# 20250709 – July Specifications Committee Meeting

## July Specifications Committee Meeting Agenda

**Meeting Date**
***Wednesday, July 7, 2025 @ 9:00am***
**Meeting Location: Building 5, Conference Room 820, Technical Support Division Charleston, WV**
Also meeting virtually via Google Meet video conference. E-mail distribution message includes instruction.

**Approved Permanent Specification changes from last Committee meeting (05/07/25)**

- **679.2.2-Specialized Concrete Mix Design and Testing:** The revision replaces the *Rapid Chloride Permeability* Test with the *Surface Resistivity Test* and Requirements.
- **106.1-Source of Supply and Quality Requirements (BUY AMERICA):** Adds a definition for ”Manufactured Products” and outlines State and Federal use of those *Manufactured Products.*
- **109.7-Payment for Material on Hand:** Revision expands on the process of steel fabricators receiving payment.
- **212.2.5.3-Degree of Nonconformance:** Adds reference to MP 212.02.20
- **410.7.1.5-Bond Strength, 410.13.6-Bond Strength Adjustments:** Revision changes negative price adjustments and elaborates that the bond testing protocols may not be reflective of in-place performance.
- **506.8-Repair Assessment Period:** New Subsection – Requires additional repairs on newly repaired pavements exhibiting signs of failure within a thirty(30)-day assessment period.
- **601.3.1-Mix Design Requirements:** The revision adds the Sequential Air Meter (SAM) testing requirements for Mix Design Approval. This will replace the 601 SAM Testing SP requirements completely when the supplemental specification goes into effect.
- **609.2.1- Detectable Warning Surfaces:** Revision requires products meet AASHTO-PEAS testing T388 requirements and adds a list of our Dome Size requirements.
- **625.5.3-Casing:** Updates language, clarifying the specification’s intent.
- **720.3.2-Quality Assurance (QA) Testing:** Replaces “Contractor” with “Engineer”.

**Approved Special Provisions (SP) from last Committee meeting (03/05/25)**

- **SP 106-Build America Buy America (2025):** Adds a definition for ”Manufactured Products” and outlines State and Federal use of those *Manufactured Products.* **(10/1/2025, This will be authorized by the Federal Gov., THIS FORM WILL BE REQUIRED WITH ALL PROPOSALS FOLLOWING THAT DATE)**
- **SP 109-**
- **SP 315-Trail Surface Aggregate (TSA):** Adds guidelines for (TSA) and creates a mixture of crushed aggregates that will compact.
- **SP 410-**

**Items removed from the Agenda:**

- **None**

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**Old Business Items**

| SECTION | TITLE | DESCRIPTION |
|---|---|---|
| 651<br>652<br>715 | **Section 651-Furnishing and Placing Soil**<br>**Section 652-Seeding and Mulching**<br>**Section 715.25-715.32** *(Ground Agricultural Limestone, Fertilizers, Mulch Material, Seed, Inoculating Bacteria, Biological Growth Stimulants, and Hydraulic Growth Material)*<br>D. Kirk | **NO VOTE-SPECIFICATION 651, 652, 715 POSTPONED UPDATES TO COME…**<br>**4th time to Committee. (January, March, May, July)**<br>Three specification changes updating the requirements for seeding and mulching.<br>1. Section 651-Furnishing and Placing Soil<br>2. Section 652-Seeding and Mulching<br>*a. Updated from the last meeting.*<br>3. Section 715.25-715.32<br>a. (Ground Agricultural Limestone, Fertilizers, Mulch Material, Seed, Inoculating Bacteria, Biological Growth Stimulants, and Hydraulic Growth Material)<br>*b. Updated from the last meeting.*<br>Specifications are redlined show the revisions. |
| 642 | **642.6-Silt Fence**<br>**642.7-Method of Measurement (Table 642.7.1)** | **NO VOTE-SPECIFICATION 642 POSTPONED UPDATES TO COME…**<br>**3rd time to Committee! (March, May, July)**<br>Two specification changes updating Section 642-Temporary Pollution Control:<br>***1. Section 642.6-Silt Fence***<br>• Specification adds three grades of silt fence. This is based on a range of products on the WVDOH Approved Products List. Recommended in the specification are Temporary, Standard, and High Performance. The differences are strength and UV stability. Temporary silt fence will be adequate for projects that can be completed in a single construction season. Standard silt fence will be used for projects that last two seasons. High Performance silt fence will be used for longer projects, and in challenging situations such as shallow concentrated flow that are likely to overstress standard silt fence. Guidance is also provided for post spacing, and for length and slope of disturbed area above the silt fence. |

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| | D. Kirk | ***2. Section 642.7-Method of Measurement:***<br>• Updating the Table that is linked to 642.7.1-Temporary Pollution Control Units Value Method: https://transportation.wv.gov/highways/TechnicalSupport/specifications/642.7UnitValueMethod/Pages/default.aspx<br>The revisions removes 652 Items in the Table. |
| SP 601 | **SP601-Mass Concrete**<br><br>K. Kukaua | **3rd time to Committee! (March, May, July)**<br>A Special Provision for Mass Concrete. The revision updates a previously approved SP adding Type 1T To the Materials section. |
| 601 | **601.1–Description, 601.2–Materials, 601.3-Proportioning, 601.4-Testing, 601.8-Forms, 601.9-Adverse Weather Conditions, 601.10-Placing Concrete, 601.12-Curing and Protecting Concrete**<br><br>Developed by WVU<br>Vetted by A. Thaxton | **3rd time to Committee! (March, May, July)**<br>Specification change to Section 601-Structural Concrete. The revision adds requirements for Class M concrete. WVU was contracted to research and develop a specification for mass concrete. |
| 688 | **Section 688-Field Painting of Metal Structures**<br><br>K. Trent | **3rd time to Committee! (March, May, July)**<br>Specification change to the entire Section 688-Field Painting of Metal Structures. |
| SPWV JobsAct | **SP WV Jobs Act**<br><br>D. Ballard | **2nd time to Committee! (May, July)**<br>Special Provision WV Jobs Act. The revision updates outdated language from 2018. |
| 101 | **101.2-DEFINITIONS:**<br><br>J. Adkins | **2nd time to Committee! (May, July)**<br>Specification change to Section 101-Definition of Terms, 101.2-Definitions. The update revises the definition of "Engineer" removing Chief Engineer and reinstating State Highway Engineer. |

