i. The Inspector will notify the Contractor of the observed pattern segregation.
- ii. The Contractor may continue to work at their own risk while they immediately

and continually adjust the operation to eliminate the pattern segregation from future work.

- iii. As a minimum and in the presence of the Engineer and the Contractor's Representative, Division personnel shall determine the average depth of pavement surface macrotexture according to MP 401.07.24 in areas with the pattern segregation and in areas with non-segregated pavement. The pattern segregation is unacceptable if the difference in average pavement texture depth between the non- segregated and segregated areas exceeds the following:
 - a. For 9.5 mm or Wearing I mixes – 0.012 inch ~~(0.305 mm)~~
 - b. For 12.5 mm mixes – 0.016 inch ~~(0.406 mm)~~
- iv. The Engineer will determine if the pavement is defective as specified in Section 410.7.3.3.

410.7.3.2-Test Section: If the macrotexture tests identify unacceptable pattern segregation, then:

- i. Immediately suspend placing the asphalt course. Evaluate the cause of pattern segregation according to the Paving Operation QC Plan. Provide proposed corrective actions to the Engineer and do not resume placing the asphalt course until after the Engineer reviews the proposed corrective actions and authorizes paving to continue.
- ii. Determine if the pattern segregation resulted in defective pavement as specified in Section 410.7.3.3.
- iii. After the Engineer allows paving to resume, place a test section not to exceed 200 tons. If the corrective actions do not eliminate observed pattern segregation, the Department will suspend paving, even if it is before the Contractor places the entire test section. Propose additional corrective actions and construct another test section. Resume normal paving operations after constructing an entire test section without pattern segregation as determined by the Engineer.

410.7.3.3-Defective Pavement: At locations selected by the Engineer and with the Engineer present, drill three 6-inch diameter cores from the area of pattern segregation and three cores from the pavement representing a non-segregated area. Do not compress, bend, or distort samples during cutting and handling and immediately provide the cores to the Inspector. The Inspector will transport cores to the producer's laboratory. With the Engineer present, test the cores at the plant for density, asphalt content, and gradation. Additional cores and/or additional testing as per MP 401.07.24 Measuring Pavement Macrotexture Depth can be used to further evaluate the pavement.

An area of pattern segregation contains defective pavement if:

- a. the summation of absolute deviations from any two sieves is 20% or more from the JMF;
- b. the core density is defective, the mixture is defective in asphalt content;
- c. or the mixture is defective for percent passing the 75 μ m (No. 200) sieve.

The core density is defective, or the cores are defective for asphalt content or gradation of the 75 μ m (No. 200) sieve if the PWL is less than 55 as determined in accordance with MP 401.13.50 and based on three samples (n=3). Remove and replace the full width of the

affected lane and a minimum of 5 feet beyond each end of the area with unacceptable pattern segregation. Construct replacement pavement conforming to the appropriate surface tolerances.

410.7.4-Flushing: Provide a mix that will not flush. Flushing is continuous or repeated areas of excessive asphalt on the pavement surface. The Division may recognize flushing until the Division approves the project through final inspection. The Division will address flushing as follows:

410.7.4.1-Evaluating Flushing: When the Engineer observes flushing, then:

- i. The Engineer will immediately notify the Contractor of the observed flushing.
- ii. The Contractor may continue work at its own risk while it immediately and continually adjusts the operation to eliminate flushing from future work.
- iii. In the presence of the Engineer, determine the average depth of pavement surface macrotexture according to MP 401.07.24 in areas of suspected flushing. If the average texture depth is less than or equal to 0.006 inches (~~0.152 mm~~), then the pavement will be considered to be flushed and is defective.

410.7.4.2-Test Section: If the macrotexture tests identify flushing, then:

- i. Immediately suspend placing the paving course. Evaluate the cause of flushing according to the Paving Operation QC Plan and as directed. Provide proposed corrective actions to the Engineer and do not resume placing the paving course until after the Engineer reviews the proposed corrective actions and authorizes paving to continue.
- ii. Remove and replace the defective wearing course at no cost to the Division for the full width of the affected lane and a minimum of 5 feet beyond each end of the area of defective wearing course. Construct replacement wearing course conforming to the appropriate surface tolerances.
- iii. After the Engineer allows paving to resume, place a test section not to exceed 200 ~~TN~~ tons. If the corrective actions do not eliminate observed flushing, the Division will suspend paving even if it is before the Contractor places the entire test section. Propose additional corrective actions and construct another test section. Resume normal paving operations after constructing an entire test section without flushing as determined by the Engineer.

410.8-BLANK

410.9-EQUIPMENT:

410.9.1-Plants: All plants shall meet the general requirements set forth in AASHTO M156 unless it can be demonstrated to the satisfaction of the Engineer that a consistent quality mix can be produced with modifications to any of these requirements.

All plants in West Virginia producing asphalt for the Division shall provide documented evidence of compliance with current requirements of the West Virginia Air Pollution Control Commission.

All plants which are not in West Virginia but producing asphalt for the West Virginia Division of Highways shall provide documented evidence of compliance with current

requirements of the laws and regulations of the State in which they are producing, applicable to air pollution.

410.9.2-Dust Collector: An efficient dust collecting system shall be provided to prevent the loss of fine material. The material collected may be returned to the mixture at a uniform rate or discarded.

410.9.3-Truck Scales: Truck scales shall be provided at each Plant, except that truck scales are not required at properly calibrated automatic batching plant facilities which are equipped with digital printout equipment, and which load the trucks directly from the mixer or the weigh hopper in a surge or storage silo.

A person designated as a weigher shall be provided by the producer. The weigher shall certify that the weight of the asphalt, as determined either by the truck scales or from the digital printout of the batch weights, is correct.

Each truck shall be weighed empty prior to each load, except at automatic batch plants approved to operate without truck scales.

All truck scales shall be mounted on solid foundations which will insure them remaining plumb and level.

Approval and sealing of scales shall be conducted at the frequency determined by the West Virginia Division of Labor, Bureau of Weights and Measures, and when the plant is moved, or upon the request of the Engineer. The Engineer shall be notified of any scale malfunctions when material is being furnished to Division of Highways projects. The Division may, at its option, accept inspection and sealing by out-of-state agencies when the mixing plant is located outside West Virginia.

A digital recorder shall be required on all truck scales. The digital recorder shall produce a printed record of the gross, tare and net weights, and the time, date, truck identification, and project number. Provision shall be made for constant zero compensation and further provision shall be made so that the scales may not be manually manipulated during the printing process. The system shall be interlocked so as to allow printing only when the scale has come to rest. In case of breakdown of the automatic equipment, the Engineer may permit manual operation for a reasonable time, normally not to exceed 48 hours, while the equipment is being repaired.

The scales shall be of sufficient size and capacity to weigh the loaded trucks that are used for delivery of asphalt from the plant.

410.9.4-Test Weights: As part of its standard equipment, each plant which proportions aggregate by weight shall provide a minimum of ten 50-pound ~~(22.68 kg)~~ test weights for the purpose of verifying the continued accuracy of its weighing equipment.

Plants which proportion asphalt material by weight shall furnish, in addition to the above, one five pound ~~(2.268 kg)~~ test weight.

410.9.5-Surge and Storage Silos: During the normal daily operation of the plant, asphalt may be stored in a surge or storage silo for a maximum of ~~12-6~~ hours, provided the silo has received prior evaluation and acceptance through the District plant inspection. The resulting temperature of the material at time of placement and compaction shall be sufficient to comply with 410.10.1, ~~3~~ and 410.10.4

~~Longer silo storage times, up to 24 hours, may be permitted for dense graded asphalt if the storage silo is insulated and/or heated to assure that the proper mix temperature is maintained. The gates at the bottom of the storage silo shall be adequately heated and sealed when the asphalt is held for the extended period of time. When asphalt is stored for the extended time period, it shall not be used until the temperature has been checked and the asphalt has been visually inspected for hardening of the mix and stripping of the asphalt from the aggregate. Approval of the extended storage time may be revoked if it is determined through inspection and/or testing that the extended storage is having a detrimental effect on the asphalt.~~

410.9.6-Inspection of Equipment and Plant Operations: The Engineer shall have access to the plant to assure the adequacy of the equipment in use, to inspect the conditions and operation of the plant, to verify weights, to verify the proportion and character of materials, and to determine if specified temperatures are being maintained in the preparation of the mixture.

410.9.7-Trucks for Transporting Mixture: The use of diesel fuel, kerosene, or similar solvent-based products which can dissolve the asphalt film from the aggregate particles will not be permitted for use as a release agent. Any commercial release agent which is certified as harmless to the mix may be used; however, the Division reserves the right to restrict any release agent that is shown to cause problems during placement of the mix. All excess release agent shall be removed from the truck bed prior to loading the asphalt.

All truck beds shall be insulated with approved material. No trucks shall be used which cause segregation of the materials, which show large oil leaks, or which cause undue delays in delivery of material. All trucks shall be provided with a waterproof cover and a hole in the body for the purpose of conveniently checking the temperature of the load. Covers shall be suspended slightly above the mixture, shall extend over the sides of the truck, and shall be securely fastened to eliminate air infiltration and to prevent water from coming in contact with the mixture.

410.9.8-Laboratory: A testing facility or laboratory, as described below, shall be provided within reasonable proximity of the asphalt plant. Plant operations must be visible from within the laboratory.

The laboratory shall be of sufficient size to hold all laboratory test equipment and supplies with adequate floor space to allow the technicians to test samples in an efficient manner. The laboratory shall be furnished and maintained with adequate ventilation, heat, light, water, sink and drainage, electrical or gas outlets, or both, work table, shelves, and supply cabinets.

The laboratory shall be supplied with the equipment and materials listed below and these shall be maintained to meet the applicable requirements of AASHTO or ASTM:

- i. Hot plate, gas or electric.
- ii. Large ovens (as needed for heating and drying samples), gas or electric.
- iii. Unit weight container, ½ cubic foot ~~(0.014 cubic meter)~~. Required for slag only.
- iv. Balances of sufficient capacity and accuracy for conducting specified tests and plant calibration.

- v. Thermometers: dial type, liquid-in-glass, and digital as required for conducting standard test procedures and monitoring mix temperatures. Digital thermometers shall be equipped with an appropriate sturdy probe that can be pushed into a sample of hot asphalt to check the temperature of the mix.
- vi. Ro-Tap Sieve shaker or equivalent, with 8 and/or 12 inch ~~(200 and/or 300 mm)~~ diameter screens.
- vii. Sample splitters for fine and coarse aggregates.
- viii. Miscellaneous items (including sample splitting trowels, scoops, square point shovel, aggregate sample pans, heat resistant gloves, measuring rules, brushes, flashlight, timing devices, and glassware as needed).
- ix. Expendable supplies necessary for performance of tests.
- x. Equipment for determining the maximum specific gravity of asphalt mixtures as specified in AASHTO T209.
- xi. Non-contact infrared thermometer accurate to $\pm 2^{\circ}\text{F}$ ~~($\pm 1^{\circ}\text{C}$)~~.
- xii. Equipment for determining the bulk specific gravity of asphalt mixtures using saturated surface dry specimens complying with AASHTO T166.
- xiii. Marshall equipment necessary to comply with AASHTO T245 and ASTM D5581, including a calibrated automatic testing apparatus having recording capabilities and compaction hammers. (Marshall designs only)
- xiv. Asphalt content ignition oven with built-in scale and printer meeting the requirements of AASHTO T308, Test Method A.
- xv. Calibrated Gyratory compactor meeting requirement of AASHTO T312 with computer (including software for data acquisition and test calculations) and printer. Compactor must be calibrated to the internal angle in accordance with AASHTO TP71 with annual verification (Superpave designs only).

410.9.9-Asphalt Paving Equipment: Asphalt paving equipment shall be self-contained and of sufficient size, power, and stability to receive, distribute and strike-off the asphalt mixture at rates and widths commensurate with the typical sections and other details shown on the plans. The paver shall be provided with an activated screed or strike-off assembly equipped to be heated. Approval of the paver by the Engineer will be based on the demonstrated capability of the equipment to place the mixture to the required cross-section, profile, and alignment in an acceptable, finished condition ready for compaction.

The paver shall be equipped with means of preventing the segregation of the coarse aggregate particles when moving the mixture from the paver hopper to the paver augers. It shall also be capable of pushing a sufficient amount of the mixture under the auger gearbox to prevent streaking or tearing of the mat. Some paver models may require the installation of a manufacturer retrofit kit or equipment modification to accomplish this.

Specialized equipment or hand methods approved by the Engineer may be employed to spread the asphalt mixture where the use of standard full-scale paver is impractical due to the size or irregularity of the area to be paved.

Pavers shall be equipped with mechanical or automatic grade and slope controls. The use of automatic grade and slope controls with a traveling straight edge shall be required only when specified on the Plans or in the Proposal. Both the grade and slope controls shall be in working order at all times. In the event of failure of the automatic controls, the Contractor will be permitted to finish the day's work using manual controls but will not be allowed to resume work the following day until the grade and slope controls are in proper working order.

410.9.10-Compaction Equipment: Compaction may be performed by self-propelled steel-wheeled, pneumatic-tired and/or vibratory rollers. Hand-held rollers or vibrating plates may be used in small inaccessible areas if approved by the Engineer. Prior to use on any project, the roller shall be inspected to see that it is in good mechanical condition. The total weight, weight per inch of width (steel-wheeled), and average ground contact pressure (pneumatic-tired) shall be documented.

410.10-PAVING OPERATIONS:

410.10.1-Spreading and Finishing: Before spreading any material, the contact surfaces of curbs, gutters, manholes, and of adjacent Portland cement concrete pavement edges shall be painted or sealed with asphalt material. Exact edge of pavement, except on concrete, shall be established by a string or chalk line for a distance of not less than 500 feet ahead of the spreading operation. For projects where the existing pavement was milled prior to the placement of new asphalt, the edge of pavement shall be the edge of milled section.

For mixes produced with neat (non-modified) asphalts (which may include PG 64H- 22, PG 64S-22, PG 58H-28, and PG 58S-28) the temperature of the mixture at the time of placement shall be within the temperature requirements of the JMF. The JMF temperature range shall be the liquid asphalt supplier's specified mixing temperature $\pm 45^{\circ}\text{F}$ ~~($\pm 25^{\circ}\text{C}$)~~ with a maximum mixing temperature of 338°F ~~(170°C)~~. Additional allowances will be made for water injection processes with a minimum mixing temperature of 220°F ~~(105°C)~~.

The mix temperature shall be monitored by inserting a thermometer into the mix through the hole in the truck bed.

The temperature of the completed mix, when measured at the plant, shall be within the tolerance as established by the JMF. The first load which demonstrates temperatures outside of that range shall be accepted, provided that the temperature is still within the master temperature range. No additional loads of material shall be run out until necessary steps are taken to reestablish the temperature of the mix within the plant tolerance. When measured at the project site, the temperature of the mix shall be within the tolerance established by the JMF. The first truck load of material which demonstrates temperatures outside of that range or any trucks in transit at that time shall be accepted provided temperatures are within the master temperature range. Any truckload of material which exceeds the master temperature range may be rejected by the Engineer. However, the plant shall immediately be notified that no additional loads of material are to be dispatched until necessary action is taken to reestablish temperature within JMF specification limits.

When the surface temperature falls to within 10°F ~~(6°C)~~ of the weather restrictions of Table 410.8, the mix temperature may be increased up to a maximum of 338°F ~~(170°C)~~ unless otherwise specified by the asphalt supplier. The temperature of each truckload of material shall be monitored for compliance. Any truckload of material which exceeds this maximum temperature may be rejected by the Engineer.

Mixes produced with asphalts that contain modifiers for high or low temperature performance enhancement shall meet the temperature requirements recommended by the asphalt supplier, as determined using the mid-point of the mixing temperature range shown on the asphalt temperature-viscosity charts and allowing for $\pm 25^{\circ}\text{F}$ ~~(14°C)~~.

410.10.2-Safety Edge: When the total specified lift thickness of pavement is 1.5 inches or greater, asphalt safety edge shall be constructed on the outside pavement edge. The device utilized shall be a model listed on Division Approved Product Listing.

The resulting finished surface of the safety edge shall be sufficiently consolidated so as to show no segregation or raveling of the aggregate and shall have the same surface profile and texture of the compacted mat surface.

