

20240612 – June Specifications Committee Meeting

June Specifications Committee Meeting Agenda

Meeting Date

Wednesday, June 12, 2024 @ 9:00am

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 (04/03/24)

- **204.5-Basis of Payment:** Revision clarifies when mobilization payment is made.
- **601.3.2.2-Air Content:** Revision clarifies completion of air content testing before concrete pump.
- Two Specification changes incorporating MASH Test Level 3 requirements.
 - **636.6.2-Shadow Vehicle,**
 - **715.41.4-Truck Mounted Attenuator (TMA) and Trailer Truck Mounted Attenuator (TTMA)**

Approved Project Specific Special Provisions (SP) from last Committee meeting (04/03/24)

- **SP108-Prosecution and Progress**

Items removed from Committee Agenda

- **None**

Old Business-Provisions discussed at the last committee meeting.

SECTION	TITLE	DESCRIPTION
<u>636</u>	SP636-Digital Speed Limit Trailer J. Adkins	6th time to Committee; discussed in August, October, December, February, and April. Project Specific Special Provision for Digital Speed Limit Trailer on high speed, multi-lane highways, work areas. Update to Special Provision removes Appendix 636A; it is redline copy showing revision. <u>Approval is expected in June.</u>
<u>720</u>	720.3.2-Quality Assurance (QA) Testing V. Allison	4th time to Committee; discussed in December, February, and April. Specification change to Section 720-Smoothness Testing. The revision updates the turnaround time for testing and the removal of Schedule 3 paving. Updates per comments at the last meeting; it is redline copy showing the revisions.

20240612 – June Specifications Committee Meeting

	SP-Civil Rights and Labor (CRL)	<p>2nd time to Committee; discussed in April.</p> <p>The purpose of this SP is to notify contractors and subcontractors that they will be required to electronically submit certified payrolls and subcontractor payments utilizing the Civil Rights & Labor (CRL) module within the AWP system.</p> <p>The SP addresses CRL system requirements and access procedures, payroll submission/import methods, and subcontractor payment submission requirements.</p>
	D. Ballard	No update to the Special Provision.
<u>406</u>	SP406-High Friction Surface Treatment	<p>2nd time to Committee; discussed in April.</p> <p>The purpose of this SP is to include language as it should pertain to a bridge deck, specifically, and in-service bridge deck that has cracking.</p> <p>The SP addresses the widespread bridge deck cracking and then applies the High Friction Surface Treatment. Overall, this provides an overlay that includes high friction for safety purposes and takes care of the cracks.</p>
	K. Baranowski	No update to Special Provision.
<u>715</u>	715.42.10.5-PVC-Coated, Galvanized Rigid Conduit	<p>2nd time to Committee; discussed in April.</p> <p>Specification Change to Section 715-Miscellaneous Materials. After several years listed as plan notes, the update adds the subsection to 715.42.10-Electrical Conduit to help create an APL and aid in the materials finalization process.</p> <p>No update to the specification; it is the redline copy showing the revision.</p>
	G. Mullins	Approval is expected in June.

New Business – New Provisions for Spec Committee

SECTION	TITLE	DESCRIPTION
<u>106</u>	106.1-Source of Supply and Quality Requirements	<p>1st time to Committee</p> <p>Specification change to Section 106-Measurement and Payment. Updating Buy America requirements to correlate with new guidance from FHWA. The revision adds reference to the MPs and federal guidelines.</p>
	J. Adkins	The specification is redline copy showing the revisions.

20240612 – June Specifications Committee Meeting

<u>109</u>	<p>109.20.1-Electronic Ticket Delivery</p> <p>G. Hanna</p>	<p>1st time to Committee Specification change to Section 109-Measurement and Payment. Revisions adds precast concrete products, pipe, and reinforcing steel to subsection.</p> <p>The specification is redline copy showing the revision.</p>
<u>601</u>	<p>SP601-Structural Concrete</p> <p>A. Gillispie</p>	<p>1st time to Committee. Project Specific Special Provision (SP) for Structural Concrete. The revision adds Class S concrete.</p>
<u>645</u>	<p>SP645-EPS Geofoam Box Culvert</p> <p>D. Verno (TRC)</p>	<p>1st time to Committee. Project Specific Special Provision (SP) for use of the induced trench method using geofoam to install a culvert. This Project Specific Special Provision is intended to only be used on the coalfields expressway.</p>
<u>701</u>	<p>SP701-Expansive Hydraulic Cement</p> <p>A. Gillispie</p>	<p>1st time to Committee. Project Specific Special Provision (SP) for Hydraulic Cement. Revision adds Expansive Hydraulic Cement as a subsection.</p>
<u>701</u>	<p>701.5-Rapid Hardening Hydraulic Cements</p> <p>A. Gillispie</p>	<p>1st time to Committee. Specification Change to 701-Hydraulic Cement. The revision adds new subsection 701.5-Rapid Hardening Hydraulic Cement to the subsection.</p> <p>The specification is redline copy showing the revisions.</p>

2024 Specifications Committee

The Specification Committee typically meet every other month; on the first Wednesday at 9:00am. 2024 meetings will be held in **February (2/7), April (4/3), June (6/12), August (8/8), October (10/2), and December (12/4).**

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

Deadline for new items & updates to these provisions is May 12, 2024.

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.*

Comments

Comments are requested for Specifications Changes and Project Specific Special Provisions as they help in the decision-making process. Please send comments by Friday prior to the meeting!

20240612 – June Specifications Committee Meeting

Please Send Comments to either: Dee.L.Begley@wv.gov or Janie.M.Adkins@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 through 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 WVDOH 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 along with a brief overview of the item or reason for the change:

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.

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 redline 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.

20240612 – June Specifications Committee Meeting

- SPs in committee may be used in advertised project. Hope to work to address comments & finish approving at subsequent meeting.

2023 Standard Specification Roads and Bridges

Print Version:

WVDOH Employees-contact us or stop by Technical Support

Industry-We have an order form on our webpage here:

- https://transportation.wv.gov/highways/TechnicalSupport/specifications/Documents/SpecBookOrderForm_20230925.pdf

2024 Supplemental Specifications

The 2024 Supplemental is posted on our webpage.

- <https://transportation.wv.gov/highways/TechnicalSupport/specifications/Pages/default.aspx>

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March 21, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

**SECTION 636
MAINTAINING TRAFFIC**

636.19-PORTABLE MESSAGE SIGNS:

636.19.3-Sign Types:

ADD THE FOLLOWING SUBSECTION:

636.19.3.3-Digital Speed Limit Trailer: A Digital Speed Limit Trailer (DSLTL) shall conform to the general requirements of 636.19. The DSLTL shall incorporate a standard speed limit sign per MUTCD sign designation R2-1. The size of the R2-1 shall be a minimum of 48-inches by 60-inches. The background sheeting used to fabricate the R2-1 shall meet the requirements of ASTM D4956 IV, VIII, IX, or XI. The static message numerical portion of the R2-1 shall be replaced with the digital display panel. The DSLTL support structure shall provide for a minimum R2-1 mounting height of 7-feet above the roadway.

The DSLTL shall also incorporate beacons. One beacon shall be located immediately above and below the R2-1 sign and "Work Zone" plaque. Each beacon shall consist of a circular yellow signal indication having a minimum nominal diameter of 8-inches. The beacons shall be vertically aligned and centered horizontally with the R2-1 sign. The edge of each beacon housing shall be located no closer than 12-inches outside of the nearest edge of the R2-1 sign or "Work Zone" plaque. The DSLTL shall be programmed such that each beacon will be flashed at a rate of not less than 50 or more than 60 times per minute. The illuminated period of each flash shall be a minimum of 1/2 and a maximum of 2/3 of the total cycle for each beacon. The DSLTL shall incorporate automatic adjustment of the luminance of the beacons under varying light conditions. The DSLTL shall provide the user the option of turning the beacons off or alternately flashing the beacons while the display is in operation.

Each DSLTL shall have remote communication capabilities using a cellular modem allowing the user to change the displayed speed remotely using manufacturer provided

DRAFT

March 21, 2024

software. In addition, each separate DSLT shall have the ability for the user to change the displayed speed manually at the device. Each DSLT shall provide the user with the ability to monitor the battery level both remotely using the manufacturers provided software, provided there is cellular coverage where the device is placed, and manually at the device. Each device shall provide the user the ability to manually charge the battery if necessary. The DSLT shall have a twenty (20) day minimum autonomy with flashers functioning.

The DSLT shall be charged at all times and maintained in proper working conditions. If one or more of the devices stops functioning due to neglect by the Contractor to properly maintain the device and not replaced or repaired within 36 hours a penalty of \$500 per calendar day shall be applied. If the DSLT is non-functional due factors outside the control of the Contractor the penalty shall not apply (an example such as vehicle impact and vandalism), however repair or replacement shall be within 48 hours.

636.19.4-Placement:

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

636.19.4-Placement, Operation, Removal, and Documentation: Placement of and messages displayed on portable message signs shall be approved by the Engineer. Portable message signs are not to be placed where they conflict with one another. Plan placement locations may be adjusted as needed in the field, with the Engineer's approval, in order to achieve greater advance sight distance and/or to utilize other existing devices or terrain features such as temporary barrier, guardrail, or benches to shield the device from impacts provided the device maintains the operational function as intended by the placement location shown in the plans. A minimum sight distance of 800 feet should be achieved if possible. Devices placed behind concrete barriers or guardrail should be placed at and behind the downstream end of such features if possible. Unless specified in the plans, portable message signs shall not be located within a transition or taper.