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| 109 | **109.20.1-Electronic Ticket Delivery**<br><br>D. Brayack | **2nd time to Committee! (May, July)**<br>Specification change to Section 109-Measurement and Payment, 109.20.1-Electronic Ticket Delivery. The revision adds steel superstructure components (pre-fab or construct on site) and stay-in-place forms. |
| 401<br><br>SP401 | **401.13.3**<br><br>**SP401-Basis of Payment**<br><br>K. Kukaua | **2nd time to Committee! (May, July)**<br>Specification Change to Section 401-Asphalt Base, Wearing, and Patching and Leveling Courses, Section 401.13.3. The revision adds requirement for sealing all longitudinal joints regardless of achieved density and clarifies payment method.<br><br>*The specification has been updated since the last meeting. The revision replaces and removes language and increases percentages in the chart.* |
| 403<br><br>SP403 | **Section 403- Crack Sealing In Asphalt Pavement**<br><br>**SP403-Joint and Crack Sealing of Asphalt Pavements**<br><br>K. Kukaua | **2nd time to Committee! (May, July)**<br>Specification change to Section 403-Crack Sealing In Asphalt Pavement. Revision updates the title and revises the entire section. The update adds PG binder into the crack sealant spec to be used for longitudinal joint sealing.<br><br>*The specification has been updated since the last meeting. The revision replaces "longitudinal" joints with "constructed joints" and restructures the section to avoid overlapping procedures for the two materials.* |
| 420 | **420.2.2-Fine Aggregate, 2FA and 3FA**<br><br>K. Kukaua | **2nd time to Committee! (May, July)**<br>Specification update to Section 420-Single/Multiple Course Micro Surfacing. The revision shifts Type 2FA requirements for Sieves No. 8 and No. 30 to ensure there are no conflicts with the existing aggregate being used within West Virginia. |
| 601 | **601.13.3.3.1-Weather Conditions**<br><br>J. Adkins | **2nd time to Committee! (May, July)**<br>Specification change to Section 601-Structural Concrete, Subsection 601.13.3.3.1-Weather Conditions. The revision updates language to correlate to changes made in Section 688. The update includes removing dates and allows heated containment. |

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| 601 | **601.3.2.1-Consistency**<br><br>A. Thaxton | **2nd time to Committee! (May, July)**<br>Specification change to Section 601-Structural Concrete, Subsection 601.3.2.1-Consistency. The revision clarifies that a superplasticizer may be used in field adjustments regardless if it was included in the original approved mix design.<br><br>*The specification has been updated since the last meeting. The update revises the sixth paragraph.* |
| 604 | **604.8.1-Initial Backfill Zone**<br><br>A. Thaxton | **2nd time to Committee! (May, July)**<br>Specification change to Section 604-Pipe Culverts, subsection 604.8.1-Initial Backfill Zone. The revision removes updates language to be designed per ASTM 1675. |

**New Business Items**

| | | |
|---|---|---|
| 106 | **106.3-Samples**<br><br>D. Brayack | **1st time to Committee!**<br>Specification change to Section 106 Control of Materials, Subsection 106.3-Samples. The revision adds a reference to the materials listed in Specification 109.20.1. |
| 107 | **107.26.2.2-No Asbestos Containing Materials Reported** | **1st time to Committee!**<br>Specification change to Section 107 No Asbestos Containing Materials Reported. The revision removes a sentence to eliminate confusion in the following sentence. |
| 311 | **311.2-Materials**<br><br>**311.4-Composition of Optional Stabilizing Mixtures**<br><br>A. Thaxton | **1st time to Committee!**<br>Specification change to Section 311-Open Graded Free Draining Base Course, Subsections 311.2-Materials, and 311.4-Composition of Optional Stabilizing Mixtures. The revision clarifies that the cement being discussed is Tyle 1L. |
| SP 601 | **601.1.1-Ultra High Performance Concrete**<br><br>A. Thaxton | **1st time to Committee!**<br>Special Provision for Structural Concrete. The revision updates a previously approved SP by adding SMARTUP, and replacing “Holcim” with “AMERIZE”. |
| SP601 | **601.3-Proportioning**<br><br>A. Thaxton | **1st time to Committee!**<br>Special Provision for Surface Resistivity of Lightweight Concrete. The revision updates a previously approved SP by adding sections that detail Surface Resistivity Testing. |

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| SP662 | **662.12**<br><br>R. Tabassum | **1st time to Committee!**<br>Special Provision for Roadway Lighting. The revision updates a typo in the previously approved SP. |

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**Deadline for new items & updates for the September 3, 2025 Meeting are due August 3, 2025.**
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/revise your items in a timely manner per Specification Committee Guidelines.
NOTE: *Failure to submit updates may result in removal of item and/or delays.*

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

Please Send Comments to: **Jacinda.n.Chapman@WV.gov**

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

**TYPES OF PROVISIONS:**
There are three standard types of provisions typically discussed in committee:

1. **Specification Changes** – These are permanent changes to the WVDOH Standard Specifications.
    - Unless inserted into a project proposal, these changes typically go into effect in January (of subsequent year) with the Supplemental Specifications
2. **Special Provisions (SP)** – Are applied to an individual project or a small group of projects and require two (2) meetings for approval.
3. **Project Specific Special Provisions (PSSP)** – Can be shown to committee-but not required, does not require two (2) meetings for approval, **REQUIRES MANAGEMENT APPROVAL.** Project Specific Special Provisions are applied to only an individual project.

**NEW BUSINESS ITEMS:**
New items should be setup & submitted in the following format along with a brief overview of the item or reason for the change:

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

NOTE: *Red-line copy is a form of editing which indicates removal or addition of text. You can redline a Microsoft Word document by using the built-in "Track Changes" feature.*

**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.

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

## 2023 Standard Specification Roads and Bridges and the 2025 Supplemental Specifications Manuals

Both available on our Publications Webpage:
https://transportation.wv.gov/highways/TechnicalSupport/specifications/Pages/default.aspx

Both available for order:
https://transportation.wv.gov/highways/TechnicalSupport/specifications/Documents/SpecBookOrderForm_20230925.pdf

*NOTE:* WVDOH Employees may contact Jacinda Chapman or stop by technical support for a copy(ies).

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~~December 10, 2024~~ April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 651
# FURNISHING AND PLACING TOPSOIL

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

**651.1-DESCRIPTION:**

This work shall consist of acquiring sites outside the right-of-way from which topsoil can be obtained and the hauling and placing of such material, or hauling and placing of topsoil from stockpiles within the right-of-way, all in accordance with these Specifications and at locations indicated on the Plans or designated by the Engineer.

**651.2-MATERIALS:**

Topsoil shall consist of the uppermost layers of fertile and friable soil that contains humus material. This material varies in thickness in accordance with soil groups and usually possesses a darker color than the subsoil. The texture of the topsoil may vary within the range of natural loam, silty clay loam, and sandy loam. Acceptable topsoil shall contain at least 3% organic matter ~~in the range of 2% to 20%~~ and be sampled at least once per project using AASHTO T 267 method; multiple sources or change of sources shall also be sampled.

Topsoil containing less than 3% organic matter shall be conditioned with biological growth stimulants. The requirements for these amendments shall conform to 715.30.

## CONSTRUCTION METHODS

**651.3-STRIPPING TOPSOIL:**

~~Prior to removal from the site, the soil will be tested by the Division to determine the humus and nutrient value.~~ Care shall be exercised as to the depth of stripping, and any loads with an excess of subsoil shall be discarded. The Contractor shall ~~mow or otherwise remove~~ remove all heavy grass, weeds, or other vegetation, including root mass, in ~~over~~ the areas before stripping.