Safety edge is not to be used through intersections, against curb or barrier, or when directed by the Engineer. The paving operation shall allow for automatic and/or manual transitions at cross roads, driveways, and intersections. The Engineer may allow short sections of handwork for transitions at driveways, intersections, interchanges, and bridges.

410.11-PROTECTION OF PAVEMENT AND TRAFFIC CONTROL:

The Contractor shall be responsible for the protection of asphalt surfaces from damage by their equipment and personnel. When the construction of asphalt surfaces is undertaken on projects under public traffic and the road surface is 16 feet wide or greater and the ADT is 400 or greater, the Contractor shall place no passing signs, Interim pavement markings, and Temporary pavement markings to delineate the edge line, centerline, and/or lane line of the roadway as required herein and in the project plans. The provision of Section 336: Maintaining Traffic shall apply.

Interim markings are described as markings applied to freshly resurfaced roadways between lifts and after placement of the final lift prior to opening the portion of the roadway being resurfaced to traffic. These markings are intended to provide the minimum amount of delineation required for safe navigation of the roadway and are to be succeeded by Temporary markings within a three (3) to fourteen (14) day period, based on the type of roadway and ADT, as specified herein. Interim and Temporary markings shall conform to the requirements of Section 663: Pavement Markings.

410.12-METHOD OF MEASUREMENT:

Asphalt will be measured by the Square Yard (SY). The quantity will be determined by the Plan Quantity as provided for in the proposal unless otherwise directed by the Engineer.

Any patching or leveling mixture placed on a subbase or base course constructed in the same Contract with the asphalt items shall be at the expense of the Contractor. No additional compensation will be allowed for the material or any work incidental to its placement unless otherwise approved by the Engineer. No additional measurement is necessary nor will addition compensation be allowed for the placement of Safety Edge.

410.13-BASIS OF PAYMENT:

The quantities determine as provided above, will be paid for at the contract unit price for the items listed below, which prices and payment shall be full compensation for furnishing all the materials and doing all the work herein prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, field laboratory, supplies, tack coat, and incidentals necessary to complete the work and provide the performance criteria specified.

There will be no additional compensation for Interim Pavement Markings.

410.13.1-When a Lot of asphalt material is found not in compliance with the tolerance requirements for asphalt content and gradation as shown in MP 401.02.31, it shall be subject

to a price adjustment in accordance with the criteria for Determination of Percent Within Limits established in MP 401.13.50 and pay factors in Table 410.13.3.1.

410.13.2-Blank

410.13.3–For Interstates and divided NHS Highways, the unit price for each Lot of asphalt pavement Mat shall be adjusted as follows in Table 410.13.3.1 in accordance with MP 401.13.50. For two-lane and non-divided NHS Routes, the pay factor for asphalt content and percent passing the 75 µm (No. 200) sieve shall be determined by Table 410.13.3.1. However, the mat density pay factor shall be determined by Table 410.13.7.2.

TABLE 410.13.3.1

Percentage of Material Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96-100 ^{Note 1}	102 ^{Note 1}
90- 95-100	100
75-89	[(0.5)PWL]+55
55-74 ^{Note 2 1}	[(1.4)PWL]-12

~~Note 1 Payment of 102% for mat density shall be subject to additional requirement of the average compaction for the lot being evaluated to be a minimum of 93% density.~~

Note ~~2~~ 1 Material with a PWL less than 55 is considered defective and will be considered for removal and replacement of the lot. If only one lot characteristic has a percent within limits less than 55, the Engineer, may allow the Contractor to leave the defective lot in place. The decision to remove and replace the subject lot shall include evaluation of all lot characteristics for pay and surface characteristics as per guidelines set forth in MP 401.07.25. If the material is left in place, the Department will pay for the defective lot at a value not to exceed 50% of the contract unit price of asphalt per square yard. (~~i.e.~~, Contract unit price = \$10 sy → \$5 sy max)

410.13.3.1-Price Adjustment: The Division will compute the percent of the contract unit price paid as follows:

$$\text{Lot Payment} = \text{CP} (2\text{PD} + \text{PB} + \text{PA}) / 400$$

Where:

CP = Contract unit price per lot (unit price times lot quantity)

PD = Payment Factor Percentage for mat density

PB = Payment Factor Percentage for asphalt content.

PA = Payment Factor Percentage for percent passing the 75 µm (No. 200) sieve

Shoulders and ramps shall be included in penalty calculations for mixture and compaction unless they are constructed independently, where the density requirements shall be waived. When compaction requirements are waived, PD will be minimum of 100.

410.13.4-Joint Density Adjustments: For Interstates and divided NHS Highways, joint Density PWL calculations shall be in accordance with MP 401.13.50. Joint Density bonus adjustments will be calculated for joint lots with a PWL greater than or equal to 80. Joint Density negative adjustments will be calculated for joint ~~lot~~ lots with a PWL less than or equal

to 60. Price adjustments shall be calculated using the formulas below. There will be no adjustment for joint lots who's PWL ~~falls between 60 and 80 is greater than 60.~~

~~Bonus adjustment calculated as follows:~~

$$\text{\$T} = \frac{\text{PWL} - 80}{20} \times 4,000$$

Negative adjustment calculated as follows:

$$\text{\$T} = \frac{60 - \text{PWL}}{60} \times 12,500$$

Adjustments calculated for lots less than or greater than 10,000 feet in length shall be prorated directly proportional to the amount of length less than or greater than 10,000 feet.

For two-lane and non-divided NHS Routes, refer to Section 410.13.7.3.

410.13.5-Thickness Adjustments: No payment will be made for pavement areas deficient in thickness by more than 35% T.

Pavement which is deficient in thickness by more than 50% T is considered to be inadequate to perform satisfactorily and shall be removed and replaced at no added cost to the Division.

The balance of the item, the portion of the item not treated in the manner set forth above, will be treated in the manner set forth in 410.13.5.1 below.

410.13.5.1-Price Adjustments for Thickness - When all individual measurements meet or exceed the specified thickness, there will be no adjustment for payment. If any individual values or when the average value of the pavement thickness per lot is less than the specified total thickness, the quantity of pavement represented by this average thickness will be paid by a direct calculation as defined as follows:

$$\text{Price Adjustment \%} = \left(\frac{t}{T} \right) \times 100$$

Where:

T = Total Plan Thickness

t = avg. lot thickness + 0.04 in.

This value is then applied to the unit price for the asphalt place in the lot, this adjustment shall remain separate from the PWL adjustments for AC, Gradation, Density, etc.

410.13.6-Bond Strength Adjustment: For Interstates and divided NHS Routes, bond Strength PWL calculations shall be in accordance with ~~410.13.50~~ MP 401.13.50, Guide to Statistical Analysis of Material Using Quality Level Analysis-Percent within Limits. However, for the purpose of relieving large standard deviations from abnormally strong samples, any sample with a strength exceeding 150 psi will be evaluated as 150 psi instead of the actual strength. The actual strength ~~should~~ shall still be recorded as such on the reporting form.

~~Bond Strength positive adjustments will be calculated for lots with PWL greater than or equal to 90.~~ Bond Strength Negative adjustment will be calculated for lots with PWL less than or equal to 70. There is no adjustment for bond Strength lots who's PWL ~~falls between 70 and 90 is greater than 70.~~

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Positive adjustment calculated as follows:

$$\$T = \frac{PWL - 90}{20} \times 2,000$$

Negative adjustment calculated as follows:

$$\$T = \frac{70 - PWL}{70} \times 40,000 - 25,000$$

Adjustments calculate for lots less than or greater than the standard 2,500 tons shall be prorated directly proportional to the amount of tonnage less than or greater than 2,500 tons. This shall be calculated on the theoretical tonnage for the lot, not the actual tonnage used.

For two-lane and non-divided NHS Routes, refer to Section 410.13.7.4.

410.13.7 – Two-Lane and Non-divided NHS Route Exceptions: Due to the wide range of variability on the roadway, the following exceptions for lot/sublot layout and analysis of existing condition dependent test results shall apply:

410.13.7.1-Acceptance Testing of Asphalt: A lot shall consist of three (3) to seven (7) equal sublots. A normal sublot size is 500 tons unless operational conditions and sublot size dictate otherwise. Determine the number of sublots on the project by converting the square yardage of the travel lanes and simultaneously paved shoulders to tonnage. Divide the tonnage by 500 and round to the nearest whole number (n). Use that number (n) in Table 410.13.7.1 to determine the number of lots to be used for acceptance.

TABLE 410.13.7.1

<u>Number of Sublots (n)</u>	<u>Number of Lots</u>
<u>3 to 7</u>	<u>1 Lot with (n) even sublots</u>
<u>8</u>	<u>2 Lots with 4 even sublots each</u>
<u>9</u>	<u>2 Lots - Lot 1, 5 Sublots / Lot 2, 4 Sublots</u>
<u>10</u>	<u>2 Lots with 5 even sublots each</u>
<u>11</u>	<u>2 Lots - Lot 1, 6 Sublots / Lot 2, 5 Sublots</u>
<u>12</u>	<u>2 Lots with 6 even sublots each</u>
<u>13</u>	<u>2 Lots - Lot 1, 7 Sublots / Lot 2, 6 Sublots</u>
<u>14</u>	<u>3 Lots - Lot 1, 5 Sublots / Lot 2, 5 Sublots / Lot 3, 4 Sublots</u>
<u>15</u>	<u>3 Lots with 5 even Sublots each</u>

Turn lanes, intersections, and independently constructed shoulders shall not be subject to price adjustments, positive or negative, if the combined square yardage converts to less than 500 tons. If the square yardage converts to over 500 tons, then one additional sublot for asphalt content, percent passing the 75 µm (No. 200) sieve, and bond strength shall be added to the last lot constructed. Compaction shall be monitored, documented, and submitted to the Engineer by a certified Asphalt Field and Compaction Technician to assure that it meets specification requirements.

410.13.7.2 -Basis of Payment: The payment factor for density shall be adjusted as follows in Table 410.13.7.2. This payment factor (PD) will then be used in the Lot Payment calculation formula in Section 410.13.3.1.

TABLE 410.13.7.2

Payment Factors for Pavement Mat Density	
Average Lot Percent Density	Payment Factor (PD)
Greater than 98 %	Note 1
94.00% to 98.00%	102
93.00% to 93.99%	101
91.50% to 92.99% 98.00%	100
88.00% to 91.49%	$= 100 - 4*(91.50\% - \text{Percent density})$
Less than 88%	$= 84 - 10*(88\% - \text{Percent density})$ ^{Note 2}

Note 1 High mat density is only a problem if it leads to asphalt flushing on the surface of the mat or rutting due to an unstable mix. The Division will make a special evaluation of the material and determine the appropriate action.

Note 2 When the density decreases, the mat will be more susceptible to accelerated deterioration and a decrease in the expected service life of the pavement. For mat densities less than 88%, the percent of Contract Bid Price will be decreased by an additional 10% per percentage of mat density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action.

410.13.7.3-Joint Density Adjustments: The adjustment for joint density shall be determined by Table 410.13.7.3. This adjustment is per linear foot and will be multiplied by the total number of linear feet in the lot to determine the total lot adjustment. This is calculated per lot and applied per Section 410.13.8.3.

TABLE 410.13.7.3

Pay Adjustment for Pavement Joint Density per Linear Foot	
Average Lot Percent Density	Price Adjustment (\$ / LF)
Greater than 97 %	Note 3
94.00% to 97.00%	0.40
91.50% to 93.99%	$= [0.40 - \{0.12*(94.00 - \text{Percent Density})\}]$
89.00 % to 97.00%	0
88.00% to 88.99%	-0.20
Less than 88%	$= [\{0.50*(\text{Percent Density} - 88.00)\} - 0.20]$

Note 3 Joint density slightly above 97% is normally only a problem if it leads to asphalt flushing on the surface of the mat or rutting due to an unstable mix. The Division will make a special evaluation of the material and determine the appropriate action.

410.13.7.4-Bond Strength Adjustments: The adjustment for bond strength shall be determined by Table 410.13.7.4. This is calculated per lot and applied per Section 410.13.8.4. This shall be calculated on the theoretical tonnage for the lot, not the actual tonnage used.

TABLE 410.13.7.4	
Pay Adjustment for Bond Strength per 2500 Ton Lot	
Average Lot Bond Strength (PSI)	Price Adjustment (\$ / Lot)
Greater than 150.00	5,000
100.00 to 149.99	= [5,000 – 100*(150.00 – PSI)]
100.00 and Greater	0
75.00 to 99.99	= [1,000*(PSI - 75.00)] – 25,000]
Less than 75.00	- 25,000

410.13.78-Lot Payment Calculations: The pay factors that are calculated with in the specification are to be applied in the following way:

410.13.78.1-PWL Factors: The calculated total PWL for a given lot is applied to the bid unit price for the asphalt mixture in the lot. Once the unit price has been adjusted the quantities can be calculated to arrive at the payment for the lot.

410.13.78.2-Thickness Adjustment: There is no adjustment for thickness greater than the thickness that is specified in the plans. If there is a Price Adjustment (Section 410.13.5) for thickness this factor (percentage) is applied to the contract bid unit price times the quantity in the lot to arrive at a dollar amount penalty. This penalty is applied to the overall payment for the lot.

410.13.78.3-Joint Density Adjustment: If it is determined in Section 410.13.4 of this specification that a Joint Density Adjustment is warranted the dollar amount determined in the formulas of Section 410.13.4 or Table 410.13.7.3 shall be applied to the overall payment for the lot.

410.13.78.4-Bond Strength Adjustment: If it is determined that a Bond Strength Adjustment is warranted ~~by~~ the formulas in Section 410.13.6 or Table 410.13.7.4 shall be used to calculate the adjustment. This adjustment shall be applied to the overall payment for the lot.

410.14-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
410001-*	“design method” Asphalt Base Course, Type “mix type”	Square Yard (Meter)
410002-*	“design method” Asphalt Wear Course, Type “mix type”	Square Yard (Meter)
410007-*	“design method” Asphalt Skid Pavement, Type “mix type”	Square Yard (Meter)

- * Sequence number
 “design method” shall be either Marshall or Superpave
 “mix type” from Table 401.4.2A or 401.4.2B

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 508

DIAMOND GRINDING

508.9-SMOOTHNESS:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE THE FOLLOWING.

Smoothness of the riding surface shall be determined by the Engineer using an inertial profiler. ~~Smoothness incentives based on the International Roughness Index (IRI) shall be as follows:~~

TABLE 508.9-ENGLISH

Posted Speeds \leq 45 mph		Posted Speeds $>$ 45 mph	
Final IRI (inches/mile)	Incentive (\$ per 0.1 mile section)	Final IRI (inches/mile)	Incentive (\$ per 0.1 mile section)
0.00—70.00	\$450.00	0.00—50.00	\$450.00
70.01—100.00	$-11*(IRI)+1220.00$	50.01—65.00	$-22*(IRI)+1550.00$
100.01—135.00	\$0.00	65.01—80.00	\$0.00

TABLE 508.9-METRIC

Posted Speeds \leq 70 km/h		Posted Speeds $>$ 70 km/h	
Final IRI (meters/km)	Incentive (\$ per 0.1 km section)	Final IRI (meters/km)	Incentive (\$ per 0.1 km section)
0.0000—1.1048	\$450.00	0.0000—0.7892	\$450.00
1.1050—1.5784	$-950*(IRI)+1499.56$	0.7893—1.0259	$-1899.54*(IRI)+1949.12$
1.5785—2.1308	\$0.00	1.0261—1.2627	\$0.00

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 720

SMOOTHNESS TESTING

720.5-NATIONAL HIGHWAY SYSTEM (NHS) PAVEMENT PROJECT:

720.5.2-Schedule 1 NHS Pavement Projects:

DELETE TABLE 720.5.2 AND REPLACE THE FOLLOWING.

TABLE 720.5.2

Schedule 1 NHS Pavement Projects

IRI for each 0.1-mile section (in/mi)	Price Adjustment (\$)
30.0 or Less	+600
30.1 to 60.0	-20(IRI) + 1,200
60.1 to 65.0 or Less	0
65.1 to 95.0	-20(IRI) + 1,300
95.1 or Greater	Corrective Action Required

720.5.3-Schedule 2 NHS Pavement Projects:

DELETE TABLE 720.5.3 AND REPLACE THE FOLLOWING.