Portable message signs that in the judgement of the Engineer are not adequately shielded from impacts by utilizing barriers or terrain as described above shall be delineated with traffic cones, channelizer cones, or drums on the approach to them. The delineation devices shall be tapered from the outside edge of the paved shoulder, or outside edge of the device if no paved shoulder exists, at a spacing of twenty-five (25) feet. The length of the taper shall be 150-feet and shall end fifty (50) feet in advance of the device. The remaining fifty (50) feet leading up to the device shall be delineated with a minimum of three (3) additional delineation devices placed inside of the inside edge of the device and tangent to the roadway. Additionally, such devices shall be operational at all times to provide clear visibility. This shall include time periods allowed herein when such devices are temporarily no longer needed to serve their intended function of contributing to the efficient or safe operation of the work zone but are temporarily allowed to remain in place. In such cases, Changeable Message Signs shall be set to flashing warning mode or shall display an alternative generic message approved by the Engineer if a specific informational message is not currently required.

Changeable Message Signs not adequately shielded and not expected to be needed for an entire daylight period or for more than four (4) hours at night shall be temporarily relocated to

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a shielded location or other location off the shoulder, either of which shall be approved by the Engineer.

In cases where the work zone speed limit in effect through the work area is reverted to the normal posted speed limit in accordance with the specifications below, and a reduced work zone speed limit is not to be reinstated within 72-hours, all DSLT's and Speed Monitoring Trailers not adequately shielded shall be relocated as specified above for Changeable Message Signs and the coverings on existing post mounted static speed limit signs displaying the normal posted speed limit shall be uncovered if directed by the Engineer. If the time period between reverting to the normal posted speed limit and reinstatement of a reduced work speed limit exceeds fourteen (14) days, all Speed Monitoring Trailers and DSLT's shall be removed from the project and payment for all such devices will cease until the devices are again necessary and reinstalled.

If specified in the plans, the work zone speed limit displayed on the Speed Monitoring Trailers and the DSLT displays shall be adjusted under different work zone conditions in accordance with the instructions in the plans. Plan specified upward adjustments of the speeds displayed on these devices shall only be implemented after obtaining additional concurrence from the project Engineer. The project Engineer may, based on project specific circumstances not contemplated by the plans, direct the Contractor to not upwardly adjust the work zone speed limit.

Portable message signs shall not be activated, deactivated, or have their displayed message automatically changed using a pre-programmed schedule.

Unless otherwise requested by the Engineer, the Contractor shall submit a weekly report to the Engineer documenting dates and times of any changes to portable message signs including location and displayed message.

636.23-METHOD OF MEASUREMENT:

636.23.22-Portable Message Signs:

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

636.23.22.1- Changeable Message Sign: The quantity of "Changeable Message Sign" shall be the actual number of days that the sign is used on the project.

636.23.22.2- Speed Motoring Trailer: The quantity of "Speed Motoring Trailer" shall be the actual number of days that the sign is used on the project.

636.23.22.3- Digital Speed Limit Trailer: The quantity of "Digital Speed Limit Trailer" shall be the actual number of days that the sign is used on the project.

636.25-PAY ITEMS:

ADD THE ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
636031-*	Digital Speed Limit Trailer	Day

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~~Appendix 636A. This sheet is not required with PS&E submission.:~~

~~———— Designer Note: This specification requires use of Digital Speed Limit Trailers (DSLTL) in lieu of Work Zone Speed Limit When Flashing static signing on projects. It is intended for only specified projects which meet criteria below.~~

- ~~● The ADT of the Interstate or expressway is 25,000 or greater.~~
- ~~● The normal posted speed limit of the Interstate or expressway is 50 MPH or greater.~~
- ~~● Work zone speed limits are expected to be in effect at any locations along the mainline of the Interstate or expressway for a total of thirty (30) complete days or more during the duration of the project.~~
- The work zone length is a minimum of three (3) miles.

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March 18, 2024_May 2, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 720 SMOOTHNESS TESTING

720.1-DESCRIPTION:

To measure and evaluate the ride quality of pavement surfaces in accordance with the International Roughness Index (IRI), as well as the most recent forms of AASHTO R-56, AASHTO M328, and AASHTO R-57.

720.2-EQUIPMENT:

720.2.1-High-Speed or Low Speed Inertial Profiler: Provide a high-speed or low speed inertial profiler for measuring and evaluating the ride quality of pavement surfaces. The inertial profiler shall be certified at a facility approved by the Materials Control, Soils and Testing Division (MCS&T). Certification facilities should conduct the evaluation in accordance with the most recent edition of AASHTO R-56 “Standard Practice for Certification of Inertial Profiling Systems”. All inertial profilers shall be maintained in accordance with the most recent edition of AASHTO M 328 “Standard Specifications for Inertial Profiler” Calibration and verification shall be done in accordance with MP 720.10.0. The Contractor shall submit equipment certification documentation after becoming certified or after recertification. Proof of equipment certification shall be available upon request.

720.2.2-Inertial Profiler Operator Certification: Certification through the Material Control, Soils and Testing Division shall be required to operate an inertial profiler in the State of West Virginia. The operator shall pass a written exam administered by MCS&T. All operators receiving a passing score on the written exam will be placed on the WVDOH Materials Certification Directory that is found on the MCS&T webpage. Certification shall be for a period of three years. Certified operators shall contact MCS&T for certification renewal.

720.3-RIDE QUALITY TESTING:

720.3.1-Quality Control (QC) Testing: QC testing on ~~NHS routes~~ all eligible projects is the responsibility of the Contractor. QC testing is optional, but when performed shall be completed in accordance with MP 720.10.01 Section 8 and shall be completed no later than ~~fourteen (14)~~ thirty (30) calendar days after all lanes are continuously open to traffic. Data collection shall be done by a certified inertial profiler and certified inertial profiler operator (See 720.2.1 and 720.2.2;). Collected profile data shall be submitted to ~~the project engineer~~ the DOH MCS&T roadway inbox DOHMCSnTRoadway@wv.gov in accordance with MP 720.10.01 Section 10

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within ~~five (5)~~ seven (7) calendar days of testing. Price adjustments will be calculated according to Contractor’s QC data unless QA testing determines otherwise.

~~**720.3.2 Quality Assurance (QA) Testing:** QA testing is the responsibility of the Division. The Engineer shall submit a “Bridge and Pavement Testing Request Form” form to MCS&T via email, within five (5) calendar days after all lanes are continuously open to traffic. Within fourteen (14) calendar days from receiving the request, the Division will conduct QA testing. The Division will use a certified inertial profiler and certified operator for QA testing.~~

~~**720.3.32-Quality Assurance Verification (QAV) Testing:** QAV testing is the responsibility of the Division. The Division’s profile data and the Contractor’s profile data will be compared to determine the IRI differences. Final project price adjustments will be made using the Contractor’s profile data if the IRI differences are within the allowable limits outlined in Table 720.3.3. The Contractor shall submit a pavement testing request form to MCS&T to the DOH MCS&T roadway inbox DOHMCSnTRoadway@wv.gov within five (5) calendar days after all lanes are continuously open to traffic. QA testing will be completed in accordance with MP 720.10.01 Section 8 and should be completed no later than thirty (30) calendar days after receiving the pavement testing request from the Contractor, or within 30 calendar days of the Contractor’s QC test. In the event QA testing cannot be completed within thirty (30) calendar days of QC testing, price adjustments will be calculated solely based on QC data. If QC testing was not performed, then price adjustments will be calculated solely based on QA data regardless of time frame. The Division will perform testing using a certified inertial profiler and a certified inertial profiler operator in accordance with the most recent edition of AASHTO R 56 “Standard Practice for Certification of Inertial Profiling Systems”.~~

~~**720.3.3-QA Testing Comparison:** The Division’s profile data and the Contractor’s profile data will be compared to determine the IRI differences. Final project price adjustments will be made using the Contractor’s profile data if the IRI differences are within the allowable limits outlined in Table 720.3.3. If the QA testing IRI differences do not meet the maximum allowable difference from Table 720.3.3, QA testing data will be used for final price adjustments. This Comparison is only applicable if both profiles are completed within thirty (30) calendar days of each other.~~

**TABLE 720.3.3
QAV Testing Allowable IRI Differences**

Contractor’s IRI Mean (in/mi)	Maximum Allowable Differences
50.0 or Less	8.5% of Contractor’s IRI Mean
50.1 to 150.0	6.0% of Contractor’s IRI Mean
150.1 or Greater	7.0% of Contractor’s IRI Mean

~~**720.3.4 Referee Testing:** Referee testing is the responsibility of the Division. If the QAV testing IRI differences does not meet the maximum allowable difference from Table 720.4.3, the Division will perform referee testing using a certified inertial profiler and a certified inertial profiler operator in accordance with the most recent edition of AASHTO R 56 “Standard Practice for Certification of Inertial Profiling Systems”. The profile data from the referee test shall be used in determining the final project price adjustments.~~

~~—720.3.4.1-Referee Data: If the referee test data still does not meet the allowable IRI differences MCS&T can recommend the Contractor recertify their inertial profiler and inertial profiler operator that was used on the project.~~

720.3.54-Testing After Repairs: Should repairs be needed to the surface from the defects in the pavement prior to project closeout, QA ~~and QAV~~ testing shall be conducted after all repairs are made. This will be the final tested value for the lot.