Topsoil shall be stored on the stripping site out of construction limits, if feasible. Any topsoil that cannot be stored on the construction site must acquire approval by the Engineer ~~must be obtained prior~~ to transport~~ing~~ any material from the stripping site.

**651.4-TRANSPORTING:**

Topsoil material shall not be placed until the entire roadway (including surfacing) has been completed, unless otherwise provided for on the Plans or approved in writing. During hauling operations, the surface of the highway shall be kept reasonably clean to avoid creating a traffic hazard.

**651.5-PLACING AND MANIPULATING:**

Areas to be topsoiled shall be brought reasonably close to the lines and grades shown on the Plans or established by the Engineer. Topsoil may not be applied to slopes steeper than 2H:1V. All slopes less than or equal to 2H:1V that do not meet an organic matter of at least 3% require the application of topsoil. An approved hydraulic growth medium may be used in replace of topsoil if designated by the Engineer and must meet all requirements in 715.31.

Prior to application, fertilizer lime or sulfur, and other soil amendments shall be added to the topsoil according to the soil analysis, in accordance with section 652.4.1. The Contractor shall ~~scarify~~ track the surface of the subsoil before the topsoil is placed, unless otherwise permitted, for bonding the topsoil layer with the subsoil.

Topsoil shall be applied at a minimum depth of 6 inches. For Type B and C seed mixtures, the topsoil must be tracked again to compact to a minimum thickness of four (4) inches. For Type A seeding (lawn type seeding), compact the topsoil and then finely graded to provide a smooth surface. All sites must then be scarified ~~shall be accomplished~~ by disking, harrowing, raking, or other approved methods. Depressions and ridges formed by construction equipment, during final grading or scarifying, shall be parallel to the contours.

~~Topsoil shall not be spread to a greater depth than that required to make the work conform to the natural terrain after shrinkage and settlement have taken place.~~ After spreading the soil, all deleterious materials (large lumps or clods, brush, litter, or other foreign material, and stones exceeding two (2) inches approximately in any dimension) shall be raked up and removed from the site. For Type A seeding (lawn type seeding), remove all material over one (1) inch in any dimension.

The Contractor shall take all reasonable precautions to avoid injury to existing plant growth, structures, and roadway surface.

**651.6-METHOD OF MEASUREMENT:**

The quantity of work done will be measured in cubic yards of "Furnishing and Placing Topsoil" or "Placing Stockpiled Topsoil", which shall be the material actually removed from previously selected site or sites outside the right-of-way of from stockpiles within the right-of-way, and acceptably placed and spread on the areas designated to receive it, as determined from the net total of load tickets of vehicles.

**651.7-BASIS OF PAYMENT:**

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 materials 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.

No separate payment will be made for stripping topsoil within the right-of-way limits and transporting or stockpiling of such material.

**651.8-PAY ITEMS:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 651001-* | Furnishing and Placing Topsoil | Cubic Yard |
| 651002-* | Placing Stockpiled Topsoil | Cubic Yard |

* Sequence number

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~~February 11, 2025~~ April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 652
# SEEDING AND MULCHING

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

**652.1-DESCRIPTION:**

This work shall cover all operations incidental to the establishment and maintenance of grass, forb, and leguminous vegetation, including the furnishing and sowing of seed; furnishing and applying fertilizer, ~~agricultural~~ limestone, other soil amendments, and mulch material, all in accordance with these Specifications and at locations indicated on the Plans or designated by the Engineer.

**652.2-MATERIALS:**

Materials shall meet the requirements in the following Subsections of ~~Division 700~~ Section 715:

| MATERIAL | SUBSECTION |
|---|---|
| Biological Growth Stimulants | 715.30 |
| Fertilizers | 715.26 |
| ~~Ground Agricultural Limestone~~ LIMESTONE | 715.25 |
| Hydraulic Growth Mediums | 715.31 |
| Inoculating Bacteria | 715.29 |
| Matting for Erosion Control | 715.24 |
| Mulch Materials | 715.27 |
| Seed | 715.28 |
| Water | * |

* Water shall be reasonably free from injurious chemicals and other toxic substances harmful to plant life. The source of water used is subject to the approval of the Engineer.

Temporary seed, such as ~~annual ryegrass (Italian ryegrass) and weeping lovegrass~~ common oats and cereal rye, used in the seed mixture~~s~~ B~~, C, or D,~~ shall be of a commercial grade meeting the requirements of the State Seed Law. Temporary seed labeled with the notation "germination

below standard" shall not be used. Temporary seed shall not be used after one year from date of germination test shown on the label. Seed other than that specified above shall meet the requirements of subsection 715.28.

Tackifier or chemical mulch binders shall be of commercial grade and conform to the requirements in subsection 715.27.1. Topsoil, if called for, shall conform to the requirements in section 651. All materials will be subject to approval or rejection, in part or in whole.

## CONSTRUCTION METHODS

### 652.3-SEASON OF WORK:

Permanent seeding or ~~second and third seeding~~ re-application and spot application, following the original seeding, under section 652, shall be performed between the dates of ~~March 1~~ February 15th to ~~June 15~~ ~~20th~~ May 31st and August 1st to October ~~15~~ 31st. Specific seeding dates are made for each seed mixture and can be found in 652.5.

Temporary seeding outside the above planting dates shall fall under section 642. Seed shall be applied following construction at any time the weather will allow seeding equipment to operate, under 642, without regard to seasons.

### 652.4-AREA PREPARATION FOR SEEDING AND MULCHING:

Seeding, fertilizing, liming, applying soil treatments, and mulching shall not be ~~applied~~ conducted until the specified areas have been brought to lines and grades shown on the Plans. Topsoil~~, when called for,~~ or hydraulic growth media shall be spread ~~to the depths indicated on the Plans.~~ In accordance to section 651.

~~The application rate for agricultural limestone will be determined by a pH test after cuts and embankments are completed just prior to seeding. The Plans will show the estimated tons of lime needed for the job based on general knowledge of the soils in the area. The final application rate will be determined by the Engineer based on the pH test, conducted in accordance with MP 700.04.10.~~

**652.4.1-Soil Tests and Analysis:** A soil test is required on all areas greater than one (1) acre when the area has reached final grade and permanent seeding is the next step. A soil test is optional for areas less than one (1) acre and will be determined by the Engineer if required. The area shall be evaluated by the Engineer to determine where the distinguishable representative areas are located. A distinguishable representative area is defined as where visible changes, such as a change in color or texture, in soil occur. All representative areas of the site shall be divided into maximum of five (5) acre increments and tested individually.

On each representative soil type, a composite sample is needed. A minimum of ten (10) subsamples of soil from the top four (4) to six (6) inches will be collected. The subsamples should be taken randomly throughout the area. The subsamples should be thoroughly mixed and the composite sample should be sent to a certified soil testing laboratory for analysis. The laboratory, at a minimum, should report: pH, buffer pH, fertilizer requirements and recommendations, and lime requirements and recommendations.

