April Specifications Committee Meeting Agenda

Meeting Date

Wednesday, April 7, 2021 @ 9:00am
Skype Meeting. E-mail distribution message includes instruction.

Approved Permanent Specification changes from last Committee meeting (2/3/21)

- **307.2-Materials** Removes reference to 704.6.3.
- **601.2-Materials** Adds concrete sealer material reference.
- **603.15-Pay Items** Update pay item unit of deck panel to square foot to correlate with method of measurement
- **704.6.2-Gradation, Quality, and Crushed Particle Requirements, 704.6.3-Sampling, Testing and Acceptance Procedure** Revision moves Table 704.6.2

Approved Project Specific Special Provisions (SP) from last Committee meeting (2/3/21)

- **SP403-Crack Sealing in Asphalt Pavement**
- **SP615-Alternative Technical Concept**
- **SP636-Temporary CCTV**

Items removed from Committee Agenda

- **None**

Old Business - Provisions discussed at last Committee meeting

SECTION	TITLE	DESCRIPTION
212	**SP212 - Shoring, Causeway**	**3rd time to Committee; discussed in October, December & February.** Project Specific Special Provision (SP) for Shoring, Causeway. SP updated per comments at the last meeting (clarifying 'Temporary Structure' is separate item and add 'maintain' to basis of payment). It is redline copy showing the changes. Approval is expected in April.
636	**636.19.4-Placement**	**2nd time to committee; discussed in December and February.** Proposed specification change to Section 636. The revision updates the placement requirements of Portable Message Signs. corrects the unit of deck panel items to square foot, as that's how it is listed in method of measurement subsection. No update to the specification. Approval is expected in April.

306	**SP306 - Rubbilization**	**Update to previously approved SP; 2nd time to Committee.** Project Specific Special Provision for Rubblization. It is redline copy showing the proposed changes to it. SP updated per comments at the last meeting (clarifying proof roll, method of measurement, and basis of payment). It is redline copy showing all the changes to it from prior approved version. Approval is expected in April.
663	**SP663 - Pavement Markings** (Districtwide Striping Contract)	**Update to previously approved SP; 2nd time to Committee.** Project Specific Special Provision for Districtwide Striping Contract, SP663-Pavement Markings. It is redline copy showing the proposed changes to it. No update to the SP. Approval is expected in April.
407	**SP407 - Stress Absorbing Membrane Interlayer**	**Update to previously approved SP; 2nd time to Committee.** Project Specific Special Provision for Stress Absorbing Membrane Interlayer (SAMI) seal. It is revision of the gradation requirements. SP has been updated (remove ASTM references, gradation to reference 405.2.1, and update pay item). It is redline copy showing the proposed changes to it from prior approved version.
405	**405.2.1-Aggregate**	**2nd time to Committee; discussed in February.** Proposed specification change to Table 405.2. 1, revision of the aggregate gradation requirements. It is redline copy showing the proposed changes to it. No update to the specification.
107	**107.21.1-Erosion and Sedimentation Control**	**2nd time to Committee; discussed in February.** Proposed specification change to Section 107. The revision to 107.21.1 are updates to the NPDES permit registration process. Specification has been revised; it is redline copy showing the changes from last meeting.
207	**SP207 - Impervious Membrane**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for Impervious Membrane to protect MSE wall straps from degradation and deterioration from future deicing salts of roadway. SP has been updated; it is redline copy showing the changes from last meeting.

207	**SP207 - Soil Monitor Settlement Pins**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for Soil Monitor Settlement Pins to monitor poor soil conditions in steep slope area. SP has been updated; it is redline copy showing the changes from last meeting.
211	**211.3.3-Core**	**2nd time to Committee; discussed in February.** Proposed specification change to Section 211. The revision updates the impervious core subsection. The specification has been updated and is redline copy showing the proposed changes.
403	**SP403 - Void Reducing Asphalt Membrane**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for Void Reducing Asphalt Membrane (VRAM), a base asphalt material placed ahead of construction at longitudinal construction joints in asphalt surface courses to decrease deterioration of joint over time. No update to the SP.
410	**Section 410**	**2nd time to Committee; discussed in February.** Proposed specification change to Section 410. This specification suggestions is from Industry (Asphalt Association of WV). It is redline copy showing the proposed changes. No update to the SP.
601	**601.3.1.1.1.4.2-Preventions Level W, X and Y**	**2nd time to Committee; discussed in February.** Proposed specification change to Section 601. The revision to in Section 601.3.1.1 (Mix Design Using Potentially Reactive Aggregate) allows Lithium Nitrate Admixture. Specification has been revised (clarify equation calculations) and is redline copy showing the proposed changes.
615	**SP615 - Jacking Superstructure**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for design, implementation, and maintenance of the jacking of steel superstructure to complete repairs as described in the plans. No update to the SP
626	**626.5.1.1-Facing Elements**	**2nd time to Committee; discussed in February.** Proposed specification change to Section 626. The revision updates AASHTO references to M336. No update to the specification. Approval is expected in April.

627	**SP627 - Finger Expansion Joint**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for a finger expansion dam. SP has been updated per comments at the last meeting.
642	**SP642 - Turbidity Curtain**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for turbidity curtain. SP has been updated and is redline copy showing the changes from last meeting.
690	**SP690 - Cross Slope and Superelevation Tolerances**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for final pavement surface tolerances. SP has been updated and is redline copy showing the changes from last meeting.
691	**SP691 - Finished Surface Lidar Survey**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for pavement survey. SP has been updated and is redline copy showing the changes from last meeting.
707	**SP707 - CFB Ash**	**2nd time to Committee; discussed in February.** Project Specific Special Provision for new type of Circulating Fluidized Bed Combustion (CFB) ash. There was a meeting with WVDOH personnel and industry related to these special provision in February and March. SP has been updated per comments during these meeting; it is redline copy showing the changes from last meeting.
601	**SP601 - ASCM Mitigation**	**1st time to Committee.** Project Specific provision on testing to determine if ASCMs (and CFB ash as a sub-category of ASCM) can sufficiently mitigate ASR.

New Business - New Provisions for Spec Committee

SECTION	TITLE	DESCRIPTION
695	**SP695-Mainline Pavement**	**Update to previously approved SP; 1st time to Committee.** Project Specific provision for Mainline Pavement. The revision adds reference to Section 410. The SP is redline copy showing the proposed changes.
102	**Section 102-Bidding Requirements and Conditions**	**1st time to Committee.** Proposed specification change to Section 102. It is a complete section rewrite. The specification is redline copy showing the proposed changes.

103	**Section 103-Award and Execution of Contract**	**1st time to Committee.** Proposed specification change to Section 102. It is a complete section rewrite. The specification is redline copy showing the proposed changes.
218	**SP218-Scaling, SP218-Rockfall Drape, and SP218-Rock Anchors for Concrete Slabs**	**1st time to Committee.** Three Project Specific special provision for Rockfall Mitigation: • SP218 - 218.8-Scaling • SP218 - 218.9-Rockfall Drape • SP218 - 218.10-Rock Anchors for Concrete Slabs
636	**636.3-Control of Traffic Through Work Areas.**	**1st time to Committee.** Proposed specification change to Section 636. The revision updates the Traffic Control Supervisor requirements. The specification is redline copy showing the proposed changes.
636	**636.11-Flagger or Traffic Director, 636.23.14-Flagger, and 636.23.15-Traffic Director**	**1st time to Committee.** Proposed specification change to Section 636. The revision updates the flagger and traffic director requirements. The specification is redline copy showing the proposed changes.
662	**SP662-High Mast Tower**	**1st time to Committee.** Project Specific Special Provision on High Mast Tower foundation, maintenance platform, and concrete pad.
681	**681.2.10-Forms**	**1st time to Committee.** Proposed specification change to Section 681. The revision removes sample forms references located on Division webpage, as this is outdated and are not available.
698	**698-Prefabricated Bridge Element and Systems**	**1st time to Committee.** Project Specific Special Provision on prefabricated bridge elements and systems that are built off alignment to accelerate onsite construction.
715	**715.42.8.7-Technician Accessories**	**1st time to Committee.** Proposed specification change to Section 715. The revision updates traffic signal cabinet outlet and light. The specification is redline copy showing the proposed changes.

Comments

Comments are requested on these Specifications Changes and Project Specific Special Provisions. Please share your comments by **April 5, 2021**, they help in the decision making process.

Please Send Comments to: DOHSpecifications@wv.gov

Deadline for new items & updates to these provision is May 7, 2021.

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

Next Meeting

Wednesday, **June 2, 2021** at 9:00 a.m.
Skype Meeting and/or Group meeting location is in Building 5, Room 855 (meeting invite will include details.)

2017 Standard Specification Roads and Bridges & 2021 Supplemental Specifications

Electronic Copy (pdf): The 2017 Standard Specifications Roads & Bridges & 2021 Supplemental Specifications can be viewed, printed, or downloaded from the Specifications Website. A link to the Specifications pages is here: http://transportation.wv.gov/highways/contractadmin/specifications

Print Version: Hard copies of the 2017 Standard Specifications Roads and Bridges & 2021 Supplemental Specifications are available thru Contract Administration. An order form for the book is on Specifications Website. A link to the page is here: http://transportation.wv.gov/highways/contractadmin/specifications

2021 Specifications Committee

The Specification Committee typically meet every other month; on the first Wednesday. 2021 meetings will be held in February (2/3), April (4/7), June (6/2), August (8/4), October (10/6), and December (12/1).
Calendar subject to change, updates will be given, as needed.

Specifications Committee Website

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

Materials Procedures

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

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

File Format Structure and Progression of items thru Specifications Committee

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

TYPES OF PROVISIONS:

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

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

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

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

Each item should also include a description with:

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

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

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

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

PROGRESSION OF ITEMS THRU COMMITTEE AND APPROVAL:
Depending on how important the project and/or comments/discussion of item at previous meeting, then several things can happen in no particular order.

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 212
STRUCTURE, ROCK, AND WET EXCAVATION

ADD THE FOLLOWING SUBSECTIONS TO THE SECTION:

212.1-DESCRIPTION:

212.1.1-Shoring: This work consists of providing shoring to contain causeway material at specific areas designated in the Contract ~~and any temporary bridge structures needed to maintain flow of water around causeway structures~~.

212.3-GENERAL:

212.3.1-Shoring: Materials and Construction Requirements: The Contractor shall locate, size, design and construct shoring which provides all necessary rigidity, and supports the loads imposed to facilitate construction as shown on the plans. The areas shown on plan are representative of what may be constructed under the U.S. Army Corps of Engineers 404 Permit. The contractor may reduce the causeway areas or use other means of Construction Access provided these means do not violate the 404 Permit requirements.

When the height of shoring exceeds 5' above the base of the excavation, shoring drawings shall be provided by the Contractor to the Engineer for information only. The drawings shall be prepared, signed and sealed by the Contractor's Engineer. These drawings shall be approved and signed by the Contractor and provided to the Engineer at least 10 days prior to start of work.

~~Temporary bridge drawings shall be provided by the Contractor to the Engineer for information only. The drawings shall be prepared, signed and sealed by the Contractor's Engineer. These drawings shall be approved and signed by the Contractor and provided to the Engineer at least 10 days prior to start of work. October 19, 2012~~

Shoring ~~and temporary bridges~~ shall be constructed in conformity with the shoring ~~and bridge~~ drawings provided to the Engineer. Prior to placing construction ~~or traffic~~ loads on the supported earth ~~and bridges~~, the Contractor's Engineer shall certify in writing that shoring ~~and~~

~~bridge~~ materials and construction have been inspected and that all shoring, ~~bridge,~~ materials and construction are in conformity with the drawings. A copy of this certification shall be submitted in an appropriate form for the Engineer's records.

If the embankment, construction, ~~traffic~~ or any other surcharge is in excess of what the original shoring ~~or bridges were~~ was designed for, the Contractor shall provide a signed letter from the Contractor's Engineer prior to the load placement stating that the shoring ~~and/or bridges~~ will support the additional load.

Shoring ~~and bridge~~ drawings shall include the following information as applicable:

1. The size and grade of all structural materials.
2. Design notes, including design assumptions and construction details.
3. Where applicable, restrictions on heavy equipment placement at specific locations adjacent to the shoring.
4. Areas determined by the Contractor's Engineer where de-watering of the shored excavation will be required, and a description of the requirements (i.e., head added by the pump, flow rate, minimum pump size, etc.) and methods to be used for de-watering.
5. All other information determined by the Contractor's Engineer to be pertinent to the design and successful construction of the shoring ~~and/or bridges~~.

212.11-METHOD OF MEASUREMENT:

212.11.1-Shoring: Shoring ~~and temporary bridge structures~~ will not be measured, but will be paid for as a single lump sum for each area described on the plans.

212.12-BASIS OF PAYMENT:

212.12.1-Shoring: Payment for shoring, causeway will be full compensation for all labor, materials equipment required to design, construct, maintain, and remove the shoring ~~and temporary bridges~~.

The Contractor will be paid 75% of the bid price once the causeway is constructed. The remaining 25% will be paid once the causeway is removed and the area is restored to its original condition.

212.13-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
212010-001	Shoring, Causeway	Lump Sum

September 15, 2020

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.19-PORTABLE MESSAGE SIGNS:

636.19.4-Placement:

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

Portable message signs that are not adequately shielded from impacts by utilizing barriers or terrain as described herein to the satisfaction of the Engineer 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. In such cases the Contractor shall modify the speed displayed on the static speed limit sign accordingly if the speed limit in effect through the work area is changed, and 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. In such cases, if the device is not expected to be needed for an entire daylight period or for more than four (4) hours at night, the device shall be temporarily relocated to a shielded location or other location off of the shoulder, either of which shall be approved by the Engineer.

Placement of and messages displayed on portable message signs shall be approved by the Engineer. A changeable message sign and a speed monitoring trailer 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. A minimum sight distance of 800 feet should be achieved if possible, provided the device will maintain the operational function as intended by the placement location shown in the plans. Devices placed behind concrete barriers or guardrail should be placed at and behind the downstream end of such features if possible.

The approach to all portable message signs not adequately shielded from impacts to the satisfaction of the Engineer shall be delineated with traffic cones, channelizer cones, or drums. 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 25-feet. The length of the taper

shall be 150-feet and shall end 50-feet in advance of the device. The remaining 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.

Speed monitoring trailer systems shall be located within the area of the reduced work zone speed limit, but shall not be located within or before a transition or taper.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 306
RUBBLIZATION OF PORTLAND CEMENT CONCRETE PAVEMENT

306.1-DESCRIPTION:

This section covers the equipment, construction and testing procedures for in place Rubblization of Portland Cement Concrete (PCC) Pavement for creating a base material for either asphalt pavement or new PCC pavement. Rubblization is the process of breaking and compacting the existing pavement. All equipment and materials shall be provided in accordance with this Specification and as directed by the Engineer.

306.2-MATERIALS:

Aggregate or processed Reclaimed Asphalt Pavement (RAP) may be used to fill voids, holes, or low spots in the rubblized pavement.

306.2.1-Fill Aggregate: The fill aggregate shall be clean, durable stone such as granite, slag, limestone or other high-quality aggregate. The quality of the fill material is important to the success of the base of the pavement. A hard, crushed, single size aggregate is recommended. Fill Aggregate shall meet the requirements listed in Section 703 of the Standard Specification.

306.2.~~3~~2-Reclaimed Asphalt Pavement: Reclaimed Asphalt Pavement may be substituted for the fill aggregate material on roadways. Materials testing will be waived, however the RAP shall be processed allowing for the Top Size gradation not to exceed 3/4 inches (19 mm) or the maximum fill thickness. Approval shall be by visual inspection by the Engineer. Payment for RAP fill material substitution shall be at the same unit bid price for Fill Aggregate.

306.3-EQUIPMENT:

Provide safe, environmentally acceptable equipment that can produce a specification product. All equipment, tools, and machines used in the process of rubblization shall be maintained in satisfactory working conditions at all times.

306.3.1-Breaker:

306.3.1.1-Multi-Head Breaker (MHB): The equipment shall consist of a self-contained, self-propelled MHB. Hammer heads shall be mounted laterally in a single row or in pairs with half the hammers in a forward row, and the remainder diagonally offset in a rear row so there is continuous pavement breaking from side to side. This equipment shall have the capability of rubblizing pavement up to 13 ft. ~~(4 m)~~ in width, in a single pass. Hammer drop height shall have the ability to be independently controlled.

306.3.1.2-Resonant Breaker: The equipment shall consist of a self-contained, self-propelled resonant frequency pavement breaking unit capable of producing low amplitude, 2,000 lbs. ~~(8,880 N)~~ blows, at a rate of not less than 44 per second.

306.3.2-Vibrator Roller: Use a vibratory steel wheel roller having a total weight of not less than 10 tons. Operate the roller in the vibratory mode and at a speed not to exceed 6 feet ~~(1.8 m)~~ per second.

306.3.3-Pneumatic Roller: A self-propelled rubber tire roller shall be used on the project unless otherwise requested by the Project Manager. The rubber tired rollers shall have a gross load adjustable to apply 300-500 psi of pressure for the tire rolling width. Tire pressure shall be specified for the pneumatic tire rollers and shall not vary more than plus or minus 5.0 psi ~~(34.5 kPa)~~. It is recommended that the rollers travel no more than 10 miles per hour

306.3.4-Z-Plate Roller: The equipment shall consist of a self-contained, self-propelled vibratory steel wheel roller with a Z-pattern grid cladding mounted transversely to the surface of the drum. The vibratory roller shall have a minimum gross weight of ~~9 metric tons (~~10 tons~~)~~.

306.3.5-Miscellaneous Equipment: Provide hand rakes, shovels and other equipment as necessary to perform the work. Provide cutting equipment to cut reinforcing steel should it become exposed.

306.4-CONSTRUCTION:

306.4.1-Quality Control Plan: Quality Control Plan shall be submitted to the Engineer detailing the process, equipment, and personnel to be used. Prior to the acceptance of the proposed breaking plan, the Contractor shall complete a strip for evaluation by the Engineer. To ensure the pavement is being broken to the specified dimensions. The Contractor shall excavate a broken area of 10 sq. ft. ~~(1 sq. m)~~, in two separate locations during the first day of breaking, as directed by the Engineer. Modifications to the breaking procedure must be made if the size requirements are not met. These excavations may be repaired with replacement

material. If breaking procedures or conditions change, additional excavations to inspect the broken pavement dimensions shall be made, as directed by the Engineer.

306.4.2-Pavement Preparation: Prior to rubblization, asphalt concrete overlays and patches larger than three square feet shall be removed from the PCC pavement. The Engineer shall verify the removal of asphalt pavements and approve the pavement for beginning the rubblization process

Saw full depth joints and completely sever load transfer devices to isolate the rubblizing area. Saw jointed pavements at an existing joint. PCC pavement or other PCC appurtenances to remain in place shall be saw cut and severed from the pavement to be rubblized with a full-depth saw cut.

Care shall be taken to not damage adjacent pavement during rubblization. Repair damage to the adjacent pavement caused by contractor as the engineer directs, at no cost to the Division.

The Contractor shall prevent damage to underground utilities and drainage structures during rubblizing. Approved alternate breaking methods shall be used over underground utilities and drainage structures as specified on the plans or directed by the Engineer.

306.4.3-Rubblization Process: Break the concrete pavement uniformly across the pavement width into particles that have a maximum dimension no greater than 12 inches.

At the surface, the equipment shall break the pavement such that at least 75% of the pieces (by weight) are a maximum of 2 in. ~~(50 mm)~~.

Below the reinforcing steel or in the lower one-half of the pavement, at least 75% of the pieces shall be a maximum of 9 in ~~(230 mm)~~.

Concrete to steel bond shall be broken. Uniform breaking shall be maintained through successive passes of the breaking equipment.

306.4.3.1-Determining Particle Size: Determine particle size by excavating 2 test holes, of about 10 square feet each, during the first half day. Excavate at least one test hole per lane mile thereafter. Backfill, compact, and restore the stability of each test hole. The subsequent testing may be waived by the Engineer provided that the surface conditions indicate that the process is meeting the particle size requirements.

306.4.3.~~1~~2-Existing Reinforcing Steel: Remove reinforcing steel exposed at the surface by cutting below the surface, disposing of the steel off site, and using fill aggregate to level the surface. Do not remove unexposed reinforcing steel.

306.4.4-Compaction: Prior to placing the asphalt overlay the complete width of the broken pavement shall be compacted by vibratory steel wheel and pneumatic tire rollers in the following sequence:

306.4.4.1-After Breaking:

306.4.4.1.1-Breaking using Multi-Head Breaker (MBH): A minimum of four (4) passes with z-pattern steel gird roller, four (4) additional passes with a vibratory roller, and two (2) passes with a pneumatic tire roller.

306.4.4.1.2-Breaking using Resonance Breaker: A minimum of four (4) passes with a vibratory roller, and two (2) passes with a pneumatic tire roller.

306.4.4.1.3-Proof Roll the Broken Concrete Sections: Proof roll with a fully loaded tandem dump truck to ensure adequate strength of the roadway. Unless otherwise specified in the plans, any weak or unstable spots discovered through proof rolling shall be corrected by the Contractor and approved according to the Engineer, in accordance with Section 104.3 and 109.4 of specifications.

306.4.4.2-Immediately Prior to Overlay: A minimum of two (2) passes with a vibratory roller.

306.4.5-Regrading: The contractor shall not trim the broken or rubblized pavement, or otherwise attempt to grade the broken or rubblized pavement to improve grade lines.

306.4.6-Additional Fill Aggregate: Fill holes and localized depressions, deeper than 2 inches, with fill aggregate and compact as the engineer directs.

306.4.7-Opening to Traffic: Public traffic will not be allowed on the rubblized pavement before the required asphalt overlay(s) are in place, except at crossovers and/or access points. Public traffic will not be allowed on a rubblized crossover or access point for more than 24 hours. Maintenance of crossovers and/or access points shall be as specified by the Engineer. Crossovers and/or access points shall be maintained in the same compacted state as the other areas, until the asphalt overlay is in place. Construction traffic on the rubblized base shall be limited to delivery of materials directly ahead of the paver.

Traffic Control will be in accordance with Section 636, and the *Manual on Temporary Traffic Control For Streets and Highways, Current Edition*, or as directed by the Engineer

306.4.8-Paving Limitations: A tracked paver shall be used to place the first lift of hot-mix asphalt binder over the prepared rubblized pavement. During stage construction, the overlay width shall be such that it will not interfere with subsequent rubblizing operations. At a given location, the overlay shall be placed within 48 hours of the pavement breaking operation.

If rain occurs between rubblizing and paving, the rubblized pavement shall be dry and stable to the satisfaction of the Engineer before the paving operation begins.

If a material transfer device is proposed, the Contractor shall submit equipment specifications with axle loading configurations and proposed paving sequence to the Engineer three weeks prior to paving. The Engineer will provide any equipment restrictions based on device loadings and proposed paving sequence.

306.5-METHOD OF MEASUREMENT:

306.5.1 Square Yard Measurement: The Quantity of work done will will be determined by the Plan Quantity as provided for in the proposal, subject to the provisions of 104.2 and 109.2.

306.5.2 Tons Measurement: The quantity of work done will be the number of tons of material complete in place and accepted. the quantity will be determined by the Contractor from the total weigh slips for each vehicle load weighed upon an approved standard scale or from digital printout slips from an automatic batching plant, and certified by the Contractor as correct

306.6 BASIS OF PAYMENT:

The quantities, determined as provided above, will be paid for at the contract unit price bid for the items listed below.

306.6.1 Square Yard Payment: Payment for rubblization includes all materials, dust control, equipment, labor for preparing the surface, rubblizing the existing pavement and complying with all requirements. Rubblizing shall be measured for payment in square yards of existing pavement in place.

306.6.2 Tons (Mg) Payment: Payment for fill aggregate includes furnishing all materials including water for compaction, scarification and manipulation of existing surface and doing all the work prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies, and incidentals necessary to complete the work.

306.7-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
306001-001	Rubblization	Square Yard
306002-001	Fill Aggregate	Ton

~~December 23, 2020~~ February 3, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR THE
DISTRICT WIDE STRIPING CONTRACT

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 663
PAVEMENT MARKINGS AND RUMBLE STRIPS

663.4–PAVEMENT PREPARATION – PREMARKING, CODING:

ADD THE FOLLOWING TO THE END OF THE SECTION:

The ~~Department~~ Division will be responsible for coding and spotting where old markings cannot be determined. The Contractor must give notification to the Division at least twelve (12) calendar days prior to commencement of work in that District to give the District sufficient time to perform any such coding and spotting.

663.5–APPLICATION:

663.5.1–General:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

Prior to commencement of work, and only if required by the binder manufacturer, all existing edge, lane or center lines will be fully eradicated in accordance with Section 636.7 - Eradication of Pavement Markings. When eradicating lane or center lines, the Contractor shall replace the lines within twenty-four hours from the start of eradication. The eradication work shall not entitle the Contractor to additional payments above the contract price or to additional time to perform the contract.

663.5.2.1–Approved Equipment and Personnel:

ADD THE FOLLOWING SUBSECTION:

663.5.2.1.1–Project Control Coordinator: The Contractor is responsible for quality control, and shall employ a Project Control Coordinator (PCC) for this project, at the Contractor's expense. The PCC shall be designated and in attendance at the Pre-Construction Conference; failure to have the PCC assigned and in attendance shall delay the Engineer's issuance of the Notice to Proceed until completed, at no cost to the Division and with no extension of the contract time.

The PCC shall meet the following requirements:

- Shall be a member of the District Pavement Marking Crew and on this crew throughout the project.
- Shall be responsible for all communication between the District Pavement Marking Crew and the Engineer.
- Shall take and record a minimum of five (5) retroflectivity readings throughout the day, per color, per pavement marking crew. The equipment used to take these readings shall be the LTL-X meter manufactured by Delta Light and Optics which is approved for use by the Engineer or another meter approved in writing by the Traffic Engineering Division. The LTL-X readings and the printout tape shall be included in the Daily Centerline report. The tapes shall have the date, color and route on the LTL-X Log ID.
- Shall fill out all Daily Centerline Report(s) and provide these completed forms to the Engineer for payment on a weekly basis; failure to timely submit the reports will delay payment for this work. A separate Daily Centerline Report is required for each pay item of work performed by the Contractor on the day of the report. The Daily Centerline report shall include but not limited to the following:
    1. Date
    2. Location (Route #, Milepost, and GPS Coordinates / landmark description)
    3. Hours worked (including start and stop times)
    4. Detailed listing of personnel and equipment used
    5. Amount of material used
    6. Miles or feet of striping performed
    7. Detailed listing of traffic control devices used
    8. Weather information
    9. LTL readings with LTL tapes
    10. Any other applicable information.

The Engineer will randomly check the accuracy of these Daily Centerline Report(s). If a discrepancy of more than 2% is found, the Contractor may be required in the sole discretion of the Engineer to have an independent consultant, approved by the Division, to verify all pay items on this contract. The cost of the consultant will be the responsibility of the Contractor.

ADD SUBSECTIONS 663.5.10 AND 663.5.11 TO THE SECTION:

663.5.10-District Wide Striping Contract: The lineal footage and mileage quantities listed within the Proposal are estimates only. If the work under the Contract requires that additional lineal footage or mileage be striped, the Contractor shall be paid for additional work at the Contract unit bid price, but shall not be entitled to additional time to perform the Contract.