720.4-RIDE QUALITY ANALYSIS:

720.4.1-Data Location: The average IRI number used in ride quality analysis shall be the mean roughness index (MRI) which is the average IRI of both the left and right wheel path. Analysis shall be done in accordance with MP 720.10.01 Section 9.

720.4.2-Omitted Sections: Bridge Structures and any sections tested which are not included in the pavement project shall be removed from the Smoothness Analysis. These removed bridges and sections shall also include a Lead-In and Lead-Out distance to be removed from the Ride Quality Analysis. The Lead-In distance shall be two hundred (200) feet and the Lead-Out distance shall be two hundred (200) feet.

720.4.3-Sampling Lots: The pavement shall be divided into sampling lots of one-tenth (0.1) lane mile each. Each Lot shall have a smoothness measurement, expressed in inches per mile (in./mi.).

720.4.3.1-Special Cases for Sampling Lots Less Than One-Tenth (0.1) Lane Mile: In some cases, sampling, lots of one tenth (0.1) lane mile will not be attainable. These cases include areas at the end of the project as well as areas that are before the ‘lead in’ length of bridges. If these areas are less than five-hundredths (0.05) of a lane mile that will be eliminated from Smoothness analysis. If these areas are more than five-hundredths (0.05) lane mile these areas will be included in analysis and pay adjustments will be prorated to the nearest one hundredth (0.01) mile. ~~This shall apply to all projects governed by Section 720.~~

720.5-NATIONAL HIGHWAY SYSTEM (NHS) PAVEMENT PROJECT:

Pavement projects located on any NHS route and greater than 0.2 miles of continuous new pavement shall be tested with a high-speed or low speed inertial profiler certified in accordance with Section 720.2.

720.5.1-Determining National Highway System Routes: The NHS map should be used when determining if a route is on the National Highways System. This tool can be found online at the following link:

<https://wvdot.maps.arcgis.com/apps/dashboards/88e87932344946408b7c17f1bd454752>

720.5.2-Schedule 1 NHS Pavement Projects: NHS pavement projects with a total new pavement thickness of four (4) inches or greater shall be classified as Schedule 1 NHS Pavement Projects. The final price adjustments for Schedule 1 NHS Pavement Projects shall be determined using the calculations shown in Table 720.5.2.

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TABLE 720.5.2
Schedule 1 NHS Pavement Projects

IRI for each 0.1-mile section (in/mi)	Price Adjustment (\$)
65.0 or Less	0
65.1 to 95.0	<u>1,300</u> - 20(IRI) + <u>1,300</u>
95.1 or Greater	Corrective Action Required

720.5.2.1-Corrective Action for Schedule 1 NHS Pavement Projects: Corrective action shall be required for Schedule 1 NHS Pavement Projects having an IRI greater than 95.1 in/mi. Corrective action shall be performed using diamond grinding, micro milling, or other work methods approved by the Engineer.

720.5.3-Schedule 2 NHS Pavement Projects: NHS pavement projects with a total new pavement thickness ~~three (3) inches or greater~~ and less than four (4) and greater than one (1) inch inches shall be classified as Schedule 2 NHS Pavement Projects. The final price adjustments for Schedule 2 NHS Pavement Projects shall be determined using the calculations shown in Table 720.5.3.

TABLE 720.5.3
Schedule 2 NHS Pavement Projects

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

~~**720.5.4-Schedule 3 NHS Pavement Projects:** 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 720.5.4.~~

~~**TABLE 720.5.4**
Schedule 3 NHS Pavement Projects~~

IRI for each 0.1-mile section (in/mi)	Price Adjustment (\$)
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:

Pavement projects located on any Non-NHS routes shall be tested with equipment outlined in 720.2.1, 720.2.2 and 720.3 if the project meets all four of the following requirements:

1. Resurfacing is the primary project type
2. Greater than 1 mile of continuous pavement;
3. Edge lines and center line on the new pavement in accordance with Section 663.
4. Thickness of one inch (1) or more of new pavement (including scratch if used)

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720.6.1-Ride Quality Analysis Before Project: Non-NHS pavement projects shall be tested before the pavement project begins. Any new construction of a Non-NHS route will be evaluated as an NHS route according to 720.5.

720.6.2-Data Source Collection After Project Completion: The data-source collection after project completion shall be collected by the Division’s high-speed or low speed inertial profiler as referenced in 720.3.2. On non-NHS routes Quality Control Testing is optional for the contractor. If QC testing is performed, it shall follow the process outlined in section 720.3.

720.6.3-Final Price Adjustments for Non-NHS: If the average ~~percent~~ 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**

IRI for each 0.1-mile section (in/mi)	Price Adjustment (\$ per 0.1-mile Section)
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- PROJECTS THAT DO NOT FALL UNDER PREVIOUS CHARACTERIZATIONS:

At the discretion of the Engineer pavement projects not falling into any of the other classifications shall be measured and evaluated for ride quality analysis under the direction of the Engineer. If recommended by the Engineer this shall be done by the Contractor with a ten (10) foot straightedge. There will not be any pay adjustments based on Smoothness for these projects.

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March 5, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

**ELECTRONIC SUBMISSION OF PAYROLLS AND
SUBCONTRACTOR PAYMENT**

1.0-GENERAL REQUIREMENTS:

The Contractor and all subcontractors shall submit all certified payrolls and subcontractor payments, including those made to Disadvantaged Business Enterprises (DBEs), using the AASHTOWare™ Project Civil Rights and Labor (CRL) system in accordance with this provision. For subcontractor payments, the term “subcontractor” shall include all vendors subject to the Required Contract Provisions Federal-Aid Construction Contracts (FHWA-1273). All subcontracting agreements made by the Contractor shall include this Special Provision.

There will be no direct payment for recording and reporting of this information. All costs associated with this provision shall be considered incidental. More information about the CRL system can be located at: <https://www.aashtowareproject.org/index.php>.

2.0-SYSTEM REQUIREMENTS:

The CRL system is web-based. The Contractor shall ensure compatibility with the CRL system as necessary to successfully execute the work. The CRL system requires the ability to read, create, and edit spreadsheets in the .xlsx file format.

Contractors will be contacted by the Department after the project is awarded to begin the process for accessing the CRL system for them and their subcontractors. Contractors must register for payroll access and develop a method of import prior to the Pre-Construction Conference. The Department’s Civil Rights Compliance Division will provide training for entry of certified payrolls and subcontractor payments in CRL. Detailed information can be found on the Department’s Civil Rights Compliance Division webpage at: <https://transportation.wv.gov/crc/Pages/default.aspx>

Contractors shall ensure each subcontractor, including DBEs, has registered for payroll access and developed their method of import prior to commencing work. The Contractor and subcontractors will be granted access after submitting Request Access forms for each individual user who requires an account. Only those firms with a contract in the system should submit the Request Access form. The software is configured so that each firm can only see their specific

DRAFT

contract information. There will only be one single sign-on process for multiple application access within the Department.

The Department will provide access and a log-in identification (ID) for the CRL system to designated employees of the Contractor and approved subcontractors entered into the system for the contract. The login ID and password are unique to the designated employee and must not be shared with other employees. There are no fees associated with accessing the system or receiving a login ID.

3.0-PROCEDURES:

3.1-Certified Payroll and Subcontractor Data Submission: The Contractor and all subcontractors shall use the CRL system to provide the Department with electronic certified payrolls. The Contractor shall assume all responsibility for ensuring all payrolls and all subcontractor payrolls are submitted and certified electronically in CRL for each week in which any contract work is performed. If all payrolls are not received in this timeframe, the progress payment shall be withheld until all necessary payrolls have been received. Electronic submittal of certified payrolls can be submitted using the following methods:

- Manually add, copy, or modify data directly into CRL;
- Import payroll data with the CRL payroll spreadsheet XML converter tool available at <https://xml.cloverleaf.net/spreadsheet/>;
- Convert payroll system program data to Payroll XML and import it into the CRL system. Information on how to convert to payroll program data to an XML file can be located at <https://xml.cloverleaf.net/resourcekit/>;
- The Contractor may send, on behalf of a subcontractor, payroll payment information based on a signed, certified paper payroll through the Electronic Proxy Payroll Process. Import payroll data with the CRL payroll spreadsheet XML converter tool available at <https://xml.cloverleaf.net/spreadsheet/>.

The Department's Civil Rights Compliance Division may require at any time certified paper copies of payrolls conforming to FHWA-1273 from any or all Contractors working on the project.

3.2-Subcontractor Payment Submission Requirements: The Contractor shall post payment to subcontractors in CRL, including DBE firms listed on their DBE plan towards meeting their contract DBE goal, within fourteen (14) days after receipt of payment from the Department. The Contractor shall submit, and shall require each subcontractor to provide, payment amounts relative to all involvement on the project during the life of the contract in which participation occurs and verification is available. The Contractor shall enter all payments made to all subcontractors into the Payment area of CRL for each estimate.

Refer to the Special Provision for Subcontractor Prompt Payment for further information regarding subcontractor payments.

The Department's Civil Rights Compliance Division may require at any time proof of payments from any or all subcontractors working on the project, including any information related to Contractor DBE payments.

DRAFT

March 18, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

**SECTION 406
HIGH FRICTION SURFACE TREATMENT**

406.1-DESCRIPTION:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

Bridges to receive an High Friction Surface Treatment (HFST) overlay shall be pretreated/primed for the purpose of crack sealing and complete waterproofing.