TABLE 720.5.3

Schedule 2 NHS Pavement Projects

IRI for each 0.1-mile section (in/mi)	Price Adjustment (\$)
46.0 or Less	+600
46.1 to 76.0	-20(IRI) + 1,520
76.1 to 80.0 or Less	0
80.1 to 120.0	1,200 - 15(IRI)
120.1 or Greater	-600

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720.5.4-Schedule 3 NHS Pavement Projects:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE THE FOLLOWING.

NHS pavement projects with a pavement thickness less than three (3) inches and more than one (1) inch shall be classified as Schedule 3 NHS Pavement Projects. The final price adjustments for Schedule 3 NHS Pavement Projects shall be determined using the calculations shown in Table 720.5.3 720.5.4. ~~Payment for any bonus on a project shall require the average IRI for the entire project to be 67 in/mi or less.~~

**TABLE 720.5.4
Schedule 3 NHS Pavement Projects**

IRI for each 0.1-mile section (in/mi)	Price Adjustment (\$)
46.0 or Less	+300
46.1 to 76.0	-10 (IRI) + 760
76.1 to 80.0 or Less	0
80.1 to 120.0	1,200 – 15 (IRI)
120.1 or Greater	-600

720.6-NON-NATIONAL HIGHWAY SYSTEM PAVEMENT PROJECTS:

720.6.3-Final Price Adjustments:

DELETE THE CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING.

~~**720.6.3 Final Price Adjustments:** Final price adjustment incentives shall be calculated using percent improvement. 0.1 mile sections of after project completion data with an IRI of 170 in/mi or greater will be ineligible for final price adjustment and if the average percent improvement for the entire project is less than fifty percent (50%) the project will not be eligible for price adjustments. If the average percent improvement is more than fifty percent the final price adjustments for non-NHS pavement projects shall be determined using the calculations shown in Table 720.6.5.~~

**TABLE 720.6.3
Non-NHS Pavement Projects**

Percent Improvement (%)	Price Adjustment Incentive (\$ per 0.1-mile Section)
50.1 or Greater	18 (Percent Improvement) — 700
50.0 or Less	0
Where:	

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$$\text{Percent Improvement (\%)} = \frac{\text{Before IRI of Lot} - \text{After IRI of same Lot}}{\text{Before IRI of Lot}} \times 100$$

720.6.3-Final Price Adjustments: If the average percent improvement for the entire project is 30.1% or more, no price adjustment will be assessed for the project. If the average percent improvement for the entire project is 30.0% or less, then each 0.1 mile lot that has an IRI of 80.1 or greater, will be penalized based on the following table. Table 720.6.3.

TABLE 720.6.3
Non-NHS Pavement Projects

<u>IRI for each 0.1-mile section</u> <u>(in/mi)</u>	<u>Price Adjustment</u> <u>(\$ per 0.1-mile Section)</u>
80.1 – 170.0	320 - 4(IRI)
170.1 or Greater	-360

Where:

$$\text{Percent Improvement (\%)} = \frac{\text{Before IRI of Lot} - \text{After IRI of same Lot}}{\text{Before IRI of Lot}} \times 100$$

720.7-PROJECT THAT DO NOT FALL UNDER PREVIOUS CHARACTERIZATIONS:

DELETE THE SUBSECTION TITLE AND REPLACE WITH THE FOLLOWING.

720.7-PROJECTS THAT DO NOT FALL UNDER PREVIOUS CHARACTERIZATIONS:

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 711

PAINTS, COATING, OILS, AND INKS

711.5-CONCRETE PROTECTIVE COATINGS AND STAIN:

711.5.2-Physical Requirements:

DELETE BULLET NUMBER iv. IN SUBSECTION 711.5.2 AND REPLACE WITH THE FOLLOWING:

- iv. Color–The color choices ~~permissible~~ shall conform to SAE International AMS-STD-595 A, Federal Standard Colors. The color difference, ΔE , of the acceptance samples shall not be more than five units from the chosen Federal Standard Numbers ~~37925, 36650, 37925, 36622~~.

711.5.3-Approval:

DELETE THE CONTENTS OF SUBSECTION 711.5.3 AND REPLACE WITH THE FOLLOWING:

For approval, the manufacturer shall submit copies of certified test reports to Materials Control, Soils and Testing (MCS&T) Division for review and approval. An independent testing laboratory acceptable to the Division shall perform the tests described herein on representative samples of the material. Tests listed herein are the minimum testing requirements to be met. Attach copies of test procedures which differ from those stated herein. In addition, provide brochures or booklets containing detailed instructions and explanatory remarks about surface preparation, application procedures, and other pertinent operations. The Division may also choose ~~approved products materials~~ from the National Transportation Product Evaluation Program (NTPEP) and/or the North East Protective Coating Committee (NEPCOAT) tested materials.

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711.12-EPOXY COATINGS:

711.12.2-Composition:

DELETE BULLET NUMBER i. IN SUBSECTION 711.12.2 AND REPLACE WITH THE FOLLOWING:

- i. Color–The color ~~permissible-choice~~ shall conform to SAE International AMS-STD-595 A, Federal Standard Colors. The color difference, ΔE , of the acceptance samples shall not be more than five units from the chosen Federal Standard Numbers ~~20062, 26373~~.

711.22-ZINC RICH LOW VOC SYSTEM:

711.22.1-General:

DELETE THE CONTENTS OF SUBSECTION 711.22.1 AND REPLACE WITH THE FOLLOWING:

~~Initial approval of the system will be based on testing of the complete system for specification compliance.~~—Each product in the system shall be from the same paint manufacturer. Each coat shall be a contrasting color to the one previously applied. The use of the intermediate coat meeting 711.22.3, shall be at the option of the paint manufacturer. In either case, the adhesion of the system shall be a minimum of 4A when tested in accordance with ASTM D3359, Method A. The adhesion test shall be conducted approximately 14 days after application of the top coat. All products shall have a maximum VOC of 2.8 lbs / gallon ~~(336 g/l)~~ with exception of the primer, which shall have a maximum VOC of 3.5 lbs / gallon ~~(420 g/l)~~. The paint storage life will be based on manufacturer recommendations. The prime fabricator is responsible for choosing the paint system when shop applied.

711.22.4-Top Coat:

711.22.4.1-Physical Requirements:

DELETE BULLET NUMBER ii. IN SUBSECTION 711.22.4.1 AND REPLACE WITH THE FOLLOWING:

- ii. Color–The color choices ~~permissible~~ shall conform to SAE International AMS-STD-595 A, Federal Standard Colors. The color difference, ΔE , of the acceptance samples shall not be more than five units from the chosen Federal Standard Number ~~20062, 26373~~.

ADD THE FOLLOWING:

711.23-MATERIAL/SYSTEM APPROVAL:

711.23.1-The Division will develop an approved list of products meeting this specification. This list will be placed on the Division’s website. The list may be based upon previous testing performed by the Division, or the Division may choose materials from the National Transportation Product Evaluation Program (NTPEP) and/or the North East Protective Coating Committee (NEPCOAT) tested materials. Upon approval by the Division, further testing may not be required. The Division may request random samples to assure compliance with specification requirements. Upon request, the manufacturer shall supply the MCS&T Division with the following for each product:

- i. One, one-gallon kit of the product
- ii. One gallon thinner
- iii. Instructions for mixing, thinning and application
- iv. Materials Safety Data Sheet for both the paint and thinner
- v. Product data sheet

711.24-SAMPLE SUBMISSION:

711.24.1-All samples for approval testing and all supporting documentation shall be shipped to the address provided below:

West Virginia Division of Highways
Materials Control, Soils and Testing
Paint Laboratory
190 Dry Branch Drive
Charleston, West Virginia, 25306

711.24.2-Paints and coatings submitted for approval testing shall be furnished to the MCS&T Division in appropriate containers not holding more than one gallon of material. Each component shall be labeled appropriately, and the following information shall be provided with the sample:

- i. Name and address of Manufacturer
- ii. Trade Name or Trade Mark
- iii. Type of Paint
- iv. Lot or Batch number
- v. Date of manufacturing
- vi. All SDS/PDS information pertaining to the material
- vii. Reference to the Division’s Standard Specifications

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION

I. GENERAL:

The West Virginia Division of Highways (Division) is committed to assuring the participation of Disadvantaged Business Enterprises (DBEs) in our highway construction program managed by the Civil Rights Compliance (CRC) Division. In support of this commitment and in compliance with the requirements for contracts funded, in whole or part, with assistance from the United States Department of Transportation (USDOT), the Division requires that any contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of USDOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Division deems appropriate.

The contractor shall designate and make known to the Division a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of Disadvantaged Business Enterprises (DBEs).

If a formal goal has not been designated for this contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of materials and services needed for the performance of this work.

The contractor is encouraged to use the services of banks owned and controlled by minorities or women. Agreements between a bidder/proposer and the DBE in which the DBE promises not to provide subcontracting quotations to other bidders/proposers are prohibited.

II. DEFINITIONS:

- A. “Disadvantaged Business Enterprise”** means a firm that is certified as a DBE, in accordance with the provisions of 49 CFR §26, by the West Virginia Department of Transportation’s DBE Unified Certification Program.
- B. “USDOT-assisted contract”** means any contract between the Division and a contractor (at any tier) funded in whole or part with USDOT financial assistance, including letters of credit or loan guarantees, except a contract solely for the purchase of land.
- C. “Good faith efforts”** means efforts to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement.
- D. “Joint venture”** means an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their

property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

- E. **“Primary industry classification”** means the North American Industrial Classification System (NAICS) designation which best describes the primary business of a firm. The NAICS is described in the *North American Industry Classification Manual—United States*, which is available via the internet at the U.S. Census Bureau Web site: <http://www.census.gov/eos/www/naics/>.

III. DBE CERTIFICATION REQUIREMENTS:

- A. In order to be classified as a DBE under this specification, a firm must be approved by the DBE Unified Certification Program prior to the letting date of any project in which a firm wants to participate as DBE.
- B. Under 49 CFR Part 26.71(n), DBE firms are not certified in general terms, in a way that makes every type of work performed eligible for DBE credit. Rather, the WVDOT, through its Unified Certification Program, will grant certification to a firm only for specific types of work which the socially and economically disadvantaged owners have the ability to control.
- C. The DBE rule requires all certification actions, including those expanding the types of work a firm is authorized to perform for DBE credit, to be made final before the date on which bidders on a prime contract must respond to a solicitation [49 CFR 26.81(c)].
- D. The DBE Uniform Certification Application and related documents, as well as the directories of certified DBE consulting and contracting firms, may also be obtained from the Division online at: <http://www.transportation.wv.gov/eo/DBE/Pages/default.aspx>

IV. DBE GOAL:

- A. The DBE goal determined by the West Virginia Division of Highways for this contract is _____% of the contract bid amount.
- B. The contractor shall indicate its goal in the appropriate space in Section C, Item 3 – Contractor’s Goal for DBE Participation, of the Notice contained in the project proposal. The goal so indicated will be used in determining the award of the contract in accordance with this Special Provision and Section 103 of the Standard Specifications.

V. CONTRACTOR’S DBE PLAN:

- A. **Plan requirements.** All bidders ~~are encouraged to shall~~ submit their DBE Participation Plan (Section C – Contractor’s Plan for DBE Participation) ~~with their bid; or no later than 5 calendar days after bid opening when submitting his/her bid on www.Bidx.com, as described in the Notice contained in the project proposal. A Participation Plan form is attached to this provision.~~ The Plan shall include the following:
1. Name of DBE Subcontractor(s) or Suppliers(s).
 2. Description of work each is to perform, to include: Line Number, Item Number, Description, ~~Type of Work~~, Quantity, Unit, Unit Cost and Total Cost.
 3. The dollar value of each proposed DBE subcontract and the percentage of the total contract value represented by combined DBE participation; the extent to which

payments to DBEs may be counted as DBE participation is set forth in Section VIII., DBE Participation Requirements, below.

4. ~~Written and signed documentation Submitting the Plan to the Division on www.Bidx.com, as described in Section C of the proposal document shall be considered assurance~~ of the bidder's commitment to use a DBE subcontractor whose participation is being utilized to meet the DBE contract goal.
 5. Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment, and any other documentation deemed necessary by the Civil Rights Compliance (CRC) Division, must be submitted to the CRC Division before a contractor's DBE Plan will be approved.
 6. Plans ~~may shall~~ be submitted ~~by e-mail to Error! Hyperlink reference not valid., fax 304-558-4236, or personal delivery and must be received by the WVDOT CRC Division no later than 4:00 p.m. eastern time on the submission due date with the bid in www.Bidx.com.~~
- B. Effect of Failure to Submit a Plan.** ~~The bidder who does not submit a DBE Participation plan with the bid shall submit it no later than 5 calendar days after the bid opening as a matter of responsibility. Failure to submit all required information within the required time frame shall be just cause for the annulment of award; and the amount of the guaranty deposited with the Proposal may be retained by the Division and deposited in the Division of Highways Fund, not as a penalty, but as liquidated damages. a DBE Plan with the bid, or failure to provide the Division any requested documentation within five (5) calendar days of the request, is cause to deem the bidder irresponsible. An irresponsible bidder forfeits its guaranty bond, and the bond will be deposited to the Division of Highways fund. The award may then be made to the next lowest responsible bidder, or the work may be readvertised or otherwise, as decided by the Division may decide.~~
- C. Qualification of DBEs in Plan.** In order to be accepted under this program all DBE subcontractors and suppliers of materials or services must be certified for the applicable Type of Work and NAICS code, in accordance with Section III of this provision, at the time of the letting.
- If a DBE firm has not been certified for the type of work it is intending to perform on a given contract, then the Division of Highways cannot count the firm's participation on that contract toward meeting DBE contract goals or the agency's overall DBE goal. If a bidder has submitted a bid with DBE participation in response to the DBE goal, and the DBE firm named in the bid documents has not been certified in the type of work that the DBE firm would perform on the contract, then the bid shall not be considered because it does not qualify as a responsible bid.
- D. Changes to DBE Participation Plan.** The contractor shall utilize the specific DBEs listed on the DBE Participation Plan to perform the work and supply the materials for which each is listed unless the contractor obtains written consent by the CRC Division. Unless written consent is provided, the contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.
- E. Termination of a DBE from DBE Participation Plan.** A prime contractor cannot terminate a DBE subcontractor listed on an approved DBE Participation Plan without good cause, documented by the prior written consent of the Division. For the purposes of this paragraph, good cause includes, but is not limited to, the following circumstances:

1. The listed DBE subcontractor fails or refuses to execute a written contract;
 2. The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
 3. The listed DBE subcontractor fails or refuses to meet the prime contractor's after-bid-award reasonable, non-discriminatory bond requirements;
 4. The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
 5. The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215, and 1200 or applicable State law;
 6. The WV Department of Transportation has determined that the listed DBE subcontractor is not a responsible contractor;
 7. The listed DBE subcontractor voluntarily withdraws from the project and provides written notice to the Division of its withdrawal;
 8. The listed DBE is ineligible to receive DBE credit for the type of work required;
 9. A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;
 10. Other documented good cause as determined by the Division.
- F. Termination without Good Cause.** Good cause does not exist if the prime contractor seeks to terminate a DBE upon which it relied to obtain the contract if the reason for the proposed termination is so that the prime contractor can self-perform the work for which the DBE contractor was engaged or so that the prime contractor can substitute another DBE or non-DBE contractor after contract award.
- G. Procedure for Terminating DBE from DBE Participation Plan.** In order to obtain Division approval to terminate and/or substitute a DBE subcontractor, the following steps are required:
1. The prime contractor must give notice in writing to the DBE subcontractor, with a copy to the Division, of its intent to request to terminate and/or substitute; the notice must state the reason for the termination and/or substitution and must give the DBE subcontractor five (5) calendar days to respond to the notice.
 2. The DBE subcontractor must respond to the notice within the five calendar day period and advise the Division and the prime contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Division should not approve the prime contractor's action; if required in a particular case as a matter of public necessity (*e.g.* safety), the Division may provide a response period shorter than five days.
 3. In addition to post-award terminations, the provisions of this bullet (G) *Procedure for Terminating DBE from DBE Participation Plan* apply to pre-award deletions of, or substitutions for, DBE firms put forward by offerors in negotiated procurements.