**652.4.2-Seedbed Preparation:** ~~Interchanges, medians and similar~~ Areas with ~~3 to~~ 2 Horizontal : 1 Vertical (H:V) slope or flatter, excluding areas involving subsurface drainage from base course material, shall be scarified sufficiently to produce a seed bed ~~as directed by~~

~~the Engineer~~. For slopes 3H:1V and flatter, scarify soil to a depth of 2-4 inches. For slopes 3H:1V to 2H:1V, scarify subsoil to a depth of 0.5-1 inches. Remediation of the pH should be made to the subsoil at the time of soil scarification, whether lime or sulfur is required based on soil test. See Table 653.4.3 for recommended bulk densities. All large sticks, brush, loose roots, stones exceeding two (2) inches approximately in any dimension, and other debris shall be removed prior to seeding operations. ~~The area shall be back dragged to eliminate depressions, ruts, or equipment track marks on slopes.~~ Before topsoil application, use a bulldozer to track the soil perpendicular to the slope making track indentations to reduce potential for topsoil slippage. Once check slots are in place, apply and track with a dozer to a minimum thickness of four (4) inches. The area shall be free of depressions, ruts, or excessive equipment track marks, other than check slots, on slopes. Seed bed preparation will not be necessary on slopes steeper than ~~3 to 1~~ 2H:1V.

**~~652.4.1~~ 652.4.3 Preparation of Lawn Type Area for Seeding:** ~~All areas to be seeded to "Type C-2" lawn mixture, and "Type C-1" mixture in rest areas~~ Lawn type areas will use "Type A" mixture in rest areas, medians, shoulders, and lawns. The seedbed shall be fine graded. The finished grade shall be uniform and free of irregularities or ~~water pockets~~ depressions. The finished grade shall be free of weed and plant growth, stones over one (1) inch~~es~~ in diameter, or other debris. This debris will be disposed of as directed by the Engineer. Immediately prior to seeding, all areas shall be cultivated to provide a reasonably firm but friable seedbed. The depth of tillage shall be three (3) inches or as directed by the Engineer. Limestone as required and fertilizer as specified shall be worked into the upper three (3) inches of the seedbed before seeding.

**TABLE 652.4.3**

| **Recommended Lime Bulk Densities** | | | |
|---|---|---|---|
| **Soil Texture** | **Ideal Bulk Densities** | **Bulk Densities that May Affect Root Growth** | **Bulk Densities that Restrict Root Growth** |
| | **(lb/ft$^3$)** | **(lb/ft$^3$)** | **(lb/ft$^3$)** |
| Sands, loamy sands | < 99.9 | 105.5 | > 112.4 |
| Sandy loam, loams | < 87.4 | 101.8 | > 112.4 |
| Sandy clay loams, loams, clay loams | < 87.4 | 99.9 | > 109.2 |
| Silts, silt loams | < 81.2 | 99.9 | > 109.2 |
| Silt loams, silty clay loams | < 87.4 | 96.8 | > 103.0 |
| Sandy clays, silty clays, some clay loams (35-45% clay) | < 68.7 | 93 | > 98.6 |
| Clays (> 45% clay) | < 68.7 | 86.8 | > 91.8 |

**652.4.4 Soil Additives and Amendments:** The application rate for limestone, fertilizer, and other soil amendments will be determined by a soil test after cuts and embankments are completed just prior to seeding. The Plans will show the estimated tons of lime, fertilizer, and other soil amendments needed for the job based on general knowledge of the soils in the area. The final application rate will be determined by the Engineer based on the soil test, conducted in accordance with MP 700.04.10.

**652.5-SOWING SEED:**

Immediately following area preparation, seed shall be sown. Only certified seed shall be used. Certified seed is seed that has been screened to check for satisfactory genetic purity and varietal identity and meets all requirements of State Seed Law. Seed shall not be used after one year from date of germination test shown on the label Legume seed shall be inoculated with approved cultures, in accordance with the instruction of the manufacturer. Seed may be directly sown with a drill seeder, if site conditions permit. Alternatively, seed may be sown by hydroseeding. When using a hydroseeder, the inoculant shall be increased to five times the normal rate.

~~If machine breakdown occurs during hydroseeding, the following practices should be used to avoid seed damage:~~

- ~~For machine breakdown of thirty (30) minutes to two (2) hours, fifty percent (50%) more seed shall be added to the slurry, based on the proportion of the slurry remaining in the tank.~~
- ~~For machine breakdown of more than two (2) hours, a full rate of seed shall be used.~~

Seed shall be sown by approved methods which provide for uniform distribution of seed. Rates of application and type of seed mixture shall be in accordance with Table 652.5 unless otherwise specified on the Plans.

~~For lawn areas, the broadcast seeding shall be made in two applications, using one half the seed each time and the second sowing to be at right angles to the first. After broadcasting or otherwise applying the seed, the seedbed shall be firmed by means of a roller or cultipacker.~~

Specific seeding dates are made for each seed mixture.

a. Type A is to be seeded from February 15th to ~~June 20th~~ May 31st and from August 1st to October 31st.
b. Type B seed mixture is to be seeded from March 1st to June 20th and October 1st to October 31st.
c. Type C mixture is to be seeded from August 1st to October 31st.
d. Type E mixture is to be planted from March 20th to June 30th and October 15th to the first frost.

**652.5.1-Reseeding, Refertilizing, and Remulching:** Any area failing to establish ~~a stand due to weather or adverse soil conditions~~ seventy percent (70%) of cover by area over 100% of the site due to any reason shall be reseeded, refertilized, and remulched as directed by 652.8 and by the Engineer.

**TABLE 652.5-SEED MIXTURES**

| Variety of Seed | Type B | Type C** | | Type D | Type L |
|---|---|---|---|---|---|
| | | C-1 | C-2 | | |
| | Medians, Shoulders (Ditch Slope) Waterways, and Mowable Areas of Interchange* | Coarse Lawn Grass<br>For Use in Urban and Rest Area Locations | Fine Lawn Grass<br>For Use where a Fine Lawn is Desired | Cut and Fill Slopes<br>(Including Benches and Bifurcated Median) | All areas |
| | Lb. per acre | Lb. per acre | Lb. per acre | Lb. per acre | Lb. per acre |
| Kentucky 31 Fescue | 65 | 45 | | 20 | |
| Red Fescue (Pennlawn) | 20 | 20 | 20 | 20 | 41 |
| Kentucky Bluegrass | | 25 | 40 | | |
| Merion Bluegrass | | | 30 | | |
| Crown Vetch | | | | 20 | |
| Hard Fescue Mixture*** | | | | | 63 |
| White Dutch Clover | 3 | | | | |
| Annual Ryegrass Aug 1 to May 15<br>or<br>Weeping Lovegrass May 15 to Aug 1 | 7<br><br>3 | 7<br><br>3 | 7 | 7<br><br>3 | 12<br><br>5 |

* Areas will be considered mowable when slopes are 3 to 1 or flatter.

** Type C-1 and C-2 seed mixtures shall be used in all urban, suburban, and rest areas where lawn type turf is desired with mowing maintenance intended. C-2 lawn mixture shall be used along sidewalks, adjacent to private lawns.