406.2-MATERIALS:

ADD THE FOLLOWING AFTER THE FIRST SENTENCE:

Materials for the pretreatment/ priming of bridge decks must be from the same manufacturer and proven by the manufacturer of the binder to be compatible.

406.3-ACCEPTANCE TESTING:

REMOVE AND REPLACE THE FIRST SENTENCE WITH THE FOLLOWING:

The binder and aggregate shall be evaluated by AASHTO Product Evaluation and Audit Solutions. Bridge deck pretreatment/primer must have certification from the binder manufacturer that the materials are compatible. This certification shall be submitted to the Engineer a minimum of two weeks prior to starting work.

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406.5-PLACING:

ADD THE FOLLOWING AFTER THE FIRST PARAGRAPH:

The manufacturer’s representative must be on site for the pretreatment/primer on bridge decks. Plans will indicate locations and whether the pretreatment/primer is to be a flood coat or crack chasing method. The Contractor is responsible for the proper construction sequence and methods of applying the binder and aggregate after the application of the pretreatment/primer on bridge decks.

406.11-BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SECOND PARAGRAPH:

Pretreatment/primer of bridge decks will be incidental to Quantity of “High Friction Surface Treatment”.

DRAFT

February 28, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

**SECTION 715
MISCELLANEOUS MATERIALS**

715.42-TRAFFIC SIGNAL MATERIALS AND EQUIPMENT:

715.42.10 Electrical Conduit:

ADD THE FOLLOWING SUBSECTION:

715.42.10.5–PVC-coated, Galvanized Rigid Conduit: The galvanized rigid conduit shall be approved by Underwriters Laboratories, National Electrical Manufacturers Association (NEMA) RN-1, and American National Standards Institute (ANSI) C80-1. In addition to approval, the conduit shall meet the following standards:

- a. ~~The conduit shall meet the following standards:~~ ASTM D149, ASTM D1735, ASTM D2247, ASTM D2240, ASTM D1308, ASTM D638, ASTM D746, ASTM D1151, ASTM D870, ASTM G152, ASTM G153, ASTM D3359, ASTM D4585, ASTM B571
- b. Exterior finish shall have a 40 mil PVC coating.
- c. Interior finish shall have a 2 mil urethane coating.
- d. Thread finish shall have a urethane coating over hot galvanized steel.
- e. Each length of conduit shall be furnished with one liquid tight connector.

This conduit shall be used from junction box to junction box at each road crossing, unless otherwise specified in the project plans. Suitable for bore and jack installation operations.

SECTION BREAK

NEW BUSINESS ITEMS

DRAFT

September 28, 2023 April 24, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 106

CONTROL OF MATERIALS

106.1-SOURCE OF SUPPLY AND QUALITY REQUIREMENTS:

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

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

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

“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.

“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), fiber optic cable (including drop cable), optic fiber, engineered wood, lumber, or drywall. A “construction material” does not include an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives. Items that consist of two or more of the listed materials that have been combined together through a manufacturing process, and items that include at least one of the listed materials combined with a material that is not listed through a manufacturing process, are treated as manufactured products and not as construction materials.

“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.

“Domestic steel products” means steel products for which ~~all manufacturing processes, including application of a coating, have occurred in the United States.~~ all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

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

DRAFT

September 28, 2023 April 24, 2024

“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.

“Manufacturing process” for construction materials means the final manufacturing process and the immediately preceding manufacturing stage for the construction material.

“Manufacturing process” for steel and iron 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.

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

“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.

“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.

“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.

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

106.1.2-State and/or Federal Use of Domestic Steel and Iron: Any steel or iron materials used for either Federal-aid highway and state contract projects shall be manufactured, including the applications of any coatings, in the United States and compliant with 23 U.S.C. 313 and 23 CFR 635.410, entitled “Buy America Requirements.” 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.

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 furnish a certificate of compliance which covers all materials and products involved, including those of any subcontractors and suppliers certifying compliance with Buy America requirements prior to the permanent incorporation of the materials into the project in accordance with MP 106.10.50. ~~The Division shall not authorize or make any payments to a Contractor not fully compliant with this requirement. Any payment made to any Contractor who did not fully comply with this requirement may be recovered by the Division.~~

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Any exception to Federal Buy America requirements for domestic steel and iron will be in accordance with ~~MP 106.10.50~~ MP 106.10.51 and shall be compliant with 23 U.S.C. 313, ~~and~~ 23 CFR 635.410, and 2 CFR 184.

106.1.3-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; however does not apply to any State funded projects with a contract award amount of \$50,000, or less.

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, in accordance with MP 106.10.50. ~~Any payments made by the Division to any Contractor who did not fully comply with this requirement may be recovered by the Division.~~

106.1.4-Use of Domestic Construction Materials: Any construction materials, as defined in Section 106.1.1, 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.” Section 70901-52, entitled the “Build America, Buy America Act” as implemented by the Office of Management and Budget (OMB) in the “Preliminary Guidance for Construction Materials” in ~~OMB Memorandum M-22-11~~ M-24-02. No construction material may be used unless the manufacturing process for the manufacture of the construction material occurs in the United States. The Buy America standards that apply to the manufacturing process for construction materials are listed in ~~MP 106.10.50~~ MP 106.10.51.

Buy America also applies to all 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 ~~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 permanently installed into the project, the Contractor shall supply adequate documentation certifying compliance with Buy America requirements prior to the permanent incorporation of the materials into the project in accordance with MP 106.10.50.

Any exceptions to Buy America requirements for domestic construction materials will be in accordance with ~~MP 106.10.50~~ MP 106.10.51 and shall be compliant with the Build America, Buy America Act.

DRAFT

106.1.5-Exceptions: Any exceptions to state preference requirements for domestic aluminum, glass, and steel products will be in accordance with ~~MP 106.10.50~~ MP 106.10.51 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.

DRAFT

April 11, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 109

MEASUREMENT AND PAYMENT

109.20-WEIGH TICKETS:

109.20.1-Electronic Ticket Delivery:

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

In addition, for asphalt, precast concrete products, pipe, reinforcing steel, 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 interface with the WVDOH e-ticketing portal and 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.

DRAFT

May 8, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

**SECTION 601
STRUCTURAL CONCRETE**

601.1-DESCRIPTION:

ADD THE FOLLOWING AFTER THE TENTH PARAGRAPH IN THE SUBSECTION:

Class S concrete shall be used for bridge decks and other bridge elements when designated in the plans. This mix shall be used to produce a concrete of high durability with low shrinkage potential.

601.2-MATERIALS:

ADD THE FOLLOWING TO THE TABLE:

MATERIAL	SECTION OR SUBSECTION
Expansive Hydraulic Cement	701.5

601.3-PROPORTIONING:

ADD THE FOLLOWING AFTER THE FIFTH PARAGRAPH:

Design mixture testing for Class S concrete shall be in accordance with MP 711.03.23 and shall include air content, slump, compressive strength, surface resistivity, sequential air method (SAM) number, and shrinkage tests. The Contractor shall complete the following tests for mix design acceptance of Class S concrete before mix design submittal and approval:

- **Surface Resistivity-** For establishment of the mixture proportions, specimens for surface resistivity tests shall be made on representative samples prepared and tested in accordance

with AASHTO T 358. A set of three 4-inch x 8-inch cylinders shall be fabricated and moist cured from both of the batches at the minimum cement factor as outlined in Section 3.3 of MP 711.03.23, as specified in AASHTO R 39, for 28 days prior to testing, and the results of this test shall not be less than 40 kΩ-cm.

- **SAM number-** For establishment of the mixture proportions, SAM number tests shall be performed on a representative sample from both of the batches at the minimum cement factor as outlined in Section 3.3 of MP 711.03.23. These samples shall be prepared and tested in accordance with AASHTO T 395. The SAM number for both of these samples shall be less than or equal to 0.20.
- **Shrinkage-** For establishment of the mixture proportions with Portland cement, the 28-day drying shrinkage shall not exceed 0.035% based on average of three specimens from a representative sample from one of the batches at the minimum cement factor as outlined in Section 3.3 of MP 711.03.23. This sample shall be tested in accordance with ASTM C157. Specimens shall be moist cured for 7 days before beginning the 28-drying shrinkage testing.

For establishment of the mixture proportions with Expansive hydraulic cement, the 28-day drying shrinkage shall not exceed 0.035% based on average of three specimens from a representative sample one of the batches at the minimum cement factor as outlined in Section 3.3 of MP 711.03.23. This sample shall be tested in accordance with ASTM C878. The initial 7-day expansion shall range from 0.03% to 0.06%. Specimens shall be moist cured for 7 days before beginning the 28-drying shrinkage testing.

The cost of all test mix requirements shall be considered incidental to the cost of Class S concrete.

601.3.1-Mix Design Requirements:

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

Prior to the start of construction, the Contractor shall design and submit to the Engineer for approval the proportion of materials, including admixtures, to be used which will result in a workable concrete having the applicable properties enumerated below, including those of Table 601.3.1A. A mix design prepared in accordance with MP 711.03.23, shall be required for each class of concrete to be used in the work. The mix design shall be accompanied by a statement giving the source of materials and certified test data from a Division approved laboratory demonstrating the adequacy of the mix design. The Contractor shall notify the Engineer of any change in the source of materials or the addition of admixtures during the progress of the work, since such change may necessitate a new mix design. The Contractor shall also state the \bar{A} value of the fine aggregate and the \bar{A} value of the combined grading of the coarse aggregate, fine aggregate, and cement used in the mix design. Each mix design shall remain approved for a period of three years from the date of approval, after which the mix design may be re-approved for an additional time period. The guidelines for this re-approval process are set forth in MP 711.03.23.