VI. CONTRACT AWARD REQUIREMENTS:

- A. Good Faith Efforts Required.** In order to be deemed responsible and be awarded this contract, a bidder must demonstrate good faith efforts to meet the DBE goal established by the Division. The bidder can meet this good faith requirement in either of two ways:
1. The bidder can meet the goal, documenting commitments for participation by DBE firms sufficient for this purpose on a Contractor’s Plan for DBE Participation (a sample is attached to this Special Provision), or
 2. The bidder can document adequate good faith efforts showing that the bidder took all necessary and reasonable steps to achieve a DBE goal which, by their scope, intensity, and appropriateness to the objective, would be reasonably expected to obtain sufficient DBE participation, even if they were not fully successful.

The following is a list of types of actions that will be considered as part of the bidder’s good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

- a. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.
- b. Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.
- c. Providing interested DBEs with adequate information about the plans, specifications and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- d. Negotiating in good faith with interested DBEs.
 - i. It is the bidder’s responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.
 - ii. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm’s price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder’s failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of

the responsibility to make good faith efforts. Prime contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

- e. Not rejecting DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities. The contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the contractor's efforts to meet the project goal.
- f. Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance required by the Division or contractor.
- g. Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- h. Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

B. Determining Good Faith Efforts. In determining whether a bidder has made good faith efforts, the Division may take into account the performance of other bidders in meeting the contract. For example, when the apparent successful bidder fails to meet the contract goal, but others meet it, the Division may reasonably raise the question of whether, with additional reasonable efforts, the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the goal, but meets or exceeds the average DBE participation obtained by other bidders, the Division may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made good faith efforts.

C. Documentation of Good Faith Effort. When the established contract goal is not being met, all documentation of good faith effort must be submitted to the CRC Division, and must be received no later than five (5) calendar days after bid opening as a matter of responsibility. Contractors who fail to demonstrate that good faith efforts were made prior to the bid shall not be eligible to be awarded the contract. The Division may take any efforts it deems appropriate to assure the completeness and accuracy of documentation submitted to demonstrate good faith efforts.

D. Bidder's Assurance. ~~The bidder's signature in Section J of the Notice contained in this proposal~~ Submitting the bid to the Division on www.Bidx.com shall be ~~written considered~~ assurance he/she will comply with this special provision. The Contractor's proposed DBE goal percent (Section C-~~Item 3~~) must be completed or the bid will be deemed irregular.

E. Failure to Demonstrate Good Faith Effort. A bid that fails to demonstrate good faith effort MUST be excluded from consideration as non-responsible. Under 49 CFR 26.53(a), when there is a contract goal the Division "must award the contract only to a bidder who makes a good faith effort to meet it." Federal funds cannot be used to fund contract activities that are not in compliance with 49 CFR Part 26. If the Division determines that the apparent successful bidder has failed to meet the requirements to demonstrate good faith effort, the Division will, before taking any further action, provide

the bidder an opportunity for administrative reconsideration of the Division's determination.

1. As part of this reconsideration, the bidder will have the opportunity to provide written documentation or argument concerning the issue of whether it made adequate good faith effort, by either meeting the contract goal or by documenting its actions to do so.
2. The Division's decision on reconsideration will be made by an official who did not take part in the original determination that the bidder failed to make adequate good faith effort.
3. The bidder will have the opportunity to meet in person with the reconsideration official to discuss the issue of whether it made adequate good faith effort.
4. The Division will send the bidder a written decision on reconsideration, explaining the basis for finding that the bidder did or did not make good faith effort.
5. The result of the reconsideration process is not appealable to the U.S. Department of Transportation.

VII. CONTRACT COMPLIANCE REQUIREMENTS:

Each contractor or subcontractor that fails to carry out the requirements set forth below will be subject to a breach of contract and, after notification to the Federal Highway Administration, the West Virginia Division of Highways may terminate the contract or subcontract or initiate other such remedy as deemed appropriate.

- A. Policy.** It is the policy of the West Virginia Division of Highways to ensure non-discrimination in the award and administration of USDOT-assisted contracts, to create a level playing field on which DBEs can compete fairly for USDOT-assisted contracts, to ensure that the DBE program is narrowly tailored in accordance with applicable law, to ensure that only firms that fully meet eligibility standards are permitted to participate as DBEs, to help remove barriers to the participation of DBEs in USDOT-assisted contracts, and to assist in the development of firms that can compete successfully in the marketplace outside the DBE program. Consequently, the DBE requirements of 49 CFR Part 26 apply to this contract.
- B. DBE Obligation.** By execution of the contract, the contractor expressly accepts and agrees to the following assurance, and further agrees to include this assurance in each and every subcontract executed between the prime contractor and a subcontractor: The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of USDOT-assisted contracts.
- C. Sanctions.** Failure by the prime contractor to fulfill the DBE requirements and to demonstrate good faith efforts constitutes a breach of contract. In the event of a breach of contract, the Division may take the following actions:
 1. Withholding of progress payments.
 2. Withholding payment to the prime contractor in an amount equal to the unmet portion of the contract goal.
 3. Termination of the contract.
 4. Such other remedy as the Division deems appropriate.

- D. Records and Reports.** All contractors must keep detailed records and provide regular reports to the Division on a quarterly basis, or as requested, on their progress in meeting contractual DBE obligations. These records may include, but are not be limited to, payroll, lease agreements, cancelled payroll checks, cancelled supply and material checks, and executed subcontracting agreements. At the end of each quarter, prime contractors will be requested to submit certified reports on monies paid to each DBE subcontractor/supplier on all active USDOT-assisted contracts.

VIII. COUNTING DBE PARTICIPATION TOWARD GOAL REQUIREMENTS:

The Division will only count expenditures to a DBE contractor toward DBE goals if the DBE is performing a commercially useful function on the contract. A commercially useful function is generally being performed when a DBE is responsible for the execution of a distinct element of the work and is carrying out its responsibilities by actually performing, managing and supervising the work involved in accordance with normal industry practice (except where such practices are inconsistent with the DBE regulations and these guidelines) and when the DBE firm receives due compensation as agreed upon for the work performed. Regardless of whether an arrangement between the contractor and the DBE represent standard industry practice, if the arrangement erodes the ownership, control or independence of the DBE or does not meet the commercially useful function requirement, sanctions against the DBE firm and the prime contractor may be pursued.

- A. DBE Management:** The DBE must be responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering materials, and installing (where applicable) and paying for the material itself. The DBE must perform the work of the contract with its own work force.

If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, the Division will presume that the DBE is not performing a commercially useful function; the DBE may present evidence to rebut this presumption.

When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the DBE's subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward DBE goals.

The Division's decisions on commercially useful function are reviewable by the Federal Highway Administration, but are not appealable to the USDOT.

- B. Equipment:** In order to perform a commercially useful function the DBE subcontractor shall be responsible for any equipment necessary to complete the work within the approved Participation Plan.
1. The DBE may lease equipment consistent with standard industry practices.
 - a. The DBE shall be responsible for negotiating the cost, arranging for the delivery of, and paying for leased equipment.
 - b. Copies of the lease agreements shall be submitted for approval by the Division prior to the work being performed.

- c. The DBE subcontractor shall provide paid invoices to the Division for all leased equipment.
 2. The cost of equipment leased from the prime contractor or its affiliates will not be counted towards the goal. The Division does not consider a DBE subcontractor as performing a commercially useful function when it leases equipment from a prime contractor and the equipment is a critical element of the DBE's ability to perform its contract. All leasing agreements, including incidental equipment leasing agreements between the prime contractor and the DBE subcontractor must be submitted to and approved by the WVDOT EEO Division prior to performance of the work.
- C. Materials:** The DBE shall negotiate the cost, determine quality and quantity, arrange delivery of, install (where applicable) and pay for the materials and supplies required for the work of the contract. Invoices for materials should be in the name of the DBE firm not the prime contractor. The Division will count expenditures by DBEs for materials or supplies toward DBE goals as provided in the following;
1. If the materials or supplies are obtained from a DBE manufacturer, count 100 percent of the cost of the materials or supplies toward DBE goals. For the purposes of this paragraph, a manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
 2. If the materials or supplies are purchased from a DBE regular dealer, count 60 percent of the cost of the materials or supplies toward DBE goals. A regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers.
 3. With respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of materials or supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, toward DBE goals, provided the fees are reasonable and not excessive as compared with fees customarily allowed for similar services. The Division will not count any portion of the cost of the materials and supplies themselves toward DBE goals, however.

The WVDOT may allow the use of joint checks to purchase material/supplies used by the DBE when the following conditions are met: (1) the prime contractor acts solely as a guarantor, (2) the DBE must release the check to the supplier, (3) such payment arrangements are available to all subcontractors and not restricted to DBE's, (4) advance approval is obtained by WVDOT EEO Division.
 4. If the materials or supplies are obtained from the prime contractor or an affiliate of the prime contractor, the cost of the materials or supplies will not be counted toward the goal.

D. DBE Trucking Firms: To be certified as a DBE trucking firm, the firm must own at least one fully operational truck that is fully licensed and insured and that is used on a day to day basis. DBE trucking firms must be covered by a subcontract or a written agreement approved by the DOT EEO office prior to performing their portion of the work. In order to perform a commercially useful function, the DBE trucking firm is restricted to the same subcontracting limitation in effect for other contractors. The DBE trucking firm must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a this contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.

1. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
2. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
3. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of transportation services provided by DBE-owned trucks on the contract. The DBE is entitled to credit for the total value of transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract.

Example – DBE Firm X uses two of its own trucks on a contract. It leases two trucks from DBE Firm Y and six trucks from non-DBE Firm Z. DBE credit would be awarded for the total value of transportation services provided by Firm X and Firm Y, and may also be awarded the total value of transportation services provided by four of the six trucks provided by Firm Z. In all, full credit would be allowed for the participation of eight trucks. With respect to the other two trucks provided by Firm Z, DBE credit could be awarded only for the fees or commissions pertaining to those trucks Firm X receives as a result of the lease with firm Z.

4. A lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

G. Suspensions and Decertification's: If any DBE listed on the *Contractor's DBE Plan* has been suspended or decertified as a DBE **before** the execution of a subcontract agreement between the Prime and the DBE, the DBE's proposed work cannot be counted toward the project's DBE goal. Conversely, if a DBE has been suspended or decertified **after** the Prime and the DBE have executed a subcontract agreement, the contractor may continue to use the DBE and will continue to receive credit toward the project's DBE goal.

H. North American Industrial Classification (NAIC):

DBE work can only be counted toward meeting the contract DBE goal if the work to be performed by the DBE is:

1. Within the Type of Work for which the DBE is certified AND

2. Within the classification of the North American Industry Classification System (6 digit NAIC codes) approved for the DBE.

PARTICIPATION OF A DBE SUBCONTRACTOR WILL NOT BE COUNTED TOWARD A CONTRACTOR'S FINAL COMPLIANCE WITH ITS DBE OBLIGATIONS ON A CONTRACT UNTIL THE AMOUNT BEING COUNTED HAS ACTUALLY BEEN PAID TO THE DBE.

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**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION
CONTRACTOR’S PLAN FOR DBE PARTICIPATION**

[1] DBE Sub-Contractor or Supplier	[2] Line Number	[3] Item Number	[4] Description	[5] Type of Work (from DBE Directory)	[6] Quantity	[7] Unit	[8] Unit Cost	[9] Total Cost

[10] CONTRACTOR’S DBE GOAL: TOTAL COST OF ALL DBE PARTICIPATION \$_____. PERCENT OF TOTAL BID AMOUNT: _____

EXPLANATORY NOTES:

- “DBE Sub-Contractor” (column [1]), for the purpose of this certificate, means a disadvantaged business as defined by Special Provisions in this Proposal.
- If material is to be supplied, the figure in column [9] shall not exceed 60% of the actual cost unless the material is manufactured by a DBE; if material IS manufactured by a DBE, 100% of the cost may be recorded.
- If material is not supplied by a regular dealer as defined in 49 C.F.R. 26.55€(2)(ii), the figure in column [9] shall only include a reasonable and customary fee or commission for providing a bona fide service.
- For line [10], enter the total cost of DBE participation and the percentage of the total contract bid amount that this total DBE cost represents.
- The Contractor’s authorized signature on this plan shall serve as documentation of commitment to use the DBE subcontractor(s) listed above by the contractor to meet the contract goal.
- The Contractor shall submit written and signed confirmation from the DBE that it is participating in the contract **as provided in the prime contractor’s commitment.**

Authorized Signature _____

Title _____

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 106

CONTROL OF MATERIALS

106.1-SOURCE OF SUPPLY AND QUALITY REQUIREMENTS:

106.1.1-State Requirements Governing Domestic Aluminum, Glass, and Steel:

106.1.1.1-Definitions: Unless the context in which used clearly requires a different meaning, as used in this section:

“Public Works” includes roads, highways, streets, bridges, sidewalks, sewage systems, buildings, engineering and architectural works, and any other structure, facility or improvement constructed or undertaken by the Division.

“Aluminum and glass products” means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated, or otherwise similarly processed from aluminum and glass.

“Domestic aluminum and glass products” means aluminum and glass products for which all manufacturing processes, including application of a coating, have occurred in the United States.

“Steel products” means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more of such operations, from steel made by the open hearth, basic oxygen, electric furnace, Bessemer or other steel making process.

“Domestic steel products” means steel products for which all manufacturing processes, including application of a coating, have occurred in the United States.

“Coating” means all processes that protect or enhance the value of a material or product to which it is applied, such as, but not limited to, epoxy coatings, galvanizing, and painting.

“State contract project” means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of any materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited.

“United States” means the United States of America and includes all territory, continental or insular, subject to the jurisdiction of the United States.

106.1.1.2-State Preference For Domestic Aluminum and Glass Products: Any aluminum or glass products to be supplied in the performance of any contract or subcontract for the construction, reconstruction, alteration, repair, improvement, or

maintenance of public works or for the purchase of any item of machinery or equipment to be used at the sites of public works shall be manufactured in the United States and compliant with Chapter 5, Article 19 of the West Virginia Code. This requirement applies to all federal and state public works contracts, including state purchase order contracts. This requirement does not apply to any contract awarded in an amount less than or equal to \$50,000.

The Division shall not authorize or make any payments to a Contractor not fully compliant with this requirement. Prior to any payment, the Division shall require the Contractor to furnish a certificate of compliance which covers all materials and products involved, including those of any subcontractors and suppliers. Any payments made by the Division to any Contractor who did not fully comply with this requirement may be recovered by the Division.

106.1.1.3-State Preference For Domestic Steel Products: Any steel products used or supplied for a state contract project shall be manufactured, including the application of any coatings, in the United States and compliant with Chapter 5, Article 19 and Chapter 5A, Article 3, Section 56 of the West Virginia Code, entitled the “West Virginia American Steel Act of 2001.” This requirement applies to all federal and state contracts, including state purchase order contracts.

The Division shall not authorize or make any payments to a Contractor not fully compliant with this requirement. Prior to any payment, the Division shall require the Contractor to furnish a certificate of compliance which covers all materials and products involved, including those of any subcontractors and suppliers. Any payment made to any Contractor who did not fully comply with this requirement may be recovered by the Division.

106.1.1.4-Exceptions: Any exceptions to state preference requirements for domestic aluminum, glass, and steel products will be in accordance with MP 106.XX.XX and shall be compliant with Chapter 5, Article 19 and Chapter 5A, Article 3, Section 56 of the West Virginia Code.

When foreign-made aluminum, glass, and steel products are used or supplied in compliance with an approved exception, the Contractor shall be responsible for providing procedures acceptable to the Division for determining that specification requirements are met, including all inspections at no additional cost to the Division. The use of foreign-made products will not be reason for grant an extension of contract time.

106.1.2-Federal Requirements Governing Domestic Steel, Iron, and Construction Materials:

106.1.2.1-Definitions: Unless the context in which used clearly requires a different meaning, as used in this section:

“Material” means any tangible substance incorporated into a Federal-aid highway project.

“Federal-aid highway project” means highway construction, maintenance, and utility projects funded in whole or in part with Federal-aid funds.

“Manufacturing process” means any process which modifies the chemical content, the physical size or shape, or the final finish of a material, including melting and mixing, rolling, extruding, machining, bending, grinding, drilling, and coating.

“Coating” means all processes which protect or enhance the value of the material to which the coating is applied.

“Construction material” means an article, material, or supply that is or consists primarily of non-ferrous metals, plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), glass (including optic glass), lumber, or drywall.