** A combination of approved certified varieties with no one variety exceeding 50% of the
* total hard fescue component.

**TABLE 652.5**
**Seed Mixtures**

| Variety of Seed | Type A Mowable Areas [b] (lb/ac) | Type B Cut and Fills (lb/ac) | Type C Cool Season (lb/ac) | Type E Wet Areas (lb/ac) |
|---|---|---|---|---|
| Common Oat (*Avena sativa*) (March 1- October 31) [a] | | 30 | | |
| Cereal Rye (*Secale cereal*) (November 1-Feb 28) [a] | | 30 | | |
| Autumn Bentgrass (*Agrostis perennans*) | 10 | 3.7 | | |
| Chewing's Fescue (*Festuca rubra ssp. commutate*) | 25 | | | |
| Hard Fescue 'Chariot' (*Festuca brevipila*) | 35 | | 35 | |
| Hard Fescue 'Heron' (*Festuca ovina var. duriuscula*) | 35 | | 35 | |
| Creeping Red Fescue (*Festuca rubra*) | 55 | | 55 | |
| White Clover (Trifolium repens) | 3 | | 7 | |
| Big Bluestem (Andropogon gerardii) | | 6 | | |
| Virginia Wildrye (Elymus virginicus) | | 8.4 | | 4 |
| Switchgrass (Panicum virgatum) | | 6.4 | | |
| Indiangrass (Sorghastrum nutans) | | 14 | | |
| Partridge Pea (Chamaecrista fasciculate) | | 1 | | |
| Black-Eyed Susan (Rudbeckia hirta) | | 0.6 | | |
| Narrowleaf Mountainmint (Pycnanthemum tenuifolium) | | 0.1 | | |
| Wild Bergamot | | 0.5 | | |
| Panicledleaf Ticktrefoil (Desmodium paniculatum) | | 0.4 | | |
| Smooth Oxeye (Heliopsis helianthoides) | | 0.4 | | |
| Flat-top Goldentop (Euthamia graminifolia) | | 0.1 | | |
| Redtop (Agrostis gigantean) | | | 4 | |

**TABLE 652.5**
**Seed Mixtures**

| Variety of Seed | Type A Mowable Areas [b] (lb/ac) | Type B Cut and Fills (lb/ac) | Type C Cool Season (lb/ac) | Type E Wet Areas (lb/ac) |
|---|---|---|---|---|
| Birdsfoot Trefoil (Lotus corniculatus) | | | 8 | |
| Fox Sedge (Carex vulpinoidea) | | | | 4 |
| Fowl Bluegrass (Poa palustris) | | | | 3.5 |
| Redtop Panicgrass (Panicum rigidulum) | | | | 4 |
| Common Rush (Juncus effuses) | | | | 0.5 |
| Shallow Sedge (Carex lurida | | | | 3 |
| Blue Vervain (Verbena hastate) | | | | 0.8 |
| Wingstem (Verbesina alternifolia) | | | | 0.2 |
| Joe Pye Weed (*Eutrochium purpureum*) | | 1.5 | | 1.5 |
| Swamp milkweed (*Asclepias incarnata*) | | | | .1 |
| Butterfly Milkweed (*Asclepias tuberosa L.)* | | .10 | | |
| Common Milkweed (*Asclepias syriaca*) | | .10 | | |
| Purple coneflower (*Echinacea purpurea*) | | 1.5 | | |

a. Choose a nurse crop according to season of planting.

b. Type A will be utilized for mowable areas. Type A seed mixture shall be used in all urban, suburban, rest areas, WVDOH facilities, and mowable areas along roadways where lawn type turf is desired with mowing maintenance intended.

**652.6-APPLYING MULCH, LIME, ~~AND~~ FERTILIZER, AND OTHER SOIL AMENDMENTS**:

**652.6.1-General:** Whenever permanent or temporary seeding is made on bare soil or newly completed construction work, the following criteria shall be followed in regard to mulching.

i. Hydraulic erosion control products shall be used on all slopes but consult 652.6.2 for further details and specifications.

ii. Rolled erosion control products (RECPs) may be used on slopes less than or equal to

2H:1V.

iii. Straw mulch (excluding hay) shall be used on slopes ~~1 ½ to 1 or flatter~~ less than or equal to 4H:1V. ~~Wood cellulose fiber mulch shall be used on cut slopes steeper than 1½ to 1. The Engineer may make adjustments in the type of mulch to meet local conditions on the job.~~

~~i.~~

When using straw mulch, the mulch shall be anchored with ~~an acceptable~~ a non-toxic tackifier or binder as described in Section 652.6.~~2~~5 ~~below~~. The sequence of application, when using straw mulch shall be as follows:

1) Seed, lime, ~~and~~ fertilizer, other soil amendments shall be sown prior to mulching.
2) Mulch and non-toxic tackifier ~~mulch~~ or binder shall be placed within twenty-four (24) hours of sowing seed.

~~When permanent seeding follows a temporary cover crop, wood cellulose fiber mulch shall be used and the quantity of mulch shall be determined by the amount of living and dead plant residue on the soil surface in accordance with subsection 652.6.3.2.~~

Where the temporary seeding has been destroyed by subsequent construction, the mulch will be the same type and amount as required for bare soil or new construction.

~~**652.6.2-Straw Mulch:** Straw shall be applied at the rate of approximately two tons per acre. Straw mulch around buildings, sidewalks or other structures may be held in place with a form of netting or chemical mulch binders applied according to the manufacturers' specifications.~~

**652.6.2-Hydraulic Erosion Control Products:** Hydraulically applied erosion control products (HECPs) are applied to bare soil by means of a mechanically agitated hydro seeder or by broadcast spreading. Typically, a mixture of cut or shaved wood, straw, bonded fiber matrix, or defibrated organic fiber matrix and a stabilizing emulsion or tackifier constitutes the components of HECP. Paper mulch is not approved for use other than for the use of a mulch binder on straw.

Table 652.6.2A lists qualifications for the accepted HECPs. The products are presented in respect to the acceptable slope that the individual HECPs may be applied, as shown in Table 652.6.2B.

**TABLE 652.6.2A**

| **Mulch Types** | | | | | |
|---|---|---|---|---|---|
| **Property** | **Test Method** | **Straw** | **HECP Type 1** | **HECP Type 2** | **HECP Type 3** |
| **Physical** | | | | | |
| Color | Observed | Natural | Colored to contrast application area, shall not stain concrete or painted surfaces. | | |
| Organic Matter | ASTM D2974 | 100% | 90% minimum | | |
| Water Holding Capacity | ASTM D7367 | | 600% Minimum | 800% Minimum | 1200% Minimum |

| | | | | | |
|---|---|---|---|---|---|
| Acute Toxicity | ASTM 7101<br>EPA 2021.0-1 | Non Toxic | | | |
| **Endurance** | | | | | |
| Functional Longevity | ASTM D5338 | ≥ 90 days | ≥ 90 days | ≥ 180 days | ≥ 365 days |
| **Performance** | | | | | |
| Maximum Slope Application | Observed | 4.0H:1V | 4.0H:1V | 2.0H:1V | 0.5H:1V |
| Cover Factor | ASTM D8298 | | C ≤ 0.3 | C ≤ 0.05 | C ≤ 0.01 |
| Ground Cover | ASTM D6567 | > 85% | > 90% | > 95% | > 97% |
| Vegetation Establishment | ASTM D7322a | | 300% Minimum | 400% Minimum | 500% Minimum |

a. ASTM test methods developed for Rolled Erosion Control Products (RECPs) that have been modified to accommodate Hydraulic Erosion Control Products (HECPs).