Approved Hydration Control Stabilizing Admixtures, as defined in Section 707.15, which are designed to stop the hydration of cement in a concrete mix, enabling an extension to the allowable discharge time from a truck mixer as outlined in Section 601.7, may be added to an

existing approved concrete mix design in accordance with the procedures outlined in MP 711.03.23.

TABLE 601.3.1A

Class of Concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Standard Size of Coarse Aggregate***	Entrained Air
	Pounds per Square inch	lbs./c.y.*	lb. of water / lb. of cement **	Number	Percent
A	3500	682	0.51	7, 78, or 8	7.5
K	4000	658	0.44	57, 67	7.0
B	3000	564	0.49	57, 67	7.0
C	2500	494	0.58	57, 67	6.0
D	2000	400	0.62	57, 67	5.5
H	4000	See Table 601.3.1C	0.40	57,67	6.5
DC	4500	705	0.44	7, 78, 8	6.0

* An equal mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1C. The Contractor may choose either option.

** When using a SCM, masses of these materials shall be considered as cement for purposes of establishing maximum water content.

*** A number 67 coarse aggregate may be used in Class DC concrete, provided the Engineer approves the use of that size aggregate for the specific project on which it is to be used. That approval will depend on the minimum spacing of the reinforcing steel in the drilled shaft foundation.

TABLE 601.3.1B

Material	Class of Concrete	Quantity
Fly Ash	All Classes Except H	20%
Slag Cement	All Classes Except H	50%
Silica Fume	All Classes Except H	8%

TABLE 601.3.1C

Option	Cement	Fly Ash	Slag Cement	Silica Fume
1	470 lbs.	132 lbs.		30 lbs.
2	423 lbs.		195 lbs.	30 lbs.

MP 711.03.26 shall be used to control the cement factor in all classes of concrete except Class H and Class S.

The Contractor may develop mix designs with a reduced target cement factor as indicated in Table 601.3.1D in lieu of Table 601.3.1A, provided the aggregates used in those mix designs meet the requirements for optimized aggregate gradation in Section 601.3.2.4.1. The \bar{A} requirements will not apply for mix designs that use optimized aggregate gradation.

The Contractor shall develop Class S mix designs according to the requirements of Table 601.3.1D. The aggregates used in Class S mix designs shall meet the requirements for

optimized aggregate gradation in Section 601.3.2.4.1. The \bar{A} requirements will not apply to Class S concrete.

TABLE 601.3.1D

Class of concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Nominal Maximum Aggregate Size	Entrained Air
	Pounds per Square inch	lbs./c.y. ^{Note 1}	lb. of water/lb. of cement ^{Note 2}	Inches	Percent
A	3,500	642	0.51	½ or ⅜	7.5
K	4,000	618	0.44	1 or ¾	7.0
B	3,000	524	0.49	1 or ¾	7.0
C	2,500	454	0.58	1 or ¾	6.0
D	2,000	360	0.62	1 or ¾	5.5
H	4,000	See Table 601.3.1E	0.40	1 or ¾	6.5
S	4,000	600	0.42 ^{Note 4}	1 or ¾	6.5
DC ^{Note 3}	4,500	665	0.44	½ or ⅜	6.0

^{Note 1} An equal mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1E. The Contractor may choose either option. This footnote does not apply to Class S concrete for the substitution of a SCM for cement. The substitution of a SCM for cement is specified in the last paragraph of this subsection.

^{Note 2} When using a SCM, masses of these materials shall be considered as cement for purposes of establishing maximum water content.

^{Note 3} Nominal maximum aggregate size of ¾ inches may be used in Class DC concrete, provided the Engineer approves the use of that size aggregate for the specific project on which it is to be used. That approval will depend on the minimum spacing of the reinforcing steel in the drilled shaft foundation.

^{Note 4} The maximum water content for a mix design with Expansive hydraulic cement may be increased to 0.45.

TABLE 601.3.1E

Option	Cement	Fly Ash	Slag Cement	Silica Fume
1	440 lbs.	127 lbs.		25 lbs.
2	397 lbs.		186 lbs.	25 lbs.

The target cement factor for Class S concrete shall include at least one of the SCMs from Table 601.3.1F as a replacement portion by equal mass. The SCM(s) shall be limited to not more than two of the SCMs listed in Table in 601.3.1F. However, the maximum replacement percentage for any individual SCM shall not be exceeded, and the total replacement percentage of any combination of SCMs shall not exceed 50%.

TABLE 601.3.1F

Material	Quantity	
	Minimum %	Maximum %
Fly Ash	15	25
Slag Cement	25	50
Silica Fume	6	10

**601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.3-Level of Prevention:**

DELETE THE TABLE AND REPLACE WITH FOLLOWING:

TABLE 601.3.1.1.1.3
Determining the Level of Prevention

Level of ASR Risk	Classes of Concrete		Precast Concrete Member	Prestressed Concrete Member
	D	A, B, C, K, H, S, DC		
Risk Level 0	V	V		V
Risk Level 1	W	X		Y
Risk Level 2	X	Y		Z
Risk Level 3	Y	Z		See footnote**

** It is not permitted to construct prestressed concrete members (Section 603) with Aggregate Reactivity Class of R3. Measures must be taken to reduce the level of risk in these circumstances by selecting the aggregates only from the Reactivity Classes of R0, R1, or R2.

**601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.4-Requirements for Various Prevention Levels:**

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

These requirements shall apply to all classes of concrete except Class H and Class S. The prevention levels for Class H and Class S concrete is specified in section 601.3.1.1.1.5.

**601.3.1.1-Mix Design Using Potentially Reactive Aggregate:
601.3.1.1.1-Selecting Preventive Measures For ASR:
601.3.1.1.1.4-Requirements for Various Prevention Levels:
601.3.1.1.1.4.2-Preventions Level W, X and Y:**

DELETE AND REPLACE THE CONTENTS OF TABLE 601.3.1.1.1.4.2b WITH THE FOLLOWING:

TABLE 601.3.1.1.1.4.2b
Minimum Replacement Level of SCM (percentage by mass of cementitious material)

Type of SCM*****	Alkali Content of SCM* (Na ₂ O _e)	Level W	Level X	Level Y
Fly ash** (Cao ≤18%)	≤3.0	15	20	25*****
	>3.0, ≤4.5	20	25*****	Not Allowed
Slag Cement	≤1.0	25	35	50

DRAFT

May 8, 2024

TABLE 601.3.1.1.1.4.2b

Minimum Replacement Level of SCM (percentage by mass of cementitious material)

Silica Fume***	≤1.0	1.2 x LBA or 2.0 x KGA	1.5 x LBA or 2.5 x KGA	1.8 x LBA or 3.0 x KGA
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* The alkali content of all approved SCM sources is listed on the WVDOH approved list of SCMs (APL). If the alkali content of an SCM source is not listed on the APL, the Division will test the SCM from the source to determine the alkali content prior to its use on any WVDOH project.

** The CaO content of approved fly ash sources is listed on the WVDOH approved list of fly ash (APL). If the CaO content of a fly ash source is not listed on the APL, the Division will test the fly ash from the source to determine the CaO content prior to its use on any WVDOH project.

*** The minimum level of silica fume (as a percentage by mass of cementitious material) is calculated on the basis of the alkali (Na₂O_e) content of the concrete contributed by the Portland cement and expressed in lb/yd³ (LBA in Table 601.3.1.1.1.4.2b). LBA is calculated by multiplying the cement content of the concrete in lb/yd³ by the alkali content of cement divided by 100. For example, for a concrete containing 500 lb/yd³ of cement with an equivalent alkali content of 0.81 percent of Na₂O_e, the value of LBA = 500 x 0.81/100 = 4.05 lb/yd³. For this concrete, the minimum replacement level of silica fume for Level Y is 1.8 x 4.05 = 7.3 percent. Regardless of the calculated value, the minimum level of silica fume shall not be less than 7 percent when it is only method of prevention. Mix design with silica fume > 8% shall be reviewed and approved by the Engineer.

**** Mix designs with minimum 25% of fly ash shall be reviewed and approved by the Engineer.

***** If two SCMs are used in Class S concrete in combination, the minimum mass replacement levels given in Table 601.3.1.1.1.4.2b for the individual SCMs may be reduced, provided the sum of the parts of each SCM is greater than or equal to one. For example, if silica fume and slag cement are used together, the silica fume level may be reduced to one-third of the minimum silica fume level in the Table 601.3.1.1.1.4.2b provided the slag cement is at least two-thirds of the minimum slag level required.

Note: The minimum replacement levels in Table 601.3.1.1.1.4.2b are appropriate for use with Portland cements of moderate to high alkali contents (0.71 to 1.00 percent Na₂O_e). Table 601.3.1.1.1.4.2c provides recommendations for adjusting the level of SCM when the equivalent alkali content of the Portland cement is above or below this range. The replacement levels should not be below those given in Table 601.3.1.1.1.4.2b for prevention level W, regardless of the equivalent alkali content of the Portland cement.