Once the Contractor begins a particular route or segment area, he shall continue this pavement marking until the scheduled route is completed.

Once the Contractor begins work on this Contract, he shall continue work until all of the scheduled routes are completed.

The Contractor ~~shall not place any pavement markings prior to April 15th~~ may commence with striping operations at any time after issuance of the Notice to Proceed. In the event of failures, damages, or other issues attributable to the application of the striping materials selected by the Contractor under application conditions that are outside the recommendations of the material manufacturer, the Contractor shall be responsible for and obligated to correct such issues. There shall be no extension of time given for weather.

Retroreflectivity values shall at all times be maintained throughout the warranty period. Loss due to pavement failure, unless caused by the marking material, will not be considered as a material failure and will not be included in the loss calculations and/or retroreflectivity readings.

663.5.11-Interim Completion Date / Priority Painting: At the Pre-Construction Conference the Contractor will be provided with county maps showing the Priority Painting routes to be painted. The contractor shall paint the centerline and lane line on all routes by July 1, _____. The Contractor shall be assessed liquidated damages per Section 108.7.1 for each calendar day that any of the routes are not marked with both the center line and lane line.

The Engineer may add or eliminate any route to or from the schedule.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 407
ASPHALT STRESS ABSORBING MEMBRANE INTERLAYER FIBER SAMI SEAL

407.1-DESCRIPTION:

This section covers the materials, equipment, construction and application procedures for placing Stress Absorbing Membrane Interlayer (SAMI) seal used as an interlayer between existing distressed pavements and a surface course of asphalt. The SAMI Seal is a process of applying asphalt emulsion, fiber glass strands, and aggregate in a single process. All ingredients are to be properly proportioned, mixed, and spread on the paved surface in accordance with this Specification and as directed by the Engineer.

407.2-MATERIALS:

Furnish the components of the SAMI Seal to include polymer-modified asphalt emulsion, clean cover aggregate, and fiber glass. Use materials meeting the following:

407.2.1-Asphalt Emulsion: The emulsified asphalt shall be polymer modified and shall contain asphalt, water, emulsifier, and polymer. It is typically recommended that the emulsified asphalt contain three percent (3%) polymer solids based on asphalt weight. It shall be pumpable and suitable for application through a distributor truck. Examples of polymer modified emulsified asphalt classifications may include CRS-2P (SBS), CRS-2L (LM) and shall meet the requirements listed in Section 705 of the ~~Standard~~ Specifications.

407.2.2-Fiber Glass: The glass fiber shall be Classification E Glass for general application as defined in ASTM D578, Standard Specification for Glass Fiber Strands. The glass fiber spools shall be supplied internally wound, in coils or cheeses. Spools shall be cut in-place into 60mm, (2.38") lengths which are distributed uniformly across and between the two applications of the asphalt emulsion. The range of application rates for the glass fiber shall be 2 to 4 ounces per square yard.

407.2.3-Cover Coat Aggregate: The cover coat aggregate used shall be the type specified for the particular application requirements of the SAMI seal. The cover coat aggregate shall be clean, durable stone such as granite, slag, limestone or other high-quality aggregate.

The shape and quality of the cover coat material is important to the successful application and performance of a chip seal. A hard, crushed, single size aggregate is recommended. Cover Coat Aggregate shall meet the requirements listed in Section 703 of the ~~Standard~~ Specification. The portion of the aggregate that has two fractured faces shall be greater than or equal to 80%. Aggregate meeting requirement locks together and provides better long term retention and stability.

407.2.3.1-Gradation: When tested in accordance with AASHTO T-27 ~~(ASTM C 136)~~ and AASHTO T-11 ~~(ASTM C 117)~~, the aggregate gradation shall be within one of the ~~following~~ bands found in Table 405.2.1 of Section 405 – Chip Seals.

~~Sieve Size~~	~~TYPE I~~		~~TYPE II~~		~~TYPE III~~	
	~~Nominal Maximum Size~~					
	~~1/4 in.~~	~~No. 9~~	~~3/8 in.~~	~~No. 8~~	~~1/2 in.~~	~~No. 67~~
~~1" (25.0 mm)~~						~~100~~
~~3/4" (19 mm)~~					~~100~~	~~90-100~~
~~1/2" (12.5 mm)~~			~~100~~	~~100~~	~~95-100~~	
~~3/8" (9.5 mm)~~	~~100~~	~~100~~	~~95-100~~	~~85-100~~	~~0-15~~	~~20-55~~
~~1/4" (6.4 mm)~~	~~95-100~~		~~0-35~~		~~0-10~~	
~~#4 (4.75 mm)~~		~~85-100~~		~~10-30~~		~~0-10~~
~~#8 (2.36 mm)~~	~~0-20~~	~~10-40~~	~~0-3~~	~~0-10~~	~~0-3~~	~~0-5~~
~~#16 (1.18 mm)~~		~~0-10~~				
~~#50 (300 µm)~~		~~0-5~~				
~~#200 (75 µm)~~	~~0-1~~	~~0-2~~	~~0-1~~	~~0-2~~	~~0-1~~	~~0-2~~

407.3-MIXTURE DESIGN REQUIREMENTS:

407.3.1-Mix Design: Submit to the Engineer, at least five working days before the start of production, a complete mix design prepared and certified by an experienced laboratory. The mix design shall consist of:

1. Signed certificate(s) of analysis covering the specific materials to be used on the project.
2. Specify target application rates for the aggregate, fiber glass and binder as well as permissible operating tolerances so that adjustments may be made due to varying field conditions.
3. List of material sources. Material sources must be on approved source lists published by the division. Materials Procedure 700.00.05, Guidelines for Establishing and Maintaining Approved Lists of Materials and Sources, outlines the requirements of these approved lists.

Once the design has been approved, no material substitution will be permitted unless approved by the Engineer. A new mix design is required for any change in aggregate or asphalt emulsion source.

407.4-CONSTRUCTION:

407.4.1-Equipment: Provide safe, environmentally acceptable equipment that can produce a specification product. All equipment, tools, and machines used in the application of SAMI seal shall be maintained in satisfactory working conditions at all times.

407.4.1.1-Emulsion and Fiber Distributor: The distributor shall be capable of providing a uniform application rate of asphalt ~~binder~~ emulsion varying from 0.02-0.60 gal/yd^2 over a variable width. The uniformity of the distributor shall not vary by more than 0.02 gal/yd^2. It shall be equipped with a variable power unit for the pump and full circulation spray bars, which are adjustable laterally and vertically. The nozzle angle and bar height shall be set to provide 100 percent of double coverage in a single pass.

The distributor shall include computerized application controls, a tachometer, pressure gauges, accurate volume devices, calibrated tank, and a thermometer for measuring temperatures of the emulsified asphalt in the tank.

The pressure distributor shall have computerized rate controller that automatically adjusts the distributor's pump to the ground speed. The distributor shall be capable of heating and re-circulating the emulsion to the specified temperature.

The emulsion and fiber applicator used shall be designed for applying the ~~bituminous binder~~ asphalt emulsion reinforced with glass fibers. The fiber cutter and distributor shall be an integrated unit. The applicator shall comprise an open bottom spray bar housing, a fan or blower producing a down draft in the housing, and two separate spray bars, one in front of the fiber applicator housing and one following. The fiber applicator shall be calibrated and capable of applying at the desired controlled rates.

407.4.1.2-Spreader Box: The machine shall be specifically designed and manufactured to apply various types of aggregate. It shall be self-propelled and supported by at least four tires on two axles capable of providing a uniform application rate of aggregate from 5-50 lbs/yd^2 ~~(2.7-27 kg/m^2)~~ over a variable width. It shall be designed to convey aggregate materials from a rear receiving hopper to a front spread hopper. The machine shall apply this aggregate in a uniform pattern across the entire width of the spread hopper regardless of spreading widths. The application rates will remain consistent regardless of the speed of the machine or changing spread widths. This shall be done with computer controls that monitor the ground speed and adjust the spread hopper rate in relationship to ground speed. Application rates will be preset in lbs/yd^2 ~~(kg/m^2).~~

407.4.1.3-Pneumatic Rollers: A minimum of two self-propelled rollers shall be used on the project unless otherwise requested by the Engineer. The rubber tired rollers shall have a gross load adjustable to apply 200-250 psi ~~(1379-1724 kPa)~~ of rolling width. Tire pressure shall be specified for the pneumatic tire rollers and shall not vary more than plus or minus 5.0 psi ~~(34.5 kPa)~~. It is recommended that the rollers travel no more than 10 miles per hour

407.4.1.4-Sweepers: Self-propelled four wheeled rotary mechanical brooms and or vacuum brooms capable of operating in both forward and reverse is recommended. Brooms should be checked to ensure they are in good condition and meet applicable environmental standards.

407.4.1.5-Miscellaneous Equipment: Provide hand squeegees, shovels and other equipment as necessary to perform the work. Provide cleaning equipment such as power brooms, air compressors, water flushing equipment, and hand brooms for surface preparation.

407.4.1.6-Lights on Equipment: Equip power brooms, distributors and truck mount spreaders with at least one approved, flashing, rotating or oscillating amber light that is visible in all directions. Equip continuous spreader units with one such light on each side.

407.4.2-Application: SAMI seals shall be applied in a manner to fill minor cracks and leave a uniform surface with straight longitudinal joints, transverse joints and edges.

407.4.2.1-Weather Limitations: SAMI seals shall not be applied unless the atmospheric temperature is 55 degrees F and rising, nor when the temperature has been below 45 degrees F in the preceding 12 hours. No ~~bituminous~~ asphalt material shall be applied while the surface is wet nor when impending weather conditions are such that proper curing may not be obtained.

407.4.2.2-Surface Preparation: The surface shall be thoroughly clean and dry when the ~~bituminous~~ asphalt material is applied. Material cleaned from the surface shall be removed and disposed of as directed by the engineer. Protect drainage structures, monument boxes, water shut-offs, etc., during application of bond coat and mixture.

407.4.2.3-Emulsion and Fiber Application: Properly sized nozzles shall be used for the material and application rate specified. Emulsion application rates shall vary between 0.35-0.45 gallons per square yard. Fiber application rates shall vary between 2-4 ounces per square yard. Multiple series of nozzles, for spraying the ~~bituminous material~~ asphalt emulsion, shall be spaced longitudinally, as to incorporate a number of sources for dispensing the cut glass fibers through the open bottom housing to the surface between the sprayed ~~bituminous materials~~ asphalt emulsions.

~~Basically, s~~Spray a layer of emulsion, then blow in the chopped fiberglass, and coat it with another layer of emulsion.

407.4.2.4-Aggregate Placement: Aggregate spreader shall be self-propelled and shall be equipped with hoppers, revolving cylinders and adjustments necessary to produce a uniform distribution of particles at the specified rate. Immediately following the application of the emulsion and fiber material, cover aggregate shall be applied uniformly without ridges or laps at the specified rate and adjusted as directed by the ~~engineers~~ Engineer to produce a minimum of excess loose particles. Deficiencies in the application of cover aggregate shall be corrected prior to rolling.

407.4.2.5-Compaction: Immediately following the application of the cover material, the treated surface shall be completely rolled. Rollers shall work in tandem and complete a minimum of three passes with a sufficient overlap. A minimum of one roller pass shall be completed using pneumatic tire type, meeting the minimum requirements. Depending

on the speed of the chip seal operation and the width of coverage, additional rollers may be required

At no time shall the rollers lag more than 500' behind the aggregate spreader. All ballasting shall conform to manufacturer's specifications.

407.4.2.6-Sweeping and Clean-up: Sweeping shall be performed using a pickup type sweeper or kickoff broom as appropriate for the work and as approved by the Engineer. Sweeping shall be completed within 6 hours of material application. Initial sweeping shall remove all loose or unbound material. All debris shall be removed from the job site.

407.4.3-Temporary Pavement Marking: Shall be in accordance with Section 636

407.4.4-Pre-paving Meeting: Hold an on-site pre-paving meeting with the Engineer before beginning work to review and discuss the following.

1. Detailed work schedule
2. Traffic control plan
3. Calibration of equipment
4. Mix design previously submitted to the Engineer
5. Equipment inspection, including transport units

407.4.5-Test strip: Test Strip(s) ~~are~~ is intended to demonstrate the mixing of materials and placement procedures of each mixing machine to be used on the project. Test strip shall be performed at the beginning of the first day's production and on the roadway to be treated. The completed test strip (minimum 500 feet length) shall be reviewed to detect and correct any variances in surface texture, material ratio(s) and finished surface appearance. Additionally, the test strip will be used to establish the target job application rate.

407.4.6-Traffic Control: Do not allow traffic on the mixture until it has cured sufficiently to prevent pickup by vehicle tires. Protect the new surface from damage at intersections and driveways. Repair all damage to the mixture caused by traffic. All costs associated with this repair work will be borne by the Contractor. Otherwise Traffic Control will be in accordance with Section 636, and the *Manual on Temporary Traffic Control for Streets and Highways, Latest Edition*, or as directed by the Engineer.

407.4.7-Quality Control: A mixture is to be produced that will meet the JMF and quality control tolerances. Notify the Engineer immediately if the quality control test results exceed any of the tolerances and stop mixture production. Identify the cause of the excess deviation and determine the corrective action necessary to bring the mixture into compliance. Secure the Engineer's approval before resuming work.

For Quality Assurance purposes, samples for gradation will be taken from aggregate stockpiles designated by the Contractor for use. The frequency of sampling and testing will be established by the Engineer based upon the ~~Department's~~ Division's current acceptance program and local conditions encountered.

407.5-MEASUREMENT AND PAYMENT:

Payment for SAMI Seal includes all materials, equipment, labor for preparing the surface, placing temporary pavement markings, placing the SAMI Seal mixture and complying with all requirements. The placement includes application a surface course for full width coverage as specified in the contract documents.

The completed work as measured will be paid for at the contract unit price for the Items detailed in Section 407.6.

Materials placed in stockpiles or on the road not meeting the required tolerances may be accepted at a reduced price if it is not considered detrimental to the life of the treatment by the Engineer. The following price adjustment schedule will be used when appropriate and applied accordingly to representative material:

i. Five percent reduction in the bid price per square yard for each one-tenth percent the asphalt content is out of tolerance.

ii. One percent price adjustment in the bid price per square yard for each one percent that the aggregate gradation is out of the job mix range.

iii. Five percent reduction in the bid price per square yard for application rate dropping below the established rate by more than 2 lb/sq yd. If the application rate drops below the established rate by more than 3 lb/sq yd, the material will not be accepted and measures will need to be taken by the contractor to correct for such deficiency.

Price adjustments under i., ii., and iii. above shall apply concurrently; however, price adjustment will not apply in the event the material is rejected. The disposition of rejected material will be subject to the approval of the Engineer.

407.6-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
407001-001	Stress Absorbing Membrane Interface (SAMI) Seal, Type **	Square Yard (SY)

** Type of Aggregate Gradation from Section 407.2.3.1 (and specification 405.2.1), either A, B, or C.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 405
CHIP SEAL

405.2-MATERIALS:

405.2.1-Aggregate:

TABLE 405.2.1
Design Aggregate Gradation Requirements for Chip Seal

Sieve Size	Type A		Type B		Type C	
	Nominal Maximum Size					
	1/2 in	No. 67	3/8 in	No. 8	No. 4	No. 9
1 in (25 mm)	–	100	–	–	–	–
3/4 in (19 mm)	100	90-100	–	100	–	–
1/2 in (12.5 mm)	90-100		100	100	–	–
3/8 in (9.5 mm)	5-30	20-55	90-100	85-100	100	100
No. 4 (4.75 mm)	0-10	0-10	5-30	10-30	90-100	85-100
No. 8 (2.36 mm)	–	0-5	0-10	0-10	5-30	10-40
No. 16 (1.18mm)	0-2		–	–	0-10	0-10
No. 30 (600 µm)	–	–	0-2		–	–
No 50 (300 µm)	–	–	–	–	0-2	0-5
No. 200 (75 µm)	0-2	0-2	0-2	0-2	0-2	0-2

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.21-PROTECTION OF RIVERS, STREAMS, AND IMPOUNDMENT:

107.21.1-Erosion and Sedimentation Control:

DELETE THE CONTENTS OF SUBSECTION 107.21.1, AND REPLACE WITH THE FOLLOWING:

The Contractor shall be responsible for water quality throughout the duration of construction in accordance with the National Pollutant Discharge Elimination System (NPDES) permit registration with the West Virginia Department of Environmental Protection ~~Agency~~ (WVDEP).

Any project with less than 1 acre *(0.4 ha)* of Earth disturbing activities will include a Letter of Non-registration (LONR). The Contractor shall provide the WVDOH with an Erosion and Sediment Control Plan and use erosion and sediment control Best Management Practices (BMPs) for any work that has the potential to affect water quality.

The WVDOH will provide for information purposes only and for possible use in the contractor's Storm Water Pollution Prevention Plan (SWPPP):

a. Estimated start and completion dates for the project.
b. List and name all receiving stream(s).
c. Topo map with the Limit of Disturbance (LOD) and receiving streams identified.
d. Sequence of Construction Activities.
e. Drainage Report, including the following:
    i. Drainage area maps for construction site discharges points. Note: Discharge points are all locations where the project stormwater leaves the site or enters a stream.
    ii. Pre-Construction Drainage Maps, including 1 year 24-hour discharge calculations for each discharge point.
    iii. Post Construction Drainage Maps, including 1 year 24-hour discharge calculations for each discharge point.
    iv. Ditchline and pipe sizing calculations.

v. Discharge points and drainage analysis for completed project.
vi. Permanent Stormwater Management design details.
vii. For Large Construction Projects (3 Acres or more of earth disturbing activities) with post-construction peak discharge 10% (or more) greater than the pre-construction peak discharges of 5 cubic feet per second or more for the 1-year, 24-hour storm: Post-construction stormwater management BMPs must be implemented to reduce potential location erosion at the discharge point. (Include calculations with permit application) Calculations and justification must be submitted if post-construction stormwater management features are deemed unnecessary.

f. Tier 2 or Tier 3 Stream Protection Designation (as designated by the WVDEP), Stream with an approved sediment-related Total Maximum Daily Load (TMDL)
g. Preliminary Site Plan (Maps) showing Limits of Disturbance in a closed polygon and projected in NAD83 WV State Plane Coordinate System in ArcGIS Shapefile (.shp) or Google Earth (.kmz or .kml) ~~and Receiving Waters; in ArcGIS Shapefile (.shp) and/or AutoCAD Drawing (.dwg) format~~.
h. Municipal Separate Storm Sewer Systems requirements (Design Directive 506) if applicable.
i. Soil maps https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Prior to commencing construction activities, the Contractor shall be responsible for Developing and implementing a site-specific Storm Water Pollution Prevention Plan (SWPPP) and Groundwater Protection Plan (GPP). Additionally, a Karst Mitigation Plan (KMP) is required on projects located in: Berkeley, Fayette (south of CR 25), Grant, Greenbrier, Hampshire, Hardy, Jefferson, Mercer, Mineral, Monroe, Morgan, Monongalia (east of I-79) Pendleton, Pocahontas, Randolph, Summers, and Tucker Counties. The KMP must be included in the West Virginia Department of Environmental Protection (WVDEP) NPDES registration. The Contractor shall provide the WVDOH with the following details:

1. Construction details and all information necessary to demonstrate that the Contractor's SWPPP and GPP satisfy all conditions of the NPDES Permit. In addition to the information the WVDOH provides for the Contractor's use if applicable.
2. The Contractor's SWPPP must include ~~a~~ During-Construction Drainage Maps include 1 year 24-hour discharge calculations for each discharge point
3. Each road or access road shall be classified as either permanent or temporary and categorized by construction activity: New, improved, incidental construction activity, or maintenance only. Temporary roads shall be reclaimed as soon as practical after they are no longer needed for operations. New or improved roads shall be designed with the complete specifications along the entire road.
4. Incidental construction activity necessary to address rills, ~~and~~ gullies, ~~and~~ or other drainage issues, shall be designed with the complete specifications on that specific segment.
5. Preliminary Site Plan (Maps) showing Limits of Disturbance in a closed polygon and projected in NAD83 WV State Plane Coordinate System in ArcGIS Shapefile (.shp) or Google Earth (.kmz or .kml)~~Detailed Site Plan (Maps) showing Limits of Disturbance and Receiving Waters; in ArcGIS Shapefile (.shp) and/or AutoCAD Drawing (.dwg) format~~.

6. Stormwater Pollution Prevention Plan; Project Site specific detail, phasing and projected schedule, Best Management Practices, Enhanced Best Management Practices (if applicable), Tier 2 or Tier 3 Stream Protection Designation (as designated by the WVDEP), Stream with an approved sediment-related Total Maximum Daily Load (TMDL), Cross-sections, Plan and Profile, Slope Stability Analysis, Soils, Location of topsoil stockpiles. Note: As per WVDEP requirements, the site maps and plans shall contain a North arrow with sites oriented to the North, with a minimum of five-foot topographical contours.
7. Soil maps https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.
8. Designating a "Qualified Person" for Stormwater Pollution Prevention Plan development, compliance inspection, and corrections.
    a. "Qualified Person" means a person who is knowledgeable in the principles and practices of sediment and erosion controls, pollution prevention, and possesses the education and abilities to assess conditions at the proposed site that could impact stormwater quality and to assess the effectiveness of proposed stormwater controls to meet the requirements of this permit.
9. Initial inspection by Qualified Person for compliance with proposed plan & proper installation
10. Frequency of inspections:
    a. For Projects discharging into Tier 1 Streams (as designated by the WVDEP) inspection of all erosion and sediment control BMPs within disturbed areas at least once every seven calendar days and within 24 hours after any precipitation event greater than 0.25" per 24 hrs. period
    b. For Projects discharging towards Tier 2, Tier 3, or 303(d) Streams (as designated by the WVDEP) Inspection of all erosion and sediment control BMPs within disturbed areas at least once every four calendar days and within 24 hours after any precipitation event greater than 0.25" per 24 hrs. period.
11. Temporary seeding & mulching within 4 days when areas will not be re-disturbed for more than 14 days. Any defective controls identified during the inspection must be repaired and/or installed correctly within 24 hours and corrections verified upon re-inspection by the Qualified Person within 48 hours. Permanent seeding and mulching within 4 days of reaching final grade. Final stabilization within 4 days after construction has been completed.

~~11.~~12. Installation of discharge point/outlet signs/markers

~~12.~~13. Waste and Borrow Site Plans
    a. Offsite waste and/or borrow plans and controls
        - Note: Separate NPDES CSW General Permit Registration (if applicable)
    b. Cross-sections, Plan and Profile
    c. Slope Stability Analysis

~~13.~~14. Groundwater Protection Plan; Project Site specific detail (including the design of the concrete washout if applicable)

~~14.~~15. The GPP shall include the following elements:
    a. A description of the operations, processes and materials present at the facility that may affect or contaminate groundwater.
    b. Procedures and containment facilities to protect groundwater resources from the potential contaminants.

c. MSDS sheets
d. These processes and facilities shall be identified on a facility map.
e. The GPP must be signed by someone with signature authority for the applicant. Note: Signature Authority: a responsible corporate officer (President, Vice Pres. Secretary, Treasure), principal executive officer or ranking elected official, Senior Executive Director or a letter of delegation of authority for the signatory is provided that is signed by one of the above.

The ~~Department~~ Division will review the documents for completeness and provide the Contractor with comments, if required, within:

i. 15 calendar days of receipt of all required documents for Minor Construction Projects (1 to 3 acres of disturbance).
ii. 30 calendar days for projects for Large Construction Projects (3 acres or greater of disturbance), however projects over 100 acres, will allow a 60 calendar day review period.

If revisions are required, the Contractor shall revise documents and resubmit to the Engineer, and ~~Departments~~ Division's review time is restarted.

Once submitted to WVDEP, the approval time allotted shall be:

i. 90 calendar days for minor construction projects (1 to 3 acres of disturbance).
ii. 180 calendar days for large construction projects (3 acres or greater of disturbance).

Projects with public notice requirement shall warrant an additional 45 calendar days of review/approval time. Delay in WVDEP approval in excess of the above shall be considered an Excusable Noncompensable Delay in accordance with Section 108.6.2.

The Contractor shall prepare a Spill Prevention, Control and Countermeasures (SPCC) plan that itemizes specific measures that will be implemented to prevent and clean up chemical and petroleum product spills that may occur during all phases of construction. Fuel storage and refueling activities, equipment maintenance activities and equipment washing will be kept at least 500 feet away from any watercourse or wetland.

The Contractor shall implement an Quarterly Employee training program for all on-site personnel directly involved with construction activities at all levels of responsibility that reiterates the components and goal of the SWPPP ~~(Quarterly)~~.

i. Address: spill & leak response and internal reporting, good housekeeping, and routine inspection & maintenance.
ii. Document training: Date, Time, Location, Attendees, Subjects Discussed

SWPPP template, GPP template, and guidance documents are located at: https://dep.wv.gov/WWE/Programs/stormwater/csw/Pages/home.aspx.

Flocculants, or other treatment chemicals may be used only in accordance with good engineering practices and the manufacturer/supplier specifications. Dosing rates shall be specified, and material safety data sheets (MSDS) shall be included in the contractor's SWPPP and GPP, maintained on site, and available for inspection.

Any details not shown in the plans shall be in accordance with the latest version of the *West Virginia Department of Environmental Protection, Erosion and Sediment Control Best Management Practices Manual*. In the event that temporary erosion and sediment control measures are necessary due to the Contractors negligence, carelessness or failure to install permanent controls as part of the work as scheduled, such work shall be performed by and at

the expense of the Contractor ~~at his own expense~~.

Earth disturbing activities shall not be initiated until the WVDEP has approved the NPDES permit modification, SWPPP, GPP, and KMP (if required). The ~~Department~~ Division will not be responsible for any delays in obtaining WVDEP approval of the NPDES permit modifications due to the timeliness of WVDEP's review or the contractor's failure to provide a complete SWPPP, GPP, KMP (if required) or submit corrections and/or additional information required by WVDEP in a timely manner. Any additional/future NPDES permit registration modification applications shall be submitted by the contractor through the WVDEP Electronic Submission System (ESS).

During construction the contractor shall be responsible for:

1. Implementing remedial action to correct and/or repair failing erosion and sediment control features.
2. Implementing storm and winter shutdown procedures.
3. Shaping the earthwork prior to the suspension of grading operations each day in a manner that will permit storm runoff with minimum erosion.
4. Installing, operating and maintaining erosion and sediment control features in an acceptable condition.
5. Cleaning out and restoring to original conditions any erosion or sediment control feature that has reached half of its capacity. For sediment basins, one half of its capacity is considered as wet volume storage.
6. Providing the WVDEP with an Annual Progress Map if permitted for longer than one year
7. Directing the construction, operation, maintenance and dismantling of temporary erosion and sediment control features.

In addition to the above, the Contractor shall ~~make themselves~~ be familiar with all requirements contained within the WVDEP's General Water Pollution Control Permit, Stormwater Associated with Construction Activities Permit Number WV0115924 or latest applicable replacement permit. A copy of this permit can be found at the following internet address: http://www.dep.wv.gov/WWE/Programs/stormwater.

Noncompliance with permit conditions constitutes a violation of the Federal Clean Water Act and State Code and is subject to enforcement action by the WVDEP. The Contractor shall be responsible for any Notices of Violation, enforcement actions and/or fines associated with ~~those~~ any violations. If the Contractor incurs a fine for any Notice of Violation and Consent Order, the Contractor must provide the DOH Project Supervisor documentation that the fine ~~has been~~ is paid or the amount of the fine will be withheld from the Contractor's next invoice.