**TABLE 652.6.2B**

| **Mulch Application** | | |
|---|---|---|
| **Mulch** | **Applicable Slopes** | **Minimum Application Rate (lb/acre – dry) [a]** |
| HECP Type 1 | ≤ 4H:1V | 2,500 |
| HECP Type 2 | 4H:1V < S ≤ 2H:1V | 3,000 |
| HECP Type 3 | 2H:1V < S ≤ 0.5H:1V | 4,000 [b] |
| Straw | ≤ 4H:1V | 4,000 |

a. A higher level of mulch may be applied than that specified on the Plans, Specifications, and other terms of the Contract. In this situation, the higher level mulch is applied at the rate for the actual slope condition of the site in accordance with the mulch tables, and payment is for the actual mulch specified, not the higher level mulch.

b. HECP Type 3 may be used for permanent cover applications on slopes 1H:1V or greater at a minimum rate of 4,500 pounds per acre as directed by the Engineer only when the proper TRM installation is not practicable due to site constraints.

**652.6.2.1-HECP Type Overview:** Provide a HECP Type 1, 2, or 3 that has no germination or growth inhibiting factors and does not form a water-resistant crust that can inhibit plant growth. Provide a HECP Type 1, 2, or 3 that completely photo-degrades or biodegrades. Add seed, lime, fertilizer, and other soil amendments to the HECP Type 1, 2, or 3 mixture.

Furnish HECP Type 1, 2, or 3 where all components are pre-packaged by the manufacturer to assure material performance and compliance with the minimum requirements of Table 652.7.2.1. Under no circumstances will field mixing of HECP Type 1, 2, or 3 additives or components be accepted.

HECP Type 1 or 2 shall be applied when the soil is dry and rain is not expected within 24 hours following application. HECP Type 3 shall be applied when the soil is dry and rain is not expected within eight (8) hours following application. All applications shall have a

high degree of certainty that no heavy rain events follow within forty-eight (48) hours following application.

The HECPs must comply at minimum with Tables 652.6.2A and 652.6.2B.

**652.6.2.2-HECP Type 1:** Provide a HECP Type 1 (Hydraulic Mulch with Tack) composed of non-toxic fibers consisting of a minimum of seventy percent (70%) wood fiber or natural fibers that contain non-toxic tackifiers or binders. The HECP Type 1 should be insoluble and non-dispersible after drying to limit raindrop impact.

**652.6.2.3-HECP Type 2:** Provide a HECP Type 2 (bonded fiber matrix (BFM)) consisting of a hydraulically applied matrix composed of a minimum of seventy percent (70%) of non-toxic defibrated organic fibers with at least one of the following non-toxic additives:

i. Soil tackifiers
ii. Soil flocculants
iii. Soil polymers
iv. Cross-linked hydro-colloidal polymers, or
v. Cross-linked tackifiers.

The HECP Type 2 should be insoluble and non-dispersible after drying to limit raindrop impact.

Do not use materials composed of paper, cellulose fiber, or any mixture containing paper or cellulose. Do not use materials listed for use as a HECP Type 1. Add seed, legume inoculant, lime, and fertilizer to the HECP Type 2 mixture.

**652.6.2.4-HECP Type 3:** Provide a HECP Type 3 (fiber reinforced matrix (FRM)) consisting of a hydraulically applied matrix composed of a minimum of seventy percent (70%) of non-toxic defibrated organic fibers and a minimum of five percent (5%) crimped, biodegradable interlocking fibers with least one of the following non-toxic additives:

i. Soil tackifiers,
ii. Soil flocculants,
iii. Soil polymers,
iv. Cross-linked hydro-colloidal polymers, or
v. Cross-linked tackifiers.

The HECP Type 3 should be insoluble and non-dispersible after drying to limit raindrop impact.

Do not use materials composed of paper, cellulose fiber, or any mixture containing paper or cellulose. Do not use materials listed for use as HECP Type 1 or 2. Add seed, legume inoculant, lime, and fertilizer to the HECP Type 3 mixture.

~~**652.6.3 Hydraulic Application of Wood Cellulose Fiber as a Mulching Agent**:~~

**652.6.3-Hydraulic Erosion Control Products Application:**

**652.6.3.1-Equipment:** Hydraulic equipment shall be used for the application of a slurry of fertilizer, lime, seed, ~~prepared wood cellulose fiber, and water.~~ tackifier, legume

inoculant, water, and HECP. This equipment shall have a built-in agitation system with ~~an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed, and water.~~ a working capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of tackifier, fertilizer, lime, seed, legume inoculant, other soil amendments, water, and HECP. ~~-~~The slurry distribution lines shall be large enough to prevent stoppage. This discharge line shall be equipped with a set of hydraulic spray nozzles which will provide even distribution of the mixture or slurry in the various areas to be seeded. The slurry tank ~~shall have a minimum capacity of 1,000 gal and~~ shall be mounted on a traveling unit which may be either self-propelled or drawn, with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded to provide uniform distribution without waste.

**652.6.3.2-Preparation of Slurry and Application of HECPs: ~~Fertilizer, Seed, and Mulch:~~** ~~Wood cellulose fiber shall be applied at a minimum rate of 1,500 lbs. net dry weight per acre when seeding bare soil or new construction.~~ HECPs shall be applied at the specified rate according to the manufacturer, while following the minimum standards specified in Table 652.6.2B. When seeding into a residue or growth where temporary seeding has previously been performed, the rate will be determined by the Engineer, usually 1,000 lbs. net dry weight per acre. The ~~seed, fertilizer, wood cellulose fiber, and water~~ HECP, tackifier, seed, legume inoculant, fertilizer, lime, other soil amendments, and water shall all be combined into the slurry tank for distribution of all ingredients in one operation by the hydraulic seeding method. The agitator shall be operating at a rate sufficient to keep all materials in suspension at the time such material is added. ~~Seed shall be added first, shall be thoroughly mixed, and the fertilizer then added and put into suspension. When the tank is 40 percent (40%) full, the mulch material may be added and shall be in complete suspension by the time the tank is 75 percent (75%) full. Such increased mixing speed as is necessary for putting the entire admixture in suspension shall be maintained until the tank is emptied. Spraying may commence at such time as the full complement of water has been mixed into the slurry. It is the intent of this Specification to maintain the slurry, during the spraying operation, as~~ The addition of materials into the slurry shall be conducted in the order and time specified by the manufacturer to ensure a homogeneous slurry and survivability of the seed and inoculants. During the spraying operation, a homogenous mixture of suspended solids in the tank until the tank is emptied. Upon request of the Engineer, a representative from the HECP manufacturer shall be on site to aid in application and inspection of the mixture application.