DELETE AND REPLACE THE CONTENTS OF OPTION 3 WITH THE FOLLOWING:

Option 3: Using the Lithium Nitrate Admixture: The 30 percent (30%) aqueous solution of Lithium Nitrate Admixture meeting the requirements of Section 707.17 shall be used for all level of prevention including “Level Z” given in Table 601.3.1.1.1.3 except for Class H and Class S concrete. The dosage rate of Lithium Nitrate Admixture shall be based upon the alkali content of cement used in a concrete mix.

Calculation of lithium nitrate (LiNO₃) admixture dosage (100 percent) for mitigation without use of SCMs with a 30 percent (30%) aqueous solution of lithium nitrate.

$$\text{Gallons of LiNO}_3/\text{yd}^3 = (A \times B \times 0.55)/100$$

Where:

A = Pound of Portland cement per cubic yard in a concrete mix

B = Percentage of Alkali content of cement used in a concrete mix

DRAFT

May 8, 2024

Example: If the cement content of concrete is 550 lbs/yd³ and the total alkali content of the cement is 0.82 percent (0.82%), the dosage of lithium nitrate admixture is: $(550 \times 0.82 \times 0.55)/100 = 2.48$ Gal/yd³.

The water content of the mix shall be adjusted by removing 0.85 gallons of water per gallon of lithium nitrate solution.

Example: Amount of water to be reduced (using the value from above example)
Gal/yd³ = $0.85 \times 2.48 = 2.11$

Any concrete mix using a 100 percent (100%) lithium nitrate admixture dosage will be accepted without evaluation. The contractor shall evaluate the effectiveness of less than 100 percent (100%) lithium nitrate admixture in a concrete mix, alone or in combination with fly ash or slag cement or silica fume, in the reduction of expansion in accordance with ASTM C1567*, when a reactive aggregate(s) is (are) used in a concrete mix, at a Division approved lab (an AASHTO accredited Lab, accredited for ASTM C1567) at the contractor's expense. The dosage rate shall not be less than 50 percent (50 %) when only a lithium nitrate admixture is using for evaluation and no SCMs are included in the concrete mix. The sampling and shipping of all aggregate shall be witnessed by a representative of the Division. The ASTM C1567 test results will be considered valid for 5 years from the date of testing.

If both of the aggregates (coarse and fine) used in a concrete mix are reactive (R1, R2 or R3), the contractor shall evaluate the effectiveness of the lithium nitrate admixture, alone or in combination with fly ash or slag cement or silica fume for both of the aggregates separately. When the same source material** is proposed for the use both as coarse and as fine aggregate, test only a selection of the reactive fine aggregate or reactive coarse aggregate, unless there is reason to expect that the coarse aggregate has a different composition than the fine aggregate or vice-versa. The combination of cement, lithium nitrate admixture, alone or in combination with fly ash or slag cement or silica fume, and aggregate that expands less than 0.10% at 16 days after casting will be considered as meeting the "Requirements for Various Prevention Levels (Section 601.3.1.1.1.4)" except for Class H and Class S concrete.

The approved lithium nitrate admixture shall meet the requirements of Section 707.17 and will be listed as "Type S" admixture with footnote of approved admixture for ASR mitigation on the MCS&T web page under Division Approved Source/Product Listing (APL) for Type S: Special Performance. The alkali level of fly ash used in the subject mix shall not exceed 4.5%. The alkali level of slag cement used in the subject mix shall not exceed 1.00%. The alkali level of silica fume used in the subject mix shall not exceed 1.00%. Mix design shall be reviewed and approved by the Engineer.

* Modify the w/c ratio of the mortar used in the ASTM C1567 test to 0.50.

Replace Section 5.3 (Sodium Hydroxide Solution) of ASTM C1567 with the following:

Sodium Hydroxide Solution - Each liter of solution shall contain 40.0 g of NaOH dissolved in 800 ml of water. Add 71 ml of the lithium nitrate admixture multiplied by the decimal equivalent of the lithium nitrate admixture dosage. (For example,

to test a 75% lithium nitrate admixture dosage, each liter of solution will contain 0.75 times 71 ml of lithium nitrate admixture.) This mixture shall be diluted with additional distilled or deionized water to obtain 1.0 liter of solution. The volume proportion of soaking solution to mortar bars in a storage container shall be 4 ± 0.5 volumes of solution to 1 volume of mortar bars. The volume of a mortar bar may be taken as 184 ml. Include sufficient test solution to ensure complete immersion of the mortar bars.

** Same source material applies to same Limestone, Diabase, Quartzite and Basalt source.

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:

601.3.1.1.1-Selecting Preventive Measures For ASR:

601.3.1.1.1.5-Requirements for Various Prevention Levels for Class H Concrete:

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

601.3.1.1.1.5-Requirements for Various Prevention Levels for Class H and Class S Concrete:

601.3.1.1-Mix Design Using Potentially Reactive Aggregate:

601.3.1.1.1-Selecting Preventive Measures For ASR:

601.3.1.1.1.6-Evaluation of the effectiveness of SCM to prevent deleterious expansion:

DELETE THE CONTENTS OF THE SECTION AND REPLACE WITH THE FOLLOWING:

The contractor may evaluate the effectiveness of an SCM in the reduction of expansion in accordance with ASTM C1567*, when a reactive aggregate(s) is (are) used in a concrete mix, at a Division approved lab (an AASHTO accredited Lab, accredited for ASTM C1567) at the contractor's expense. The sampling and shipping of all aggregate shall be witnessed by a representative of the Division. ASTM C1567 test will be considered valid for 5 years from the date of testing.

If both of the aggregates (coarse and fine) used in a concrete mix are reactive (R1, R2 or R3), the contractor shall evaluate the effectiveness of SCM for both of the aggregates separately. When the same source material** is proposed for the use both as coarse and as fine aggregate, test only a selection of the reactive fine aggregate or reactive coarse aggregate, unless there is reason to expect that the coarse aggregate has a different composition than the fine aggregate or vice-versa. The combination of cement, SCM and aggregate that expand less than 0.10% at 16 days after casting will be considered as meeting the "Requirements for Various Prevention Levels (Section 601.3.1.1.1.4)" except for Class H and Class S concrete. The evaluation with the higher percentage of SCM replacement shall be selected for the minimum replacement level of SCM for prevention level in a mix design using potentially reactive aggregate.

DRAFT

May 8, 2024

When more than one mix design, for the same Producer/Supplier, is submitted for evaluation, only one evaluation of the effectiveness of an SCM in the reduction of expansion in accordance with ASTM C1567 testing data, as outlined in paragraphs first through four of this sub-section, will be required for that entire group of mix designs (except Class H and Class S) if all of the mix design in that entire group of mix designs have the same combination of cement, SCM and aggregate sources.

The alkali level of fly ash shall not exceed 4.5%. The alkali level of slag cement shall not exceed 1.00%. The alkali level of silica fume shall not exceed 1.00%. Mix designs with minimum 25% of fly ash shall be reviewed and approved by the Engineer. Mix design with silica fume > 8% shall be reviewed and approved by the Engineer.

- * Modify the w/c ratio of the mortar used in the ASTM C1567 test to 0.50.
- ** Same source material applies to same Limestone, Diabase, Quartzite and Basalt source.

601.3.2-Field Tolerances and Adjustments:

601.3.2.1-Consistency:

DELETE THE CONTENTS OF THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

Upon addition of a superplasticizer at the job site, the mixing drum shall be turned for a minimum of 60 revolutions or 5 minutes at mixing speed to establish a workable mixture of uniform composition and consistency. If a second job site addition of superplasticizer is used; the mixing drum shall be turned a minimum of 30 additional revolutions at mixing speed. All additions and mixing of the superplasticizer shall be completed before placement of the concrete is started. The total number of revolutions shall not exceed 300, and the concrete shall be discharged within the time limits in section 601.7. The slump of Class H and Class S concrete shall not exceed seven (7) inches under any circumstances.

601.3.2.2-Air Content:

DELETE THE SECTION AND REPLACE WITH THE FOLLOWING:

The target value of the entrained air at the point of placement shall be as shown in Tables 601.3.1A and D. However, when pumping concrete, the air content shall be measured before the concrete pump, and the target value of the entrained air shall be as shown in Tables 601.3.1A and D at that point. If the entrained air does not conform with the target value within plus or minus 2.5 percentage points, the Contractor shall take immediate steps to adjust the air content of succeeding loads by making necessary adjustments in the mixture. The air content shall be measured on loads already batched and enroute, as well as the first load to which any adjustments were made in batching procedures. If the air content exceeds the target value plus 3.0 percentage points the concrete shall be rejected. When the concrete is delivered in a truck mixer and the air content is less than the target value minus 2.5 percentage points the concrete shall be rejected, or the Contractor may use additional air entraining agent in an amount that is intended to achieve the target value specified. The addition is permitted under the conditions listed below.

DRAFT

May 8, 2024

The target of the entrained air content of Class H and Class S concrete at the time of placement shall be as shown in Tables 601.3.1A and D. If the entrained air does not conform with the target value within plus or minus 1.5 percentage points, the Contractor shall take immediate steps to adjust the air content of succeeding loads by making necessary adjustments in the mixture. If the entrained air content of Class H and Class S concrete does not conform to the target value plus 2.0 percentage points, the concrete shall be rejected. When Class H or Class S concrete is delivered in a truck mixer and the air content is less than the target value minus 2.0 percentage points, the concrete shall be rejected, or the Contractor may use additional air-entraining agent in an amount that is intended to achieve the target value specified. The addition is permitted under the conditions listed below.