106.1.2.2-Federal Use of Domestic Steel and Iron: Any steel or iron materials used for a Federal-aid highway project shall be manufactured in the United States and compliant with 23 U.S.C. 313 and 23 CFR 635.410, entitled “Buy America Requirements.” No steel or iron materials may be used for a Federal-aid highway project unless all manufacturing processes, including application of a coating, occur in the United States. Buy America also applies to all Federal-aid eligible projects within the scope of a finding, determination, or decision under the National Environmental Policy Act (NEPA), regardless of funding source, if at least one contract within the scope of the NEPA decision is funded with Federal funding provided under Title 23.

Buy America requirements do not apply to non-ferrous alloy materials used to make steel or any raw materials (iron ore and alloys), scrap, pig iron, or processed, pelletized, and reduced iron ore. Buy America requirements do not apply to temporary elements not permanently incorporated into a project, such as falsework, temporary sheet piling, detour bridges and the like; temporary elements left in place at the Contractor’s convenience, unless the contract plans and specifications require steel or iron components (i.e. stay-in-place forms, ties for steel, sheet piling, etc.) or imply that the item be left in place; or items that are simply moved from one place to another within the same project.

When steel or iron materials are used, the Contractor shall supply adequate documentation certifying compliance with Buy America requirements prior to the permanent incorporation of the materials into the project. Any exception to Federal Buy America requirements for domestic steel and iron will be in accordance with MP 106.XX.XX and shall be compliant with 23 U.S.C. 313 and 23 CFR 635.410.

106.1.2.3-Federal Use of Domestic Construction Materials: Any construction materials, as defined in Section 106.1.2.1, used for a Federal-aid highway construction project shall be manufactured in the United States and compliant with the “Infrastructure Investment and Jobs Act,” Section 70901-52, entitled the “Build America, Buy America Act.” No construction material may be used for a Federal-aid highway project unless all manufacturing processes, including application of a coating, occur in the United States. Buy America also applies to all Federal-aid eligible projects within the scope of a finding, determination, or decision under the National Environmental Policy Act (NEPA), regardless of the funding source, if at least one contract within the scope of the NEPA decision is funded with Federal funding provided under Title 23.

Buy America only applies to construction materials that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment,

and supplies, such as temporary scaffolding, removed at or before completion of the project. Nor does Buy America apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished project, but are not an integral part of or permanently affixed to the structure.

When construction materials are used, the Contractor shall supply adequate documentation certifying compliance with Buy America requirements prior to the permanent incorporation of the materials into the project.

Any exceptions to Federal Buy America requirements for domestic construction materials will be in accordance with MP 106.XX.XX and shall be compliant with the Build America, Buy America Act.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 109

MEASUREMENT AND PAYMENT

109.20-LOAD LIMIT VIOLATIONS AND WEIGH TICKETS:

DELETE THE TITLE AND CONTENTS OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

~~109.20-LOAD LIMIT VIOLATIONS AND WEIGH TICKETS:~~

The Allowable Gross Weight for any vehicle being used to haul materials on publicly maintained highways under the terms of this contract shall be as follows.

Title 23 Code of Federal Regulations, Section 658.17, establishes maximum allowable gross weight on the Interstate System. The maximum allowable gross weight on WV and US Routes will be as established in Chapter 17C, Articles 17 and 17A of the Official Code of West Virginia, as amended. The Public Service Commission, Weight Enforcement Section is responsible for the enforcement of these provisions.

A weigh ticket shall be required with each load of material from a commercial source which would normally have truck scales. This includes, but is not limited to, all asphalt paving materials and all aggregates regardless of the contract pay unit. The weigh ticket shall include gross, tare, and net weights, time and date of loading, Item Number or Description of Materials, Contract Number or Project Number, number of axles on haul unit, license number of haul unit, and signature of the weigher certifying that all information on the ticket is correct. If the weigher's name is printed by the computer on the ticket, then it only needs to be initialed by the weigher.

~~_____ The Department will accept electronic ticket delivery (e ticket) as documentation on projects provided that the standard information currently provided on the paper ticket is included on the e-ticket. The e-ticketing system must provide WVDOH field personnel the ability to access tickets from a smartphone, tablet, or laptop and to make notes associated with each ticket if needed. The service must also provide a daily summary report. A digital signature of the weigh person on an e-ticket or daily summary report shall be considered the equivalent as a hand signed/initialed, printed ticket.~~

For material from a commercial source or a batch plant, which would not normally have truck scales, a weigh ticket documenting the tare weight, number of axles on the haul unit, license number of haul unit, date weighed, location of scales, and signature of the weigher certifying that all information on the ticket is correct, may be supplied for each haul unit as an alternate to the ticket required in the previous paragraph. The tare weight ticket shall be supplied for each contract

on a yearly basis and when modifications are made to the vehicle or combination of vehicles. The weight of the material delivered shall be calculated and furnished by the vendor/supplier shipping the material to the project site or DOH facility. This includes, but is not limited to, concrete, structural steel, piling, reinforcing steel and all prepackaged material of known weight, such as cement, grout, fertilizer, lime, abrasives, etc.

If the haul unit is a combination of vehicles, the license number shall be supplied for each component. The tare weight shall be for the complete haul unit.

All weighing shall be done on scales approved and sealed by the West Virginia Division of Labor, Bureau of Weights and Measures. If the scales are moved or upon the request of the Engineer, the scales shall be reapproved and sealed. The Engineer shall be notified of any scale malfunctions. The Division of Highways may, at its option, accept inspection and sealing by out of state agencies when the material is being loaded outside West Virginia.

Any material, covered by this provision, which is delivered without the proper weigh ticket shall not be accepted by the Division of Highways.

Nothing in this provision relieves any party from compliance with the State Law on load limits or any fines which may be assessed for violation of said law.

ADD THE FOLLOWING:

109.20.1-Electronic Ticket Delivery: In addition, for asphalt, aggregate, and concrete, electronic ticket delivery (e-tickets) shall be required with the standard information provided as on the paper ticket. The e-ticketing system must provide WVDOH field personnel the ability to access tickets from a smartphone, tablet, or laptop and to make notes associated with each ticket if needed. The service must also provide a daily summary report. A digital signature of the weigh person on an e-ticket or daily summary report shall be considered the equivalent as a hand-signed/initialed, printed ticket.

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

**SECTION 401
ASPHALT BASE, WEARING, AND
PATCHING AND LEVELING COURSES**

DELETE THE ENTIRE CONTENTS AND REPLACE WITH THE FOLLOWING:

401.1-DESCRIPTION:

This work shall consist of constructing one or more courses of ~~hot mix asphalt (HMA) or warm mix asphalt (WMA)~~ asphalt concrete, mixed mechanically in a plant, composed of aggregate and asphalt material designed in accordance with either the Marshall or Superpave design system as specified in the contract documents, on a prepared foundation in accordance with these specifications and in reasonable close conformity with the lines, grades, weights or thicknesses, and cross sections shown on the Plans or established by the Engineer.

The unit of measurement for ~~HMA or WMA~~ asphalt concrete will be by the ton, square yard or cubic yard. The work will be accepted in accordance with these Specifications and the applicable requirements of Sections 105, 106, and 109.

401.2-MATERIALS:

The materials shall conform to the following requirements:

MATERIAL	SUBSECTION
Coarse Aggregate	703.1 thru 703.3 ^{Note 1 & Note 2} (See MP 401.02.28 for exceptions and additions required for Superpave Items.)
Fine Aggregate	702.3 (See MP 401.02.28 for additions required for Superpave Items)
Mineral Filler	702.4
Performance Graded Binders	705.5

Note 1 The total shale, coal and other lightweight deleterious material and friable particles shall not exceed 3%.

Note 2 When slag is specified in the contract, the coarse aggregate shall be slag which meets the requirements of 703.3, except as amended in this subsection.

401.2.1–Performance Graded Binder Grade: The standard grade for Performance

Graded (PG) binders shall be PG 64S-22, any deviation will be noted in the contract documents. PG 64H-22 shall be used on projects specified with over 20 million ESALs over the design life. PG 64S-22 binder may be used in asphalt placed below the top two lifts in any pavement section, scratch course and patching-and-leveling are not identified as lifts.

CONSTRUCTION METHODS

401.3-GENERAL:

Construction methods to be used in performing the work shall be submitted to the Engineer for review prior to the start of work. This review may require modification of the proposed methods to provide the desired end product. All equipment, tools, machinery, and plant shall be maintained in a satisfactory working condition.

401.4-COMPOSITION OF MIXTURES:

401.4.1-General: The aggregate for use in the designated mixture shall consist of a mixture of aggregate (coarse, fine, reclaimed asphalt pavement (RAP) if desired, or mixture thereof) and mineral filler if required. It shall be the responsibility of the Contractor to determine the percentage of RAP to be used in the mix. The amount and grade of virgin PG Binder to be used in the RAP designs shall be determined in accordance with Materials Procedure (MP) 401.02.24.

401.4.2-Job Mix Formula: Job Mix Formula (JMF) is the specification for a single mix produced at a single plant. This mix may be specific to a single project or be used on multiple projects if the basic design criteria (design compaction level and PG Binder grade) are the same.

The Contractor shall submit a proposed JMF for each combination of aggregate and asphalt material for each type of ~~HMA-asphalt concrete~~ to be produced. Depending on the design type, the JMF gradations shall be within the tolerances set forth in either Table 401.4.2A or Table 401.4.2B. Marshall mix designs shall be developed in accordance with MP 401.02.22. Superpave mix designs shall be developed in accordance with MP 401.02.28.

Each proposed JMF must be documented on the Division Form T400 ~~or T400SP~~ and the entire JMF package shall be forwarded for review to the District Materials Engineer/Supervisor. The T400/~~T400SP~~ and JMF package shall then be transmitted to the Materials Control, Soils and Testing Division for final review. If the JMF requires revision, it will be returned to the designer through the District. The T400 ~~/T400SP~~ Form shall contain the following information:

- i. Identification of the source and type of materials used in the design.
- ii. The aggregate blend percentages and the percentage for each sieve fraction of aggregate considered the desirable target for that fraction.
- iii. The percentage of asphalt binder representing the optimum asphalt content for the JMF submitted, which is to be considered the desirable target percentage.
- iv. The temperature of the completed mixture at the plant which shall be within $\pm 25^{\circ}\text{F}$ of the median mix temperature established by the temperature-viscosity chart or as recommended by the asphalt supplier.
- v. The ratio (calculated to the nearest one-tenth percent) of the Fines to Asphalt (FA). For Marshall mixes the ratio is defined as the percentage of aggregate passing the No. 200 (75 μm) sieve, divided by the percentage of asphalt content calculated at the percentage

optimum asphalt content of the design. For Superpave mixes the ratio is defined as the percentage of aggregate passing the 75 µm (No. 200) sieve, divided by the percentage of effective asphalt content calculated at the percentage optimum asphalt content of the design.

TABLE 401.4.2A
Design Aggregate Gradation Requirements for Marshall Mix Designs

Type of Mix	Base-I	Base-II (Patch & Level)	Wearing IV	Wearing-I (Scratch-I)	Wearing-III (Scratch-III)
Sieve Size	Nominal Maximum Size				
	1 ½ in (37.5 mm)	¾ in (19 mm)	¾ in (19 mm)	3/8 in (9.5 mm)	No. 4 (4.75 mm)
2 in (50 mm)	100	–	–	–	–
1 ½ in (37.5 mm)	90-100	–	–	–	–
1 in (25 mm)	90 max	100	100	–	–
¾ in (19 mm)	–	90-100	90-100	–	–
½ in (12.5 mm)	–	90 max	90 max	100	–
3/8 in (9.5 mm)	–	–	–	85-100	100
No. 4 (4.75 mm)	–	–	47 min	80 max	90-100
No. 8 (2.36 mm)	15-36	20-50	20-50	30-55	90 max
No. 16 (1.18 mm)	–	–	–	–	40-65
No. 30 (600 µm)	–	–	–	–	–
No. 50 (300 µm)	–	–	–	–	–
No. 200 (75 µm)	1-6	2-8	2-8	2-9	3-11

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**TABLE 401.4.2B
Design Aggregate Gradation Requirements for Superpave Mix Designs**

Type of Mix	37.5	25	19 ^{Note 1} (Patch & Level)	12.5	9.5 (Scratch)	4.75 (Scratch)
Standard Sieve Size	Nominal Maximum Size					
	37.5 mm (1 ½ inch)	25 mm (1 inch)	19 mm (¾ inch)	12.5 mm (½ inch)	9.5 mm (⅜ inch)	4.75 (No. 4)
50 mm (2")	100	–	–	–	–	–
37.5 mm (1½")	90-100	100	–	–	–	–
25 mm (1")	90 max	90-100	100	–	–	–
19 mm (¾")	–	90 max	90-100	100	–	–
12.5 mm (½")	–	–	90 max	90-100	100	100
9.5 mm (⅜")	–	–	–	90 max	90-100	95-100
4.75 mm (No.4)	–	–	–	–	90 max	90-100
2.36 mm (No.8)	15-41	19-45	23- 49	28-58	32-67	
1.18 mm (No.16)	–	–	–	–	–	30-60
600 µm (No.30)	–	–	–	–	–	–
300 µm (No. 50)	–	–	–	–	–	–
75 µm (No.200)	0-6	1-7	2-8	2-10	2-10	6-12

Note 1 When a 19 mm mix is specified for use as a heavy duty surface mix, it shall be designed as a fine graded mix with the additional requirement of a minimum of 47% passing the 4.75 mm (No.4) screen.

If it becomes necessary to change aggregate sources, a new mix design shall be developed and submitted for approval. When using neat (unmodified) PG Binders, the binder source may be changed without requiring a new mix design, but the binder grade must always remain the same for each design. If a source change results in the use of an additive- enhanced modified binder of the same grade, a new mix design will be required.

If a modified binder source is changed or if the modification process is changed, a new mix design shall be developed and submitted for approval. A source change to a new location with the original manufacturer/supplier and the original modification process will not require a new mix design.

At no time shall different grades of PG Binders be mixed together in the same storage tank. When it is necessary to switch to a new binder grade the tank shall be drawn down as far as possible, normally to the top of heating coils, before refilling with the new binder. The new binder shall be circulated thoroughly before restarting production.

401.4.2.1-Warm Mix Asphalt: When the Division allows an approved HMA-asphalt concrete design to be produced as warm-mix asphalt (WMA) using the water injection system, the temperature of the completed mixture at the plant may be lowered to an established range that has previously been determined through trial production. The

allowable temperature range specified on the approved T400 mix design form shall be adjusted accordingly when producing WMA. In addition, all references to the minimum compaction temperatures in Sections 401.10.3 and 401.10.4 of this specification ~~and in MP 401.05.20, Compaction Testing of HMA Pavements~~, may be waived if it can be established that additional density can be obtained at lower temperatures without damaging the pavement. Intermingling of WMA ~~and HMA with non WMA materials~~ on the same course should be avoided. If circumstances result in the need for intermingling, it must be approved by the Engineer. Upon approval, the location where intermingling occurs on the project shall be clearly defined and documented by the Contractor and submitted to the Engineer. ~~Also, if~~ the intermingling occurs on a project where the density of the pavement is being controlled by the rollerpass compaction method, then a new test section shall be established on the new material beginning at the point where the WMA and standard asphalt concrete material HMA meet. If the intermingling occurs on a project where the density is controlled via Lot by Lot testing, the location should be clearly marked so that the correct maximum theoretical density can be used. All testing requirements established for ~~HMA standard asphalt concrete~~ mix designs and quality assurance/quality control testing shall also apply to WMA.