**652.6.4-Rolled Erosion Control Products:** Rolled erosion control products (RECPs) shall be composed of natural or polymer fibers bound together to form a matrix to provide erosion control. RECPs shall conform to all requirements within 715.24. RECPs shall be installed in accordance with the manufacturer's recommendations to slope with 100% surface coverage. Single net straw matting shall be installed on slopes less than or equal to 3H:1V. Double net straw matting shall be installed on slopes less than or equal to 2H:1V.

Site preparation is crucial to achieve continuous intimate contact between the soil and the RECP. The site must be fine graded to a smooth profile and the surface must be free from any

bumps or dips that cause separation between the soil and the RECP. All installed RECP's shall be inspected to ensure proper installation. All deficiencies shall be corrected.

RECPs shall be installed as follows for proper long term effectiveness. A six (6) inch by six (6) inch trench shall be dug a minimum of three (3) feet above the top of slope. The RECP shall then be laid into the trench with six (6) inches of material extended above the trench to be used for overlap. The RECP laid in the trench shall be anchored with six (6) inch anchors at one (1) foot intervals along the width of the RECP. Backfill soil shall then be added to the trench on top of the anchored RECP and compacted. The six (6) inch overlap will then wrap around the backfilled soil and be anchored. The RECP shall then be installed parallel to the slope direction.

Each RECP should overlap another by six (6) inches to provide maximum coverage and stability. Each overlap shall be anchored at one (1) foot intervals along the length of the RECP. RECPs shall be pulled to remove excess slack without breaking contact with the soil surface and anchored to the slope with six (6) inch anchors (stakes or pins). The Engineer may require longer anchors for sandy or loose soils. Refer to table 652.7.4.1 for the minimum anchor frequency requirements.

**TABLE 652.6.4**

| **RECP Anchoring Requirement** | |
|---|---|
| **Slope Grade** | **Anchoring Frequency (anchors / square yard)** |
| Up to 3H:1V | 1.5 |
| 3H:1V to 2H:1V | 2.0 |

**652.6.5-Straw Mulch:** Clean, dry straw mulch may be applied on slopes less than 4H:1V. Straw mulch may be applied to slopes up to 2H:1V if the coverage area is less than 1 acre. Straw mulch shall be applied at a rate of two (2) tons per acre with eighty five percent (85%) surface coverage by visual observation. The maximum allowable continuous slope length for straw mulch is fifty (50) feet. Slope interruption devices or rolled erosion control products are required for continuous slope length longer than fifty (50) feet. Straw mulch must be anchored with a non-toxic tackifier or binder according to the manufacturer specifications. The non-toxic tackifier or binder should be applied on the straw at the manufacturer's recommended rates. The Contractor shall be responsible for any damage to structures from the tackifier or binder.

Straw mulch around buildings, sidewalks, or other structures may be held in place with a form of netting or may be sprayed with a non-toxic tackifier or binder by hand while protecting the structures from over spray.

**652.6.6-Limestone:** The kind and rate of application of limestone shall be determined by the soil analysis. Agricultural granular, fast acting lime, or both may be needed depending on the results from the soil analysis. Lime is not required for temporary seeding unless directed by the Engineer.

**652.6.6.1-Agricultural Granular Limestone:** Agricultural granular limestone is used for long term pH remediation. Agricultural lime shall be uniformly distributed among the area and thoroughly mixed with the soil to a depth of three (3) inches. Mixing is not

required when spreading lime with hydraulic methods. Agricultural lime shall be spread at the rate recommended by the soil analysis.

**652.6.6.2-Fast Acting Limestone:** Fast acting limestone is used for immediate pH remediation and should only be used on sites that have time-sensitive guidelines, as directed by the Engineer. Fast acting lime comes in two forms: liquid and dry. The type of fast acting lime shall be determined by the Engineer. Both forms of fast-acting limestone shall be applied at the recommended rate from results of the soil analysis.

**652.6.47-Fertilizer:** The kind and amount of fertilizer per acre shall ~~consist of any type with 1-2-1 ratio (nitrogen, phosphoric acid, and potash) providing the minimum nutrient equivalent of 1,000 lb. of 10-20-10. In addition, 300 lb. per acre of slow release urea formaldehyde fertilizer shall be added whenever second step seeding and fertilizing is not feasible due to the Contract completion date. When hydraulic seeding methods are used, the fertilizer shall be applied concurrently with the seeding and mulching operation as part of the slurry mix. When commercial fertilizer is applied by the spray or hydraulic method, it need not be worked into the soil.~~

~~Fertilizer applications for second and third step seeding shall be in accordance with subsection 652.8.~~ be determined by the soil analysis. Fertilizer type and quantity will then be prescribed by the Engineer based on a site-by-site analysis. The Engineer may require more than one type and quantity of fertilizer based on the project site characteristics due to varying soil conditions and properties.

Re-application and spot application fertilizer requirements shall be based on soil tests to determine the appropriate type and quantity to mitigate the failed vegetative establishment.

Temperature Release Nitrogen (Environmentally Sensitive Nitrogen (ESN)) should be considered during winter seeding to prevent excess nitrogen runoff and to preserve nitrogen for the growing season.

**652.6.8-Biological Growth Stimulants:** Biological growth stimulants shall be applied to all topsoil containing less than three percent (3%) organic matter by weight. The amount and type of stimulant will be determined by the soil analysis. All biological growth stimulants shall conform to 715.30.

**652.6.9-Hydraulic Growth Medium:** Hydraulic growth medium (HGM) shall be used when topsoil cannot be used and the subsoil analyzed for permanent seeding does not contain at least three percent (3%) organic matter by weight. The HGMs shall conform to sections 651 and 715.31.

**652.6.~~5~~10-Wood Chips:** Wood chips, recovered from clearing and grubbing operations, or bark will be acceptable ~~as a mulch for seeding and shall be used at a rate of 35 cubic yard per acre in lieu of straw or hay.~~ for landscaping at a depth of two (2)-four (4) inches or used to fill compost socks for erosion control measures instructed by the Engineer.

**652.7-MAINTENANCE OF SEEDED AND MULCHED AREAS:**

**652.7.1-Contractor Maintenance Requirements:** The Contractor shall maintain all seeded areas until final acceptance of the project, minimum of seventy percent (70%)

vegetative cover.~~.~~ All areas shall be protected from equipment ~~traffic and any damaged areas shall be repaired and reseeded.~~ and foot traffic and any damaged areas shall be repaired and reseeded. The Engineer will require spot application or re-application, or both, depending upon the completion date and estimated completion time of any remaining items on the project.