- i. The air entraining agent is the same as used in the approved mix design and is thoroughly mixed with a minimum of 2 gallons of water. The solution will be directed to the front of the mixer.
- ii. The mixer is turned a minimum of 30 revolutions, at mixing speed, or the number of revolutions established in tests to comply with uniformity requirements, whichever is more.

Immediately after mixing, the air content and slump shall be measured by a certified inspector.

An air adjustment may be attempted twice per truck. If after the second addition the specified air content is not achieved, the concrete shall be rejected. These procedures do not alter the limits placed on time to discharge, the total revolutions of the mixing drum, or the specified slump.

601.4-TESTING:

601.4.1-Sampling and Testing Methods:

ADD THE FOLLOWING TO THE TABLE:

Sequential Air Method (SAM) Test	AASHTO T 395
Surface Resistivity Test	AASHTO T 358

ADD THE FOLLOWING SUBSECTION:

601.4.6-Surface Resistivity Tests for Acceptance of Class S Concrete: The Contractor shall also be required to fabricate and test three (3) Surface Resistivity test specimens, in accordance with AASHTO R 100 and AASHTO T 358, every time that a set of compressive strength specimens for Class S concrete is fabricated. These test specimens shall be 4-inch x 8-inch, and they shall be tested at an age of 28-days. These test specimens shall be moist cured until as close to the time of testing as possible and the results of this test shall not be less than 30 kΩ-cm. If the testing result is less than 30 kΩ-cm, then the concrete represented by resistivity value may be removed and replaced by the Contractor. If the Contractor elects to leave the material in place, the Engineer shall evaluate it as to the adequacy for the use intended. All concrete evaluated as unsatisfactory for the use intended shall be removed and replaced by the Contractor. When the Engineer’s evaluation indicates that the work may satisfactorily remain in place, the subject material shall be paid for at a reduced unit price based on Table 601.4.6.

Table 601.4.6

Resistivity result obtained (values expressed in kΩ-cm)	Percent of unit bid price paid for material in question
28-29	95%
26-27	90%
24-25	85%
22-23	80%
20-21	70%
<20	Remove and replace

601.6-HANDLING, MEASURING, AND BATCHING OF MATERIALS:

ADD THE FOLLOWING PARAGRAPH AFTER THE FOURTH PARAGRAPH

When Expansive hydraulic cement is used, to avoid potential localized volcanic expansions, it is recommended to use pre-blended Type K expansive cement. Alternatively, the Expansive component can be added by a pre-mixed slurry at the plant or by slurry pump at the jobsite, instead of pre-blended cement, to prevent potential localized volcanic expansions.

601.7-MIXING:

DELETE AND REPLACE THE CONTENTS OF THE SIXTH PARAGRAPH OF THE SUBSECTION WITH THE FOLLOWING:

For all classes of concrete except Class H, Class S, and concrete for specialized overlays, the total amount of water in a concrete mix, including any water added at the job site, shall not be more than the amount which would cause the water-cement ratio (w/c) of that concrete mix to exceed the w/c which corresponds to the Mix Design Approved Strength, as outlined in Section 5.4 of MP 711.03.23. The maximum water amount shall also be shown in Attachment 4 or 5 of MP 711.03.23 for all approved concrete mix designs. However, under no circumstances shall the w/c in Table 601.3.1A be exceeded.

601.9-ADVERSE WEATHER CONDITIONS:

601.9.1-Cold Weather Concreting:

DELETE AND REPLACE THE FOLLOWING CONTENTS IN THE LAST PARAGRAPH:

Class H, Class S, and Class K Concrete Cold Weather Provisions: Cold weather periods shall be defined as those periods when temperatures above 50° F do not occur for more than half of any 24-hour duration. The temperature of the surface on which the concrete is to be placed shall

DRAFT

May 8, 2024

not be less than 45° F immediately prior to placement of the concrete. During the cold weather periods, as defined above, the temperature of the concrete immediately after placement shall be between 55 and 75° F.

601.10-PLACING CONCRETE:

601.10.1-General:

601.10.1.2-Concrete Placement Limitations:

DELETE AND REPLACE THE CONTENTS OF THE FIRST PARAGRAPH IN THE SUBSECTION:

Immediately prior to, and during, placement of Class H and Class S concrete, if the evaporation rate exceeds 0.10 lb./sq. ft. per hour (see Figure 1), the Contractor shall make provisions (i.e. wind breaks, fogging, etc.) to reduce the rate prior to placing concrete. These provisions shall be maintained during the placement of the concrete. If the evaporation rate obtained from Figure 1 is close enough to the maximum allowable value of 0.10 lb./sq. ft. per hour that there may a discrepancy in the exact numerical value, the following equation shall be used to obtain a more accurate value.

601.10.4-Placing Concrete Bridge Decks:

601.10.4.1-Fogging Equipment:

REMOVE AND REPLACE THE CONTENTS OF THE SUBSECTION WITH THE FOLLOWING:

When Class H and Class S concrete is used, fogging equipment shall be available for use in accordance with these specifications. The fogging nozzles shall produce an atomized mist. Fogging nozzles shall incorporate compressed air to create the mist. Handheld or hand operated equipment shall be permitted when the Contractor has demonstrated that his operator has been trained in its use.

601.11-FINISHING CONCRETE SURFACES:

601.11.4-Finishing Concrete Bridge Decks:

601.11.4.2-Class H Bridge Decks:

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

601.11.4.2-Class H and Class S Bridge Decks: The surface of the Class H and Class S concrete shall be uniformly smooth, dense and even. The surface shall then be given a suitable texture with an approved burlap drag.

The Contractor shall texture in a transverse or longitudinal direction. Once begun, the direction of texturing shall not change. All texturing shall be performed prior to the beginning of curing operations. Only one pass of the drag over the finished area will be

DRAFT

May 8, 2024

permitted. Texturing shall be in strict accordance with the time requirements of 601.12.4 for applying wet burlap.

If texturing is done in the transverse direction, the Contractor shall texture by hand methods as soon as practicable after finishing machine passage, without any additional finishing operations between the machine passage and texturing operations.

If texturing is done in the longitudinal direction, the burlap drag shall be a seamless strip and shall be attached to the work bridge such that the surface of the concrete is textured as soon as practicable after finishing machine passage, without any additional finishing operations between the machine passage and texturing operations. Small areas, inaccessible to the attached drag, may be textured by hand methods.

The finishing movement and resulting progress of the burlap drag shall be done in a manner so as to prevent ridges or gouges from forming in the concrete surface. The drag shall be weighted, and the contact area changed as required to produce a texture acceptable to the Engineer. The drag shall be cleaned as required; to remove all hardened concrete particles and shall be replaced after each day's operation.

Texture resulting from the drag shall stop within one foot of curbs or parapets.

Any hand finishing operations shall be kept to a minimum for Class H and Class S bridge decks.

601.11.4.4-Class H Concrete Finished Deck Grooving:

ADD THE FOLLOWING TO THE TITLE OF THE SUBSECTION:

601.11.4.4-Class H and Class S Concrete Finished Deck Grooving:

601.12-CURING AND PROTECTING CONCRETE:

601.12.1-Curing Under Normal Conditions:

DELETE AND REPLACE THE CONTENTS OF THE SECOND PARAGRAPH WITH THE FOLLOWING:

Concrete surfaces shall be kept completely and continuously moist. Curing shall be continued for a period of at least 7 days. This curing period may be reduced if the contractor presents evidence that the in-place concrete has attained 70% of the specified strength for the class of concrete under cure. Under no circumstances, shall the period of cure be less than 3 days. The reduced curing period option is not applicable to Class H, Class S, or Class K concrete. When placing concrete elements with a minimum dimension greater than two (2) feet, the contractor shall not be permitted to add additional cement to the target cement factor in the approved mix design in order to obtain high-early strength and/or reduce curing time. Surfaces may have coverings temporarily removed for finishing, but the covering shall be restored as soon as possible.

601.12.2-Curing Under Cold Weather Conditions:

DELETE THE FOURTH PARAGRAPH AND REPLACE WITH THE FOLLOWING:

DRAFT

Class H, Class S, and Class K Concrete Provisions: The surface temperature of the concrete shall be maintained between 55 and 75°F for 72 continuous curing hours immediately after placement. After this 72 hour period, a minimum concrete surface temperature of at least 50°F shall be maintained for an additional 96 continuous curing hours.

601.12.4-Curing Class H Concrete:

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

601.12.4-Curing Class H and Class S Concrete: It is the nature of Class H and Class S concrete material to quickly form a plastic film at the surface upon drying. This film is to be protected from drying and cracking by prompt covering with wet burlap. Regardless of the type of concrete placed, the use of membrane curing compounds will not be allowed. Floor drains shall be immediately unplugged to permit the deck to drain.

The concrete surface shall be completely covered with clean, wet burlap. The burlap shall be thoroughly saturated over its entire area, but shall be drained of excess water before application. Burlap shall be lapped a minimum of one foot and shall lay flat. Failure to apply wet burlap within 30 minutes after discharge of the concrete from the truck and within 10 minutes of the completion of finishing operations shall be cause for rejection of the work as determined by the Engineer. Care shall be exercised to ensure that the burlap is well drained. Burlap shall be continuously wet for a period of seven days by means of automatic intermittent sprinkling or a continuous wetting system.