At the Project's Pre-Construction Conference, the Contractor shall submit to the ~~Department~~ Division the SWPPP, GPP, KMP (if applicable), the Co-Applicant #1 signature page (Exhibit 1) and the Contractor's E&S Manager's Contact information.

The Contractor's E&S Manager's Contact information shall contain ~~the following information~~: the name, title, mailing address, and telephone number(s) of the person who ~~will be~~ is responsible for the Erosion and Sediment Control plans, implementation, maintenance, etc., for the life of the NPDES registration.

Upon completion of the Pre-Construction Conference, the ~~Department~~ Division will review the SWPPP, GPP, and KMP (if applicable). The ~~Department~~ Division will provide

comments to the contractor concerning any deficiencies in the SWPPP, GPP, and KMP (if applicable). This review shall be considered as an effort by the ~~Department~~ Division to assist the contractor in meeting the NPDES Permit requirements. Only the WVDEP has the authority to approve NPDES registration documents. Once any necessary corrections and/or additional information are submitted by the contractor, the ~~Department~~ Division will modify the existing NPDES registration for this project to make the Contractor the number one Co-Applicant to the permit. Once this ~~has been~~ is completed, the Contractor shall be responsible for any and all fees, violations, ~~and~~ or fines assessed against the project that ~~is a~~ result ~~of~~ from the Contractor's negligence, carelessness, or failure to install permanent controls as part of the work as scheduled.

If any of the components of the approved SWPPP prove ineffective at minimizing or preventing sediment laden stormwater from leaving the project site, the contractor shall implement additional BMPS, modify the SWPPP, and modify the NPDES permit registration to provide a more effective means of controlling/eliminating erosion and ~~siltation~~ sediment from the stormwater runoff. If approved BMPS are ineffective at protecting receiving waters and the contractor is unable to identify and employ BMPS capable of preventing sediment laden runoff from leaving the project site the contractor shall immediately cease further land disturbance until such time that the unauthorized discharge ceases.

Once the project is complete, the Contractor will still bear responsibility for the NPDES registration until either a Notice of Termination (NOT) is received from the WVDEP or the Contractor has received final payment for the project. If an NOT has not been received by the time the final payment is made, the ~~Department~~ Division will modify the NPDES registration to remove the Contractor's name from the registration.

Exhibit 1 can be located online at:
http://www.transportation.wv.gov/highways/contractadmin/specifications/107.21.1EnSExhibit1/Pages/default.aspx.

The Contractor will be advised if the project is located within an urbanized area with respect to the NPDES Municipal Separate Storm Sewer System (MS4) Permit. The MS4 permit requires on-site management of the runoff from the first one (1) inch of rainfall from the additional impervious area (if >5,000 sf) for an average 24-hour storm preceded by 48 hours of no measurable precipitation or provide equal benefits for water quality. The contractor is advised that any proposed changes or substitutions to the project may require additional stormwater management mitigation and any costs associated with such mitigation shall be borne by the contractor at no additional cost to the ~~Department~~ Division. The contractor shall allow seven (7) calendar days for the ~~Department~~ Division and the local MS4 authority to review and comment on the proposed changes. Additionally, changes or substitutions proposed by the contractor shall be approved by the ~~Department~~ Division in advance of implementing any changes. Post-construction stormwater management shall comply with the WVDOH MS4 stormwater management plan requirements of NPDES general permit registration no. WVR30004 or the latest applicable registration number and Design Directive 506.

Periodic inspections of the site and BMP's will be conducted by representatives of the WVDEP to ensure compliance with the conditions and requirements of the NPDES permit. Representatives of other resource agencies may also conduct site inspections throughout the life of the construction contract.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 207
EXCAVATION AND EMBANKMENT

207.2-MATERIALS:

ADD THE FOLLOWING:

207.2.3-Impervious Membrane: High Density Polyethylene (HDPE) geo-membrane liner systems shall have a nominal thickness of 30 mils. The geo-membrane shall be manufactured of new, first quality resin and shall be compounded and manufactured specifically for the intended purpose. The resin manufacturer shall certify each batch for the following properties:

Property	Test Method	Requirements
Specific Gravity	ASTM D 792	> 0.940
Melt Index	ASTM D 1238	< 0.4g/10 min.
Carbon Black Content	ASTM D 1603	2% - 3%

If requested by the Engineer, the HDPE supplier shall make available this certification for the Engineer's verification of the material.

207.9-SUBGRADE:

ADD THE FOLLOWING:

207.9.2-Impervious Membrane: Impervious Membranes shall be constructed as shown in the plans or as directed by the Engineer.

The surface of the HDPE geo-membrane liner system shall not have striations, roughness, pinholes, or bubbles and shall be free of holes, blisters, and any foreign matter; such as, soil or oil accumulation.

All seams of the HDPE geo-membrane liner system shall be, as per the manufacturer's specifications, sealed or overlapped to prevent leakage.

HDPE geo-membrane liner systems shall be delivered and, before installation, stored so that no damage is caused to the material.

Before liner installation, it shall be assured that the area that is to be lined shall be smooth and free of sharp objects or debris of any kind. No equipment or tools shall damage the membrane by handling, equipment, or personnel movement.

HDPE installation shall not be done during any precipitation or in the presence of excessive moisture such as fog or dew. The Engineer shall be the sole judge in determining satisfactory conditions.

Seams shall be oriented parallel to the line of maximum slope. Seams shall have a finished overlap of between 3 to 4 inches.

Field-testing of seams, according to the manufacturer's specifications, shall be conducted to verify satisfactory seaming conditions.

When backfilling, care shall be taken to prevent any damage to the HDPE system. The Contractor shall slope the last placed level of backfill away from the wall facing to rapidly direct runoff of rainwater away from the wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

207.15-METHOD OF MEASUREMENT:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

The quantity of work done under this item will be the number of square yards of Impervious Membrane established in the Proposal, subject to the adjustment provided in Section 104.2 and 109.2 of the Specifications.

207.16-BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

The cost of furnishing all materials, including furnishing all labor, materials, and equipment necessary to complete Impervious Membrane will be included in this item.

207.17-PAY ITEM:

ADD THE FOLLOWING ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
207036-*	Impervious Membrane	Square Yard

* Sequence number

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 207
EXCAVATION AND EMBANKMENT
(SOIL MONITORING SETTLEMENT PINS)

207.7-FORMING AND COMPACTING EMBANKEMENT:

ADD THE FOLLOWING:

207.7.6-Settlement Pins:

207.7.6.1-Scope: The work herein specified shall consist of furnishing materials, equipment, and labor necessary to complete and install the soil monitoring settlement pins shown in the contract plans. The Contractor shall install the soil monitoring settlement pins in the locations shown in the plans. Settlement pins shall be installed once the subgrade is achieved per the contract drawings and the embankment fill has been placed to a specific elevation defined in the general notes. Before purchase of any materials or the initiation of any work on the soil monitoring settlement pins, the Contractor shall submit a plan for the approval of the Engineer. The plan shall show the ~~anticipated~~ locations of the soil monitoring settlement pins. The construction in the area of monitoring shall not begin until the settlement characteristics are acceptable to the Engineer. The Contractor shall be responsible for taking the readings from the soil monitoring settlement pins. The Contractor shall be responsible for the soil monitoring settlement pins maintenance for the duration of the project. The Engineer shall contact Geotechnical personnel from the ~~Materials Control, Soils, and Testing~~ Division, for assistance in inspection, installation, and data evaluation.

207.7.6.2-Purpose: Settlement is anticipated at the embankment as shown in the plans. Settlement shall be monitored in accordance with this special provision before the steel piling at the specific monitoring location can be installed. Information from the soil monitoring settlement pins will be used by the Engineer to evaluate the settlement at critical sections. This information will assist the Engineer in evaluating the project construction. ~~The construction in the area of monitoring shall not begin until the settlement characteristics are acceptable to the Engineer.~~

207.7.6.3-Installation: Soil Monitoring Settlement Pins shall consist of 4-foot long #5 reinforcement bars driven a minimum of 3 feet into the ground. A point shall be marked on each pin that can be measured and identified for future readings. The soil monitoring settlement pins must be labeled for easy identification and reference. The initial location and elevation of each soil monitoring settlement pin shall be established by the Contractor. Elevation surveys shall be accurate to within 0.01 foot. A minimum of one reference point shall be established for each monitoring location. This reference point shall be outside the influence of any movement resulting from construction.

207.7.6.4-Readings and Reporting: Prior to taking readings, the Contractor shall present a reporting form for the approval of the Engineer. Time/Settlement graphs will be required. Readings shall be provided to the Engineer on a weekly basis. Readings shall be determined once per week after the embankment placement has been completed. The Engineer shall determine when the readings are to be terminated. ~~As a guide, t~~Termination could be considered if the time rate of settlement is equal to or less than one-eighth (1/8) inch per week for at least four (4) consecutive weeks. The Engineer will provide a copy of the readings to Geotechnical personnel of ~~Materials Control, Soils, and Testing~~ the Division.

207.7.5-Control: See ~~plan~~ table in general notes~~, Table 1~~ for settlement pin locations. The soil monitoring settlement pins should be placed immediately~~,~~ after the completion of the fill. ~~Reading of the soil monitoring settlement pins shall be made once per week.~~

207.7.6-Acceptance: Acceptance by the Engineer of the soil monitoring settlement pins and approval to proceed with monitoring shall be based on the satisfactory completion of the installations. The Contractor shall provide a plan showing the locations and elevations of the soil monitoring settlement pins and reference points. Acceptance by the Engineer to proceed with the installation of the piles at the monitoring location shall not be given until the settlement is one-eighth (1/8) inch or less per week for four (4) consecutive weeks. The Contractor shall provide the Engineer with a report showing the time/settlement graphs.

207.7.7-Protection: The Contractor shall be responsible for the protection of the soil monitoring settlement pins from damage. All damaged instrumentation shall be replaced or repaired at the Contractor's expense. Damage shall be corrected at the Contractor's expense, as directed by the Engineer, before continuing construction. Work in the area of the damaged instrumentation shall be stopped until the instrumentation is repaired by the Contractor and approved by the Engineer.

207.15-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

The quantity of work done will be the actual number of soil monitoring settlement pins per each completed in place and accepted by the Engineer.

207.16-BASIS OF PAYMENT:

ADD THE FOLLOWING:

The quantities, as determined as provided above, will be paid for at the contract unit price bid for the item listed below, which price and payment shall be full compensation for excavating, backfilling, disposing of surplus material, furnishing all the materials and doing all the work herein prescribed in a workman like and acceptable manner, including all tools, equipment, supplies and incidentals necessary to complete the work.

207.17-PAY ITEM:

ADD THE FOLLOWING ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
207050-000	Soil Monitor Settlement Pins	Each

~~January 12, 2021~~ February 3, 2021

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 211
BORROW EXCAVATION

211.3-GENERAL:

211.3.3-Impervious Core:

DELETE THE CONTENTS, AND REPLACE WITH THE FOLLOWING:

An ~~I~~imperious core~~s~~ shall be constructed for all sediment ~~dams~~ basins built of rock, gravel, and pervious soils.

~~The impervious core shall have a minimum dimensions as set forth in WVDEP Erosion and Sediment Control Best Management Practices Manual, latest edition.~~

When a key is necessary for the sediment ~~dam~~ basin, the impervious core shall be made an integral part of the key. When the impervious core is not constructed of soil, the core shall be anchored into the key by trenching for a minimum depth of 2 feet (610 mm).

The impervious core may be constructed using one of the following methods:

a) Soil Impervious Core: Soil impervious cores may be shaped to facilitate placement and compaction. The coefficient of permeability of the soil used for the impervious core must be 10^{-4} cm per sec or less. A key, a minimum of 4 feet (1.2 m) in depth, must be constructed into the original ground. The compaction of the impervious core shall be as in accordance with Section 716.3.

b) Concrete Impervious Core: When concrete is used for the impervious core, Class B Concrete shall be used. The requirements of Section 601, Structural Concrete shall control the mixture and placement of the concrete. The Engineer may waive the testing of the Class B Concrete if the concrete is from an approved plant.

c) HDPE or LLDPE Impervious Core: When the impervious core is constructed of High Density Polyethylene (HDPE) or Low Linear Density Polyethylene (LLDPE), the liner shall be manufactured to be suitable for buried conditions and may be either smooth or textured. The Contractor shall obtain recommendations from a liner manufacturer for the material best suited for impervious cores, handling, storage, and construction procedures. The manufacturer of the liner shall furnish the Engineer a Letter of Certification stating the liner is suitable for the intended use.

d) Other Methods for an Impervious Core: The Contractor may design and use other methods of preventing the seepage of water from the wet area. The Engineer must approve the design of the alternative method.

The bottom width of the impervious core should, at a minimum, equal the total embankment height. The maximum size of the impervious core is a function of the embankment's upstream and downstream external slopes.

When the impervious core is not constructed ~~used~~ using the Soil Impervious Core method the Contractor shall submit a plan containing construction details and materials to be used for the impervious core(s) for the approval of the Engineer prior to the start of work and the purchase of any materials. This submittal will be part of the temporary and permanent pollution control schedules and methods required by Section 642.3 ~~Preconstruction Conference, Construction Methods, Section 642, Temporary Pollution Control, of the *West Virginia Division of Highways Standard Specifications Roads and Bridges*, latest edition~~.

January 14, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 403
VOID REDUCING ASPHALT MEMBRANE

403.1-DESCRIPTION:

This work consists of furnishing and installing Void Reducing Asphalt Membrane (VRAM) material ahead of construction of longitudinal construction joints in asphalt concrete surface courses.

403.2-MATERIALS:

The material shall be a base asphalt modified with styrene-butadiene diblock or triblock copolymer without oil extension, or styrene-butadiene rubber elastomers. It shall not use air blown asphalt, acid modification, or other modifiers. VRAM material shall meet the requirements of table 403.2 below.

TABLE 403.2 VRAM MATERIAL REQUIREMENTS

Test	Test Requirement	Test Method
Dynamic shear @ 88°C (unaged), G*/sin δ, kPa	1.00 min.	AASHTO T 315
Creep stiffness @ -18°C (unaged), Est Stiffness (S), MPa m-value	300 max. 0.300 min.	AASHTO T 313
Ash, %	1.0 to 4.0	AASHTO T 111
Elastic Recovery, (unaged) 10 cm elongation, hold 5 minutes before cutting, 25°C, Report to nearest 0.1%	70 min.	ASTM D6084 Method A
Separation of Polymer, Difference in °C of the softening point (ring and ball apparatus)	3 max.	ASTM D7173, AASHTO T53

403.3-EQUIPMENT:

403.3.1-Distributor: When a pressure distributor is used to apply VRAM, the distributor shall be equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the hauling tank to prevent localized overheating.

403.3.2-Melter: When a melter kettle is used to transport and apply VRAM, only oil-jacketed, double-boiler melter kettles with agitating and recirculating systems shall be used. Material from the kettle may be dispensed through a pressure feed wand with an applicator shoe or through a pressure feed wand into a hand-operated "thermal push cart."

403.4-CONSTRUCTION:

403.4.1-Surface Preparation: Prior to placing VRAM, the pavement surface area to be treated shall be cleaned of all foreign material. VRAM shall be applied only to surfaces that are dry and cleaned of all dust, debris, and any substances that will prevent adhesion. VRAM may be placed before or after the tack coat placement, however, tack coat shall not be placed on top of VRAM material. When placing after the tack coat, the tack coat must be fully cured prior to placement of the VRAM.

403.4.2-Weather Requirements: VRAM shall be applied only when the pavement surface temperature and the ambient temperature are a minimum of 40 °F and rising.

403.4.3-Application: VRAM shall be applied at the application rate and width listed in Table 403.4.3.

When the VRAM material will not be exposed to traffic, the Contractor shall coordinate the application of VRAM and placement of the asphalt mixture to ensure the center of the VRAM application is within ± 2.0 inches of the center of the cold longitudinal joint being constructed.

When traffic is to be maintained across the VRAM material, the Contractor shall apply VRAM material on the cold longitudinal construction joint such that 60 percent of the specified band width is placed on the side of the joint that will be paved first. The contractor shall not open to traffic if width of exposed VRAM material is greater than 6 inches.

If the paving operation allows VRAM to be placed on only one side of the cold longitudinal joint at a time and it is not exposed to traffic, the Contractor shall place 50 percent of the required width and application rate prior to paving the first pass. Prior to closing the cold longitudinal joint with the final pass, the Contractor shall place the remainder of the VRAM material and coat the cold joint's vertical face with VRAM material. The total amount of VRAM material applied shall meet the application rate listed in Table 403.4.3.

If the work includes constructing only one side of a cold longitudinal joint; such as adjacent to pavement to remain in place, or against curb, or curb and gutter; the Contractor shall construct the VRAM using one-half the width and one-half the application rate listed in Table 404.4.3.

The VRAM, meeting the requirements specified herein, shall be applied to the existing surface at the width and target application rate as specified in the following table:

TABLE 403.4.3 VRAM APPLICATION RATES

Coarse-Graded HMA Mixtures [Note 1]		
Overlay Thickness, in	**VRAM Width, in.**	**Application Rate, lb/ft**
1	18	1.15
1 ¼	18	1.31
1 ½	18	1.47
1 ¾	18	1.63
≥ 2	18	1.80
Fine-Graded HMA Mixtures [Note 1]		
Overlay Thickness, in	**VRAM Width, in.**	**Application Rate, lb/ft**
1	18	0.80
1 ¼	18	0.88
≥ 1 ½	18	0.95

Note 1 - Refer to Table 4 of MP 401.02.28 for definitions of coarse and fine graded mixes

Ensure the applied width of VRAM is within ± 1.5 inches of the width specified. If the VRAM flows more than 2 inches from the initial placement width, the Contractor shall immediately stop placement and perform corrective actions.

When beginning placement of a run of VRAM, the Contractor shall use a suitable release paper to cover previous VRAM application to prevent doubling up of thickness of VRAM.

The contractor shall ensure the VRAM is suitable for construction traffic to drive on without pickup or tracking within 30 minutes of placement. If pickup or tracking occurs, immediately stop placement of VRAM and repair damaged areas.

403.4.4-Paving: Prior to start of paving, the Contractor shall ensure the paver end plate and any grade control devices are adequately raised above the finished height of the VRAM. The contractor shall immediately cease placement of asphalt mixture and VRAM if flushing is noted in the asphalt surface and shall not continue placement of the asphalt mixture until the issue is corrected.

403.5-ACCEPTANCE:

The Contractor shall furnish a bill of lading for each tanker supplying material to the project. The Contractor shall verify the application rate of VRAM within the first 1,000 feet of the day's scheduled application length and every 6,000 feet the remainder of the day. For projects less than 3000 feet, the rate will be verified once.

Verification shall be done by placing suitable paper or a pan of known weight at a random location in the path of the VRAM placement. After VRAM application, pick up the paper or pan and obtain the weight of material. Calculate the weight per foot of VRAM. Ensure the actual weight per foot of VRAM is within ± 15 percent of the target application rate from Table 403.4.3. Application rate verification shall be provided to the Engineer. Replace VRAM in the areas where the samples are taken.

403.6-METHOD OF MEASUREMENT:

The quantity of work done will be measured in linear feet of VRAM completed and accepted in place.

403.7-BASIS OF PAYMENT:

The quantity of work, as determined above, will be paid for at the contract unit price bid for the item below, which price and payment shall be full compensation for furnishing all materials, and doing all the work prescribed in a workmanlike and acceptable manner, including all the labor, tools, equipment, supplies and incidental necessary to complete the work.

403.8-PAY ITEM:

ITEM	DESCRIPTION	UNIT
403001-001	Void Reducing Asphalt Membrane	Linear Foot

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 410
ASPHALT BASE AND WEARING COURSES, PERCENT WITH LIMITS

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

410.1-DESCRIPTION:

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

Additionally, the following Materials Procedures (MP) for Square Yard Paving may be obtained by contacting the Materials Control, Soil and Testing (MCS&T) Division:

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

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

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

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

410.2-MATERIALS:

The materials shall conform to the following requirements:

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

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

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

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

CONSTRUCTION METHODS

410.3-GENERAL:

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

410.4-COMPOSITION OF MIXTURES:

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

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

The Contractor shall submit a proposed JMF for each combination of aggregate and asphalt material for each asphalt mixture to be produced. Depending on the design type, the JMF

gradations shall be within the tolerances set forth in either Table 410.4.2A or Table 410.4.2B. Marshall mix designs shall be developed in accordance with MP 401.02.22. Superpave mix designs shall be developed in accordance with MP 401.02.28.

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

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

TABLE 410.4.2A
Design Aggregate Gradation Requirements for Marshall Mix Designs

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

TABLE 410.4.2B
Design Aggregate Gradation Requirements for Superpave Mix Designs

Type of Mix	37.5	25	19 Note 1 (Patch & Level)	12.5	9.5 (Scratch)	4.75 (Scratch)
Sieve Size	Nominal Maximum Size					
	37.5 mm (1 ½ inch)	25 mm (1 inch)	19 mm (3/4 inch)	12.5 mm (1/2 inch)	9.5 mm (3/8 inch)	4.75 (No. 4)
50 mm (2”)	100	–	–	–	–	–
37.5 mm (1½”)	90-100	100	–	–	–	–
25 mm (1”)	90 max	90-100	100	–	–	–
19 mm (3/4”)	–	90 max	90-100	100	–	–
12.5 mm (1/2”)	–	–	90 max	90-100	100	100
9.5 mm (3/8”)	–	–	–	90 max	90-100	95-100
4.75 mm (No.4)	–	–	–	–	90 max	90-100
2.36 mm (No.8)	15-41	19-45	23- 49	28-58	32-67	
1.18 mm (No.16)	–	–	–	–	–	30-60
600 µm (No.30)	–	–	–	–	–	–
300 µm (No. 50)	–	–	–	–	–	–
75 µm (No.200)	0-6	1-7	2-8	2-10	2-10	6-12

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

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

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

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

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

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

410.5-TESTING:

410.5.1-Test Methods:

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

410.6-CONTRACTORS QUALITY CONTROL:

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

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

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

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

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

410.7-ACCEPTANCE TESTING:

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

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

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

TABLE 410.7.1

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

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

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

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

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

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

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

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

Acceptance for joint density shall be as per 410.13.4.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

iv. The Engineer will determine if the pavement is defective as specified in Section 410.7.3.3.

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

i. Immediately suspend placing the asphalt course. Evaluate the cause of pattern segregation according to the Paving Operation QC Plan. Provide proposed corrective actions to the Engineer and do not resume placing the asphalt course until after the Engineer reviews the proposed corrective actions and authorizes paving to continue.

ii. Determine if the pattern segregation resulted in defective pavement as specified in Section 410.7.3.3.

iii. After the Engineer allows paving to resume, place a test section not to exceed 200 tons. If the corrective actions do not eliminate observed pattern segregation, the Department will suspend paving, even if it is before the Contractor places the entire test section. Propose additional corrective actions and construct another test section. Resume normal paving operations after constructing an entire test section without pattern segregation as determined by the Engineer.

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

An area of pattern segregation contains defective pavement if:

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

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

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

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

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

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

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

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

410.8-BLANK

410.9-EQUIPMENT:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

410.9.5-Surge and Storage Silos: During the normal daily operation of the plant, asphalt may be stored in a surge or storage silo for a maximum of ~~12~~ 6 hours, provided the silo has received prior evaluation and acceptance through the District plant inspection. The resulting temperature of the material at time of placement and compaction shall be sufficient to comply with 410.10.~~13 and 410.10.4~~

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

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

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

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

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

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

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

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

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

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

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

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

Pavers shall be equipped with mechanical or automatic grade and slope controls. The use of automatic grade and slope controls with a traveling straight edge shall be required only when specified on the Plans or in the Proposal. Both the grade and slope controls shall be in working order at all times. In the event of failure of the automatic controls, the Contractor will be

permitted to finish the day's work using manual controls but will not be allowed to resume work the following day until the grade and slope controls are in proper working order.

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

410.10-PAVING OPERATIONS:

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

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

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

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

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

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

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

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

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

410.11-PROTECTION OF PAVEMENT AND TRAFFIC CONTROL:

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

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

410.12-METHOD OF MEASUREMENT:

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

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

410.13-BASIS OF PAYMENT:

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

There will be no additional compensation for Interim Pavement Markings**.**

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

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

410.13.2-BLANK

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

TABLE 410.13.3.1

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

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

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

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

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

Where:

CP = Contract unit price per lot (unit price times lot quantity)
PD = Payment Factor Percentage for mat density
PB = Payment Factor Percentage for asphalt content.
PA = Payment Factor Percentage for percent passing the 75 µm (No. 200) sieve

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

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

Density negative adjustments will be calculated for joint list with a PWL less than or equal to 60. Price adjustments shall be calculated using the formulas below. There will be no adjustment for joint lots who's PWL falls between 60 and 80.

Bonus adjustment calculated as follows:

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

Negative adjustment calculated as follows:

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

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

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

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

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

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

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

$$\text{Price Adjustment } \% = \left(\frac{t}{T}\right) x100$$

Where:

T = Total Plan Thickness

t = avg. lot thickness + 0.04 in.

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

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

Bond Strength positive adjustments will be calculated for lots with PWL greater than or equal to 90. Bond Strength Negative adjustment will be calculated for lots with PWL less than

or equal to 70. There is no adjustment for bond Strength lots who's PWL falls between 70 and 90.

Positive adjustment calculated as follows:

$\$T = \frac{PWL-90}{20}$ X ~~2,000~~ 5,000

Negative adjustment calculated as follows:

$\$T = \frac{/0-PWL}{70}$ X ~~40,000~~ 25,000

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

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

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

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

TABLE 410.13.7.1

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

Turn lanes, intersections, and independently constructed shoulders shall not be subject to price adjustments, positive or negative, if the combined square yardage converts to less than 500 tons. If the square yardage converts to over 500 tons, then one additional sublot for asphalt content, percent passing the 75 µm (No. 200) sieve, and bond strength shall be added to the last lot constructed. Compaction shall be monitored, documented, and

submitted to the Engineer by a certified Asphalt Field and Compaction Technician to assure that it meets specification requirements.

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

TABLE 410.13.7.2

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

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

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

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

TABLE 410.13.7.3

Pay Adjustment for Pavement Joint Density per Linear Foot	
Average Lot Percent Density	Price Adjustment ($ / LF)
Greater than 97 %	Note 3
94.00% to 97.00%	0.40
91.50% to 93.99%	= [0.40 – {0.12*(94.00 - Percent Density)}]
89.00% to 91.49%	0
88.00% to 88.99%	-0.20
Less than 88%	= [{0.50*(Percent Density – 88.00)} – 0.20]

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

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

TABLE 410.13.7.4	
Pay Adjustment for Bond Strength per 2500 Ton Lot	
Average Lot Bond Strength (PSI)	**Price Adjustment ($ / Lot)**
Greater than 150.00	5000
100.00 to 149.99	= [5000 – 100*(150.00 – PSI)]
75.00 to 99.99	= [{1000*(PSI - 75.00)} – 25,000]
Less than 75.00	- 25,000

410.13.~~7~~8-Lot Payment Calculations: The pay factors that are calculated with in the specification are to be applied in the following way:

410.13.~~7~~8.1-PWL Factors: The calculated total PWL for a given lot is applied to the bid unit price for the asphalt mixture in the lot. Once the unit price has been adjusted the quantities can be calculated to arrive at the payment for the lot.