401.5-TESTING:

401.5.1-Procedures:

AASHTO R 47	Reducing Samples of Asphalt Mixtures to Testing Size <u>Reducing Samples of HMA To Testing Size (Quartering Method)</u>
AASHTO R 68	Preparation of Asphalt Mixtures by Means of The Marshall Apparatus
AASHTO T 11	Materials Finer Than No. 200 (75 µm) Sieve in Mineral Aggregates by Washing
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 30	Mechanical Analysis of Extracted Aggregate
AASHTO T 164	Quantitative Extraction of Asphalt Binder from HMA <u>Quantitative Extraction of Bitumen from Bituminous Paving Mixtures</u>
AASHTO T 166	Bulk Specific Gravity (Gmb) of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens <u>Bulk Specific Gravity of Compacted Bituminous Mixtures</u>
AASHTO T 168	Sampling Bituminous Paving Mixtures <u>Sampling Hot-Mix Asphalt</u>
AASHTO T 209	Maximum Specific Gravity and Density of Asphalt Mixtures <u>Maximum Specific Gravity of Bituminous Paving Mixtures</u>
AASHTO T 245	Resistance to Plastic Flow of Asphalt Mixtures Using Marshall Apparatus <u>Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus</u>
AASHTO T 308	Asphalt Binder Content of Asphalt Mixtures by the Ignition Method <u>Asphalt Content of HMA By the Ignition Method (Test Method A)</u>
AASHTO T 312	Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyrotory Compactor <u>Determining the Density of HMA Specimens by Means of The Superpave Gyrotory Compactor</u>
AASHTO T 355	Standard Method of Test for In-Place Density of Asphalt Mixtures by Nuclear Methods

ASTM D5581	Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (For Base-I Marshall Designs)
MP 700.00.06	Aggregate Sampling Procedures

401.6-CONTRACTORS QUALITY CONTROL:

401.6.1-Quality Control Testing: Quality control of bituminous asphalt is the responsibility of the Contractor. The Contractor shall maintain equipment and qualified personnel including at least one certified Asphalt Plant Technician at each plant. The technician shall be in charge of all plant quality control activities such as mix proportioning and adjustment and all sampling and testing activities necessary to maintain the various properties of asphalt within the limits of the specification.

The Contractor shall maintain necessary equipment and qualified personnel including at least one certified Asphalt Field and Compaction Technician at each project during paving operations. Additionally, a certified Asphalt Field and Compaction Technician with certification to perform nuclear density testing of asphalt pavements shall perform all testing necessary to assure compaction of the asphalt meets specification requirements. ~~Compaction Technicians may serve as Asphalt Field and Compaction Technicians for asphalt compaction testing until December 31, 2017.~~

The Contractor, shall design a workable Quality Control Plan, detailing the type and frequency of sampling and testing deemed necessary to measure and control the magnitude of the various properties of the asphalt governed by these specifications. This plan, prepared in accordance with MP 401.03.50 shall be submitted to the Engineer for review prior to production of material under this specification.

401.6.2-Job Mix Formula (JMF) Field Verification: For each JMF, a mix design field verification shall be conducted during the first days of plant production. For Marshall designs, the verification shall be in accordance with the guidelines established in MP 401.02.27. For Superpave, designs it shall be in accordance with MP 401.02.29. The field verification is for the purpose of demonstrating that the JMF can be produced within the specified tolerances set forth in the MP. If the mix cannot be ~~produce~~ produced within these requirements, a new mix design will be required.

401.6.3-Quality Control Testing Requirements: After the JMF design field verification has been successfully completed, sampling frequency and test requirements for quality control shall be as set forth in MP 401.02.27 for Marshall designs and MP 401.02.29 for Superpave designs. If the Division determines that a mix cannot be consistently produced within the tolerance limits of the specified design properties, approval of the mix may be revoked and the contractor will be required to provide a new mix design.

401.6.4-Compaction: Projects shall be tested for compaction in accordance with the Lot-by-Lot test method described in Section 401.6.4.2 if the project limits meet all ~~four~~ of the following requirements:

1. Measured roadway width greater than 16 feet
2. Total design overlay thickness of pavement greater than or equal to 1.5 inches.
- ~~3. Total average daily traffic (ADT) greater than 500.~~
- ~~4.~~ 3. Total projects length greater than or equal to 0.5 miles, excluding skip paving.

If a project does not meet the above criteria, testing for compaction shall be in accordance with the Rollerpass test method described in Section 401.6.4.32.

In addition, areas of Trench Paving, Pavement Widening, and Pavement Repairs shall be tested in accordance with the Rollerpass test method or to the satisfaction of the Engineer.

When asphalt is placed in areas that require a non-uniform thickness and tapers to a thin edge including patch and level and scratch, acceptance testing of the material is not required. Compaction shall be accomplished with a minimum of eight (8) roller passes prior to reaching the temperature specified in section 401.10.4. A pass shall be defined as the entire roller traversing a spot on the pavement. Compaction shall be performed by a three-wheel (steel) roller or pneumatic-tire roller.

Acceptance testing is not required on areas which are too narrow to be compacted with the roller use for the mainline paving, as defined in the contractor's QC plan; such areas shall be compacted to the satisfaction of the Engineer.

401.6.4.1-Density Testing: All Gauge standardization procedures, calibration procedures and all Density testing conducted shall be in accordance with AASHTO T-355 - *Standard Method of Test for In-Place Density of Asphalt Mixtures by Nuclear Methods*. Testing shall be conducted in the backscatter position and follow ~~the~~ AASHTO ~~Procedure~~ T355 with the exception that no gauge rotation will be required. All gauge tests shall be conducted with the source end of the gauge in the direction of paving. The Gauges used for both QC and QA, shall also have a gauge comparison tested as prescribed in section 401.6.4.1.1.

401.6.4.1.1-Gauge Comparison: For purposes of an accurate comparison, nuclear gauges used for QC and QA shall be compared using the following procedure. If an alternate gauge is brought to the project, repeat the following procedure. Note, this process is required for informational purposes however density readings for Acceptance testing will not be adjusted to compensate for any differences in readings between gauges. The gauge used for the Contractor's quality control testing shall ~~be~~ compared with the gauge used for the Division's verification testing at the same locations.

- ~~1. The gauge used for the Contractor's quality control testing should be compared with the gauge used for the Division's verification testing.~~
- 2.1. Standardize both gauges according to AASHTO T 355.
- ~~3. Place the aluminum plate provided by the Division on the standard block used for verification testing. Place the standard block on material weighing a minimum of 110lb/ft³. The block must not be near metal or other objects during testing and must not be moved. Keep the gauges separated a minimum of 30 feet during testing.~~
2. Take five (5) one-minute wet density readings with each gauge in the backscatter position at three randomly located positions within the initial 500 feet of paving.
 - a. Locations shall be at least 100ft from the initial construction joint and a minimum of 1 foot from the edge of the pavement.
3. The range of the five readings at each location shall not exceed 25 kg/m³. If the readings exceed this range, perform a new set of five readings. A gauge should not be used if the repeatability of the gauge is not within this range.
4. Utilize the average of the 15 readings to note the difference between the gauges to

be used for QC and QA. The Contractor shall take note of this difference whilst performing QC testing. All documentation shall consist of original wet density readings as shown on the gauge, no offset is permitted to be entered into the gauge.

a. $\text{Difference} = \text{QA Gauge} - \text{QC Gauge}$ [note sign]

4. ~~Take five ten (5/10) one minute wet density readings with each gauge in the backscatter position and record the wet density readings exactly as shown on the gauge. The gauges are to be oriented on the block the same as for standardization. Record the wet density readings exactly as shown on the gauge. Location of the ten reading are selected in the following manner:~~
 - ~~—Locate the testing location randomly within the first 250 feet of paving, excluding the first 50 feet and a minimum of 10 feet from any area requiring handwork, i.e., manholes, inlets.~~
 - ~~—Take five (5) readings at the location moving transversely across the roadway. Take readings at the following offsets from the centerline: 1, 3, 7, 9, 11 feet. If the paving width exceeds 12 feet, divide the offset locations evenly~~
 - ~~—Take an additional five (5) readings at the 5 foot offset position.~~
 - ~~—If the roadway is narrower than the given offset locations adjust accordingly, test a minimum of four (4) offsets locations.~~
 - ~~—If paving width exceeds 12 feet, take readings at 1 foot from each edge and divide the remaining transverse footage evenly for the remaining 4 locations. The 5 foot offset position shall still be utilized as described in c.~~
5. ~~The range of the five readings located at the five foot offset shall not exceed $241.5 \text{ lb/kg/ft}^3 \text{ m}^3$. If the readings exceed this range, perform a new set of five readings. A gauge should not be used if the repeatability of the gauge is not within this range.~~
6. ~~Average the five readings for each gauge. The gauges are considered similar if the averages of the readings are within $3.75 \text{ kg/m}^3 \text{ lb/ft}^3$.~~
7. ~~The density readings for verification testing will not be adjusted to compensate for any differences in readings between gauges.~~

~~—**401.6.4.1.2 Thin Lift Correction:** A Thin Lift Correction shall be performed on the existing pavement layer, in the state at which it will be paved. Density readings for the Correction shall be taken prior to paving. The correction shall be calculated as described in the operations manual of the testing device. The Thin Lift Correction shall be established as described below:~~

~~Lot-By-Lot: Ten randomly located tests within the initial 1,500 feet. The average of the ten tests shall be used as the underlying density in the correction equation. These values shall be recorded on the thin lift correction testing form. A new thin lift correction shall be completed if the existing pavement changes, e.g. milled, unmilled, scratch, concrete.~~

~~Rollerpass: Five randomly located tests within the initial area of paving for the day or wherever a new Rollerpass is to be established. These five tests shall be conducted within a 400-foot section, the average shall be used as the underlying density in the correction equation. These values shall be recorded on the thin lift correction testing form. This section shall begin 100 feet beyond the transverse joint, or immediately when a new Rollerpass is to be conducted.~~

401.6.4.2-Lot-by-Lot Testing: Density of the traveled lanes, shoulders, and Longitudinal Joint will be accepted in the field on a lot by lot basis. Lots will be established cumulatively and will be specific for each JMF.—A normal lot size shall not exceed 1000 linear feet of paving, unless operational conditions or project size dictates otherwise. Each lot shall consist of five equal sublots. A standard subplot shall be 200 linear feet. Sublots shall be tested with randomly located nuclear density tests, ~~tests shall utilize the Thin Lift Correction as described in 401.6.4.1.2.~~ ~~A normal lot size shall not exceed 1500 linear feet of paving with five, 300 linear foot sublots, unless operational conditions or project size dictates otherwise. If the remaining footage of the final two lots of a project combine to be less than 2000 linear feet following the following:~~

1. If the length is greater than 1000 feet but less than or equal to 1500 feet combine length into a single lot and, divide its length into five equal sublots;
2. If the remaining length is greater than 1500 feet and less than 2000 feet, divide the length into two equal lots with five equal sublots in each lot.

Breakdowns or stoppages of short periods due to such causes as weather or equipment failure will not be considered as reason to adjust the lot size. The original lot will be continued when work resumes. Relative density shall be calculated based on the Maximum Specific gravity from the Division approved JMF or the Maximum Specific Gravity established under section 401.6.2, Job Mix Formula Verification, whichever is more recently established.

401.6.4.2.1-Mat Density: Compaction testing for the mat density shall be performed for all traveled lanes and shoulders and will be evaluated based on an Upper Specification Limit (USL) of 97.0% relative density and a Lower Specification Limit (LSL) of 932.0% relative density. The average mat density of the Lot shall be calculated as the average of the subplot results. Acceptance of Mat Density shall be in accordance with Section 401.13.3.

401.6.4.2.2-Joint Density: Longitudinal joint density testing shall be performed on all constructed joints between traveled lanes. ~~Testing of a A~~longitudinal joints constructed between a travel lane and a shoulder ~~will is~~ not requireddtesting. Joint density testing is not required until both lanes of the joint are constructed. The first lane constructed shall be referred to as the cold side and the second lane shall be referred to as the hot side. Joint density testing shall be conducted on the hot side, with the gauge positioned four inches from the constructed joint. Only longitudinal joints constructed on the surface course shall be subject to density testing.

Longitudinal joint density testing shall be accepted in the field on a lot by lot basis as described in Section 401.6.4.1. Compaction testing for the joint density will be evaluated based on an Upper Specification Limit (USL) of 97.0% relative density and a Lower Specification Limit (LSL) of 90.0% relative density. The average joint density of the Lot shall be calculated as the average of the subplot results. Acceptance of joint density shall be in accordance with Section 401.13.3.

401.6.4.3-Roller Pass Testing: A Rollerpass Control Section shall be completed on a daily basis, when roadway conditions change where they would affect the compaction effort, or when the Engineer determines the current rollerpass is unsatisfactory. ~~The A~~

rollerpass shall be established prior to the mat reaching the temperature specified in section 401.10.4. ~~and~~

If a project does not meet the criteria in section 401.6.4, testing for compaction shall be in accordance with the rollerpass test method described in Section 401.6.4.2.

In addition, areas of trench paving, pavement widening, and pavement repairs shall be tested in accordance with the rollerpass test method or to the satisfaction of the Engineer.

A rollerpass shall be conducted in the following manor:

1. The ~~Control~~ Rollerpass Control Section shall be conducted ~~within the first 100 feet beyond the initial transverse construction joint, or~~ If an additional rollerpass is required by the Engineer conduct it immediately when a new Rollerpass is to be conducted. Follow section 401.6.4.1.2 to establish a Thin Lift correction factor.
2. Apply four passes with the breakdown roller (a pass shall be defined as the entire roller traversing a spot on the pavement) to the roadway, then conduct two randomly located nuclear density testing within the section; record the results, the average, and the mat temperature at each test location.
3. Apply an additional two passes and repeat the nuclear density testing in the same locations; record the results, the average, and the mat temperature at each test location.
4. Repeat step 3 until one or more of the following conditions occur: (a) less than 5 kg/m³ increase occurs between the average of two sets of readings, (b) the density of the material exceeds 97.0% Gmm, or (c) one of the two test location “breaks over” (i.e. shows a decrease in density) after exceeding 92.0% of Gmm, or (d) the temperature of the mat has fallen below 175 °F.
5. Compute the Percent of Gmm using the average of the two readings and record on the worksheet using the thin lift correction.

If the mat begins to show signs of distress (such as excessive surface aggregate breakage or mat cracking) before reaching 175 °F, then discontinue rolling and record the number of roller passes completed before the stress signs occurred. If a tender mix, as defined in Section 3.3, is encountered the Contractor may be allowed to continue rolling at lower temperatures if it can be demonstrated that additional densification can be achieved at a lower temperature without causing any pavement distress.

Once the control section is completed, the ~~Thin Lift corrected~~ density shall be equal to or greater than 92.0% of Gmm. If the ~~thin lift corrected~~ density does not meet 92% of Gmm, repeat the procedure above immediately. If after two control sections the density still does not meet 92% of Gmm, contractor shall apply the number of passes associated with the highest percent density, minimum of 8 passes, unless the Engineer determines more appropriate means. To help with this decision, an evaluation may be made of the existing pavement condition and any density test results obtained prior to construction of the test section will be reviewed.

If the ~~thin lift corrected~~ density within the control section ~~meets~~ 92% of Gmm conduct a proving section in the proceeding ~~200-1000~~ feet. Within the proving section, apply the established number of passes and conduct ~~ten-five~~ randomly located nuclear density tests. The average of these ~~ten-five~~ tests shall exceed a minimum density of 92% Gmm and be within ~~±5034.0~~ kg/m³ of the average wet density determined in the Rollerpass control

section. If this is not achieved a new ~~test-rollerpass~~ section shall be conducted.
All data shall be submitted the Engineer on associated Rollerpass forms.

401.7-VERIFICATION TESTING:

401.7.1-Acceptance Testing of HMA Asphalt Concrete: Acceptance testing of asphalt is the responsibility of the Division. For Superpave mixes, the acceptance sampling and testing requirements for the mixture shall be as set forth in MP 401.02.29.

401.7.2-Surface Tolerance: Final smoothness testing of all new Asphalt surfaces shall be in accordance with Section 720.

When compaction is completed on the course, it shall present a uniform surface, true line and grade, conforming to the cross section shown on the Plans. When tested with a straightedge of approximately 10 feet in length and a template of the specified dimensions, the finished base course shall not show a deviation greater than ¼ inch and the finished wearing course shall not show a deviation from the required surface greater than 3/16 inch.

The Contractor shall provide the straightedge and template for checking the surfaces and an employee to use them under the direction of the Engineer. Any irregularity of the surface exceeding the limits specified shall be corrected. Depressions which develop after the initial rolling shall be corrected by loosening the mixture and adding new material. High places shall be corrected by removing excess material.

Areas of completed courses found to be defective shall be removed and replaced with approved mixtures laid in accordance with these specifications, and no additional compensation will be allowed for materials used or work involved in replacing defective areas.

401.7.3-Lot by Lot Compaction: ~~Verification~~Acceptance testing of mat and joint density is the responsibility of the Division. The Division will conduct density ~~verification~~acceptance testing in accordance with section 401.6.4.1. ~~Verification~~Acceptance activities will be accomplished by conducting testing completely independent of the quality control activities.