601.13-PROTECTIVE SURFACE TREATMENT:

601.13.1-Silane Treatment for Bridge Superstructure:

REMOVE AND REPLACE THE SECOND PARAGRAPH OF THE SUBSECTION WITH THE FOLLOWING:

The application of this silane protective surface treatment is not required for elements constructed from Class H and Class S concrete.

601.14-METHOD OF MEASUREMENT:

REMOVE AND REPLACE THE FIRST AND SECOND PARAPGRAPH OF THE SUBSECTION WITH THE FOLLOWING:

The quantity of work done for Classes A, B, C, D, H, K, M, and S concrete will be measured in cubic yards, complete in place and accepted as determined by the dimensions on the Plans or Contract Documents, subject to adjustments provided for in Sections 104.2 and 109.2.

The quantity of work done for Class H, Class S, and Class K concrete will be measured in cubic yards, complete in place and accepted, as measured from one end of the bridge to the other, fascia to fascia, and from the top of the forms to the finished elevation of the proposed deck surface. The volume of concrete required to fill the flutes of stay-in-place forms shall be calculated by taking the Contractor's approved *SIP_{adj}* factor and multiplying by the square yardage of SIP area minus beam widths, expansion dam widths, etc. as applicable.

601.16-PAY ITEMS:

DRAFT

May 8, 2024

ADD THE FOLLOWING TO THE TABLE:

601010-*	Class S Concrete	Cubic Yard
601025-009	Modified Concrete, Class S	Cubic Yard
601026-005	Modified Architectural Concrete, Class S	Cubic Yard

DRAFT

May 21, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

**SECTION 645
REINFORCED SOIL SLOPES**

645.1-DESCRIPTION:

ADD THE FOLLOWING CONTENT AFTER THE FIRST PARAPGRAH OF THE SUBSECTION:

Expanded polystyrene (EPS) Geofom shall be used in the backfilling of box culverts and shall be placed directly against the box culverts as shown in the plans or as established by the Engineer. The EPS Geofom shall be in accordance with these specifications and in close conformity with manufacturer's recommendations.

The following includes providing, handling, and installing EPS Geofom.

645.2-MATERIALS:

ADD THE FOLLOWING SUBSECTIONS:

645.2.4-Expanded Polystyrene (EPS) Geofom Material:

645.2.4.1-EPS Geofom: EPS Geofom shall be in compliance with ASTM D6817. EPS Geofom types shall be specified in the construction plans. All EPS Geofom blocks shall be treated by the manufacturer with a tested and proven termite treatment for below grade applications, 3-year minimum field exposure. The treatment shall be EPA registered, meet requirements of ICC ES AC239, and be recognized in an ICC ES report.

645.2.4.2-GeoGripper Plates (Or Equivalent): GeoGripper® or equivalent inter-block connectors shall be used to restrain EPS Geofom from moving laterally. The plate shall be made of galvanized or stainless steel with two-sided multi-barbed design capable of piercing geofom. Each plate shall be capable of a lateral holding strength of 60 lbs.

DRAFT

May 21, 2024

The number of inter-block connectors shall be determined in the field based on the size of geofoam block utilized and their locations. Typically, four inter-block connectors are required for each 4 ft by 8 ft geofoam block.

645.3-FOUNDATION PREPARATION:

ADD THE FOLLOWING CONTENT AND SUBSECTION AFTER THE FIRST PARAGRAPH:

Project site preparation and installation of EPS Geofoam placement shall be according to manufacturer's recommendations, requirements and/or sequencing as indicated in project plans and the following and shall meet the approval of the Engineer:

1. Site Verification of Conditions: Verify conditions of substrate, and other conditions which affect installation of geofoam.
2. Equipment shall not be driven directly on EPS blocks and nonwoven fabric without the minimum required cover as indicated on project plans. If necessary to access or construct portions of the fill, equipment may drive on sacrificial blocks of EPS. Sacrificial blocks of EPS fill which shall include any EPS block upon which traffic as driven, shall be removed after access is no longer required, and shall be completely replaced with new EPS blocks meeting all the requirements of this Specification. Sacrificial EPS shall be thick enough to adequately protect underlying permanent EPS blocks. Any EPS beneath the sacrificial layer that is damaged by transmission of stresses through the sacrificial layer shall be removed and replaced.
3. There shall be no debris of any kind between adjacent surfaces of EPS blocks at the time adjacent EPS blocks are placed.
4. There shall be no standing water or accumulated snow, ice or frost on the previously placed EPS block layer within the area where subsequent EPS blocks are to be placed at the time of block placement.
5. EPS blocks shall be placed so that all vertical and horizontal joints between blocks are tight. Where EPS block is placed against a cut in soil for benching or keying into the existing ground or new embankment, if there are gaps between EPS blocks and adjacent soil cut, the space shall be filled with sand and hand tamped.
6. Inter-block connectors shall be used to restrain EPS blocks from moving laterally. The inter-block connectors shall be set into the EPS block such that the inter-block connectors do not cause a gap to exist between adjacent layers of EPS blocks.
7. With the exception of sandbags or similar "soft" weights used to temporarily restrain EPS blocks and nonwoven fabrics against wind, no construction material other than shown on the approved drawings shall be placed or stockpiled on the EPS blocks. At no time shall heat or open flame be used near the EPS blocks so as to cause melting or combustion of the EPS.
8. Partial installations or temporary exposures and finished surfaces of EPS shall be protected from damage during construction. Surfaces or blocks of EPS damaged during construction and prior to completion and acceptance of the EPS block fill shall be removed and replaced.

645.3.1-Protection:

1. At all stages of construction, the EPS blocks shall be handled in a manner to prevent physical damage to the blocks. EPS blocks with cracks of any size are not acceptable and shall be rejected. Holes shall not be created in the blocks at any stage of manufacturing, storage, or construction to facilitate shipping or handling of the blocks.
2. If the EPS blocks are to be stockpiled at the construction site until placement, a secure storage area shall be identified and designated by the Contractor for this purpose, subject to approval. The storage area shall be away from any heat source or construction activity that produces heat or flame or would expose the blocks to hydrocarbon fuels such as diesel, kerosene, or gasoline. In addition, smoking shall not be allowed in the storage area. EPS blocks in temporary on-site storage shall be secured with sandbags and similar “soft” weights to prevent their being dislodged by wind. The blocks shall not be covered in any manner that might allow the buildup of heat beneath the cover. The blocks shall not be trafficked on by any vehicle or equipment. In addition, foot traffic by person shall be kept to a minimum.
3. The amount of time during which EPS blocks can be stored at the Project construction site shall be limited to a maximum of 30 calendar days.
4. Cover any EPS fill to be exposed to sun light for more than 90 days with opaque material which will prevent ultraviolet light degradation.
5. Any damage to the EPS resulting from the contractor’s vehicles, equipment, or operations, shall be corrected.
6. Correct damage to EPS as follows:
 - a. Slight damage (<0.12 cubic feet with no linear dimension >1 foot) may be left in place as is.
 - b. Replace EPS blocks with damage (i.e., exceeding the “slight” category) with EPS blocks which meet the specifications. EPS blocks exceeding the slight damage criteria may be cut to eliminate the damage and the remaining undamaged portion of the block may be used within the fill, provided the undamaged portion of the block meets all other requirements.

645.3.2-Delivery, Storage and Handling: Delivery, storage, and handling instructions provided by manufacturer should be strictly followed. Store above ground and protected from moisture, liquids, and sunlight prior to installation. Product should not be exposed to open flame or other ignition sources.

645.7-ACCEPTANCE:

ADD THE FOLLOWING AFTER THE FIRST PARAGRAPH:

Prior to acceptance of Expanded Polystyrene (EPS) Geofoam, the following shall be submitted:

- a. EPS Geofoam manufacturer’s product literature, instructions, technical data., and technical bulletins. Including physical properties in compliance with ASTM D6817 Type specified, and shop drawings showing the EPS Geofoam block layout.
- b. A summary of test compliance with specified performance characteristics and physical properties.

DRAFT

May 21, 2024

- c. Manufacturer shall supply a product certificate showing evidence of Third-Party Quality Control.

After EPS Geofoam and has been installed and before the work has been accepted, the Contractor and Inspector shall perform a visual inspection of the EPS Geofoam coverage. Any area deemed unacceptable and questionable as to remaining in position during the placement of backfill material shall be replaced or repaired, as required.

If portion(s) of the EPS Geofoam are deemed unacceptable, the portion(s) shall be removed and replaced at the expense of the Contractor.

645.10-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

645002-*	EPS Geofoam, "Type"	Cubic Foot
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DRAFT

April 29, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

FOR

**SECTION 701
HYDRAULIC CEMENT**

ADD THE FOLLOWING SUBSECTION:

701.5-EXPANSIVE HYDRAULIC CEMENT:

Expansive hydraulic cement shall conform to the requirements of ASTM C845, Type K.

701.5.1-Expansive Component: Expansive component (mineral additive) may be blended with an ASTM C150 Type I or ASTM C595 TYPE IL to produce an ASTM C845 Type K. The resulting blend shall meet the requirements of ASTM C845, Type K and identical proportions shall be used in the proposed mix design.

DRAFT

May 7, 2024

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

**SECTION 701
HYDRAULIC CEMENT**

ADD THE FOLLOWING SUBSECTION

701.5-RAPID HARDENING HYDRAULIC CEMENTS:

Rapid Hardening Hydraulic Cements shall be calcium sulfoaluminate, CSA, and be in accordance with ASTM C1600.