410.13.~~7~~8.2-Thickness Adjustment: There is no adjustment for thickness greater than the thickness that is specified in the plans. If there is a Price Adjustment (Section 410.13.5) for thickness this factor (percentage) is applied to the contract bid unit price times the quantity in the lot to arrive at a dollar amount penalty. This penalty is applied to the overall payment for the lot.

410.13.~~7~~8.3-Joint Density Adjustment: If it is determined in Section 410.13.4 of this specification that a Joint Density Adjustment is warranted the dollar amount determined in the formulas of Section 410.13.4 or Table 410.13.7.3 shall be applied to the overall payment for the lot.

410.13.~~7~~8.4-Bond Strength Adjustment: If it is determined that a Bond Strength Adjustment is warranted ~~by~~ the formulas in Section 410.13.6 or Table 410.13.7.4 shall be used to calculate the adjustment. This adjustment shall be applied to the overall payment for the lot.

410.14-PAY ITEMS:

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

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 601
STRUCTURAL CONCRETE

601.3-PROPORTIONING:

601.3.1-Mix Design Requirements:

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:

ADD THE FOLLOWING AT THE END OF SUBSECTION 601.3.1.1.1.4.2

Option 3: Using the Lithium Nitrate Admixture: The 30 percent 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 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 ($LiNO_3$) admixture dosage (100 percent) for mitigation without use of SCMs with a 30 percent aqueous solution of lithium nitrate.

$$\text{Gallons of } LiNO_3/yd^3 = (A \text{ x } B \text{ x } 0.55)/100$$

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

Example: If the cement content of concrete is 550 lbs/yd^3 and the total alkali content of the cement is 0.82 percent, the dosage of lithium nitrate admixture is: (550 x 0.82 x 0.55)/100 = 2.48 Gal/yd^3.

~~Liters of LiNO3/m3 = (A B 4.6)/100~~

~~Where:~~

~~A = Kg of Portland cement per cubic meter in a concrete mix~~

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

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/yd^3 = 0.85 x 2.48 = 2.11

Any concrete mix using a 100 percent lithium nitrate admixture dosage will be accepted without evaluation. The contractor shall evaluate the effectiveness of less than 100 percent 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 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 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.

December 21, 2020

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 615
STEEL STRUCTURES

615.1-GENERAL:

615.1.1-Description:

ADD THE FOLLOWING:

Jacking Steel Superstructure. This work shall consist of the design, implementation, and maintenance of the jacking of steel superstructure to complete repairs as described in the plans. Jacking of steel superstructure shall include access, jacks, structural members, connections, rollers and other supports as needed to jack the superstructure and adequately support the anticipated loads during construction, including, but not limited to, dead loads, wind loads, and construction loads.

615.1.2-Notice of Beginning Work:

ADD THE FOLLOWING:

615.1.2.1-Submittals: Submittals shall be accepted by the Engineer prior to commencement of the subject work.

615.2-WORKING DRAWINGS:

ADD THE FOLLOWING:

615.2.3-Jacking Steel Superstructure: The Contractor shall submit drawings illustrating fully their proposed method of jacking the superstructure. The drawings shall show details of all jacks and product data; structural members, rollers, connections and other supports;

sequence of jacking; and jacking procedures. The drawings shall be complete in detail for all anticipated phases and conditions during erection. Design calculations, sealed by a West Virginia Registered Professional Engineer, shall be submitted by the Contractor to the Engineer at least twenty-one (21) calendar days prior to commencing work, unless otherwise noted in the plans. Receipt of plans, drawings and calculations does not constitute review or approval or relieve the Contractor of their responsibility to satisfactorily design the jacking of the superstructure. The design calculations shall demonstrate that member capacities for jacking and supported members are not being exceeded.

615.8-BASIS OF PAYMENT:

ADD THE FOLLOWING:

615.8.2-Jacking Steel Superstructure: The quantities, determined as provided above, will be paid for at the contract unit prices bid for the items listed below, which prices and payments shall be full compensation for furnishing all the material and doing all the work herein prescribed in workmanlike and acceptable manner including all labor, tools, equipment, supplies, access, installation of web-stiffeners (if required), beveled plates, rollers, structural modifications (if required), necessary upkeep and maintenance, and incidentals necessary to complete the work.

The Contractor will be paid 75% of the bid price for this item once all the jacking of steel superstructure is in place to complete repairs. The remaining 25% will be paid once it is all removed.

615.9-PAY ITEMS:

ADD THE FOLLOWING:

ITEM	DESCRIPTION	UNIT
615039-001	Jacking Steel Superstructure	Lump Sum

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 626
RETAINING WALL SYSTEMS

626.5-MATERIALS:

626.5.1-Mechanically Stabilized Earth Components:

626.5.1.1-Facing Elements:

DELETE THE CONTENTS OF SUBSECTION 626.5.1.1.3 AND REPLACE THE FOLLOWING:

626.5.1.1.3-Wire Facings: Wire facing shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO ~~M 32-M/M 32-~~ M336 and welded into the finished configuration in accordance with AASHTO ~~M 55-M/~~M 55. Galvanizing shall conform to the minimum requirements of AASHTO M-111.

Retention material shall be placed along the back face of the wire facing to retain the backfill behind the wall. Retention material shall be capable of retaining the backfill, UV resistant and shall have a high permittivity.

DELETE THE CONTENTS OF SUBSECTION 626.5.1.1.5 AND REPLACE THE FOLLOWING:

626.5.1.1.5-Metal Soil Reinforcing or Attachment Devices: Cutting of reinforcing strips or mesh at vertical obstacles shall not be permitted. Care must be taken to avoid damage to the galvanized coating during handling, storing, and shipping.

The following requirements shall apply to all soil reinforcing and attachment devices:

A. Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to ASTM A-36. Galvanization shall be required and shall conform to the minimum requirements of AASHTO M-111.

B. Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the requirements of paragraph one of Section 709.4. Galvanization shall be applied after the mesh is fabricated and shall conform to the minimum requirements of AASHTO M-111.

C. The tie strips shall be shop fabricated of a hot rolled steel conforming to the

minimum requirements of ASTM A-570, Grade 50 or equivalent. Galvanization shall be required and shall conform to AASHTO M-111.

D. Loop embedments shall be fabricated of cold drawn steel wire conforming to ASTM A-510, UNS G-10350 or AASHTO ~~M 32~~ M336. Loop embeds shall be welded in accordance with ASTM A-185. Both shall be galvanized in accordance with ASTM B-633 or AASHTO M-111.

E. Bolts shall meet the requirements of AASHTO M-164. Nuts shall meet the requirements of AASHTO M-291 Grade DH or AASHTO M-292 2H. Fasteners shall be galvanized in accordance with AASHTO M-232.

F. Connector pins and mat bars shall be fabricated from cold drawn steel conforming to AASHTO ~~M 32~~ M336and welded to the soil reinforcement mats as shown in the plans. Galvanization shall be required and shall conform to AASHTO M-111.

February 3, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 627
FINGER EXPANSION DAM & DRAINAGE ASSEMBLY

627.1-DESCRIPTION:

The work shall consist of removing the existing finger expansion dam assembly, and of furnishing and placing the new finger expansion dam and drainage assembly at the locations indicated on the plans. The construction shall be in accordance with this Specification and in reasonably close conformity with the Plans or as established by the Engineer.

627.2-MATERIALS:

627.2.1-Steel Products: All steel components of the finger dam and drainage assembly shall meet AASHTO Designation M270, 36 ksi or 50 ksi, and the requirements of Section 615 of the Specifications unless otherwise noted herein or in the plans.

627.2.2-Reinforcing Steel: Reinforcing steel bars shall be epoxy coated and shall be in accordance with Section 602 of the Specifications.

627.2.2-Finger Dam Drain Trough: The finger dam drain trough shall be fabricated using a continuous synthetic fabric reinforced elastomer that is resistant to abrasion, sunlight, oils, and saltwater and shall comply with the requirements listed below:

Description	Requirement	ASTM Method
Thickness (inches)	0.25	
Durometer Hardness (Shore A)	50 or 60	D2240
Low Temperature Brittleness (wrapped around a 3” dia. mandrel)	No Cracking (22 hrs. @ -20°F)	
Tensile Strength (minimum, both directions)	800 lbs./in.	D412
Elongation (maximum)	30%	D412
Tear (Die C)	120 lbs./in.	D624

Description	Requirement	ASTM Method
Ozone Resistance	No cracks for 100 hours of exposure of 20% elongated samples @ 100°F and 100 PPHM ozone.	D1149

The finger dam drain trough shall not be spliced unless indicated on the approved shop drawings. When splices are indicated, they shall be vulcanized by the manufacturer. Longitudinal splices are not permitted.

The maximum depth of the finger dam drain trough shall be controlled so that it does not come into contact with the existing bridge substructure.

627.3-SHOP DRAWINGS:

The Contractor shall field verify all plan dimensions to ensure accuracy of expansion joint fabrication prior to submission of shop drawings.

The Contractor shall design and develop the sequencing of all work as required by the plans and prepare shop drawings of sufficient detail to fabricate all structural steel components necessary for completion of the contract. Sequencing details and shop drawings shall be certified by the Contractor and submitted to the Engineer.

627.4-PREPARATION OF JOINT:

The Contractor shall remove the existing expansion joint assembly to the limits shown in the plans. The opening left by the removal of the joint shall meet the dimensional requirements shown in the plans. If additional concrete is needed to extend the deck to obtain the required joint opening, this work and material shall be included in this item.

The Contractor, to the satisfaction of the Engineer, shall inspect the portion of the existing expansion joint assembly to remain in place as shown in the plans. If, in the opinion of the Engineer, the remaining steel assembly has been separated from the anchor studs or the anchor studs are no longer bonded to sound concrete, the Contractor shall cut the deck, remove those portions of the existing steel and studs, and fill the void with Class K Concrete to the limits shown for placing the new joint. The repair material shall be fully cured prior to pouring the concrete headers. These repairs, if required, shall be included in this item unless otherwise shown in the plans.

Care shall be taken to not damage the reinforcing bars or their bond to the existing concrete. Any bars missing or damaged beyond repair, in the opinion of the Engineer, shall be replaced with new epoxy coated bars of comparable size. Contractor shall be responsible for all costs associated with any repair deemed necessary by the Engineer. These bars shall be coupled to sound rebars once the damaged portions have been removed. These repairs, if required, shall be done in accordance with Sections 104.3 and 109.4 of the Specifications unless otherwise shown in the plans.

The Contractor shall protect from damage all materials, which are to remain in place. Materials damaged due to the Contractor's operations, as determined by the Engineer, shall be repaired or replaced at no additional cost to the Division and to the satisfaction of the Engineer.

627.5-INSTALLATION:

Field splices, when approved, are to be placed at crown breaks or transverse breaks in deck. Welding shall meet the requirements of Section 615.5.7 of the Specifications.

The steel retainers must be placed and aligned to the correct grades and elevations. The temporary support method used to achieve this alignment is subject to the Engineer's approval.

Remove all loose and unsound concrete from the surface within the joint area. Blast clean the joint area, steel retainer and anchorage in accordance with the Structural Steel Painting Council Specification SP10 immediately prior to placement of the concrete.

After installation is completed, the manufacturer's representative shall certify to the Engineer, in writing, that the expansion dam assembly was installed in accordance with the Manufacturer's requirements.

627.6-WATERTIGHT INTEGRITY TEST:

The Contractor shall test the entire (full-length) joint system for watertight integrity. Contractor shall employ a method satisfactory to the Engineer. The entire joint system shall be covered with water for a minimum duration of 15 minutes. The concrete surfaces under the joint shall be inspected, during this 15 minute period and also for a minimum of 45 minutes after the supply of water has stopped, for any evidence of dripping water or moisture outside of the expansion dam drainage system.

Should the joint system exhibit evidence of water leakage at any place whatsoever outside of the expansion dam drainage system, the Contractor shall locate the place(s) of leakage and he shall take any and all measures necessary to stop the leakage. The Engineer will approve measures deemed necessary by the Contractor.

In the event that measures to eliminate leakage have to be taken, a subsequent water integrity test shall be performed subject to the same conditions as the original test.

627.7-ACCEPTANCE CRITERIA:

The Engineer shall not accept the Contractor's work if, in the Engineer’s judgment, the following criteria are not met:

1. The Contractor fails to store, handle, mix, or install the materials according to the Manufacturer's recommendations and as specified herein.
2. Degradation of material properties under field conditions is detected. The Contractor shall replace any material showing degradation.
3. The joint fails the "watertight integrity test". If failure occurs, repairs shall be conducted in accordance with the test requirements.
4. Contractor shall be responsible for resealing all neoprene troughs that need resealed.
5. If the finished joint system contains shrinkage cracks sufficient to cause debonding, or if the system became damaged during construction or by traffic prior to final acceptance, the joint system shall be removed and replaced by the Contractor.
6. All work done as a result to meet the acceptance criteria shall be done at no additional cost to the Division.

627.8- METHOD OF MEASUREMENT:

Finger expansion dam assembly will be measured in place along the centerline of the joint in linear feet.

627.9-BASIS OF PAYMENT:

The removal of existing concrete and the old expansion device, to the limits shown in the plans, and the placement of specified materials to rebuild the expansion device and drainage system

shall be included in the payment for the items below. The quantities, determined above, will be paid for at the contract unit price bid for the items listed below, which prices and payments shall be full compensation for furnishing all materials and performing the work herein prescribed in a workmanlike and acceptable manner. The contract unit price shall also include the Manufacturer's cost, labor, tools, equipment, supplies and incidentals necessary to complete the work.

627.10-PAY ITEM:

ITEM	DESCRIPTION	UNIT
627016-001	Remove and Rebuild Expansion Joint	Linear Foot

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

FOR

SECTION 642
TEMPORAY POLLUTION CONTROL

642.6-TEMPORARY PIPE, CONTOUR DITCHES, BERMS, SLOPE DRAINS, DITCH CHECKS, SILT FENCE, PREMANUFACTURED DITCH CHECKS AND SUPER SILT FENCE AND COMPOST FILTER SOCKS:

DELETE THE HEADING AND REPLACE WITH THE FOLLOWING:

642.6-TEMPORARY PIPE, CONTOUR DITCHES, BERMS, SLOPE DRAINS, DITCH CHECKS, SILT FENCE, PREMANUFACTURED DITCH CHECKS, SUPER SILT FENCE, COMPOST FILTER SOCKS, AND TURBIDITY CURTAINS:

ADD THE FOLLOWING SUBSECTION:

642.6.7-Turbidity Curtain: Turbidity Curtain shall be provided to protect water quality in streams during construction and demolition activities. Turbidity curtains are best used to contain silt and turbidity in moving water applications.

A turbidity curtain is a flexible, impermeable barrier used to trap sediment in water bodies. This curtain is generally weighted at the bottom to ensure that sediment does not travel under the curtain, which is supported at the top through a flotation system. Staked curtains are available for applications with very limited exposure to water flow or wave action.

Description and Purpose: Turbidity curtains prevent the migration of sediment from a work site in a water environment into the stream below the project site or into a larger body of water.

The practice is also sometimes referred to as 'turbidity barrier' or 'silt curtain'.

A turbidity curtain is generally used when construction activity occurs within a waterbody or along its shoreline and is of short duration, generally less than one month. Curtains are used in calm water surfaces. Turbidity curtains are not to be used across high volume or high flowing watercourses.

Turbidity curtains shall be oriented parallel to the direction of flow.

For sites not subject to heavy wave action the curtain height shall provide sufficient slack to allow the top of the curtain to rise to the maximum expected high-water level (including waves) while the bottom maintains continuous contact with the bottom of the water body. The bottom edge of the curtain shall have a weight system capable of holding the bottom of the curtain down and conforming to the bottom of the water body, so as to prohibit escape of turbid water under the curtain.

For sites subject to heavy wave action, the curtain height shall provide sufficient slack to allow the top of the curtain to rise to the maximum expected high-water level (including waves) while the bottom remains one foot above the bottom. The weight system shall hold the lower edge of the curtain in place so as to allow one foot of clearance above the bottom at mean low water, so that the curtain does not stir up sediment by repeatedly striking the bottom.

When there is a specific need to extend the curtain to the bottom of the watercourse in tidal or moving water conditions, a heavy woven pervious filter fabric may be substituted for the normally recommended impervious geotextile. This creates a "flow-through" medium which significantly reduces the pressure on the curtain and will help to keep it in the same relative location and shape during the rise and fall of tidal waters.

Type 1 Turbidity Curtain: Type 1 turbidity curtains are floating barriers that are designed to control various sediments or runoff in calm waters. Typical application are ponds, shallow lakes, small streams, and marshes. Type 1 depth of range is 2 feet to 20 feet.

The materials shall conform to the following requirements:

Description	Fabric	Float	Chain	Cable	Options
Standard	18oz Laminate	6” – 8”	1/4”	X	Float Size
Filter Fabric Skirt	6% Woven	4” – 8”	1/4” or 3/16"	X	Float Size, Skirt Fabric, Chain

Fabric	18 oz/sq yd PVC Laminated polyester fabric. Optional filter fabric for skirt
Flotation	6-in expanded polystyrene (EPS) foam contained in individually sealed float pockets
Tension/ballast	1/4-in Grade 30 galvanized steel chain: 5,200 lb breaking strength; 0.63 lb/ft weight
Section length	25 ft, 50 ft and 100 ft
Skirt depth	To 20 ft. Depth can be tapered to conform to bottom profile.

Type 2 Turbidity Curtain: Type 2 turbidity curtains are best used to contain silt and turbidity in moving water applications. Type 2 curtains are manufactured using high strength fabric with heavy duty tension members, along with aluminum stress plates that the bottom skirt corners. These type 2 turbidity curtains are best used in dredging and marine construction areas that experience mild current, wind, and wave activity. Typical application are lakes, streams, and slow-moving rivers. Type 2 depth of range is 2 feet to 65 feet.

The materials shall conform to the following requirements:

Description	Fabric	Float	Chain	Cable	Options
Standard	22 oz	6”, 8”, 10”, 12”	5/16” – 3/8”	5/16”	Float, Chain
Filter Fabric Skirt	Woven or Nonwoven	6” – 12”	5/16” – 3/8”	5/16”	Float, Chain, Skirt Fabric

Fabric	22 oz/sq yd PVC-coated polyester; optional filter fabric for skirt
Flotation	8-in to 12-in diameter (depending on skirt depth) expanded polystyrene (EPS) foam contained in individually sealed float pockets
Top tension	5/16-in galvanized steel cable (9,800 lb breaking strength) contained in a polyethylene tube.
Bottom tension and ballast	5/16-in galvanized steel chain: 7,600 lb breaking strength; 0.93 lb/ft weight
End connectors	High-tensile-strength aluminum universal connector at float and top tension cable. ASTM 3/8-in stainless steel locking pins. Lacing grommets on reinforced fabric on lower skirt. Chain ends shackled section-to-section. Tool-free connections.
Section length	50 ft and 100 ft, standard
Skirt depth	To 50 ft; Can be tapered to conform to bottom profile.

Furling lines may be needed for the turbidity curtain to be effective.

Anchor systems, ropes, marker buoys, solar-powered lights, repair kits may be needed to maintain the location and effectiveness of the turbidity curtain.

Type 3 Turbidity Curtain Type 3 Turbidity Curtains, also referred to as Type III Turbidity Curtains, combine ~~our~~ standard high-strength fabric with heavy duty tension members)above and below the flotation and at the bottom of the curtain), fabric reinforcement, and stress plates at the bottom skirt corners. Typical application ~~are~~ is open water exposed to moderate wind, waves and moving water. Type 3 depth range is 3 feet to 130 feet.

Description	Fabric	Float	Chain	Cable	Options
Heavy Duty	22oz or greater	10" – 24"	3/8", 1/2" 5/8"	Dual 5/16"	Float, Chain, Skirt Fabric
Filter Fabric Skirt	Woven or Nonwoven	8" – 24"	5/16" – 5/8"	Dual 5/16"	Float, Chain, Skirt Fabric

Fabric for float and chain pockets:	22 oz/sq yd PVC-coated polyester Fabric for skirt area: As above, or woven/nonwoven filter fabric
Flotation:	8-in to 12-in diameter (depending on skirt depth) expanded polystyrene (EPS) foam contained in individually sealed float pockets
Top tension:	Two 5/16-in galvanized steel cable (9,800 lb breaking strength) contained in polyethylene tubes; one above and one below the float
Bottom tension and ballast	
End connectors:	High-tensile-strength aluminum universal connector at float and top tension cable. ASTM 3/8-in stainless steel locking pins. Lacing grommets on reinforced fabric on skirt. Chain ends shackled section-to-section on the type III turbidity curtains. Tool-free connections. All corners reinforced with 40-oz PVC fabric. Aluminum stress plates at bottom corners.
Section length:	50 ft and 100 ft, standard
Skirt depth:	To 100 ft; Can be tapered to conform to bottom profile.

Furling lines may be needed for the turbidity curtain to be effective.
Anchor systems, ropes, marker buoys, solar-powered lights, repair kits may be needed to maintain the location and effectiveness of the turbidity curtain.
Anchor systems, ropes, marker buoys, solar-powered lights, repair kits.

Installation:

1. The turbidity curtain shall be located downstream of the lateral limits of the construction site and firmly anchored in place;
2. The alignment shall be set as close to the work area as possible but not so close as to be disturbed by construction equipment;
3. The height of the curtain shall be designed to account for expected wave action and water level fluctuations as a result of storm events. At a minimum, the curtain height should be 20 percent greater than the depth of the water;

4. The area that the turbidity curtain protects shall not contain large culverts or drainage outlets which may cause the curtain to fail during flow events;
5. If water depth is less than two feet, and flow at the designed alignment is minimal, the toe can be anchored in place by staking.
6. Hard armor (i.e., concrete barriers) may be necessary to protect the curtain on the upstream side in certain flowing water applications.
7. Assure that all necessary permits for work within a jurisdictional water are obtained from the regulatory agencies prior to starting work;
8. The area of proposed installation of the curtain shall be inspected for obstacles and impediments that could damage the curtain or impair its effectiveness to retain sediment;
9. All construction materials shall be removed so they cannot enter the water body;
10. Shallow installations can be made by securing the curtain by staking rather than using a flotation system;
11. Supplemental anchors of the turbidity curtain toe shall be used, as needed, depending on water surface disturbances such as boats and wave action by winds.

Monitoring:

1. The turbidity curtain shall be inspected daily and repaired or replaced immediately.
2. If the curtain is oriented in a manner that faces the prevailing winds, frequent checks of the anchorage shall be made.
3. While inspecting, look for areas where turbid water is escaping into the larger water body.

Maintenance:

1. It is not normally necessary to remove sediment deposited behind the curtain; but, when necessary, removal is usually done by hand prior to removal of the barrier. All removed silt is stabilized away from the water body;
2. The barrier shall be removed by carefully pulling it toward the construction site to minimize the release of attached sediment;
3. Any floating construction or natural debris shall be immediately removed to prevent damage to the curtain

642.7-METHOD OF MEASUREMENT:

Turbidity curtain will be measured by linear foot at the top of the curtain.

642.8-BASIS OF PAYMENT:

The quantities will be paid for at the contact unit price for turbidly curtain, which includes furnishing all materials and doing all work prescribed herein in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies, and incidentals necessary to complete the work including skirt fabric, floats, anchor systems, connectors, furling lines, ropes, chains, steel cable, ballast, repair kits (marker buoys & solar-powered lights if required).

642.9-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
642045-*	Turbidity Curtain, "type"	~~Square Yard~~ Linear Foot

"type" – Type 1, Type 2, or Type 3

~~January 7, 2021~~ February 3, 2021

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

DELETE SECTION 690 AND REPLACE WITH FOLLOWING:

SECTION 690
CROSS SLOPE AND SUPERELEVATION TOLERANCE

690.1-DESCRIPTION:

This section covers the cross slope and superelevation tolerances and testing procedures of the finished surface for the project.

690.2-EVALUATION CRITERIA:

The project shall be evaluated by District Construction personnel with assistance of the Regional Construction Engineer and participation by the FHWA. Evaluation shall occur in the following manner for cross-slope acceptability.

The as-built cross slopes shall be compared to the plan cross-slopes ~~(which were designed, submitted, and accepted prior to construction)~~.

Tangent Sections: Tangent sections shall be evaluated with a .50% tolerance (1.50% minimum – 2.50% maximum).

Tangent areas which fail to provide a cross-slope in the 1.50% - 2.50% range shall be further evaluated via the following criteria:

In general, areas in consecutive length of 250’ or more outside tolerance will require additional evaluation and potential remediation.

These specific areas shall be further investigated by site visit for conformation of cross-slope deficiencies (via additional measurements with levels or scanning) and safety/drainage concerns (location in a sag of a vertical curve, accident data, discussions with maintenance forces and traffic engineering).

After site review, if warranted, contractor is informed that the area requires remediation to comply with cross-slope criteria.

Superelevated Sections: Superelevated sections shall also be evaluated with a .50% tolerance. In general, areas in consecutive length of 250' or more with variance outside the tolerance as compared to the plan superelevated cross slopes will require additional evaluation and potential remediation.

The tangent runout and length of runoff from normal crown to full superelevation shall be in the length reference as Superelevated Sections.

These specific areas shall be further investigated by site visit for conformation of cross-slope deficiencies (via additional measurements with levels or scanning) and safety/drainage concerns (location in a sag of a vertical curve, accident data, discussions with maintenance forces and traffic engineering).

After site review, if warranted, contractor is informed that the area requires remediation to comply with superelevation criteria.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 691
FINISHED SURFACE LIDAR SURVEY

691.1-DESCRIPTION:

A terrain model representing the as built roadway surface, shoulders, and median is a required deliverable for the project. The model shall include cross sections at 50 feet intervals; generated from the modeled surface. The following items are required:

1. Digital files include an electronic surface and cross section file.
2. Hard copy of cross sections at 1" = 10' horizontal and vertical scales.
3. Tabular spreadsheet of as-built and plan cross-slopes. Digital file and hard copy.

The tabular and visual representations of the cross-slopes shall provide information for each travel lane.

691.2-DATA COLLECTION:

The terrain models described above shall be developed from mapping meeting the requirements as follows:

Data Collection for Mobile LiDAR and Reduction:

Mapping services for this project require conducting mobile LiDAR collection of roadway data by remote sensing methods. Other means of data collection may be submitted for approval prior to performing.

The contractor shall deliver triangulated surfaces and planimetric in a computer aided drafting format compatible with Division standards. The criteria will adhere to the following protocols:

Project Datum:

1. NAD83 West Virginia State Plane (GRID)
2. NAVD88 Elevations
3. All data shall be referenced to the WV DOT Real Time Network

Data Collection:

1. Minimum of two passes, one on each of the inside lanes

2. No collection when snow is present on road, shoulder, or median

Deliverables:

1. Individual file sizes shall be for maximum roadway length of five miles. ~~Five Mile Maximum file sizes~~.
2. Digital Terrain Model of road surface (inside edge of ~~pavement~~ paved shoulder to outside edge of ~~pavement~~ paved shoulder). Baseline shall be established on the median side of the yellow line.
3. Scan data in .las file type
4. All digital calibrated photos (if applicable)
5. Delivered on external hard drive

691.2.1-Submittals: All submissions of any records in an electronic medium must be in such a format that it is directly compatible with current software products used by the Department as per Section 691.2.2. Any inspection or checking of the Contractor's model by the Engineer and the acceptance of all or any part of it shall not relieve the Contractor of their responsibility to secure the proper dimensions, grades, and elevations of any part of the work.