401.7.3.1-Mat Density:- ~~Within a lot of materials offered by the contractor for acceptance, locate one random test. Perform a single 1-minute test in accordance with section 401.6.4.1. Compare the density to the specification range. If the value is within the range, the lot is accepted for density. If the density result is outside the specification range, divide the lot into five equal sublots and randomly locate a test site within each subplot. Average the five subplot results and utilize section 401.13.3 to determine any required price adjustments.~~

~~Tests will be taken at a frequency approximately equal to two lots per eight for both mat and joint density, with a minimum of two lot evaluation for each Mat and Joint per project.~~

401.7.3.2-Joint Density: ~~If a Jjoint density lot is to be tested, it will be tested with the corresponding Mat lot. Testing of a joint density lot shall follow section 401.7.3.1.subplot testing of lot is not required given an acceptable~~

~~—401.7.3.1-Evaluation for Similarity: The ten (10) verification tests taken by the Division will be statistically evaluated, using an F test and T test at a 95% confidence level, for statistical similarity to the Contractors ten (10) quality control tests. If the evaluation indicates that the Division's test results are statistically similar to the~~

~~Contractor’s test results, then the test results represented by this evaluation will be considered acceptable, therefore shall be used in the price adjustment in accordance with section 401.13.3.~~

~~—If the evaluation proves statistically not similar an investigation will be conducted to determine the cause and extent of nonsimilarity. The intent of the investigation is to define and correct any testing deficiencies that may cause a misrepresentation of the tested material. In addition, if the evaluation is statistically not similar, the Division may test additional lots and use the verification testing results for the basis of payment.~~

401.7.4-Thickness: When a uniform thickness of three inches or more is specified, excluding resurfacing, cores shall be taken to verify the thickness of the compacted pavement.

Cores will be taken by the Division at random locations. The sampling frequency shall be approximately five cores per 2,000 feet of two-lane construction, except that the sampling frequency shall normally be limited to a minimum of five and a maximum of 50 cores per project. The Division may elect to waive coring for short projects of less than 1,000 feet in length or for projects where a paving mat of uniform thickness cannot be expected (for example: tapered paving mats or pavement widening projects). The Division may also elect to take additional cores when needed to resolve problems related to pavement thickness.

The thickness shall be considered acceptable if one or both of the following criteria are met:

- (a) The average thickness equals or exceeds the specified thickness.
- (b) The average thickness is less than the specified thickness, but the difference is not statistically significant at the 95% confidence level. (Standard one tail “t” test at 0.05 significance).

The calculated ‘t’ value shall be less than or equal to the standard ‘t’ value at the 95% confidence level. The method for calculating Criteria ‘B’, shall be as follows:

$$t \leq t_{95}$$

Where:

t_{95} = value from standard “t” table for 95% confidence level

$$t = \frac{x_s - \bar{x}}{s} \sqrt{n-1}$$

x_s = specified thickness

\bar{x} = average thickness

n = number of samples

$$s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$$

x = individual core thickness

If the average thickness is less than specified and is determined to be significant as determined by criteria ‘B’, the Division shall decide on a course of action as described in Section 401.13.4.

401.8-WEATHER RESTRICTIONS:

Bituminous asphalt shall only be placed when the surface is dry and when weather conditions are such that proper handling, finishing, and compaction can be accomplished. In no case however, shall asphalt be placed when the surface temperature is below the minimum established in Table 401.8.

TABLE 401.8

Course Thickness	Minimum Surface Temperature
3 inches and over	35 °F ^{Note 1}
1.5 to 2.9 inches	40 °F
Less than 1.5 inches	50 °F

Note 1 In lieu of 35 °F, a minimum air temperature of 40 °F shall be used when paving directly on an aggregate base, subbase, or subgrade.

In addition to the above surface temperature requirements, no wearing courses shall be placed when the air temperature is less than 40° F.

401.8.1-Cold Weather Paving: When the air temperature falls below 50° F or the surface temperature falls below 60° F the provisions for cold weather paving shall apply.

Paving shall be performed so that the transverse joints in adjacent lanes shall be no more than 50 feet apart at the end of each day's paving operations.

The surface temperature shall be taken a minimum of once every hour and shall be taken in all shaded areas. The temperature requirements as listed in Table 401.8 shall apply.

It shall be the Contractor's responsibility to monitor the declining surface temperature to insure that material delivery from the plant be terminated so as to allow that all material can be placed prior to the surface temperature falling below the surface temperatures listed in Table 401.8.

The temperature of the delivered material and the mat temperature at the time final density is obtained shall be taken for every truck load. These temperatures shall be in accordance with Section 401.10.3 for delivered material and 401.10.4 for the mat temperature at the time final density is obtained.

401.9-EQUIPMENT:

401.9.1-Plants: All plants in West Virginia producing asphalt for the Division shall provide documented evidence of compliance with current requirements of the West Virginia Air Pollution Control Commission.

All plants which are not in West Virginia but producing asphalt for the West Virginia Division of Highways shall provide documented evidence of compliance with current requirements of the laws and regulations of the State in which they are producing, applicable to air pollution. All plants shall meet the general requirements set forth in AASHTO M 156 unless it can be demonstrated to the satisfaction of the Engineer that a consistent quality mix can be produced with modifications to any of these requirements.

401.9.2-Dust Collector: An efficient dust collecting system shall be provided to prevent the loss of fine material. The material collected may be returned to the mixture at a uniform rate or discarded.

401.9.3-Truck Scales: Truck scales shall be provided at each Plant, except that truck

scales are not required at properly calibrated automatic batching plant facilities which are equipped with digital printout equipment, and which load the trucks directly from the mixer or the weigh hopper in a surge or storage bin.

A person designated as a weigher shall be provided by the producer. The weigher shall certify that the weight of the asphalt, as determined either by the truck scales or from the digital printout of the batch weights, is correct.

Each truck shall be weighed empty prior to each load, except at automatic batch plants approved to operate without truck scales.

All truck scales shall be mounted on solid foundations which will insure them remaining plumb and level.

Approval and sealing of scales shall be conducted at the frequency determined by the West Virginia Division of Labor, Bureau of Weights and Measures, and when the plant is moved, or upon the request of the Engineer. The Engineer shall be notified of any scale malfunctions when material is being furnished to Division of Highways projects. The Division may, at its option, accept inspection and sealing by out-of-state agencies when the mixing plant is located outside West Virginia.

A digital recorder shall be required on all truck scales. The digital recorder shall produce a printed record of the gross, tare and net weights, and the time, date, truck identification, and project number. Provision shall be made for constant zero compensation and further provision shall be made so that the scales may not be manually manipulated during the printing process. The system shall be interlocked so as to allow printing only when the scale has come to rest. In case of breakdown of the automatic equipment, the Engineer may permit manual operation for a reasonable time, normally not to exceed 48 hours, while the equipment is being repaired.

The scales shall be of sufficient size and capacity to weigh the loaded trucks that are used for delivery of asphalt from the plant.

401.9.4-Test Weights: As part of its standard equipment, each plant which proportions aggregate by weight shall provide a minimum of ten 50-pound test weights for the purpose of maintaining the continued accuracy of its weighing equipment.

Plants which proportion asphalt material by weight shall furnish, in addition to the above, one five pound test weight.

401.9.5-Surge and Storage Bins: During the normal daily operation of the plant, asphalt may be stored in a surge or storage bin for a maximum of 12 hours, provided the bin has received prior evaluation and acceptance through the District plant inspection. The resulting temperature of the material at time of placement and compaction shall be sufficient to comply with 401.10.3 and 401.10.4

Longer silo storage times, up to 24 hours, may be permitted for dense graded asphalt if the storage silo is insulated and/or heated to assure that the proper mix temperature is maintained. The gates at the bottom of the storage silo shall be adequately heated and sealed when the asphalt is held for the extended period of time. An inert gas system may be used to purge the silo of oxygen to prevent oxidation of the asphalt. The asphalt delivered from the storage silo shall meet all of the specification requirements.

When asphalt is stored for the extended time period, it shall not be used until the temperature has been checked and the asphalt has been visually inspected for hardening of the mix and stripping of the asphalt from the aggregate. Approval of the extended storage time

may be revoked if it is determined through inspection and/or testing that the extended storage is having a detrimental effect on the asphalt.

Loading of trucks through the storage bin will only be permitted when a minimum 25-ton buffer of material is being maintained or an amount as recommended by the bin manufacturer, means shall be provided for loading the trucks directly from the mixer when the storage bin is not in operation.

401.9.6-Inspection of Equipment and Plant Operations: The Engineer shall have access to the plant to assure the adequacy of the equipment in use, to inspect the conditions and operation of the plant, to verify weights, to verify the proportion and character of materials, and to determine if specified temperatures are being maintained in the preparation of the mixture.

401.9.7-Trucks for Transporting Mixture: The inside surfaces of trucks shall be thinly coated with a ~~soapy water or a mixture with not more than ten percent lubricating oil.~~ National Transportation Product Evaluation Program (NTPEP) approved asphalt release agent. The use of diesel fuel, kerosene, or similar solvent-based products which can dissolve the asphalt film from the aggregate particles will not be permitted. Any commercial release agent which can be certified by NTPEP as harmless to the mix may be used; however, the Division reserves the right to restrict any release agent that is shown to cause problems during placement of the mix. In the case of mixtures composed of PG Binders which contain polymer modification, truck surfaces should be coated with a release agent recommended by the binder supplier. All excess coating material shall be removed from the truck bed prior to loading the asphalt.

All truck beds shall be insulated with approved material. No trucks shall be used which cause segregation of the materials, which show large oil leaks, or which cause undue delays in delivery of material. All trucks shall be provided with a waterproof cover and a hole in the body for the purpose of conveniently checking the temperature of the load. Covers shall be suspended slightly above the mixture, shall extend over the sides of the truck, and shall be securely fastened to eliminate air infiltration and to prevent water from coming in contact with the mixture.

401.9.8-Laboratory: A testing facility or laboratory, as described below, shall be provided within reasonable proximity of the asphalt plant. Plant operations must be visible from within the laboratory.

The laboratory shall be of sufficient size to hold all laboratory test equipment and supplies with adequate floor space to allow the technicians to test samples in an efficient manner. The laboratory shall be furnished and maintained with adequate ventilation, heat, light, water, sink and drainage, electrical or gas outlets, or both, work table, shelves, and supply cabinets.

The laboratory shall be supplied with the equipment and materials listed below and these shall be maintained to meet the applicable requirements of AASHTO or ASTM:

- i. Hot plate, gas or electric.
- ii. Large ovens (as needed for heating and drying samples), gas or electric.
- iii. Unit weight container, ½ cubic foot. Required for slag only.
- iv. Balances of sufficient capacity and accuracy for conducting specified tests and plant calibration.
- v. Thermometers: dial type, liquid-in-glass, and digital as required for conducting

- standard test procedures and monitoring mix temperatures. Digital thermometers shall be equipped with an appropriate sturdy probe that can be pushed into a sample of hot asphalt to check the temperature of the mix.
- vi. Standard Gilson shaker or equivalent, with screens.
 - vii. Ro-Tap shaker or equivalent, with 8 and/or 12 inch diameter screens.
 - viii. Sample splitters for fine and coarse aggregates.
 - ix. Miscellaneous items (including sample splitting trowels, scoops, square point shovel, aggregate sample pans, heat resistant gloves, measuring rules, brushes, flashlight, timing devices, and glassware as needed).
 - x. Expendable supplies necessary for performance of tests.
 - xi. Equipment for determining the maximum specific gravity of asphalt mixtures as specified in AASHTO T 209.
 - xii. Equipment for determining the in-place density of asphalt mixtures meeting the requirements of MP 401.05.20.
 - xiii. Non-contact infrared thermometer accurate to $\pm 2^{\circ}$ F.
 - xiv. Equipment for determining the bulk specific gravity of HMA-asphalt mixtures using saturated surface dry specimens complying with AASHTO T 166.
 - xv. Marshall equipment necessary to comply with AASHTO R68, AASHTO T 245 and ASTM D5581, including a calibrated ~~automatic testing apparatus~~load frame having recording capabilities (digital or analog) and compaction hammers. (Marshall designs only)
 - xvi. Asphalt content ignition oven with built-in scale and printer meeting the requirements of AASHTO T 308, Test Method A. ~~(Optional for Marshall designs—Mandatory for Superpave designs)~~
 - xvii. Calibrated Gyrotory compactor meeting requirement of AASHTO T 312 with computer (including software for data acquisition and test calculations) and primer. Compactor must be calibrated to the internal angle in accordance with AASHTO TPT344P-74 with annual verification (Superpave designs only).

401.9.9-Asphalt Paving Equipment: Asphalt paving equipment shall be self-contained and of sufficient size, power and stability to receive, distribute and strike-off the asphalt mixture at rates and widths commensurate with the typical sections and other details shown on the plans. The paver shall be provided with an activated screed or strike-off assembly equipped to be heated. Approval of the paver by the Engineer will be based on the demonstrated capability of the equipment to place the mixture to the required cross-section, profile and alignment in an acceptable, finished condition ready for compaction.

The paver shall be equipped with means of preventing the segregation of the coarse aggregate particles when moving the mixture from the paver hopper to the paver augers. It shall also be capable of pushing a sufficient amount of the mixture under the auger gearbox to prevent streaking or tearing of the mat. Some paver models may require the installation of a manufacturer retrofit kit or equipment modification to accomplish this.

Specialized equipment or hand methods approved by the Engineer may be employed to spread the asphalt mixture where the use of standard full scale paver is impractical due to the size or irregularity of the area to be paved.

Pavers shall be equipped with mechanical or automatic grade and slope controls. The use of automatic grade and slope controls with a traveling straight edge shall be required only when

specified on the Plans or in the Proposal. Both the grade and slope controls shall be in working order at all times. In the event of failure of the automatic controls, the Contractor will be permitted to finish the day's work using manual controls but will not be allowed to resume work the following day until the grade and slope controls are in proper working order.

401.9.10-Compaction Equipment: Compaction ~~may~~ shall be performed by self-propelled steel-wheeled ~~or~~, pneumatic-tired rollers. The use of either and/or vibratory or oscillatory type rollers is acceptable. ~~rollers. Pneumatic rollers shall have be equipped with skirting around the wheel area to prevent heat loss to the tires and tire . Pneumatic roller tires shall be equipped with pads.~~ Hand-held rollers or vibrating plates may be used in small inaccessible areas ~~if~~ as approved by the Engineer. Prior to use on any project, the roller shall be inspected to see that it is in good mechanical condition. The total weight, weight per inch of width (steel-wheeled), and average ground contact pressure (pneumatic-tired) shall be documented in the contractors QCP in accordance with MP 401.

401.10-PAVING OPERATIONS:

401.10.1-Cleaning and Sweeping: Immediately prior to the arrival of the paving mixture, the existing base or surface shall be thoroughly cleaned by the use of tools and equipment as may be required to remove all mud, dirt, dust, and other caked or loose material foreign to the type of treatment or surface being placed. The cleaning shall be done to a minimum width of one foot on each side beyond the width of the surface being placed.

401.10.2-Patching and Leveling and Scratch Courses: Compaction of patching and leveling and Scratch Courses shall be performed with three-wheel (steel) or pneumatic-tire rollers.

401.10.2.1-Patching and Leveling: A tack coat shall be applied to the existing pavement prior to placing patching and leveling.

Patching and leveling shall be placed at various locations throughout the project to remove irregularities in the existing pavement such as dips, or to raise the outside edge of the existing pavement to provide a uniform template prior to placing a base or wearing course. Patching and leveling shall not be placed as a continuous layer or course over the full width and length of the project.

~~—Compaction of patching and leveling shall be performed with three wheel (steel) or pneumatic tire rollers.~~

401.10.2.2-Scratch Course: A tack coat shall be applied to the existing pavement prior to placing a scratch course.

—The scratch course shall be placed to the limits designated on the plans. Scratch course shall be placed with a paving machine. The paving machine screed shall be set to drag on the high areas of the existing pavement, only depositing material in ruts and other depressions.

—The wearing course, or at least one lift of base course, should be placed over the scratch course prior to maintaining traffic in the lane where the scratch course has been placed. All repairs to a scratch course due to traffic damage shall be at the contractor's expense.

~~Compaction of a scratch course shall be performed with a three-wheel (steel) or pneumatic-tire roller.~~

401.10.3-Spreading and Finishing: Before spreading any material, the contact surfaces of curbs, gutters, manholes, and of adjacent Portland cement concrete pavement edges shall be painted or sealed with asphalt material. Exact edge of pavement, except on concrete, shall be established by a string or chalk line for a distance of not less than 500 feet ahead of the spreading operation.

For mixes produced with neat (non-modified) asphalts (which may include PG64H-22, PG 64S-22, PG 58H-28, and PG 58S-28) the temperature of the mixture at the time of placement shall be within the temperature requirements of the JMF. The JMF temperature range shall be within the master temperature range of 250° and 338°F unless otherwise specified by the asphalt supplier. The mix temperature shall be monitored by inserting a dial type thermometer into the mix through the hole in the truck bed.

The temperature of the completed mix, when measured at the plant, shall be within the tolerance as established by the JMF. The first load which demonstrates temperatures outside of that range shall be accepted, provided that the temperature is still within the master temperature range. No additional loads of material shall be run out until necessary steps are taken to reestablish the temperature of the mix within the plant tolerance. When measured at the project site, the temperature of the mix shall be within the tolerance established by the JMF. The first truck load of material which demonstrates temperatures outside of that range or any trucks in transit at that time shall be accepted provided temperatures are within the master temperature range. Any truckload of material which exceeds the master temperature range may be rejected by the Engineer. However, the plant shall immediately be notified that no additional loads of material are to be dispatched until necessary action is taken to reestablish temperature within JMF specification limits.

When the surface temperature falls to within 10°F of the weather restrictions of Table 401.8, the mix temperature may be increased up to a maximum of 338°F unless otherwise specified by the asphalt supplier. The temperature of each truckload of material shall be monitored for compliance. Any truckload of material which exceeds this maximum temperature may be rejected by the Engineer.

Mixes produced with asphalts that contain modifiers for high or low temperature performance enhancement shall meet the temperature requirements recommended by the asphalt supplier, which will be referenced on the JMF.

401.10.4-Rolling Procedure: Shoulders, ramps, and similar areas shall be compacted in the same method as the mainline.

During rolling, roller wheels shall be kept moist with only enough water to avoid picking up material. Fuel oil on roller wheels or pneumatic tires is not allowed. Rollers shall move at a slow but uniform speed with the drive roll or wheels nearest the paver.

If rolling causes material displacement, the affected area shall be loosened at once with lutes or rakes and restored to its original grade with loose material before being re-rolled. Heavy equipment, including rollers, should not be permitted to stand on the finished surface before it has thoroughly cooled or set.

Mat temperature shall be measured using a non-contact infrared thermometer. The required density shall be obtained prior to the mat temperature reaching 175° F. The

Contractor shall be allowed to lower this temperature to 165° F if they can demonstrate during the first day of placement of each lift on each project that additional densification can be achieved without causing any pavement distress.

401.10.5-Joints: The longitudinal joint in any layer shall offset that in the layer immediately below by approximately six inches; however, the joint in the top layer shall be at the centerline of the pavement if the roadway comprises two lanes of the width, or at lane lines if the roadway is more than two lanes in width. The transverse joint in any layer shall offset that in the layer immediately below by approximately six feet.

All transverse joints between existing and new pavement shall be “heeled-in” to the existing surface at the beginning and at the end of the project and at all other locations where the new pavement terminates against an existing pavement. Transverse joints between one day's production and the next shall be carefully constructed and shall be formed by cutting back into the existing section to expose the full depth of the course. All joints shall be squared up to the full vertical depth of the course to be placed, and a tack coat of asphalt material shall be applied. Joints adjacent to curbs, gutters, or adjoining pavement shall be formed by transporting back sufficient hot material to fill any space left uncovered by the paver.

The longitudinal joint between adjacent mats shall be set up to a sufficient height to receive the full compactive effort from the rollers and shall be tacked prior to placing adjacent material.

Transverse joints shall be checked for smoothness with a ten foot straight edge provided by the Contractor. All surface irregularities shall be corrected prior to proceeding with paving operations.

401.10.6-Safety Edge: When the total specified lift thickness of pavement is 1.5 inches or greater, asphalt safety edge shall be constructed on the outside pavement edge. The device utilized shall be a model listed on Division Approved Product Listing.

The resulting finished surface of the safety edge shall be sufficiently consolidated so as to show no segregation, or raveling of the aggregate and shall have the same surface profile and texture of the compacted mat surface.

Safety edge is not to be used through intersections, against curb or barrier, or when directed by the Engineer. The paving operation shall allow for automatic and/or manual transitions at cross roads, driveways, and intersections. The Engineer may allow short sections of handwork for transitions at driveways, intersections, interchanges, and bridges.

401.11-PROTECTION OF PAVEMENT AND TRAFFIC CONTROL:

The Contractor shall be responsible for the protection of asphalt surfaces from damage by their equipment and personnel. When the construction of asphalt surfaces is undertaken on projects under public traffic and the road surface is 16 feet wide or greater and the ADT is 400 or greater, the Contractor shall place no passing signs, Interim pavement markings, and Temporary pavement markings to delineate the edge line, centerline, and/or lane line of the roadway as required herein and in the project plans. The provision of Section 636: Maintaining Traffic shall apply.

401.12-METHOD OF MEASUREMENT:

Asphalt concrete will be measured by the ton, or square yard. For projects paid by the ton, the quantity will be determined by the Contractor from the total weigh slips for each vehicle

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load weighed upon an approved standard scale or from digital printout slips from an automatic batching plant, and certified by the Contractor as correct. For projects paid by the square yard, the quantity will be determined by the Plan Quantity as provided for in the proposal unless otherwise directed by the Engineer.

Any patching or leveling mixture placed on a subbase or base course constructed in the same Contract with the asphalt items shall be at the expense of the Contractor. No additional compensation will be allowed for the material or any work incidental to its placement.

No additional measurement is necessary nor will addition compensation be allowed for the placement of Safety Edge.

401.13-BASIS OF PAYMENT:

The quantities determine as provided above, will be paid for at the contract unit price for the items listed below, which prices and payment shall be full compensation for furnishing all the materials and doing all the work herein prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, field laboratory, supplies, and incidentals necessary to complete the work.

The conditioning, cleaning, and sweeping of the existing base or underlying surface shall be considered as part of the construction of the appropriate items listed in 401.14, and no additional compensation will be allowed for "Cleaning and Sweeping".

There will be no additional compensation for tack coat material used for minor (spot) areas to be patched and leveled; the cost of this tack coat material will be included in the unit bid price for the "patching and leveling" Item.

There will be no additional compensation for Interim Pavement Markings.

401.13.1-When a Lot of ~~Superpave~~ asphalt material is found not in compliance with the tolerance requirements of MP 401.02.~~2927~~ or MP 401.02.29, it shall be subject to a price adjustment in accordance with the criteria established in this MP.

~~401.13.2-When a Lot of asphalt pavement is represented by a smoothness value larger than that shown in Tables 401.7.2, the unit price of the Lot (surface course only) shall be determined as follows:~~

ENGLISH VERSION:

- ~~Reduced Unit Price = Unit Bid Price X [(127.86—As)/100]~~
- ~~Where A = 0.429 when specified smoothness is 65 in/mi~~
- ~~Where A = 0.341 when specified smoothness is 81 in/mi~~
- ~~Where s = Smoothness value measured as per 401.7.2~~

~~When the measured smoothness value exceeds the specified value by 50% or more, the Lot so measured shall be corrected, at the Contractor's expense, to comply with Tables 401.7.2.~~

401.13.3-A Lot of asphalt pavement shall have its price be adjusted in accordance with Table 401.13.3A using Formula-1. If a Lot of asphalt pavement is associated with a Longitudinal Joint Lot its price shall be adjusted in accordance with Table 401.13.3A and Table 401.13.3B using Formula-2. The longitudinal joint density determined in accordance with Section 401.6.4 shall represent the Lot on which the joint density testing was performed.

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Any price adjustment for joint density shall be applied to that Lot only.

Use Formula-1 on the first lane paved before a longitudinal joint is constructed. Use Formula-2 when both mat and joint density testing is required on a project.

FORMULA-1: Lots requiring only mat density testing:

$$\text{Lot Price Adjustment (Mat only)} = (\text{unit price}) \times (\text{Lot quantity}) \times (\text{mat density price adjustment \% from Table 401.13.3A})$$

FORMULA-2: Lots requiring both mat and joint density testing:

$$\text{Lot Price Adjustment (Mat + Joint)} = (\text{unit price}) \times (\text{Lot quantity}) \times [(\text{mat density price adjustment \% from Table 401.13.3A}) + (\text{joint density price adjustment \% from Table 401.13.3B})]$$

TABLE 401.13.3A

Adjustment of Contract Price for Pavement Mat Density	
Percent of Density	Percent of Contract Price to be Paid
Greater than 97 %	Note 1
95% <u>93%</u> to 97%	+02 <u>100</u>
92% to 94% <u>92%</u>	+00 <u>99</u>
88 <u>91</u> % to 91 <u>88</u> %	= 100 <u>99</u> – 4*(92% - Percent density)
Less than 88%	= 82 <u>84</u> – 10*(88% - Percent density) ^{Note 2}

Note 1: Mat density slightly above 97% is normally only a problem if it leads to asphalt flushing on the surface of the mat or rutting due to an unstable mix. The Division will make a special evaluation of the material and determine the appropriate action.

Note 2: When the density is less than ~~92%~~ 93%, the mat will be more susceptible to accelerated deterioration and a decrease in the expected service life of the pavement. For mat densities less than 88%, the percent of Contract Bid Price will be decreased by an additional 10% per percentage of mat density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action.

TABLE 401.13.3B

Adjustment of Contract Price for Pavement Joint Density	
Percent of Joint Density	Percent Adjustment
Greater than 97 %	Note-3
94 % to 97 %	+2.0%
92% to 93%	+1.0
90% to 97 <u>71</u> % ^{Note 4}	0%
89 % ^{Note 5}	-1.0%

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TABLE 401.13.3B

Adjustment of Contract Price for Pavement Joint Density	
Percent of Joint Density	Percent Adjustment
88 % ^{Note 5}	-3.0%
Less than 88 %	Note 5 and 6

Note 3: Density greater than 97% is normally only a problem if it leads to asphalt flushing on the surface of the mat or rutting due to an unstable mix. The Division will make a special evaluation of the material and determine the appropriate action.

Note 4: If the longitudinal joint density is determined to be less than 92% on 25% or more of the total project LOTs, then the Contractor shall be required to seal the joint a minimum of 3” on each side of the joint with a heated PG 64S-22 binder (or approved equivalent) on the entire project at no additional cost to the Division.

Note 5: Any longitudinal joint densities determined to be below 90% the Contractor shall be required to seal the joint a minimum of 3” on each side of the joint on the entire project with a heated PG 64S-22 binder (or approved equivalent) at no additional cost to the Division

Note 6: Density values less than the minimum specified 90% will be more susceptible to accelerated deterioration of both the joint and the surrounding pavement. For Joint densities less than 88%, the percent of adjustment will be decreased by an additional 6% per percentage of joint density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action.

401.13.4-When a Lot of asphalt pavement is determined to be statistically non-conforming in accordance with Criteria ‘B’ of Section 401.7.4, the Division will review the plans and project records to determine if there is an acceptable explanation for this deficiency. If it is determined that a deficiency does exist, one of the following adjustments may be used. If the deficiency is less than ¾ inch, the Division may choose to accept the material at a price equal to the bid price times the ratio of the average thickness divided by the specified thickness. If the deficiency is ¾ inch or greater, the Division may require that an additional lift of material [specified to the nearest ¼ inch of the deficiency] be placed at the Contractor’s expense. Retesting of the overlay will be at the expense of the Contractor in accordance with MP 109.00.20.

401.14-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
401001-*	“design method” Asphalt Base Course, “aggregate type”, Type “mix type”	Ton
401002-*	“design method” Asphalt Wearing Course, “aggregate type”, Type “mix type”	Ton
401003-*	“design method” Asphalt Patching And Leveling Course, “aggregate type	Ton
401007-*	“design method” Asphalt Scratch Course, “aggregate type”, Type ‘mixed type”	Ton
<u>401017-*</u>	<u>Asphalt Pothole Repair, Type</u>	<u>Ton</u>

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- * Sequence number
 - “design method” shall be either Marshall or Superpave
 - “aggregate type” shall be either stone and gravel or slag
 - “mix type” from Table 401.4.2A or 401.4.2B

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
SUPPLEMENTAL SPECIFICATION
FOR
SECTION 623
PNEUMATICALLY APPLIED MORTAR OR CONCRETE (SHOTCRETE)

623.2-MATERIALS:

DELETE THE PARAGRAPH AND TABLE AT THE END OF THE SUBSECTION AND REPLACE THE FOLLOWING:

The aggregate gradation shall comply with the requirements of Table 623.2.

<u>TABLE 623.2</u>		
<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>
Sieve Size	<u>Allowable Percent by Mass Passing Each Individual Sieve in Mix Design</u>	<u>Allowable Mix Design Tolerance During Production^{Note 1}</u>
½ inch (12.5 mm)	100	<u>± 0%</u>
¾ inch (9.5 mm)	90-100	<u>± 3%</u>
No. 4 (4.75 mm)	70-85	<u>± 3%</u>
No. 8 (2.36 mm)	50-70	<u>± 3%</u>
No. 16 (1.18 mm)	35-55	<u>± 3%</u>
No. 30 (600 µm)	20-35	<u>± 3%</u>
No. 50 (300 µm)	8-20	<u>± 2%</u>
No. 100 (150 µm)	2-10	<u>± 2%</u>
<u>Note 1</u>	<u>The maximum and minimum ranges of the allowable % by mass passing on each sieve size noted in Column 2 of Table 623.2 shall not be exceeded during production while using the tolerances in Column 3 of Table 623.2.</u>	

623.6-TESTING DURING CONSTRUCTION:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

623.6.5-Combined Aggregate Gradation: The aggregate gradation shall be performed by the contractor once for every 50 cubic yards of shotcrete that is produced from the same mix design. The aggregate gradation shall meet the requirements of Table 623.2 and be within

the allowable design mix tolerance of the approved mix design. However, not more than one aggregate gradation test (for each mix design) shall be required per calendar day as long as not more than 400 cubic yards of shotcrete is produced in a single day from the same mix design.

In situations when more than 400 cubic yards of shotcrete is produced in a single day from the same mix design, two aggregate gradation tests shall be required (one in the AM and one in the PM) for that mix design. During any calendar week (Sunday through Saturday) in which shotcrete is being produced, a minimum of one aggregate gradation test shall be required (for each mix design from which shotcrete is being produced). This aggregate gradation test shall be conducted on the first day of production of that calendar week.

Should the moving average of any five consecutive aggregate gradation tests have a result for any of the sieve sizes listed outside of the limits set forth in the gradation of the original mix design with the production tolerances of Column 3 on Table 623.2, production shall be discontinued until appropriate corrections are made. Corrections shall be made either in the aggregate proportions in the shotcrete mix (the mix design), the gradation of the aggregates, or the storage and loading of the aggregate, as the Contractor may elect.

When the small quantity work condition applies, the aggregate gradation test required after 50 cubic yards of shotcrete production shall be performed on the day that the 50 cubic yard quantity is achieved. All shotcrete produced on that day (the day that the 50 cubic yard quantity is achieved) shall be represented by the previous aggregate gradation test. The aggregate gradation test conducted on the day that the 50 cubic yard quantity is achieved shall represent the next 50 cubic yards of shotcrete produced, beginning with the shotcrete produced on the next day of production.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

**SECTION 661
TRAFFIC SIGNS AND DELINEATORS**

661.2-MATERIALS:

661.2.3-Retroreflective Sheeting and Matched Components:

DELETE PARAGRAPH TWO AND REPLACE WITH THE FOLLOWING:

Fluorescent-yellow Type ASTM-XI sheeting shall be used when fabricating the following signs: W1-6 through W1-8, all 48-inch diamond W Series, all barrier wall mounted 36-inch diamond W Series dual installed with a shoulder mounted 48-inch diamond W Series along freeways or expressways, all W Series supplemental plaques installed below a 48-inch fluorescent yellow diamond W Series, all XR Series, all XS Series, all yellow panels of extruded panel signs, any yellow flat sheet sign attached to a yellow extruded panel sign background, and any other signs designated in the Plans to have a fluorescent-yellow background.