The terrain model is subject to review by the Division before acceptance. The Contractor shall be responsible to address corrections in the model. Upon acceptance this data and model shall become the property of the Division.

691.2.2-Software Requirements: Any spreadsheets must be submitted in acceptable electronic format ~~such as Microsoft Excel or other applicable formats~~ used by the Division. The software utilized in preparation of the various Terrain Models must be compatible with the current Bentley Systems© software products used by the ~~Department~~ Division.

691.3 THROUGHT 691.7: BLANK

691.8-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
691001-001	As-Built Survey, Pavement	Lump Sum

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

FOR

SECTION 707
CONCRETE ADMIXTURES, CURING, AND COATIANG MATERIALS

707.4-SUPPLEMENTARY CEMENTITIOUS MATERIALS (SCMs) FOR USE IN PORTLAND CEMENT CONCRETE:

ADD THE FOLLOWING SUBSECTION:

707.4.~~5~~1.~~1~~-Alternative Supplementary Cementitious Materials (ASCM)-ASCMs will be evaluated by the Division in accordance with ASTM C1709, and they shall comply with the requirements of the applicable sub-section below.

The ASCM Supplier shall provide concrete test data to the Division, from an AASHTO accredited Lab, accredited for all the concrete tests which are performed. This testing shall be performed on two "control" concrete batches with cement as the only cementitious material and two "test" batches with the ASCM portion of the cementitious material content at the maximum percentage proposed for use in any WVDOH concrete mix. One of the "control" concrete batches shall be produced to meet the requirements of Class B concrete, and the other shall be produced to meet the requirements of Class K concrete. One of the "test" concrete batches shall be produced to meet the requirements of Class B concrete, and the other shall be produced to meet the requirements of Class K concrete. These batches shall be produced at the maximum w/c specified in Table 601.3.1A for Class B and Class K concrete, and the "control" and "test" batches shall have the same w/c. Adjustments may be may in admixture dosages to control other mix properties.

The following tests shall be conducted on the four concrete batches listed above: slump (AASHTO T119), air content (AASHTO T152), temperature (ASTM C1064), time of setting (ASTM C403), unit weight (AASHTO T121), compressive strength at 3, 7, 28, and 56 days (AASHTO T22), scaling resistance of concrete surfaces exposed to deicing chemicals (ASTM C672), and resistance to rapid freezing and thawing (ASTM C666-Procedure A, 3 specimens). The results of all these tests shall meet the requirements of the

applicable class of concrete for which the subject batch was produced, except that the 28-day compressive strength shall be 1,300 psi above the Design 28-day compressive strength listed in Table 601.3.1. The results of the scaling resistance of concrete surfaces exposed to deicing chemicals test shall have a Rating of 3 or less after 50 cycles. The results of the resistance to rapid freezing and thawing test shall have an average Durability Factor equal to or greater than 80 after 300 cycles.

707.4.5.1 -Circulating Fluidized Bed Combustion (CFB) ~~Fly~~ Ash: CFB ~~fly~~ ash shall meet the requirements of ASTM C618, Class F or C when sampled and tested in accordance with the applicable Section of ASTM C311, except that the maximum allowable Specification limit for Sulfur Trioxide (SO_3) shall be increased to 11.0%, and the maximum allowable water content shall be increased to 110%.

Prior to use on any WVDOH project, the CFB ~~fly~~ ash used in any concrete mix for that project will be tested by the Division, along with the cement used in that concrete mix, for expansion in water in accordance with ASTM C1038. The CFB ~~fly~~ ash shall be tested with the cement source used in that mix design at the same ratio of ~~fly~~ ash to cement, which is used in the subject mix design. The CFB ~~fly~~ ash shall be considered as acceptable for use in that mix design if the expansion result of that ASTM C1038 test is $\leq 0.020\%$ at 14 days. This ASTM C1038 testing shall be performed on a sample of CFB ash with the highest SO_3 level anticipated to be supplied from that source of CFB ash.

CFB ~~fly~~ ash may only be used in Class B or Class D concrete, and it shall not be used in any structural applications or bridge elements. The applications in which CFB ~~fly~~ ash may be used include, but are not limited to, non-structural applications such as miscellaneous concrete elements as listed in Section 4.2.6.1 of MP 601.03.50. CFB ~~fly~~ ash shall not be used in beams and girders, columns, bridge piers, arch rings including ties and spandrel walls, rigid frames, box culverts, bridge abutments, retaining walls, concrete pipe, bridge footings, and pedestals. Concrete containing CFB ash shall not be used where there is anticipated exposure to an external source of sulfates such as sewage or soils with an elevated sulfate content (above 150 ppm or greater than 0.10% by mass).

Prior to use of CFB ~~fly~~ ash on any WVDOH project, the Division will obtain a sample of that CFB ~~fly~~ ash at the Concrete Plant which will supply concrete containing the CFB ~~fly~~ ash to the subject project. MCS&T will test this sample and record at which project it was used.

~~CFB fly ash will also be tested by an AASHTO Accredited Lab, accredited for ASTM C441, for ASR mitigation in accordance with ASTM C441. For the CFB fly ash to be approved, there shall be a minimum of 50% reduction in mortar bar expansion. The alkali content of test mix shall be equal to or greater than the control mix. The weight of fly ash shall be 20-30 % of weight.~~

March 10, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

FOR

SECTION 601
STRUCTURAL CONCRETE

601.3-PROPORTIONING:

601.3.1-Mix Design Requirements:

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:

ADD THE FOLLOWING AT THE END OF SUBSECTION 601.3.1.1.1.4.2

Option 4: Using the Alternative Supplementary Cementitious Materials (ASCM): ASCMs may be used for all level of prevention including "Level Z" given in Table 601.3.1.1.1.3 except for Class H concrete. The effectiveness of an ASCM in the reduction of expansion shall be evaluated 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). 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 effectiveness of the ASCM shall be evaluated 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, ASCM 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 concrete.

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

The alkali level of ASCM shall not exceed 4.0%. The 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.

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 695
MAINLINE PAVEMENT

695.1-DESCRIPTION:

This Special Provision shall define the requirements to construct mainline pavement, which includes roadway pavement and full depth paved shoulders, to the limits as shown by the contract plans. The contractor shall construct one of the pavement systems as described herein and by the contract plans.

Asphalt Pavement System:

An asphalt pavement system shall be constructed as defined by the asphalt typical section(s) and all other documents referenced in the contract plans. This work and materials shall include asphalt wearing surface, asphalt base courses, free draining base, fabric for separation, subgrade, and subgrade preparation. The pay items, as shown on the typical section(s) of the contract plans, define the specification for the materials and workmanship only.

Concrete Pavement System:

A concrete pavement system shall be constructed as defined by the concrete typical section(s) and all other documents referenced in the contract plans. This work and materials shall include jointed plain concrete pavement, free draining base, fabric for separation, subgrade, and subgrade preparation. The pay items, as shown on the typical section(s) of the contract plans, define the specification for the materials and workmanship only.

695.2-RESTRICTIONS:

The pavement system, selected by the Contractor, shall be the complete system as shown by the typical section(s) in the contract plans.

The entire “Mainline Pavement System” shall be constructed by a single pavement system. No change in pavement system will be permitted once the paving operation has commenced.

695.3-ADJUSTMENTS:

695.3.1-Material Adjustments:

695.3.1.1-Asphalt Adjustment: This Special Provision shall make use of the latest version of the Standard Specifications, Supplemental Specifications, and applicable Special Provisions for asphalt adjustments, except as described by this special provision.

The proposed Job Mix Formula (JMF) submitted by the contractor, as described in Subsection 401.4.2, shall provide the quantity of asphalt cement, per square yard- inch (SY-IN), for each JMF. The asphalt adjustment shall be based on the lots used for thickness verification. If the pavement section is determined to be less than plan, the ratio of the average thickness to the plan thickness shall be applied to the asphalt cement quantity, for the lot considered for adjustment.

The bidding index **(Ib)** and the placement index **(Ip)** may be found posted at the Department Of Transportation's website Contract Administration's Lettings page: https://transportation.wv.gov/Highways/Contractadmin/Lettings/Pages/FuelandAsphaltPrices.aspx#AsphaltPrices

695.3.1.2-Cement Adjustment: The compensation for the quantity of Portland cement used in the Concrete Pavement System shall be adjusted based on the latest published price, in dollars per ton, for Portland Cement (Type I) quoted for the average of Cincinnati and Pittsburgh in the Engineering News Record (ENR), Construction Economics Section available at the ENR website: https://www.enr.com/economics using the posted price as published on Wednesday prior to the first day of the month, with the effective date of the index being the first day of the month. If the Wednesday prior to the first day of the month falls on a holiday or the price is otherwise not published for that date the index prices will be based on the next earliest date reported.

The adjustment shall apply regardless of an increase or decrease in the published price as described above. The contract items listed in the Proposal in the *Table Of Materials To Be Adjusted For Price Of Portland Cement At The Time Of Placement* will be adjusted in accordance with the Division's indices for Portland Cement.

The placement index (**Ip**) will be the price in effect for the first day of the month in which the specified adjustable material was actually placed. Both the bidding index (**Ib**) and the placement index (**Ip**) will be based on the average of the posted prices described above.

The bidding Portland cement index **(Ib)** and the placement cement index **(Ip)** may be found posted at the Department Of Transportation's website Contract Administration's Lettings page: http://www.transportation.wv.gov/Highways/Contractadmin/Lettings/Pages/FuelandAsphaltPrices.aspx#CementPrices.

Any dispute concerning the bidding index shall be resolved during the first voucher estimate review.

695.3.1.3-Price Adjustment Formula: The portion of the contract unit price which reflects the cost of the specified material will be adjusted for the change in accordance with the following formula:

$$Pa = [\ (Ip \div Ib) - 1\ ]\ (\ Q\ )\ C$$

Where:

Pa	=	*Price Adjustment*
Ip	=	*Price Index at time of placement*
Ib	=	*Price Index for Bidding*
Q	=	*"As Constructed" Quantity* *(converted to CY for Cement Adj.)* *(converted to TN for Asphalt Adj.)*
C	=	*see below:*

C (asphalt) = refer to Section 109.10

C (cement) = Ib (Wc) (Tadj)

Where:

Ib	*= Price Index for Bidding*
Wc	*= tons cement per cubic yard from approved mix design*
Tadj	*= (t_{avg}) / (t_{plan}) as per 695.3.1.3*

The price index for determining price adjustments for all work performed after the contract completion date, as revised by approved time extensions, will be determined as follows: The price index (Ip) shall be for the first day of the month in which the contract completion date (as extended), or the price index for first day of the month in which the work was performed, whichever is less.

The quantity of fly ash substitution shall not be included in the quantity eligible for adjustment.

The Portland cement adjustment shall be based on the lots used for thickness verification. If the pavement section is determined to be less than plan, the ratio of the average thickness to the plan thickness shall be applied to the Portland cement quantity, for the lot considered for adjustment.

695.3.2-Smoothness Adjustments: The smoothness for the chosen system of Mainline Pavement shall meet the criteria established in Section 720.

695.3.3-Fuel Adjustments:

695.3.3.1-Subgrade and Free Draining Base: Any fuel adjustment for these items shall be applied directly to the subgrade and free draining base layers of the pavement section as per the table in Section 109.9 of the Standard Specifications. The quantities shall be determined by the cubic yard (CY) calculation that was placed for the respective items in a given month applying the specifications formulas accordingly.

695.3.3.2-Pavement System: The Contractor shall include the unit weight per SY-IN of the pavement system placed (excluding subgrade and free draining base) for the conversion to the Fuel Adjustment as described in Subsection 109.9 *Table Of Materials To Be Adjusted And Cost Adjustment Factors For Diesel Fuel Usage*. For this adjustment the total square yardage will be the measured quantity accepted and the thickness in inches

will be based upon the lots as established for thickness verification. If the pavement section is determined to be less than plan, the ratio of the average thickness to the plan thickness shall be applied to the Fuel Adjustment quantity, for the lot considered for adjustment.

695.3.4-Percent Within Limits (PWL) Adjustments: Section 410 requires pay adjustments for each lift of asphalt, which is based on the bid cost of the individual lift pay item. To determine this, the following equation will be used:

Theoretical lift payment per SY used for 410 pay adjustments = (695 pay item) x 0.72 x (thickness of lift / total pavement thickness)

695.4-METHOD OF MEASUREMENT:

The quantity of Mainline Pavement to be paid for will be the number of square yards (meters) complete in place and accepted. The width for measurement will be the width of the pavement shown on the surface of the typical cross section of the Plans and additional widening where called for or as otherwise directed in writing by the Engineer. This width shall be verified by field measurements. Widths exceeding the plan dimensions shall not be paid for. The length will be measured on the surface along the centerline of each roadway ramp.

Bridge approach expansion joints will be measured separately and shall be the actual number of joints constructed, complete in place and accepted. Intersection pavement, radius returns, left and right turning lanes (including tapers), will be field verified and paid for at the completion of the project paid for in the last progress payment that includes payment for any additional pavement directed by the Engineer.

Mainline Pavement is to be placed on all side roads up to the edge of the radius return furthest from the edge of mainline traveled way as shown by the detail in the plans.

695.5-BASIS OF PAYMENT:

695.5.1-General: The quantities, determined as provided above, will be paid for at the contract unit prices less adjustments referred to below, which shall constitute full compensation for furnishing all materials as described in the item's specification and all labor, equipment, tools, field laboratory, supplies and incidentals necessary to complete the work.

695.5.2-Progress Payments: The Progress Payment Schedule shall be based upon the pavement system as shown below. This schedule is intended to compensate the contractor for the material and work accepted.

2 – Lane Roadway [L_T = 4 x project length] Project Length as defined on title sheet.
4 – Lane Roadway [L_T = 8 x project length**]**

695.5.2.1-Asphalt Pavement System:

MATERIAL IN PLACE	VALUE	L_P / L_T	Q (SY)	SUBTOTAL (SY) = Value x (L_P / L_T) x Q
HMA Mainline Pavement	**0.72**			
Free Drain. Base	**0.12**			
Fabric	**0.02**			
Subgrade	**0.12**			
Subgrade Prep.	**0.02**			
Total Progress Payment				**(SY)**

Where:

Q = Total Bid Quantity (SY)
L_P = Length placed and accepted (Ft)
L_1 = A constructed length of asphalt pavement at a thickness of t_1 x L_1= ft-in
t_1 = A proposed thickness of specified lift (in)
L_T = Total Lane Lengths (Ft) for the varying widths of different lifts (lanes & shoulders)
t_T = Total Pavement Thickness (in) per Typical Section(s)

HMA **L_p/L_T** shall be calculated as follows:

$$\frac{L_1 t_1 + L_2 t_1 + L_3 t_3 \ldots}{L_T t_T}$$

Where 1, 2, 3... Represent the different lifts as shown on the typical section(s)

695.5.2.2-Concrete Pavement System:

MATERIAL IN PLACE	VALUE	L_P / L_T	Q (SY)	SUBTOTAL (SY) = Value x (L_P / L_T) x Q
PJCP Mainline Pavement	**0.72**			
Free Drain. Base	**0.12**			
Fabric	**0.02**			
Subgrade	**0.12**			
Subgrade Prep.	**0.02**			
Total Progress Payment				**(SY)**

Where:

Q = Total Bid Quantity (SY)
L_P = Length placed and accepted (Ft)
L_1 = A constructed length of Cement pavement at a thickness of t_1 x L_1= ft^2
t_1 = A proposed thickness of specified lift (in)
L_T = Total Lane Lengths (Ft) for the varying widths of different lifts (lanes & shoulders)
t_T = Total Pavement Thickness (in) per Typical Section(s)

PJCP **L_p/L_T** = Length Placed/Length Total

695.6–THICKNESS TESTING:

The measurements which represent the thickness of the sampling units shall be analyzed to determine the average value of the pavement thickness. T=Pavement Thickness, all of the Pavement System above the Free Draining Base. This value will be used to determine the degree of compliance with the provisions set forth in 501.19 and to develop certain factors to be used in the derivation of equitable deductions as set forth in 501.23.1.2 and 501.23.1.3, in the event the provisions of this Specification are not met.

No payment will be made for pavement areas that are 0.922T or less in thickness, the area being defined in the manner set forth in 501.19.2. Pavement which is deficient in thickness by more than 0.7 inches (18 mm) and is considered by the Engineer to be inadequate to perform satisfactorily shall be removed and replaced at no added cost to the Division. The balance of the item, the portion of the item not treated in the manner set forth above, will be treated in the manner set forth in 501.23.1.2 or 501.23.1.3.

695.6.1 - When the average value of the pavement thickness is equal to or greater than the specified thickness, the quantity of pavement represented by this average thickness will be paid at the contract unit price. No additional compensation will be provided for pavement thicknesses greater than as shown by the typical section(s).

695.6.2 - When the average value of the pavement thickness is less than the specified thickness, the fraction of pavement having a thickness greater than the 0.922T will be paid for at a unit price as set forth in the following schedule, and no payment will be made for the remainder of the pavement being considered.

SCHEDULE OF UNIT PRICES	
Average Value of Pavement Thickness (Inch)	**Unit Price as Percent of Contract Unit Price**
0.01 to 0.10 Less Than Specified Thickness	98.0
0.11 to 0.20 Less Than Specified Thickness	96.0
0.21 to 0.30 Less Than Specified Thickness	94.0
0.31 to 0.40 Less Than Specified Thickness	92.2
0.41 to 0.50 Less Than Specified Thickness	90.3
0.51 to 0.60 Less Than Specified Thickness	88.4
0.61 to 0.70 Less Than Specified Thickness	86.5
More Than 0.70 Less Than Specified Thickness	0

695.7-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
695001-002	Mainline Pavement – Asphalt System	Square Yard (Meter)
695001-003	Mainline Pavement – Concrete System	Square Yard (Meter)

March 12, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 102
BIDDING REQUIREMENTS AND CONDITIONS

DELETE THE ENTIRE CONTENTS AND REPLACE THE FOLLOWING.

102.1-~~PREQUALIFICATION OF BIDDERS~~ ELIGIBILITY OF BIDDERS:

All bidders on projects let to contract by the Division shall be prequalified as provided for by rules or regulations, or both, of the Commissioner.

A Certificate of Qualification will be issued by the Commissioner fixing the amount of incomplete work a Contractor may have under contract at any one time with any entity and the type of work for which the Contractor is qualified to perform for the Division.

To obtain a Certificate of Qualification, the Contractor must submit, on the form provided by the Division, ~~file~~ a "~~"~~Contractor's Prequalification Statement~~"~~ containing the information as required based on the category of work for which prequalification is being requested.

~~Application for qualification~~A completed Contractor's Prequalification Statement will be accepted by the Commissioner until 15 calendar days prior to the date set for receiving bids on projects on which the applicant may wish to submit a Proposal. Award of a certificate may be held in abeyance until such time as the Commissioner is able to verify all references and be satisfied as to the applicant's qualifications.

No Contractor will be issued a Certificate of Qualification until the Division has had adequate time to review and verify the adequacy of the information provided in the "~~"~~Contractor's Prequalification Statement~~"~~.

I~~Additionally i~~t is the bidder~~Contractor~~'s responsibility to complete any Electronic Bidding registration required by~~from~~ the Division, and acquire all the necessary software, hardware, and networking capabilities for the Electronic Bidding process. It should be noted that only Prequalified Contractors or their authorized representatives will be approved to obtain, at their cost, an electronic bidder ID.

The Division may at its discretion allow a Contractor to submit a bid exceeding the prequalification amount allotted the Contractor provided it considers that this Contractor is particularly fitted by reason of their experience or equipment, or both, to perform the type of work involved. The prospective bidder should furnish the Division with a completed uncompleted workload form, provided in the Proposal Form, and a letter from a reputable Surety advising of their willingness to furnish a performance bond to the Contractor for the project on which the Contractor requests to exceed his or her prequalified amount.

No letter from a reputable Surety or uncompleted workload form shall be accepted after 4:00 PM Eastern Time on the Friday before project letting. Letters and forms are to be submitted via electronic mail to DOHContractorPrequalification@wv.gov. The Surety letter should include the following information: call number, project name, project number, and letting date for each project on which the Contractor requests to exceed their prequalification limit. Failure to submit this information by the specified time, incomplete submissions, those not submitted by electronic mail to the address listed above, and those not approved by the Division in writing before the opening of bids, may result in a Contractor's proposal(s) being irregular.

When more than one project is advertised, Proposals may be submitted on as many projects as the Contractor desires, providing the Contractor is qualified as described above for each individual project, but no contracts will be awarded exceeding the permissible limit of the Contractor's prequalification rating except as otherwise provided in Section 103.1.

102.2-~~CONTENTS OF~~PROPOSAL FORMS:

~~The p~~Proposal forms will be available on Bid Express and will show the location and description of the proposed work, the approximate estimates of the various quantities of work to be performed for materials to be furnished, the amount of the proposal guaranty, the number of working days or date on which the work is to be completed, and the date, time and place of opening of proposals. The proposal form will also include any special provisions or requirements not contained in the Standard Specifications. All documents included in the electronic proposal form are considered a part thereof and must not be detached or altered.

Additional information not included in the proposal form including, but not limited to, old plans, old shop drawings, geotechnical information, environmental documents, permit applications, permits, asbestos reports, hazardous materials reports, and other documents or data may be provided as an exhibit on Bid Express. All additional documents are to be considered as part of the proposal documents, unless the additional document(s) specifically states that it is for informational purposes only. Documents marked "for informational purposes only" are not to be considered contract documents, and potential bidders rely upon information contained therein at their own risk.

Any requests for additional information or other pre-construction data should be presented to the Division through Bid Express, as described in Section 102.9.

~~The Plans, Specifications, and other documents designated in the proposal form are considered a part of the proposal form whether attached or not attached.~~

~~The Proposal documents, Plans, Specifications, and other documents designated in the proposal form can be viewed and purchased on the WVDOH Bid Express Website for Electronic Bidding purposes to those authorized participants.~~

~~**102.3 ISSUANCE OF PROPOSAL FORMS:**~~

~~Proposal forms, will be issued to Prequalified Contractors only or to their authorized representatives, or to Contractors who have filed on a Division standard form an application for prequalification 15 calendar days prior to the date set for receiving bids on projects on which the applicant desires to bid.~~

~~The Division may at its discretion issue to a Contractor a Proposal requiring prequalification in excess of the amount allotted the Contractor provided it considers that this Contractor is particularly fitted by reason of their experience or equipment, or both, to perform~~

~~work of this type involved in an amount exceeding their prequalification limits and further provided that the prospective bidder furnish the Division with a letter from a reputable Surety advising of their willingness to furnish bond to the Contractor for the project. No letter from a reputable Surety will be accepted after 4:00 PM Eastern Time of Friday before project letting. Lettings must be submitted to DOHContractProcure@wv.gov. The Surety letter should include the following information: call number, project name, project number, and letting date for each project the Contractor requests to exceed their prequalification limits on. Failure to submit this information by the specified time may result in a Contractor's proposal(s) being irregular.~~

~~When more than one project is advertised, Proposals will be issued on as many projects as the Contractor requests, providing the Contractor is qualified as above for each individual project, but no contracts will be awarded exceeding the permissible limit of the Contractor's prequalification rating except as otherwise provided in 103.1.~~

102.34-INTERPRETATION OF APPROXIMATE ESTIMATES:

The quantities appearing in the proposal form are approximate only and are prepared for the comparison of bids. Payment to the Contractor will be made only for the work accepted, or for materials furnished in accordance with the Contract. If upon completion of the construction the actual quantities show either increase or decrease, the unit bid prices offered in the Proposal will prevail except as further provided.

102.45-EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK:

The bidder is required to examine carefully the Plans, Specifications, Supplemental Specifications, proposal~~contract~~ forms, and the site of the work contemplated. The submission of a bid shall be considered prima facie evidence that the bidder has made such examination and has judged for and satisfied themselves as to the character, quality, and quantity of work to be performed and material required to be furnished under the Contract.

102.56-~~PREPARATION OF PROPOSAL~~PROPOSAL SUBMISSION:

The bidders Proposal must be submitted through ~~the Division's~~ Bid Express using the electronic file provided with the proposal form and documents, by the time designated in the proposal to proceed with the letting. Proposals submitted by any other means, including on paper, will be rejected.~~Website. The bidder must furnish a unit price or a lump sum price as called for in the Proposal, in numerical figures, for each pay item listed, except that in the case of alternates, the bid may be made on only one alternate if so desired.~~

~~The Contractor or qualified and authorized agent shall use a digital signature as provided at law for the Proposal submission.~~

~~The proposal shall comply with West Virginia Contractor Licensing Act, Chapter 21, Article 11 Code of West Virginia, except that on Federal-Aid Projects a Contractor's license is not required at time of bid, but will be required before work can begin.~~

102.5.1-Schedule of Items: The bidder must furnish a unit price or a lump sum price as called for in the Proposal, in numerical figures, for each pay item listed, except that in the case of alternates, the bid may be made on only one alternate if so desired.

102.5.2-DBE Utilization Certification (Section C): The bidder must acknowledge intent to submit written and signed documentation of commitment to use a DBE subcontractor whose

participation the contractor submits to meet a contract goal and written and signed confirmation from the DBE that is participating in the contract as provided in the prime contractor's commitment, by indicating the Contractor's DBE Goal Percent.

102.5.3 Notice to Contractors: The bidder must complete all sections contained in the Notice to Contractors and check the box indicating he or she has read, understands, and intends to comply with all documents contained in the proposal.

i. Section A: Free Competitive Bidding Affidavit – Prior to the approval of Federal-Aid Contracts, a sworn statement in the form of an affidavit shall be executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded.
ii. Section B: Certification with Regard to the Performance of Previous Contracts or Subcontracts Subject to the Equal Opportunity Clause and the Filing of Required Reports
iii. Section D: Assurance Requirement Regarding Equal Employment Opportunity for Vendors, Suppliers and Contractors Engaged in Commercial Transactions with the West Virginia Division of Highways
iv. Section F: Certificate of Compliance Involving the Supplying of Aluminum, Glass, Steel or Iron Products
v. Section H: West Virginia Contractor Licensing Act Chapter 21 Article 11 Code of West Virginia License Number – The proposal shall comply with West Virginia Contractor Licensing Act, Chapter 21, Article 11 Code of West Virginia, except that on Federal-Aid Projects a Contractor's license is not required at time of bid, but will be required before a project will be awarded.
vi. Section I: Drug and Alcohol-Free Workplace – An affidavit that the Contractor implements and maintains a written drug-free workplace policy which meets the requirements of Article 1D, Chapter 21 of the Official Code of West Virginia, as amended. The successful bidder must submit a copy of its drug-free workplace policy within ten (10) days following the letting and prior to the awarding of the contract. Any successful bidder who fails to submit the policy within the specified time limit will risk forfeiture of his/her proposal guaranty.

The successful bidder must also ensure that its subcontractors implement and maintain a written drug-free workplace policy complying with Article 1D, a copy of which must be submitted to the Division by the Contractor prior to the start of the subcontract work. The contract may be terminated if the Contractor:

a. Fails to implement its policy;
b. Fails to provide information regarding implementation of the policy at the request of the Division; or,
c. Provides to the Division false information regarding the policy.

A clearly legible copy of the written drug-free workplace policy must be kept posted in a prominent and easily accessible place at the project site by each contractor subject to the provisions of Article 1D.

Every contractor shall keep an accurate record showing the names, occupation and safety- sensitive status of all employees, in connection with the construction

on the project, and showing any drug tests or alcohol tests performed and employee education and supervisor training received, which record shall be open at all reasonable hours for inspection by the Division. The Contractor must preserve these records for three years after completion and acceptance of the project.

All drug testing information specifically related to individual employee is confidential and should be treated as such by anyone authorized to review or compile program records.

vii. Section J: Amendment – Bidder must acknowledge that all amendments have been reviewed and considered in the bidder's proposal.

~~i.~~viii. Section L: Uncompleted Workload – Bidder must correctly acknowledge that the proposal they are submitting is within his or her prequalification limit or that an uncompleted workload form and letter from a reputable surety were submitted and approved in the prescribed timeframe, as detailed in Section 102.1.

102.5.4-Bid Bond: Bidders must verify his or her bid bond by completing the Bid Bond section of the electronic file, unless submitting a certified or cashier's check as described in Section 102.6.

102.6-PROPOSAL GUARANTY: *(previously 102.8 & 102.9)*

No proposal will be considered unless accompanied by a digitally signed proposal guaranty (bid) bond as described in Section 102.5.3 or in the form of a certified or cashier's check~~, or bid bond,~~ in the amount specified in the Proposal, made payable to the West Virginia Division of Highways. Bid bonds will be accepted only if executed on the official form furnished by the Division and any Proposal accompanied by a submitted electronically as described in Section 102.5.3. Any bid bond executed on a copy, duplicate, or facsimile will be rejected.

Cashier's Checks, when not utilizing an electronic bid bond, shall be submitted in an envelope and delivered prior to ~~the date and time of letting.~~ 4:00 PM Eastern Time the day before the scheduled letting. The Envelope and the Cashier's Check shall each contain the following Information:

Call Number	Letting Date
Project Number	Contractor's Name and Address

Envelopes shall be addressed to the West Virginia Division of Highways, Contract Administration Division, Charleston, West Virginia.

102.7-WITHDRAWAL OF PROPOSALS: *(previously 102.10)*

Bidders may withdraw Proposals ~~in a manner approved by the electronic bidding service provider and the Division prior to the letting.~~ during the course of reading of bids prior to the actual reading of bids on the project for which the bid is withdrawn only electronically through the Bid Express automatic bid withdrawal function or by providing a written document at the site of the letting in the following form:

~~On projects requiring prequalification, a bidder may alternatively request to withdraw its bid under the conditions and in the same manner as described for projects where Prequalification is waived provided the bidder provides written notice to the Division 2:00PM of the business day preceding the letting and the~~

~~bidder receives confirmation from the Division stating the bidder will be allowed to do so.~~

~~For projects where Prequalification is waived, and after the time provided for the opening of proposals, a bidder may withdraw its bid during the course of reading of bids prior to the actual reading of bids on the project for which the bid is withdrawn only by providing a written document at the site of the letting in the following form:~~

> "I, the undersigned, of _____, Contractor(s) hereby acknowledge that I have this day withdrawn the sealed bid of _____, Contractor(s) on West Virginia Division of Highways Project No. _____".

~~Contractors who are found to be low bidders on a number of projects of which the total exceeds the Contractor's rating may withdraw, with the approval of the Commissioner, bids on such project or projects as will bring the remaining total to within the limit of the rating. At their discretion, the Commissioner may award contracts for the project or projects on which bids have been so withdrawn to the next lowest qualified bidder.~~ Should a bidder wish to provide a written document at the site of the letting, they must notify the Division of their intent to do so via email to DOHContractProcure@wv.gov no later than 4:00 PM Eastern Time on the Friday before the scheduled letting. Additionally, the written notice(s) provided by the bidder withdrawing his or her bid(s) must be provided prior to the reading of the call(s) on which the bid is being withdrawn. No bid may be withdrawn on any call once the apparent bids have been read by the Division.

102.8-COMBINATION PROPOSALS: ***(previously 102.11)***

If the Division so elects, Proposals may be issued for projects in combination or separately, so that bids may be submitted either on the combination or on separate units of the combination. The Division reserves the right to make awards on combination bids or separate bids to the best advantage of the Division. No combination bids other than those specifically set up in proposals by the Division will be considered. Separate Contracts will be written for each individual project included in the combination.

102.9-QUESTIONS REGARDING ADVERTISED PROPOSALS: ***(previously 102.16.1)***

All projects advertised by the Division will require any questions to be asked using the Bid Express Question and Answer feature ~~of the electronic bidding service~~ in accordance with any listed requirements. The various contact information required shall be filled out and completed with valid and applicable information which the Division may verify. If the contact information is unable to be verified, then any questions associated with this information may not be answered.

Questions and Answers are for informational purposes only. Any posted questions or answers do not alter the terms and conditions of the advertised Contract in question. Official changes to the Contract shall only be issued by the Division through an amendment to the applicable Contract.

Potential Bidders may ask questions up until the time of the posted letting with no exceptions. However, it should be noted that any questions that may necessitate a change to the Contract should be asked seven (7) days prior to the posted letting date to allow the Division to issue an amendment to modify the Contract, if necessary. Questions received three (3) working days or more in advance of a posted letting should be answered prior to the time of the posted letting. Questions received within three (3) working days of the posted time of letting may or may not be answered as time allows.

102.10-PUBLIC READING OF PROPOSALS: ***(previously 102.12)***

Proposals will be received, decrypted, ~~and~~ read publicly, and published at the time and place indicated in the Notice to Contractors. Bidders, their authorized agents, and other interested parties are invited to be present.

102.11-DISQUALIFICATION OF BIDDERS: ***(previously 102.13)***

Either of the following reasons may be considered as being sufficient for the disqualification of a bidder and the rejection of their Proposal or Proposals.

i. More than one Proposal for the same work from an individual, firm, or corporation under the same or different name.

ii. Evidence of collusion among bidders. Participants in such collusion will receive no recognition as bidders for any future work of the Division until any such participant shall have been reinstated as a qualified bidder.

102.12-IRREGULAR PROPOSALS: ***(previously 102.7)***

Proposals may be considered irregular and rejected for any of the following reasons:

i. When the Proposal is not submitted by the electronic file ~~on a form other than that~~ furnished by the Division on Bid Express or if the form is altered. Use of a Division approved computer generated Schedule of Items shall not be considered an alteration of form or format within the meaning of these Specifications.

ii. When there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the Proposal incomplete, indefinite, or ambiguous as to its meaning. Also, when Division approved computer generated Schedule of Items show any alteration of format, additions or amendments not called for, errors or omissions in units of measure, or erasures.

iii. When the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award. This does not exclude a bid limiting the maximum gross amount of awards acceptable to any one bidder at any one bid letting, providing that any selection of awards will be made by the Division.

iv. Failure to sign or properly execute the Proposal.

v. Failure to indicate a proposed goal in Section C ~~, Item 3~~ of the Notice contained in the Proposal, when a Division determined goal is indicated in paragraph 5 of the Special Provision for Disadvantaged Business Enterprise Utilization.

vi. Failure to properly acknowledge receipt of amendment(s) in accordance with Section J of the notice contained in the proposal.

vii. Failure to show the West Virginia Contractor's License Number when required in Section H of the notice contained in the proposal.

viii. When exceeding prequalification limits, Contractor's failure to properly complete Section L of the notice contained in the proposal and failure to submit an uncompleted workload form and a letter from a reputable Surety by 4:00 PM Eastern Time ~~of~~ on Friday before project letting~~, advising of the Surety's willingness to furnish a bond in an amount exceeding the Contractor's prequalification limits~~ or if approval is not provided in writing by the Division, as described in Section 102.1.

ix. The proposal is mathematically and materially unbalanced. A mathematically unbalanced bid contains lump sum or unit price items that do not include reasonable labor, equipment, and material costs plus a reasonable proportionate share of the Bidder's overhead costs, other indirect costs and anticipated profit. A Materially Unbalanced Bid is when the Division determines that an award to the Bidder submitting a Mathematically Unbalanced Bid will not result in the lowest ultimate cost to the Division.

102.13-MATERIAL GUARANTY: ***(previously 102.14)***

The successful bidder shall furnish a complete statement of the origin, composition and manufacture of all materials to be used in the construction of the work, together with samples when required. Samples may be subjected to the tests provided for in these Specifications to determine their quality and fitness for the work.

~~**102.15-FREE COMPETITIVE BIDDING AFFIDAVIT:**~~

~~Prior to the approval of Federal-Aid Contracts, a sworn statement in the form of an affidavit shall be executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded.~~

~~The affidavit, with accompanying endorsement and acknowledgment sections, is contained in the contract Proposal.~~

~~**102.16-PRE-CONSTRUCTION DATA:**~~

~~Prospective bidders may review files at the West Virginia Division of Highways, Capitol Complex, Charleston, West Virginia. These files may contain additional information not included in the contract documents including, but not limited to, old plans, old shop drawings, geotechnical information, environmental documents, permit applications, permits, asbestos reports, hazardous waste reports and other data. Copies may be obtained upon request and payment of printing fees.~~

~~**102.17-CONTRACTOR'S DRUG-FREE WORKPLACE POLICY:**~~

~~Each Contractor submitting a bid must include with the bid, on a form provided by the Division, an affidavit that the Contractor implements and maintains a written drug-free workplace policy which meets the requirements of Article 1D, Chapter 21 of the Official Code of West Virginia, as amended. The successful bidder must submit a copy of its drug-free workplace policy within ten (10) days following the letting and prior to the awarding of the contract. Any successful bidder who fails to submit the policy within the specified time limit will risk forfeiture of his/her proposal guaranty bond.~~

~~The successful bidder must also insure that its subcontractors implement and maintain a written drug-free workplace policy complying with Article 1D, a copy of which must be submitted to the Division by the Contractor prior to the start of the subcontract work. The contract may be terminated if the Contractor:~~

~~1. Fails to implement its policy;~~
~~2. Fails to provide information regarding implementation of the policy at the request of the Division; or;~~
~~3. Provides to the Division false information regarding the policy.~~

~~A clearly legible copy of the written drug-free workplace policy must be kept posted in a~~

~~prominent and easily accessible place at the project site by each contractor subject to the provisions of Article 1D.~~

~~Every contractor shall keep an accurate record showing the names, occupation and safety-sensitive status of all employees, in connection with the construction on the project, and showing any drug tests or alcohol tests performed and employee education and supervisor training received, which record shall be open at all reasonable hours for inspection by the Division. The Contractor must preserve these records for three years after completion and acceptance of the project.~~

~~All drug testing information specifically related to individual employee is confidential and should be treated as such by anyone authorized to review or compile program records.~~

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 103
AWARD AND EXECUTION OF CONTRACT

DELETE THE ENTIRE CONTENTS AND REPLACE THE FOLLOWING.

103.1-CONSIDERATION OF PROPOSALS:

After the proposals are opened, ~~and~~ read publicly, and published, they will be compared on the basis of the summation of the products of the approximate quantities shown in the bid schedule by the unit bid prices. The results of such comparisons will be made ~~immediately~~ available to the public after they are presented to the division's award committee. In the event of discrepancy between unit bid prices and extensions, the unit bid price shall govern.

The right is reserved to reject any or all proposals, to waive technicalities or to advertise for new proposals if, in the judgment of the commissioner, the best interests of the state will be promoted.

If proposals for more than one project are issued to a bidder, which projects individually would be within the bidder's qualification established provided in 102.1, but a combination of more than one, considering also the work under contract and incomplete, would be in excess of their qualification, the right is reserved to consider only such proposal or proposals as, in the opinion of the commissioner, are most advantageous to the division. Additionally, consideration for such proposals submitted in excess of the bidder's prequalification limit may only be given to those for which an uncompleted workload form and letter from a reputable surety were submitted and approved by the division, in accordance with section 102.1.

Proposals containing special provisions for disadvantaged business enterprises utilization, will be considered as follows:

a) When the low bidder's goal submitted in Section C ~~Item 3~~ - ~~Contractor's Goal for DBE participation~~ DBE Utilization Certification, of the Notice contained in the project proposal, meets or exceeds the contract DBE goals, and the Division considers the amount of the bid to be reasonable,such bidder will be the successful bidder.

b) When the low bidder's goal submitted in Section C ~~Item 3 -~~ ~~Contractor's Goal for DBE participation~~ DBE Utilization Certification, of the Notice contained in the project proposal, does not meet the DBE contract goal and the Division considers the amount of the bid to be reasonable, the bidwill be accepted if he or she can show that good faith efforts were made prior to the bid to meet the contract goals.

c) When the low bidder cannot satisfy the Division that good faith efforts have been made,this bid may be rejected, and the second low bid will be evaluated in the same manner. This procedure will continue, evaluating bids in the same manner, evaluating

bids in ascending order, until either the contract DBE goal is attained or good faith efforts canbe verified and that bid will be accepted provided the amount thereof is considered reasonable by the Division.

103.2-BID PROTESTS

Each Bidder, by submitting its bid, expressly recognizes the limitation on its rights to protest contained herein, expressly waives all other rights and remedies and agrees that the decision on any protest, as provided herein, shall be final and conclusive unless wholly arbitrary.

a) A Bidder may protest any determination regarding the bids received for a project by filing a notice of intent to protest by electronic mail to DOHContractProcure@wv.gov, or hand delivery or courier to the West Virginia Department of Transportation, Division of Highways, Contract Administration Division Director, Charleston, WV. Such notice shall be provided: (a) not before the opening of the bids for the project on which intent to protest is being filed; and (b) no later than two (2) business days after the Division opens bids for the project on which intent to protest is being filed. The notice of protest shall specifically state the grounds of the protest.

b) Within seven (7) calendar days of the notice of intent to protest the protesting Bidder must file with the Division a detailed statement of the grounds, legal authorities, and facts, including all documents and evidentiary statements, in support of the protest. Evidentiary statements, if any, shall be submitted under penalty of perjury. The protesting Bidder shall have the burden of proving its protest by clear and convincing evidence.

c) Failure to file a notice of protest or a detailed statement within the applicable period shall constitute an unconditional waiver of the right to protest the evaluation or qualified process and decisions there under.

d) Unless otherwise required by law, no evidentiary hearing or oral argument shall be provided, except the Contract Administration Division Director in its sole discretion, may decide to permit a hearing or argument if it determines that such hearing or argument is necessary for the protection of the public interest. The Division shall issue a written decision regarding the protest within thirty (30) calendar days after it receives the detailed statement of protest.

e) If the Contract Administration Division Director concludes that the Bidder submitting the protest has established a basis for protest, the Division will determine what remedial steps, if any, are necessary or appropriate to address the issue(s) raised in the protest. Such steps may include, without limitation, withdrawing or revising the decisions, issuing a new solicitation, or taking other appropriate actions.

f) Should the Bidder wish to appeal the decision of the Contract Administration Division Director, he or she shall submit the appeal to the Secretary of Transportation/Commissioner of Highways within two (2) business days of receiving the decision. The Secretary of Transportation/Commissioner of Highways will then issue a final decision on the appeal within ten (10) calendar days from the date of appeal. Such decision shall be final and conclusive.

103~~.2~~.3-AWARD OF CONTRACT:

The award of Contract, if it be awarded, will be made within 30 calendar days after the opening of Proposals to the lowest responsible and prequalified bidder. The Commissioner may,

with the agreement of the successful bidder, withhold award for any length of time. The successful bidder will be notified ~~by letter, mailed to the address shown on their Proposal,~~ that their bid has been accepted and that they have been awarded the Contract.

103.32.1-Contractor's Direct Deposit Requirements: The Contractor shall receive all payments electronically via Direct Deposit. Prior to Award of the Contract, the Contractor shall be approved and registered to accept payments through the West Virginia State Auditor'sOffice electronically (www.wvsao.gov).

103.~~3~~.4-CANCELLATION OF AWARD:

The Division reserves the right to cancel the award of any Contract at any time before the execution of the Contract documents by all parties without any liability against the Division.

103.~~4~~5-RETURN OF PROPOSAL GUARANTY:

All proposal guaranties, except those of the two lowest bidders, will be released (if submitted electronically as described in Section 102.6) or returned (if submitted by certified or cashier's check as described in Section 102.6) immediately following the opening and evaluating~~checking~~ of the Proposals. The retained proposal guarantyof the unsuccessful of the two lowest bidders will be released or returned within 10 days following the awardof Contract, and that of the successful bidder will be released or returned after a satisfactory bond has been furnished, as described in Section 103.6, and the Contract has been executed.

103.~~5~~.6-REQUIREMENT OF CONTRACT BOND:

At the time of the execution of the contract, the successful bidder shall execute and deliver to the Division a good and sufficient surety or collateral bond payable to the State of West Virginia.

The successful bidder has the option of submission of the aforementioned bond in an amount equivalent to either 102 percent or 100 percent of the contract price.

The submission of the aforementioned bond in an amount equivalent to 102 percent of the contract price by the successful bidder is the standard expectation of the Division in order to comply with the current Special Provision for Subcontractor Prompt Payment and does not necessitate the withholding of retainage by the Division from monies due on future progress voucher estimates payable under the terms of the contract. Further, the decision by a particular contractor to submit said bond in an amount equivalent to 102 percent of the contract price shall be consistent and applicable throughout the duration of the contract for which the bond is being submitted and shall be consistent and applicable to all contracts executed between the Division and that particular contractor.

If the successful bidder elects to submit the aforementioned bond in an amount equivalent to 100 percent of the contract price, it is necessary that the bidder notify the Contract Administration Division in writing prior to the submission of the bond. Submission of a bond in an amount equivalent to 100 percent of the contract price does necessitate the withholding of retainage by the Division from monies due on future progress voucher estimates payable under the terms of the contract and as set forth in 109.6. Further, the decision by a particular contractor to submit said bond in an amount equivalent to 100 percent of the contract price shall be consistent and applicable throughout the duration of the contract for which the bond is being submitted and shall be consistent and applicable to all contracts executed between the Division and that particular contractor.

As an alternate, the successful bidder may deposit with the State Treasurer cash bond, United States Treasury bonds, United States Treasury notes, United States Treasury Certificates

of Indebtedness, United States Treasury bills or West Virginia Road Bonds in the amount of either 102 percent or 100 percent of the contract amount. A safe keeping receipt from a bank located in the State of West Virginia may be deposited with the State Treasurer in lieu of any of the definitive securities.

The State Treasurer shall, on a regular basis, collect all interest or income on the obligations so deposited and shall pay same, when and if collected, to the Contractor who deposited the obligations. If the deposit is in the form of coupon bonds, the State Treasurer shall deliver each coupon as it matures to the Contractor.

103.6.7-INSURANCE REQUIREMENTS:

The Contractor shall be required, in addition to any other form of insurance or bonds required under the terms of the Contract and Specifications, to procure and maintain during the life of the Contract the following types of insurance in the amounts set forth.:

All such policies of insurance, except for Workers' Compensation, shall name the Division as an additional insured and shall be occurrence policies and the Certificate of Insurance provided to the Division shall so specify. The policies must provide coverage for all damages arising out of injury to persons or property which allegedly occurred during the life of the contract regardless of when the claim is filed subject to statute of limitations.

103.6.7.1-Contractor's General Liability Insurance: The Contractor shall maintain commercial general liability (CGL) coverage with limits not less than:

General Aggregate	$2,000,000
Products/Completed Operations Aggregate	$2,000,000
Personal & Advertising Injury	$1,000,000
Each Occurrence *	$1,000,000
Damages to Rented Premises	$300,000
Medical Expense Limit	$5,000

* Each Occurrence limit shall be $2,000,000 when performing any operations that are subject to 107.8 – Railway-Highway Provisions.

The CGL shall be written on ISO occurrence form CG 00 01, or equivalent, and shall cover liability arising from premises-operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract. There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from explosion, collapse, or underground property damage whenever work involving these exposures are undertaken. The CGL policy shall include endorsements that amend the aggregate limits of insurance to be applicable to each construction project separately.

Contractor shall furnish an ACORD Form 25-S Certificate of Insurance, or its equivalent, with a 30-day notice of cancellation provisions to evidence this CGL coverage.

103.6.7.2-Workers' Compensation–Insurance and Employer's Liability Insurance: The contractor shall also give evidence for Workers' Compensation Insurance and Employers Liability Insurance, with a 30-day notice of cancelation. The benefits provided under the Workers' Compensation shall be benefits prescribed by West Virginia Code. The Employer's Liability policy must include coverage to protect the contractor for claims brought under

Section 23-4-2(d)(2)(ii) of West Virginia Code. The limits of insurance under this section shall be as follows:

Each accident	$1,000,000
Each disease	$1,000,000
Each disease/employee	$1,000,000

Evidence of this coverage can be set forth on the ACORD Form 25-S as specified in Subsection 103~~.6~~.7.1 or approved form and shall indicate that West Virginia statutory Workers Compensation coverage is included.

103~~.6~~.7.3-Automobile Insurance: The Contractor shall furnish evidence, with a 30-day notice of cancellation, to the state that it maintains an Insurance Services Office Commercial Automobile Liability insurance policy Form CA0001 or its equivalent. The policy shall include coverage for owned, non-owned, and hired vehicles.

The limits for liability insurance must be at least $1,000,000 combined single limit. Evidence for the coverage shall be set forth on an ACORD Form 25-S Certificate of Liability Insurance.

103.6.4-Steam Boiler Insurance: In event steam boilers are used on the work, the Contractor shall furnish evidence that the Contractor carries in their own behalf standard Steam Boiler Insurance having an aggregate limit of not less than $250,000.

The insurance specified shall be carried until all work required to be performed under the terms of the Contract is satisfactorily completed as evidenced by the formal acceptance of the State.

103~~.7~~.8-SPECIAL BONDS AND INSURANCE:

When the work is of such nature that special bond or insurance is required, the special requirements will be detailed and included in the Proposal for the project. This coverage could include, but not be limited to, builder's risk, installation floater, maritime exposures, environmental exposures, and professional liability.

103~~.8~~.9-EXECUTION OF CONTRACT:

The Contract shall be executed by the bidder to whom the Contract has been awarded, the bond executed by the principal and the sureties, and the Contract and bond returned to the Division within 20 days after the date of the notice of the award.

103~~.9~~.10-FAILURE TO EXECUTE CONTRACT:

Failure by the bidder to execute the Contract and file acceptable bond within 20 days after notice of award shall be just cause for the annulment of the award; and it is understood by the bidder, in the event of such an annulment of award or the Contract, that the amount of the guaranty deposited with the Proposal will be retained by the Division and deposited in the Division of Highways Fund, not as a penalty, but as liquidated damages. Award may then be made to the next lowest responsible bidder, or the work may be readvertised and constructed under contract or otherwise, as the Division may decide.

103~~.10~~.11-PRECONSTRUCTION CONFERENCE:

As soon as possible after the award of each Contract a preconstruction conference will be arranged by the Division. The Contractor, their superintendent, or an authorized agent shall be

present at the conference and shall present the proposed schedule of work, list of proposed subcontractors, if any, and a list of suppliers from whom materials are anticipated to be purchased. The information so presented shall be on forms submitted to the Contractor with the letter of contract award. The Division will make arrangements for utility representatives to be present.

March 12, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

ADD THE FOLLOWING:

218.8-SCALING:

218.8.1-Description of Work: The work consists of scaling of rock as part of the rockfall protection measures in accordance with the Contract Documents and the Contract plans. The measures are to be completed at the location shown on the final plans.

The planning and implementation of the scaling will be the responsibility of a Contractor experienced and specialized in rockfall hazard mitigation.

218.8.2-Construction Requirements:

218.8.2.1-Safety: Safety of the work is the responsibility of the Contractor. Perform the work in a manner that minimizes the exposure of the public, construction personnel, and equipment to hazardous and potentially hazardous conditions.

This work has a high potential to produce rockfall during implementation, and will require a substantial laydown area during construction. Therefore, it is recommended that the road below this work be closed and the traffic rerouted per the maintenance of traffic plans. The Contractor shall not clear brush, safety scale, or perform any work on the upslope area until the traffic is rerouted or temporary rockfall protection, as approved by the Engineer, is in place.

218.8.2.2-Excavation and Material Disposal: Slope lines shall conform to the lines and grades shown on the Plans. Excavation, which includes removal of rock overhangs, and material disposal shall be performed according to Section 207 Excavation and Embankment.

All material removed and not reused in the construction of this project shall be disposed of in accordance with Section 207.6.

218.8.2.3-Clearing and Grubbing: Clear and grub the existing slopes within the limits shown on the plans or as determined by the Engineer and dispose of all material removed resulting from the clearing and grubbing operation according to Section 201 Clearing and Grubbing. Preserve vegetation on the slopes wherever possible.

218.8.2.4-Scaling: Scaling shall be performed by the Specialty Contractor in the areas as shown in the plans by removing potentially unstable boulders, rocks, debris, loose spalls, and trees to reduce the rockfall hazard and minimize the required maintenance after construction. The Contractor shall dispose of all material removed resulting from the scaling operation.

Scaling can be accomplished by mechanical methods with either a large track hoe bucket scraping the final face or a hoe ram on isolated areas accessed from the roadway, or by hand methods by a crew utilizing pry-bars, air bladders, air wands, pneumatic or hydraulic jacks, air bags, pneumatic drills, or jack hammers. Begin scaling at the top of the slope and proceed downward. Either stabilize or scale all loose rock and other unstable materials larger than one cubic foot in volume to the satisfaction of the Engineer. The Contractor may not use blasting methods to remove large blocks or overhangs. The Contractor may use non-explosive materials, such as expanding foams, per the approval of the Engineer.

Protect personnel, the public, adjacent properties, structures, utilities, and roadway from injury or damage caused by scaling activities. Any injuries or damages caused by scaling are the responsibility of the Contractor.

218.8.3-Preconstruction Meeting: The Contractor shall meet with the Engineer before beginning work to clarify construction requirements, coordinate schedules and activities, and identify the responsibilities between the Prime Contractor and the Specialty Subcontractors. The Specialty Subcontractor performing the scaling shall attend the meeting.

218.8.4-Contractor Qualifications: Before beginning the scaling work, the Specialty Contractor shall submit a list of proposed personnel and documentation to the Engineer verifying that they meet the qualification requirements listed below. Include a list of employer's names and telephone numbers, location and dates of previous related projects, and the extent of work performed. This information must be verifiable. Allow 10 business days for the review of the documentation. Contractor’s failing to submit and meet such relative qualifications and experience will not be permitted to perform this work. The Engineer’s approval of all personnel must be received before beginning construction.

a. Site Supervisor - the Site Supervisor must be present at the job site at all times during the performance of work. Employ a Site Supervisor with at least two years of construction experience in rock scaling and who has supervised the successful completion of at least 10 projects.
b. Scaling Foreman and Scaling Crew - provide a scaling crew with one Scaling Foreman present at all times when scaling is performed. A Scaling Crew consists of three qualified scalers, one of which may also be the Scaling Foreman. Employ a Scaling Foreman and Scaling Crew who have at least two years of demonstrated experience in rock scaling in similar capacities.

c. Mechanical Scaling Operator - provide one or more persons to operate the mechanical scaling equipment selected. Employ operators who have successfully operated the selected equipment for at least one year.
d. Provide the name(s) of a registered professional engineer licensed to practice in West Virginia, who will act on behalf of the Contractor.

218.8.5-Design Submittals:

218.8.5.1-Scaling Work Plan: Submit a written Scaling Work Plan for the rock slope scaling to the Engineer for acceptance at least 10 business days before beginning work. Provide an electronic PDF file of the complete work plan via email . The work plan shall include, but not limited to, the following:

a. Documented work experience of all rock slope scaling foremen and scalers scheduled to be working on the project. Rock slope scaling foremen shall have at least 1,500 hours of documented experience as a rock slope scaler. Rock slope scalers shall have at least 1,000 hours of documented experience as a rock slope scaler.
b. Proposed construction sequence and schedule.
c. The type and quantity of tools and equipment to be used for rock scaling purposes.
d. The number of rock slope scaling crews to be employed on the project, with a rock slope scaling crew defined as one qualified foreman and two qualified scalers
e. Methods of mechanical scaling.
f. Operation plan for collection, removal and disposal of all rock slope scaling debris generated by the rock slope scaling work.
g. Operation plan for protection of roadway surface, railroad facilities, structures, utilities, and other facilities adjacent to the rock slope scaling locations.
h. If the roadway is exposed to the collection of rock slope scaling, the submittal shall include the equipment and procedure to be used to clear the roadway for public use between rock slope scaling operations.

218.8.6-Method of Measurement: The Engineer will measure Scaling by the number of crew hours accepted. A Scaling Crew consists of three qualified scalers, one of which may also be the Scaling Foreman. The Engineer will not measure idle time or stand-by time.

The unit price per bid shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work, including the breaking down of large blocks, as necessary, for removal from the site. It shall also include the cost of taking any necessary cross-sections, protecting the pavement, structures and utilities, and any repairs of damages caused by the operation(s).

218.8.7-Basis of Payment: The quantities, determined as provided above, shall be paid for at the Contract unit prices bid for the items listed below, which price and payment shall be full compensation for doing all the work prescribed in a workmanlike and acceptable manner, including all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work.

218.8.8-Pay Items:

ITEM	DESCRIPTION	UNIT
218010-008	Scaling	Hour

March 12, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

ADD THE FOLLOWING:

218.9-ROCKFALL DRAPE:

218.9.1-Description of Work: The work consists of furnishing and installing rockfall (slope) drapes as part of the rockfall protection measures in accordance with the Contract Documents and the Contract plans. The measures are to be installed at the location shown on the final plans and shall provide protection for a minimum design life of 75 (seventy-five) years.

The final design and installation of the rockfall drapes will be the responsibility of a Contractor experienced and specialized in rockfall hazard mitigation.

218.9.2-Material Requirements:

218.9.2.1-Rockfall (Slope) Drape System: The mesh shall be of woven construction and sized to withstand the design loads and shall be corrosion resistant. The size of the mesh shall be capable of retaining rocks six (6) inches and larger. Provide a slope drape that is resistant to corrosion, UV degradation, and thermal deterioration.

Furnish either steel bolt or wire rope anchor types. For steel bolt anchors, furnish a 1 inch diameter, galvanized, continuously threaded or deformed steel bar conforming to ASTM A615, Grade 75, with a minimum ultimate strength of 79,000 lbs. For wire rope anchors, furnish a galvanized 0.75 inch wire rope with a minimum breaking strength of 50,000 pounds. Do not use wood.

If using a steel bolt anchor, a plate shall be provided that transfers the load from the mesh to the anchor efficiently without damaging the mesh. Furnish a 0.375 inch thick, galvanized, 6-inch square or round mild steel bearing plate. The plate must have a rounded edge on the side in contact with mesh wire and/or anchor cable. Furnish a galvanized flat washer and hex nut torqued to 100 ft-lbs.

U-Bolt Wire Rope Clips shall be provided per FF-C-450 Type 1, Class 1. Shackles shall be provided per RR-C-2710, Type IV A, Class 2 or 3. Wire Rope Thimbles shall be provided per FF-C-450, Type 1, Class 1. Place U-Bolts on the rope end which is not tensioned and torque to the manufacturer's recommendations. Use blunt point, 11-gauge galvanized steel C-rings, 1 ½" in diameter before clamping using air driven C-ring closing tool for attaching the rhomboid shaped mesh to chain link wire mesh as described above. All miscellaneous material associated with the rockfall system such as wire rope clips, bolts, nuts, and thimbles shall be hot dipped galvanized.

Furnish wire rope clips compatible with the cable sizes, with drop forged carbon steel bases and heavy-duty hexagonal type nuts. Use thimbles and wire rope clips in accordance with the manufacturer's recommendations for size, number, spacing and torque.

All wire rope for the support ropes and wire rope anchors shall meet the Federal Specifications RR-W-410D or equivalent and satisfy the "Buy American" contracting clause.

Use neat cement grout with 4,000 psi strength to permanently fix the anchor ropes into the drill holes. Do not use chemical additives that can control, bleed, or retard set in the grout unless approval in writing is received from the Engineer.

Furnish materials that are labeled by the manufacturer so that they can be identified on the manufacturer's working drawings.

218.9.3-Construction Requirements:

218.9.3.1-Safety: Safety of the work is the responsibility of the Contractor. Perform the work in a manner that minimizes the exposure of the public, construction personnel, and equipment to hazardous and potentially hazardous conditions.

This work has a high potential to produce rockfall during implementation, and will require a substantial laydown area during construction. Therefore, it is recommended that the road below this work be closed and the traffic rerouted per the maintenance of traffic plans. The Contractor should not clear brush, safety scale, or perform any work on the upslope area until the traffic is rerouted or temporary rockfall protection, as approved by the Engineer, is in place.

218.9.3.2-Excavation and Material Disposal: Slope lines shall conform to the lines and grades shown on the Plans. Excavation, which includes removal of rock overhangs, and material disposal shall be performed according to Section 207 Excavation and Embankment.

All material removed and not reused in the construction of this project will be removed from the project and properly disposed of by the Contractor at an appropriately licensed facility. If needed, for waste sites outside of the R/W, the Contractor and/or property own shall bear all responsibility with regards to stability, permitting, mitigation, traffic controls, etc. The Contractor and/or property owner shall comply with existing land laws and/or regulations and save the State harmless from any claims for damages which may result from the waste.

218.9.3.3-Clearing and Grubbing: Clear and grub the existing slopes within the limits shown on the plans or as determined by the Engineer and dispose of all material

removed resulting from the clearing and grubbing operation according to Section 201 Clearing and Grubbing.

Preserve vegetation on the slopes wherever possible. Remove or prune vegetation where anchors are required, where the vegetation reduces the effectiveness of the slope drape, or when directed by the Engineer. The growth of shrubs and trees through the slope drape can reduce its performance.

Remove trees and brush, as needed, but no more than 10 feet beyond the proposed limits of the slope drape shown on the plans, to prevent overhanging of soil/root systems that could potentially become unstable or damage the rock fall mitigation measures.

218.9.3.4-Rockfall (Slope) Drapes: Installation of the rockfall drapes shall be performed by the Specialty Contractor in the areas as shown in the plans to control the falling of unstable boulders, rocks, and trees. The slope drape system shall be designed to withstand loads generated from rocks falling and/or sliding behind the permanently installed system and other design loads (e.g., self-weight of system, snow/ice accumulation, etc.) and that will require minimal maintenance when subjected to the design conditions. The system design shall have been previously used and shall have demonstrated satisfactory performance in similar applications and capacities. The final design of the rockfall drapes will be the responsibility of the Specialty Subcontractor and shall be installed per manufacturer's recommendations when they do not conflict with the plans or specifications. The Contractor shall follow the design procedures outlined in the document titled "Analysis and Design of Wire Mesh/Cable Net Slope Protection" prepared for the Washington State Transportation Commission (dated April 2005). The work consists of designing and constructing rockfall drapes at the locations shown on the plans. The Contractor shall furnish all labor, plans, drawings, design calculations and all other material and equipment required to design and install the rockfall drapes.

The slope drape should extend at least 5 feet beyond the crest of the slope (over more durable bedrock) and at least 10 feet over weatherable bedrock or soil. The bottom of the slope drape should be 5 feet above the bottom of the slope/ditch. The slope drape should be capable to be pulled outward at the bottom for fallen rock removal and other maintenance.

A representative from the slope drape manufacturer should be on site for at least one day at the beginning of the slope drape installation work to train and provide guidance on the installation of the slope drape.

Provide steel bolt or wire rope anchor types to secure the top of the drape. Do not exceed an anchor spacing of 25 feet for a cable net slope drape.

Rock anchors installed in weathered shale or claystone and utilizing rotary drilling techniques, the ultimate grout to rock bond strength shall not exceed 2,000 psf without load testing to verify use of a higher value. For anchors installed in durable limestone and utilizing rotary drilling techniques, the ultimate grout to rock bond strength should not exceed 6,000 psf without load testing to verify use of a higher value. A minimum factor of safety of 2.0 should be applied to these ultimate grout to rock bond strengths in the design. Pressure grouting techniques may be used to enhance grout-rock bond strength values.

The Contractor shall determine the anchor length needed to provide the minimum pullout strength to withstand the design working loads. The minimum anchor length shall

be 10 feet. Ground conditions may require anchors that are longer than the minimum length.

Connect the drape and cable net together before placing the slope drape on the slope. Securely fasten the lacing rope to each drape panel. Fasten the drape and cable net so they are flush without any gaps that exceed 4 inches. No discontinuities in the slope drape are allowed.

Twenty-five percent (25%) of the anchors for the rockfall drape and at least one anchor of each type of anchor, soil, and rock combination be proof tested to confirm a minimum pullout anchor capacity of 10 tons (20,000 lbs) is achieved for the rockfall drape anchors. The Contractor will select the location of each test anchor, and shall be approved by the Engineer, and should be performed in the presence of the Engineer. Each pullout test consists of loading the anchor assembly to 10 tons or to failure, whichever occurs first. Measure the applied test load using either a calibrated pressure gage with graduations no greater than 100 psi or a calibrated load cell. If possible, the proof testing should be oriented in the direction of actual loading (sub-horizontal) - this can be accomplished by extending a cable from the anchor to the base of the slope to tension the cable. If vertical load testing is performed, the test load should be applied by jacking against a temporary yoke or load frame; it is important that the load frame be sufficiently wide to not influence stresses within the soil. No part of the yoke or load frame should bear within 3 feet of the anchor.

Failure is defined as when the movement of the anchor continues without an increase in the load or when the anchor has displaced 2 inches. If more than twenty (20) percent of the tested anchors fail, test all of the remaining anchors. The Contractor shall replace any anchors that fail any test or that are rejected by the Engineer prior to testing at no additional cost to the WVDOH by either removing the failed anchors, thoroughly reaming and clearing the hole, and reinstalling a new anchor at the same location or locating the replacement anchor as directed by the Engineer and provide a new anchor hole and material. The Contractor shall perform no drilling for a replacement anchor until anchors within 50 feet of the replacement location have been allowed to set for at least 24 hours. The results of all anchor load tests conducted on the installed anchors shall be submitted to the Engineer on a pre-approved form within 24 hours (one day) following the completion of the test; provide the location of the anchor(s) tested in the report.

218.9.4-Preconstruction Meeting: The Contractor shall meet with the Engineer before beginning rockfall protection work to clarify construction requirements, coordinate schedules and activities, and identify the division of responsibilities between the Prime Contractor and the Specialty Subcontractors. The Specialty Subcontractor performing the slope drape installation shall attend the meeting.

218.9.5-Contractor Qualifications: Before beginning the slope protection work, the Specialty Contractor shall submit a list of proposed personnel and documentation to the Engineer verifying that they meet the qualification requirements listed below. Include a list of employer's names and telephone numbers, location and dates of previous related projects, and the extent of work performed. This information must be verifiable. Allow 10 business days for the review of the documentation. Contractor’s failing to submit and meet such relative qualifications and experience will not be permitted to perform this work. The Engineer’s approval of all personnel must be received before beginning construction.

a. Site Supervisor - the Site Supervisor must be present at the job site at all times during the performance of work. Employ a Site Supervisor with at least two years of construction experience in the installation of rockfall (slope) drapes and who has supervised the successful installation of at least 10 projects.
b. Drill Operators - employ Drill Operators who have successfully installed at least 50 drape anchors.
c. Rockfall Drape Crew – Provide a listing of current full-time employees to be used for the rockfall drape installation operations under this Contract who possess the experience for performing installation of rockfall catchment systems, as shown and specified, and identify and document specific job related experience pertaining to rock anchor and slope drape installation.
d. Provide the name(s) of a registered professional engineer licensed to practice in West Virginia, who will act on behalf of the Contractor.

218.9.6-Design Submittals:

218.9.6.1-Slope Drape Design Submittal: At least 15 business days before the planned start of the slope drape installation, the Specialty Contractor should submit complete design calculations and working drawings to the Engineer for review and approval. Provide an electronic PDF file of the complete Slope Drape Design and Installation submittal via email. Drawings should include all details, dimensions, proposed anchor types and spacing, proposed anchor drilling methods and equipment, quantities, ground profiles, and cross-sections necessary to protect the slope and mitigate for rockfall hazards. The area and ground survey data should be verified before preparing the drawings. The working drawings should be prepared to the WVDOH standards. Design the slope drape system to retain rocks six inches and larger, and has demonstrated satisfactory performance under similar conditions. Design the slope drape to resist the applied loads (e.g., static, debris, impact, snow loads, etc.) without causing distress or damage to the connecting elements. The submittal shall also include the proposed anchor grout placement procedures and equipment, proposed anchor testing methods and equipment setup, identification number and certified calibration records for the testing equipment to be used (test jack, pressure gauge and load cell), the manufacturer's recommended maintenance program for the slope drape, and a proposed construction sequence and schedule. The drawings and calculations shall be signed and sealed by a professional engineer registered by the state of West Virginia. The Engineer will approve or reject the Contractor's submittal within 10 calendar days after receipt of the complete submission. The Contractor shall not begin construction or incorporate materials into the work until the submittal requirements are satisficed and found acceptable to the Engineer.

At least 15 business days before the planned start of the slope drape installation, the Specialty Contractor should submit one sample of the proposed type of slope drape fabric (mesh types), ground anchor, and hardware (bearing nuts and plates) from the normal stock of the supplier to the Engineer for review and approval. With the samples, include certified mill reports indicating tensile yield point and elongation results of the ground anchors, and the tensile and punching tests of the cable net and slope drape.

218.9.6.2-Grout Design Submittal: At least 5 business days before the planned anchor grouting for the rockfall drape system, the Specialty Contractor should submit the

proposed grout design to the Engineer for review and approval, including the following information:

a. Manufacturer's certified test results of set time, shelf life, and compressive strength.
b. Type of Portland cement.
c. Aggregate source and gradation.
d. Proportions of mix by weight and water-cement ratio.
e. Manufacturer, brand name and technical literature for proposed admixtures.
f. Results of compressive strength tests performed according to AASHTO T106/ASTM C109 and completed no more than one year before the start of grouting. Use an AASHTO accredited independent testing lab to verify the specified minimum 28-day grout compressive strength.

218.9.7-Method of Measurement: The Engineer will measure the slope drape by the number of square yards of surface area of slope drape installed. The Engineer will not measure the area of drape used in any overlaps. Anchors and anchor tests are incidental to the slope drape and will not be measured separately.

The unit price per bid should include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work. It also includes the cost of taking any necessary cross-sections, protecting the pavement, structures and utilities, and any repairs of damages caused by the operation(s).

218.9.8-Basis of Payment: The quantities, determined as provided above, shall be paid for at the Contract unit prices bid for the items listed below, which price and payment shall be full compensation for doing all the work prescribed in a workmanlike and acceptable manner, including all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work.

218.9.9-Pay Items:

ITEM	DESCRIPTION	UNIT
218010-009	Rockfall Drape	Square Yard

March 12, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

ADD THE FOLLOWING:

218.10-ROCK ANCHORS FOR CONCRETE SLABS:

218.10.1-Description of Work: The work consists of furnishing and installing concrete slab anchors as part of the rockfall protection measures in accordance with the Contract Documents and the Contract plans. The measures are to be installed at the location shown on the plans and shall provide protection for a minimum design life of 75 (seventy-five) years.

The final design and installation of the anchoring of concrete slabs will be the responsibility of a Contractor experienced and specialized in rockfall hazard mitigation and slope stabilization.

218.10.2-Material Requirements:

218.10.2.1-Rock Anchors for Concrete Slabs: Anchors shall be galvanized, deformed steel, solid, continuous threadbar of ASTM A722/A722M-98, minimum 150 ksi ultimate strength. All anchorages shall develop at least 95 percent of the minimum specified ultimate strength of the prestressing steel, when tested in an unbonded state, without exceeding anticipated set. Bearing plates shall be prefabricated from steel conforming to ASTM A709 Grade 50. Bearing plates and anchorage covers shall be galvanized per ASTM A123.

Furnish grout consisting of a neat cement or sand/cement mixture. Furnish cement conforming to AASHTO M85/ASTM C150, Type II. Expansive admixtures may be used. Admixtures which control bleed or retard set may be used if approved by the Engineer. Furnish grout with a minimum 28-day compressive strength of 4,000 psi per AASHTO T106/ASTM C109.

Continuity of corrosion protection shall be provided at the transition from the bonded length to unbonded length of the anchor.

218.10.3-Construction Requirements

218.10.3.1-Safety: Safety of the work is the responsibility of the Contractor. Perform the work in a manner that minimizes the exposure of the public, construction personnel, and equipment to hazardous and potentially hazardous conditions.

This work has a high potential to produce rockfall or slope instability during implementation, and will require a substantial laydown area during construction. Therefore, it is recommended that the road below this work be closed and the traffic rerouted per the maintenance of traffic plans. The Contractor shall not clear brush, safety scale, or perform any work on the upslope area until the traffic is rerouted or temporary rockfall protection, as approved by the Engineer, is in place.

218.10.3.2-Excavation and Material Disposal: Slope lines shall conform to the lines and grades shown on the Plans. Excavation and material disposal shall be performed according to Section 207 Excavation and Embankment.

All material removed and not reused in the construction of this project shall be disposed of in accordance with Section 207.6.

218.10.3.3-Clearing and Grubbing: Clear and grub the existing slopes within the limits shown on the plans or as determined by the Engineer and dispose of all material removed resulting from the clearing and grubbing operation according to Section 201 Clearing and Grubbing. Preserve vegetation on the slopes wherever possible.

218.10.3.4-Anchoring of Existing Concrete Slabs: The anchor system shall be corrosion resistant. The work consists of designing and installing anchors to stabilize the existing concrete slabs at the locations shown on the plans. The Contractor shall furnish all labor, plans, drawings, design calculations and all other material and equipment required to design and install the anchors.

For rock anchors installed in weathered shale or claystone and utilizing rotary drilling techniques, the ultimate grout to rock bond strength shall not exceed 2,000 psf without load testing to verify use of a higher value, as discussed below. For anchors installed in durable limestone and utilizing rotary drilling techniques, the ultimate grout to rock bond strength should not exceed 6,000 psf without load testing to verify use of a higher value. A minimum factor of safety of 2.0 should be applied to these ultimate grout to rock bond strengths in the design. Pressure grouting techniques may be used to enhance grout-rock bond strength values. The Contractor shall select a drilling method, a grouting procedure and a grouting pressure that is expected to provide the best rock anchor capacity for the subsurface conditions at the rock anchor location.

The Contractor shall determine the anchor length needed to provide the minimum pullout strength to withstand the design working loads. The minimum anchor length shall be 10 feet.

The Contractor shall perform rock anchor capacity proof testing on at least 25 percent of the anchors (minimum one per slab section) using the axial pull test per ASTM D4435 Standard Test Method by Rock Bolt Anchor Pull Test and shall perform the tests against a temporary yoke or load frame capable of applying the testing loads. The Contractor shall not damage the slabs while performing the pullout tests; any damage caused to the slab(s)

by the Contractor will be repaired and paid for by the Contractor. Apply the test load in the following sequence based on the allowable design load (ADL):

LOAD
Alignment Load (0.05 ADL)
0.25 ADL
0.50 ADL
1.00 ADL
1.25 ADL (test load)

Record movement at each load increment. Measure the applied test load using either a calibrated pressure gage or a calibrated load cell. No part of the yoke or load frame should bear within 3 feet of the anchor. Failure is defined as when the movement of the anchor continues without an increase in the load or when the anchor has displaced 0.5 inches. If more than 20 percent of the tested anchors fail, test all of the remaining anchors. The Contractor shall replace any anchors that fail any test or that are rejected by the Engineer prior to testing at no additional cost to the WVDOH by either removing the failed anchors, thoroughly reaming and clearing the hole, and reinstalling a new anchor at the same location or locating the replacement anchor as directed by the Engineer and provide a new anchor hole and material. The results of all anchor load tests conducted on the installed anchors shall be submitted to the Engineer on a pre-approved form within 24 hours (one day) following the completion of the test; provide the location of the anchor(s) tested in the report.

218.10.4-Preconstruction Meeting: The Contractor shall meet with the Engineer before beginning work to clarify construction requirements, coordinate schedules and activities, and identify the responsibilities between the Prime Contractor and the Specialty (Sub)contractors. The Specialty Subcontractor performing the installation of the rock anchors for the concrete slabs shall attend the meeting.

218.10.5-Contractor Qualifications: Before beginning the rock anchor work, the Specialty Contractor shall submit a list of proposed personnel and documentation to the Engineer verifying that they meet the qualification requirements listed below. Include a list of employer's names and telephone numbers, location and dates of previous related projects, and the extent of work performed. This information must be verifiable. Allow 10 business days for the review of the documentation. Contractor’s failing to submit and meet such relative qualifications and experience will not be permitted to perform this work. The Engineer’s approval of all personnel must be received before beginning construction.

a. Site Supervisor - the Site Supervisor must be present at the job site at all times during the performance of work. Employ a Site Supervisor with at least two years of construction experience in the installation of rock anchors and who has supervised the successful installation of at least 10 projects.
b. Drill Operators - employ Drill Operators who have successfully installed at least 50 rock anchors.
c. Provide the name(s) of a registered professional engineer licensed to practice in West Virginia, who will act on behalf of the Contractor.

218.10.6-Design Submittals:

218.10.6.1-Grout Design Submittal: At least 5 business days before the planned anchor grouting for the concrete slab anchors, the Specialty Contractor should submit the proposed grout design to the Engineer for review and approval, including the following information:

a. Manufacturer's certified test results of set time, shelf life, and compressive strength.
b. Type of Portland cement.
c. Aggregate source and gradation.
d. Proportions of mix by weight and water-cement ratio.
e. Manufacturer, brand name and technical literature for proposed admixtures.
f. Results of compressive strength tests performed according to AASHTO T106/ASTM C109 and completed no more than one year before the start of grouting. Use an AASHTO accredited independent testing lab to verify the specified minimum 28-day grout compressive strength.

218.10.6.2-Anchoring of Existing Concrete Slabs Design Submittal: The Specialty Contractor is responsible for preparing and submitting a design proposal to the Engineer for review and approval describing the rock anchor system for stabilizing the existing concrete slabs. The design proposal shall include:

a. Description of the rock anchor installation (including drilling, grouting, and stressing information).
b. Estimated rock anchor capacity for each rock anchor.
c. Rock anchor type and bearing plate design.
d. Rock anchor minimum bond lengths, minimum unbonded lengths, and total rock anchor lengths.
e. Corrosion protection details for rock anchors and hardware.
f. Detailed plans for proof testing of rock anchors showing loading and measuring devices to be used, supports required for testing, test locations, and testing procedures to be followed..
g. Calculations and construction drawings prepared, stamped and signed by a professional engineer licensed by the State of West Virginia. These drawings must show explicit details to allow expeditious review of the proposed design and construction procedure. The plans and design calculations shall be submitted to the Engineer for review and approval at least 15 working days prior to beginning work, and shall receive approval before starting.

218.10.7-Method of Measurement: The Engineer will measure Rock Anchors for Concrete Slabs by each anchor installed. Anchor tests are incidental to the rock anchor installation and will not be measured separately.

The unit price per bid should include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work. It also includes the cost of taking any necessary cross-sections, protecting the pavement, structures and utilities, and any repairs of damages caused by the operation(s).

218.10.8-Basis of Payment: The quantities, determined as provided above, shall be paid for at the Contract unit prices bid for the items listed below, which price and payment shall be full compensation for doing all the work prescribed in a workmanlike and acceptable manner,

including all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work.

218.10.9-Pay Items:

ITEM	DESCRIPTION	UNIT
218010-010	Rock Anchors for Concrete Slabs	Each

March 25, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.3-CONTROL OF TRAFFIC THROUGH WORK AREAS:

DELETE THE NINTH PARAGRAPH OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

The Contractor shall designate a ~~trained person with~~ Traffic Control Supervisor who shall be responsible for administering the traffic control plan according to the Contract and has the authority to take all actions necessary for the safe control of traffic through the work zone. ~~If~~ For projects assigned a classification of transportation management plan Level III per DD-681, or when noted on the plans, this person shall be American Traffic Safety Services Association (ATSSA) certified as a Traffic Control Technician or a Traffic Control Supervisor or shall demonstrate equal qualifications, approved by the Division. The Contractor shall provide the Engineer with the telephone number and applicable proofs of certification of ~~this person~~ the Traffic Control Supervisor, along with the telephone number of any other person who is in charge of traffic control devices, in case of emergencies ~~at night or on weekends~~ or outside working hours, submitted prior to traffic control device installation.

March 25, 2021

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.11-FLAGGER- OR TRAFFIC DIRECTOR:

The flagger- and traffic director are separate functions and therefore, shall not be interchanged. Flagger- or Ttraffic Ddirector required for operations that are not necessary but are initiated by the Contractor for their benefit or ease of operations shall not receive payment ~~under this provision~~. Flagger- or Ttraffic Ddirector required outside of the project limits as a result of any of the Contractor's operations shall not receive payment. Flagger- or Ttraffic Ddirector required within the project limits in regards to the Contractor's transportation to or from waste areas, borrow pits, asphalt/concrete plants or other necessary sites shall receive payment if considered reasonable and necessary ~~as previously discussed~~ by the Engineer. The traffic control plan (TCP) and any approved revisions will be strongly considered in determining the appropriateness of payment.

636.11.1-Flagger: All flaggers shall be furnished by the Contractor, and it shall be the Contractor's responsibility to provide flaggers at any location necessary to assure the safety of the travelling public. ~~When flaggers are required at locations as a result of operations considered reasonable and necessary by the Engineer to complete the project, payment will be made under this provision.~~

Hand signaling devices~~,~~ and ~~approved vests~~ high visibility apparel meeting the requirements of the WVDOH Traffic Control Manual shall be used by the Contractor's personnel assigned to traffic control responsibilities. Approved headgear, if worn, and vests worn by the Contractor's personnel shall not bear the Division symbol. Wireless two-way communication shall be provided to the flaggers when they are out of sight of each other.

~~The traffic control plan (TCP) and any approved revisions will be strongly considered in determining the appropriateness of payment.~~

Flaggers must be certified by passing an American Traffic Safety Service Association (ATSSA) training. The Contractor may use noncertified flagger for their benefit, ease of operations, or other activities not receiving payment.

636.11.2-Traffic Director: ~~Flagger-Traffic Director required for operations that are not necessary but are initiated by the Contractor for their benefit or ease of operations shall not receive payment under this provision. Flagger-Traffic Director required outside of the project limits as a result of any of the Contractor's operations shall not receive payment. Flagger-Traffic Director required within the project limits in regards to the Contractor's transportation~~

~~to or from waste areas, borrow pits, concrete plants or other necessary sites shall receive payment if considered reasonable and necessary as previously discussed.~~ Traffic Director shall be an off duty uniformed police officer in properly identified police vehicle with blue lights. The traffic director shall be from police agency which will have territorial jurisdiction over the project limits. Any officer outside of their vehicle within the roadway right of way, while serving as a Traffic Director, shall be outfitted in a Type P vest meeting the requirements of the latest version of ANSI/ISEA 107.

636.23-METHOD OF MEASUREMENT:

636.23.14-Flagger ~~Traffic Director~~: Flagger shall include the cost of furnishing, installing, maintaining and moving of the "Advance Flagger" signs along with the actual flagging of traffic. The flaggers shall be paid for the actual authorized time controlling traffic and up to 30 minutes travel from a previous assignment.

636.23.15-Traffic Director: The quantity "Traffic Director" shall be the actual number of hours worked in traffic control. The traffic director shall be paid for the actual authorized time controlling traffic which includes the cost for the police vehicle.

~~636.23.15 through~~ 636.23.16-BLANK

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 662
ROADWAY LIGHTING

622.12-FOUNDATION

ADD THE FOLLOWING:

622.12.1-High Mast Tower:

622.12.1.1-High Mast Tower Foundation: High Mast Foundation shall be constructed per Standard Detail sheet TEL-16B.

622.12-1.2-High Mast Tower Maintenance Platform: High Mast Foundation on slopes shall require High Mast Maintenance Platform, see Standard Detail sheet TEL-16C for slopes and types.

622.12.1.3-High Mast Tower Concrete Pad. A High Mast Concrete Pad shall be installed if a High Mast Foundation is on a flat or rolling surface.

662.15-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

662.15.15-High Mast Tower

662.15.15.1-High Mast Foundation: The quantity of work done for High Mast Foundation will be measured in cubic yards complete in place and accepted, as determined by the dimensions in the Plans or Contract documents, subject to adjustment as provide by 104.2 and 109.2. The foundation includes Class B concrete, reinforcing steel, ground wire, anchor bolts, washers and nuts.

662.15.15.2-High Mast Maintenance Platform: High Mast Maintenance Platform, Type A, B, C, and D will be measured as a complete unit in place per each type per type

furnished and installed,

622.15.15.3-High Mast Concrete Pad: High Mast Concrete Pad will be measured as a complete unit in place per each basis.

662.17-PAY ITEMS:

ADD THE FOLLOWING ITEMS TO THE TABLE:

ITEM	DESCRIPTION	UNIT
662012-000	High Mast Foundation	Cubic Yard
662012-001	High Mast Maintenance Platform, Type "Type"	Each
662012-002	High Mast Concrete Pad	Each

"type" Type per TEL-16C, either A, B, C, or D.

February 10, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 681
ASBESTOS ABATEMENT

681.2-EXECUTION:

681.2.10-Forms:

DELETE SUBSECTION 681.2.10.

~~**681.2.10-Forms:** Sample forms located on the Divisions Specifications Website and specified are listed as follows and shall be submitted to the Engineer as required:~~

~~a. Air Test Samples Sampling Data Sheet~~
~~b. Ten Day Notice Form~~
~~c. Asbestos Disposal Form~~
~~d. Employee Release Form~~
~~e. Asbestos Abatement Observer's Wavier and General Release~~
~~f. Declaration of Witness~~

~~Specifications Website:~~
~~*http://www.transportation.wv.gov/highways/contractadmin/specifications/Pages/default.aspx*~~

March 15, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 698
PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS

ADD AS NEW SECTION:

698.1-DESCRIPTION:

Prefabricated Bridge Elements and Systems (PBES) refer to structural elements and systems that are built off the bridge alignment to accelerate onsite construction time relative to conventional practice.

The work shall conform to the West Virginia Department of Transportation, Division of Highways (WVDOH) Standard Specifications, Roads and Bridges, latest version; as amended by the WVDOH Supplemental Specifications, if applicable; and the requirements of the current AASHTO LRFD Bridge Construction Specifications, except as noted herein. WVDOH contract documents shall take precedence over the AASHTO LRFD Bridge Construction Specifications.

698.1.1-Prefabricated Bridge Element Superstructure, Deck Panel: This work consists of the manufacture, storage, delivery, erection, installation, and assembly of precast full-depth reinforced concrete bridge deck panels including all labor, materials, equipment, and incidentals necessary to complete the work as shown on the Plans. The use of cast-in-place concrete will not be considered for substitution.

698.1.2-Prefabricated Bridge Element Substructure-Abutment Cap: This work consists of the manufacture, storage, delivery, erection, installation, and assembly of precast reinforced concrete substructure elements including abutment caps. This work includes all labor, materials, equipment, and incidentals necessary to complete the work as shown on the Plans. The use of cast-in-place concrete will not be considered for substitution.

698.1.3-Prefabricated Bridge Element Substructure-Abutment, Wingwall: This work consists of the manufacture, storage, delivery, erection, installation, and assembly of precast reinforced concrete substructure elements including wingwalls. This work includes all labor,

materials, equipment, and incidentals necessary to complete the work as shown on the Plans. The use of cast-in-place concrete will not be considered for substitution.

698.2-MATERIALS:

A. Concrete:

1. Prefabricated Bridge Element Superstructure, Deck Panel – Concrete shall conform to Class H as described in Section 601 of the Specifications.
2. Prefabricated Bridge Element Substructure – Abutment, Cap – Concrete shall conform to Class B as described in Section 601 of the Specifications.
3. Prefabricated Bridge Element Substructure – Abutment, Wingwall – Concrete shall conform to Class B as described in Section 601 of the Specifications.

B. Reinforcing Steel:

All reinforcing steel bars shall conform to AASHTO M31 Grade 60 and shall be continuous hot-dip galvanized in accordance with ASTM A1094.

C. Lifting Devices:

1. The Fabricator shall design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (8th Edition). Use devices that provide support for required vertical and horizontal forces with the applicable safety factors as specified in the Component Handling and Erection Bracing requirements in the PCI Design Handbook, 8th Edition.
2. Use a lifting device that will have 2¾-inch top cover and 1-inch bottom cover after installation. This may require partial removal of the device after installation.
3. All lifting devices and hardware shall be galvanized except as noted.

D. Corrugated Metal Pipe:

Use corrugated metal pipe to form pile pockets in prefabricated substructure elements of the diameter and length indicated in the Plans. Corrugated metal pipe shall be galvanized AASHTO M36 Type I, 16 gage, and shall be in accordance with Section 713 of the Specifications.

E. Structural Non-Shrink Grout:

Use structural non-shrink grout for leveling device blockouts and other blockouts as shown. Non-shrink grout material, approved by the Engineer, shall be placed in voids in strict accordance with the specifications and manufacturer's recommendations and instructions.

698.3-SUBMITTALS:

One month prior to the start of fabrication of any precast/prefabricated bridge elements, the Contractor shall notify the Cement and Concrete Group of the WVDOH Materials Control, Soils and Testing (MCS&T) Division of when fabrication is scheduled to begin and where it will take place. MCS&T Division will provide the inspection of the prefabricated bridge elements.

The Submittals requiring written approval from the Engineer are as follows:

A. Assembly Plan:

1. Prepare and submit the Assembly Plan under the seal of a Professional Engineer registered in the State of West Virginia for approval fourteen (14) days prior to fabrication.
2. The Assembly Plan shall include, but not necessarily be limited to the following:
   a. A work area plan depicting items such as temporary earth support or other protective measures, utilities within the immediate vicinity of the work, drainage structures, etc. The Contractor shall coordinate the various subcontractors that may need to occupy the same area and shall ensure that there are no conflicts.
   b. Details of all equipment that shall be employed for the construction of the bridge, including all equipment used to lift prefabricated elements including cranes, excavators, lifting slings, sling hooks, jacks, etc. Include crane locations, operating radii, lifting calculations, etc.
   c. A detailed Critical Path Method (CPM) schedule showing the sequence of construction that the Contractor will follow. The schedule shall include a timeline for installation of all major elements of the bridge accounting for the installation of any required temporary works and cure times of grouts or closure pour concrete and other selected materials.
   d. Methods for providing temporary support of the prefabricated elements. Include methods of adjusting, bracing, and securing the element after placement.
   e. Procedures for controlling tolerance limits.
   f. Methods for forming closure pours and sealing lifting holes.
   g. Methods for curing closure pour concrete and non-shrink grout for sealing lifting holes.
   h. Method for diamond grinding to achieve deck profile and longitudinal grooving.

B. Shop Drawings for Prefabricated Reinforced Concrete Bridge Elements:

1. Prepare and submit shop drawings under the seal of a Professional Engineer registered in the State of West Virginia for approval fourteen (14) days prior to fabrication.
2. Detailed shop drawings shall be prepared in accordance with the relevant provisions of Section 105.2 of the Specifications and shall include, but not necessarily be limited to the following:
   a. Number and type and/or piece mark of the precast concrete bridge element including overall length, width, and depth or thickness.
   b. Location, size, and geometry of all steel reinforcement.
   c. Reinforcement clearance requirements and dimensional tolerances.
   d. Location and details of all inserts, anchors, and any other items required to be cast into the prefabricated elements (whether detailed on the plans by the Engineer of Record or provided for the Contractor's convenience).
   e. Locations and details of the lifting devices, including supporting calculations, type and amount of any additional reinforcing required for lifting.
   f. The minimum concrete compressive strength required prior to removal of forms and handling of the prefabricated elements.
   g. The minimum 28-day concrete compressive strength required for transportation of the prefabricated elements.

h. Exposed concrete surface finishing requirements with reference to Section 601.11 of the Specifications.

The Contractor shall receive final approval of the shop drawings prior to ordering materials or performing any work. WVDOH will reject any prefabricated concrete deck panel fabricated before receiving written approval or any panel which deviates from the approved shop drawings. The Contractor shall bear full responsibility and costs for all materials ordered or work performed prior to the approval of the shop drawings or for costs incurred due to faulty detailing or fabrication.

C. Defects and Breakage of Prefabricated Reinforced Concrete Bridge Elements: Any defects or damage made to the concrete, due to form work, stripping, or handling, shall be subject to repair or rejection. Submit proposed written repair procedures to the Engineer for approval. Do not proceed with repair without written approval from the Engineer.

698.4-CONSTRUCTION METHODS:

698.4.1-Quality Assurance:

A. Prefabricated reinforced concrete deck panels and substructure elements shall be provided by a Fabricator/Contractor with experience in the construction of bridges satisfactory to the Engineer and shall provide documentation demonstrating adequate staff, appropriate forms, experienced personnel, and a quality control plan.

B. Permanently mark each deck panel and substructure element with its number and/or piece mark, date of fabrication, and supplier identification either by stamp markings in fresh concrete, waterproof paint, or other approved means on a surface that will not be exposed after assembly. Markings shall be readily visible for purposes of inspection and erection.

C. Prefabricated reinforced concrete deck panels and substructure elements shall be prevented from cracking, damage, or creep-induced deformation during storage and handling.

D. Replace defects and breakage of prefabricated reinforced concrete deck panels or substructure elements according to the following:

1. Deck panels or substructure elements that sustain concrete damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
2. Obtain approval before performing concrete repairs.
3. Concrete repair work must reestablish the deck panel’s structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
4. Determine the cause of defects or damage and establish a corrective action plan to prevent similar repetitive defects or damage.
5. Failure to take corrective action leading to repetitive defects or damage may be grounds for rejection of prefabricated reinforced concrete deck panels or substructure elements.
6. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.

E. Rejectable defects as determined by the Engineer may be cause for rejection. Prefabricated reinforced concrete deck panels or substructure elements may be rejected for any of the following reasons:
   1. Fabrication not in conformance with the Contract Documents.
   2. Fabricated dimensions not within the allowable tolerances specified in the Contract Documents.
   3. Full-depth cracking of concrete or concrete breakage that is not repairable to 100% conformance to the requirements of this Special Provision.
   4. Honeycombed texture that extends to a depth greater than the size of the coarse aggregate and/or exposes reinforcing steel.
   5. Damaged ends or appreciable irregularities preventing satisfactory joint.
   6. Defects that indicate concrete proportioning, mixing, molding and/or consolidation not conforming to the Contract Documents.
   7. Any damage during storage, transportation, erection, or construction determined to be significant by the Engineer.

F. Fabrication of reinforced concrete deck panels and substructure elements shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement and deck finish shall be in accordance with the Specifications.

G. The plant (or Fabricator) shall document all test results for structural concrete. The quality control file shall contain, at a minimum, the following information:
   1. Element identification
   2. Date and time of concrete placement
   3. Concrete cylinder test results
   4. Quantity of used concrete and the batch printout
   5. Form stripping date and repairs (if applicable)
   6. Location and number of blockouts, inserts, and lifting devices (if applicable)
   7. Temperature and moisture conditions during curing period

698.4.2-Fabrication:

698.4.2.1-Prefabricated Bridge Element Superstructure, Deck Panel: Prefabricated reinforced concrete deck panels shall conform to Section 601 of the Specifications.

Concrete shall be cast in rigidly constructed forms, which will maintain the specified tolerances to the shapes, lines and dimensions shown on the approved shop drawings. Deck panel forms shall be well constructed, carefully aligned, clean, substantial, and firm, and securely braced and fastened together sufficiently tight to prevent leakage of mortar and provide a level, true riding surface. Holes, cutouts, anchorage, reinforcement, and any other related details shall be provided for in the panels. All items encased in the concrete shall be accurately placed in the position shown on the approved Shop Drawings. The casting beds and all form work and materials will be approved by the Engineer before any concrete is placed.

The Engineer shall be provided with a tentative casting schedule at least fourteen (14) days in advance of concrete placement to make inspection and testing arrangements. A similar notification is required in advance of the anticipated date of shipping of prefabricated elements to the project site.

Cement concrete for prefabricated reinforced concrete deck panels shall be 4000 psi, Class H structural concrete and shall meet the requirements of Section 601 of the Specifications.

Finish the prefabricated reinforced concrete deck panels according to Section 601.11.4.2 of the Specifications. Finish surface as cast-in-place. Deck panels that will receive a cast-in-place safety curb, barrier, or sidewalk shall have a raked finish with a ¼ inch amplitude applied longitudinally along the length of the panel.

The closure pour shear key cast in the sides of the concrete deck panels shall have an exposed aggregate finish. The closure pour reinforcing steel shall not be damaged by the process for creating the exposed aggregate surface. Fabricator may utilize a surface retarder with water blast, abrasive blast, or a combination of both to achieve the desired shear key finish. The abrasive blast shall use oil free compressed air. The proposed method for creating the exposed aggregate surface shall be indicated on the approved shop drawings.

The Fabricator shall not strip forms or handle the prefabricated concrete deck panel until the concrete has attained a minimum compressive strength of 70% of the design compressive strength (f'c) or the value indicated on the approved shop drawings.

Commencing immediately after final finishing, all exposed concrete surfaces shall continue to be cured for a period of at least seven (7) days with all exposed surfaces covered. All prefabricated reinforced concrete elements shall be cured in accordance with Section 601.12 or 603.8 of the Specifications except that curing may be discontinued once 70% of the design strength is achieved. Cure time from initial pouring to placement shall be a minimum of fourteen (14) days.

698.4.2.2-Prefabricated Bridge Element Substructure-Abutment: Concrete shall be cast in rigidly constructed forms, which will maintain the specified tolerances to the shapes, lines and dimensions shown on the approved shop drawings. Forms shall be well constructed, carefully aligned, clean, substantial, and firm, and securely braced and fastened together sufficiently tight to prevent leakage of mortar. Holes, cutouts, anchorage, reinforcement, and any other related details shall be provided for in the elements. All items encased in the concrete shall be accurately placed in the position shown on the approved Shop Drawings. Corrugated metal pipe for pile pocket formed voids shall be prevented from extending above the finished surface of the precast concrete portion of the prefabricated substructure element. The casting beds and all form work and materials will be approved by the Engineer before any concrete is placed.

The Engineer shall be provided with a tentative casting schedule at least fourteen (14) days in advance of concrete placement to make inspection and testing arrangements. A similar notification is required in advance of the anticipated date of shipping of prefabricated elements to the project site.

Cement concrete for prefabricated reinforced concrete substructure elements shall be 3000 psi, Class B structural concrete and shall meet the requirements of Section 601 of the Specifications.

Finish the prefabricated reinforced concrete substructure elements according to Section 601 of the Specifications. Finish surface as cast-in-place.

The Fabricator shall not strip forms or handle the prefabricated concrete substructure element until the concrete has attained a minimum compressive strength of 75% of the design compressive strength (f'c) or the value indicated on the approved shop drawings.

Commencing immediately after final finishing, all exposed concrete surfaces shall continue to be cured for a period of at least seven (7) days with all exposed surfaces covered. Cure time from initial pouring to placement shall be a minimum of fourteen (14) days.

698.4.3-Handling, Storage, and Transportation:

698.4.3.1-Handling and Storage:

A. Care shall be exercised in the handling of the prefabricated reinforced concrete elements to prevent damage. Prefabricated reinforced concrete elements damaged during handling and storage will be repaired or replaced at the Engineer's direction at no cost to WVDOH.
B. Prefabricated reinforced concrete elements shall be lifted at the designated points by approved lifting devices properly attached to the element and by proper lifting procedures.
C. Storage areas shall be smooth and well-compacted to prevent damage due to differential settlement. Prefabricated elements shall be supported on the ground by means of continuous blocking during storage.
D. Concrete shall be cured in accordance with Section 601.12 of the Specifications. A seven (7) day wet cure using burlap shall be required per Section 601.12 of the Specifications. The surface of the prefabricated reinforced concrete deck panels shall be protected from drying and cracking by prompt covering with wet burlap. Prefabricated reinforced concrete elements shall be protected from freezing temperatures (below 32°F) for five (5) days or until concrete attains the design compressive strengths (f'c) designated on the plans, whichever comes first. Do not remove protection any time before the elements attain the specified compressive strength when the surrounding air temperature is below 20°F.
E. Prefabricated reinforced concrete elements shall be loaded on a trailer using the approved lift points as described above. Shock-absorbing cushioning material shall be used at all bearing points during transportation. Tie-down straps shall be located at the lines of blocking only.
F. The prefabricated reinforced concrete elements shall not be subject to damaging torsional, dynamic, or impact stresses at any point during handling or storage.

698.4.3.2-Transportation:

A. Prefabricated reinforced concrete elements shall not be transported from the casting site until the concrete attains the minimum 28-day compressive strength specified in the Contract Documents as shown by test cylinders, and a minimum of seven (7) days has elapsed from casting of the concrete. The test cylinders shall be fabricated at the time of placement and cured under conditions comparable to the prefabricated element for which the cylinders represent.
B. A 48-hour notice of the loading and shipping schedule shall be provided to the Engineer.
C. The Contractor shall inspect prefabricated reinforced concrete elements upon receipt at the site. Prefabricated bridge elements damaged during delivery shall be repaired or replaced at the Engineer's direction at no cost to WVDOH.

698.4.4-General Procedures for Installation:

A. General Procedures for Installation of Prefabricated Bridge Element Superstructure, Deck Panel:

1. Prior to placement of prefabricated reinforced concrete deck panels, the Contractor shall survey the top elevation of the girders and install the welded support angles to meet the required plan profile. Joints between the support angle and girder top flange shall be watertight and shall be sealed with an approved material to prevent leakage of Ultra High Performance Concrete (UHPC). Install self-adhesive compressible sealer along the top edge of the support angles.
2. Immediately prior to erecting the prefabricated reinforced concrete deck panels, the closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the deck panels shall be protected from damage during the cleaning of the keyways.
3. Lift and erect the deck panels per the Contractor's means and methods and in accordance with the approved Assembly Plan. Any damage to the deck panels incurred during erection or assembly may be cause for rejection and removal of the panels at the Contractor's expense.
4. Adjust the deck panels to the proper location and elevation. Minor vertical adjustment may be made by adjusting the thickness of the self-adhesive compressible sealer to achieve the correct profile elevation and cross slope. Differences in elevation between adjacent panels shall not exceed 1/8 inch at the edge of the panel. The Contractor may propose alternative measures to ensure proper constructability and fit. Any changes must be provided on the approved shop drawings.
5. Place formwork for transverse assembly joints and seal lifting holes as required by the approved Assembly Plan. Ensure all formwork is watertight to prevent leakage of UHPC by performing a water-tightness integrity test in accordance with the Contract Documents prior to concrete placement.
6. Pre-wet all closure pour surfaces to a saturated surface dry (SSD) state in accordance with the Contract Documents.
7. Cast UHPC transverse assembly joints and shear troughs in accordance with the Section 601 Special Provision for UHPC and the Contract Documents. Cure closure pours and lifting holes. Any remaining concrete defects or lifting device holes shall be repaired as directed by the Engineer.
8. Remove any remaining formwork that is not stay-in-place. Check for voids via visual inspection and tapping. If voids are found, repair using approved methods.
9. Do not apply superimposed dead loads or construction live loads to the prefabricated superstructure until the compressive test result of the cylinders for the UHPC closure pour concrete has reached the specified minimum compressive strength of 15 ksi.

10. Diamond grind the bridge deck for profile improvement as required by the plans. Diamond grinding of the bridge deck shall not begin until the UHPC closure pour concrete has reached the specified minimum compressive strength of 15 ksi. Contractor to bid diamond grinding based on the type of coarse aggregate in the concrete mix for bridge decks. Coarse aggregate shall be in accordance with Section 601 of the Specifications.
11. Saw cut longitudinal grooves into top of bridge deck using a mechanical cutting device after diamond grinding.
12. Install High Friction Surface Treatment (HFST) in accordance with the Section 406 Special Provision.

B. General Procedures for Installation of Prefabricated Bridge Element Substructure-Abutment:

1. Establish working points, working lines, and benchmark elevations prior to placement of all prefabricated substructure elements. The Contractor is responsible for field survey as necessary to complete the work.
2. Immediately prior to erecting the prefabricated reinforced concrete substructure elements, all closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the substructure elements shall be protected from damage during the cleaning of the keyways.
3. Lift and erect the prefabricated substructure elements per the Contractor's means and methods and in accordance with the approved Assembly Plan. Any damage to the substructure elements incurred during erection or assembly may be cause for rejection and removal of the panels at the Contractor's expense.
4. Set the prefabricated substructure element in the correct horizontal and vertical location. Prefabricated substructure elements shall be supported on a level and sufficiently firm (minimum 2,000 psf) prepared bearing foundation, unless other means of support are approved in the Assembly Plan. Carefully align the pile pocket voids in the precast elements over the supporting steel bearing piling. Utilize adjustment devices (jigs, templates, shims, leveling devices, etc.) as detailed in the approved Assembly Plan and as required to establish the design horizontal and vertical position of the prefabricated substructure element. The Contractor shall ensure that the element is in the proper horizontal and vertical location prior to releasing it from the crane and setting the next unit.
5. Install temporary bracing as specified and as required in the Assembly Plan. Stability of the precast substructure elements and comprehensive substructure system shall be the responsibility of the Contractor for the duration of construction.
6. Ensure that piles extend into the pile pockets at least the minimum embedment length specified in the plans. Ensure pile pocket voids are properly and sufficiently formed for placement of self-consolidating concrete materials.

7. Install formwork for vertical wingwall closure pour and seal lifting holes as required by the approved Assembly Plan. Ensure all formwork is mortar tight to prevent leakage of concrete during casting of the closure pour.
8. Place approved self-consolidating Class H High Early Strength concrete within the pile pocket voids and wingwall closure pours in accordance with the Contract Documents. Finish the top of the pile pocket pour with a smooth, troweled finish. Allow concrete for filling pile pockets to flow partially under the prefabricated substructure element.
9. Temporary supports and/or bracing required by the Assembly Plan for the purposes of prefabricated substructure element placement shall remain in place until self-consolidating concrete used for permanent attachment of the component has achieved the specified minimum compressive strength as shown by test cylinders.

698.5-METHOD OF MEASUREMENT:

A. Prefabricated Bridge Element Superstructure, Deck Panel. The Engineer will determine the number of deck panels from actual count (Each).

B. Prefabricated Bridge Element Substructure-Abutment, Cap. The Engineer will determine the number of abutment cap elements from actual count (Each).

C. Prefabricated Bridge Element Substructure-Abutment, Wingwall. The Engineer will determine the number of wingwall elements from actual count (Each).

698.6-BASIS OF PAYMENT:

A. Prefabricated Bridge Element Superstructure, Deck Panel. Payment will be full compensation for the manufacturing, furnishing, and placement of each deck panel, in place and accepted by the Engineer. All items required to assemble each panel into a prefabricated bridge deck per the plans, including labor, materials, and equipment, shall be considered incidental to this item, and will not be paid for separately.

B. Prefabricated Bridge Element Substructure-Abutment, Cap. Payment will be full compensation for the manufacturing, furnishing, and placement of each abutment cap element, in place and accepted by the Engineer. All items required to assemble each abutment cap element into a prefabricated concrete abutment per the plans, including labor, materials, and equipment, shall be considered incidental to this item, and will not be paid for separately.

C. Prefabricated Bridge Element Substructure-Abutment, Wingwall. Payment will be full compensation for the manufacturing, furnishing, and placement of each wingwall element, in place and accepted by the Engineer. All items required to assemble each wingwall element into a prefabricated concrete abutment per the plans, including labor, materials, and equipment, shall be considered incidental to this item, and will not be paid for separately.

698.5-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
698001-001	Prefabricated Bridge Element Superstructure,	Each
698002-001	Prefabricated Bridge Element Substructure - Abutment,	Each

March 8, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 715
MISCELLANEOUS MATERIALS

715.42-TRAFFIC SIGNAL MATERIALS AND EQUIPMENT:

715.42.8-Cabinets:

715.42.8.7-Technician Accessories:

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

Convenience Outlet- A 20 ampere, 125 volt AC capacity duplex convenience outlet shall be mounted on the inside right sidewall of the cabinet. The outlet shall be ground fault protected and shall be connected to the load side of the 20 amp circuit breaker that protects only the outlet, ~~lamp~~ LED light bars, and fan.

Cabinet Light- ~~A minimum 18" (455 mm) 15 watt fluorescent cabinet light shall be mounted on the inside of the cabinet above the door opening. The cabinet light shall have an RC network and V150LA20 MOV in parallel across the AC line to protect the controller unit from noise.~~ Two (2) LED light bars, each a minimum of 20" (508 mm) long to a maximum of 24 " (610 mm) long with a nominal power input of 6 to 8 Watts providing a minimum of 650 lumens of lighting output. Each light bar shall have a minimum Color Rendering Index (CRI) of 80, a color temperature in the range of from 5,000°K to 6,000°K, and an operating range of from 0 °F to 104 °F. One light bar shall be mounted at the top front of the interior of the cabinet and the other light bar shall be mounted under the shelf above the lower load bays and wiring terminals section. The light bar assemblies shall include any on-board transformation, rectification or drivers required to connect to the 120 volt AC power source in the cabinet. The door shall activate the cabinet light switch when the door is opened.

All hardware utilized in the cabinet assembly shall be aluminum, copper, nylon, brass, nickel plated brass or stainless steel.