~~**652.8 SECOND AND THIRD STEP SEEDING, FERTILIZING AND MULCHING:**~~

**652.7.2-Re-Application:** The re-application of seed, mulch, and fertilizer shall be applied as directed by the Engineer based on ~~The Engineer will require second or third step seeding, or both, depending upon~~ the completion date~~,~~ ~~and~~ estimated completion time of any remaining items on the project~~,~~ and unsatisfactory stand development.~~ The second application of fertilizer, seed and mulch shall be applied as directed by the Engineer.~~ The application rates will be based on the stand of grass, severity of erosion and condition or growth of grass as described. ~~Spring seedings shall be refertilized and reseeded as needed in the fall from August 15 to October 15. Fall seeded areas shall be given a second step seeding and fertilizing, as required, the following spring from March 15, to May 15.~~ Spring seeding shall be re-fertilized and re-seeded as needed in the summer and fall from August 1st to October 31st. Summer and fall seeded areas shall be re-seeded and re-fertilized in the following spring from March 1st to ~~June 20th~~ May 31st.

The following shall be used as a guide for ~~second step application~~ for re-application:

i. For areas with less than fifty percent (50%) stand or subject to sever erosion, apply the ~~complete amount of seed, fertilizer, and mulch (wood cellulose fiber) as specified in the original seeding.~~ original specified seed, fertilizer, lime, and mulch rates.

ii. For areas with over fifty percent (50%) ~~of grass and slight to moderate erosion~~ stand,, apply one half the original ~~fertilizer and~~ seed fertilizer, lime, and mulch rates., ~~. If erosion is a problem apply one half the original wood fiber mulch.~~

~~The third step seeding, mulching, and fertilizing shall consist of spot application on areas not showing a satisfactory stand after the second step application. The quantity of material will be determined on the same basis as for the second step application. No urea formaldehyde fertilizer will be needed for third step seeding.~~

**652.7.3-Spot Application:** Spot application is for areas that have been damaged or not showing a satisfactory stand after the original or re-application, or both for seeding, mulching, liming, and fertilizing of the project site. The quantity of material will be determined by the Engineer based on the size and requirements of the spot applications.

**652.8-Blank**

**652.9-METHOD OF MEASUREMENT:**

Ground agricultural limestone, fast-acting limestone, fertilizer, and mulch will be measured by the ton. Seed will be measured by the pound.

~~Wood chips or bark~~ Mulch will be measured by the cubic yard. It is assumed that 17.5 cubic yard of chips or bark are equal to one (1) ton of straw for seeding. Wood chips or bark mulch will be measured by truck load or other loose volume measurement, and payment will be made on one ton equivalent of straw for each 17.5 cubic yard of ~~wood chips or bark~~ mulch.

~~Second and third step seeding operations~~ Re-application and spot application will be measured and included for payment under items in subsection 652.11.

~~Chemical mulch binders~~ Tackifier or binder for anchoring mulch will not be measured separately, but their cost shall be included in the unit price bid for mulch.

**652.10-BASIS OF PAYMENT:**

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 considered full compensation for furnishing all materials and performing all the work prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies, and incidentals necessary to complete the work.

Topsoil will be measured and paid for in accordance with the provisions of section 651.

The bid price for fertilizer is based on 10-20-10 type. When other types of fertilizer are ~~used, pay quantities will be determined using the following table.~~ determined by the Engineer based on soil tests, pay quantities will be established by the following table.

| Type of Fertilizer | Actual Quantity Used Pounds | Pay Quantity Pounds |
|---|---|---|
| 5-10-5 | 100 | 50 |
| 8-16-8 | 100 | 80 |
| 10-20-10 | 100 | 100 |
| 12-24-12 | 100 | 120 |
| 15-30-15 | 100 | 150 |
| 18-46-0 | 100 | 180 |

When fertilizer types other than those shown above are used, the relationship between the pay quantity and the actual quantity used will be established by the Engineer.

**652.11-PAY ITEMS:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 652001-* | Agricultural Limestone | Ton |
| 652001-* | Fast-Acting Limestone, Dry | Pound |
| 652001-* | Fast-Acting Limestone, Liquid | Gallon |
| 652002-* | Fertilizer, “type” | Ton |
| 652003-* | Seed Mixtures, “type” | Pound |
| 652004-* | ~~“type”~~ Mulch, “type” | Ton |
| 652006-* | Biological Growth Stimulant, “type” | Pound |
| 652006-* | Hydraulic Growth Medium, “type” | Pound |

* Sequence number

DRAFT

~~December 12, 2024~~ February 10, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 715
# MISCELLANEOUS MATERIALS

DELETE THE ENTIRE CONTENTS OF SUBSECTIONS 715.25 THROUGH 715.32 AND REPLACE WITH THE FOLLOWING:

**715.25-~~GROUND AGRICULTURAL~~ LIMESTONE:**

**715.25.1-Ground Agricultural Limestone:** Ground agricultural limestone shall consist of high calcitic or dolomitic limestone containing not less than 85% of total calcium and magnesium carbonates, ground to such fineness and clearly labeled in accordance with the requirements of the West Virginia Department of Agriculture. Ground agricultural limestone shall be furnished and used in accordance with State Laws. Suppliers must be registered with the West Virginia Department of Agriculture.

**715.25.2-Fast Acting Limestone:** Fast acting limestone shall meet all requirements of ground agricultural limestone with the West Virginia Department of Agriculture, except percent by weight passing U.S. Standard Sieves.

**715.26-FERTILIZERS:**

Commercial fertilizers shall be supplied separately or in mixtures containing the specified percentages of total nitrogen, available phosphoric acid, and water-soluble potash. Fertilizer shall be furnished in standard containers with weight, name of plant nutrients and guaranteed percentages, clearly marked, all in accordance with governing State and Federal laws. Brands must be registered with the West Virginia State Department of Agriculture.

**715.26.1-Fertilizer for Seeding:** Fertilizer for seeding shall consist of any type ~~with a 121 ratio providing the minimum nutrient equivalent specified~~ meeting the minimum specified by the soil analysis. Urea formaldehyde fertilizer shall contain a minimum of 38 percent (38%) slowly available nitrogen.

Commercial fertilizer for seeding may be supplied in any of the following forms, subject to the approval of the Engineer.

i. A dry, free flowing fertilizer that may be applied by ordinary agricultural spreaders.
ii. A fertilizer which is water soluble or one which will permit complete suspension of insoluble particles in water, applicable to hydraulic methods of application.

**715.26.2-Fertilizer for Landscape Planting:** The fertilizer shall be a co-granulated magnesium ammonium phosphate and magnesium potassium phosphate, controlled release, inorganic fertilizer compound (coarse grade). It shall have a guaranteed minimum analysis of:

| | Percent |
|---|---|
| Nitrogen | 7 |
| Maximum water soluble ammoniacal nitrogen | 2 |
| Minimum water insoluble ammoniacal nitrogen | 5 |
| Phosphoric acid (available $P_2O_5$) | 40 |
| Potash($K_2O$) | 6 |

**715.27-MULCH MATERIAL:**

**715.27.1-Mulch Material for Seeding:**

**715.27.1.1-Straw Mulch:** Straw mulch for seeding shall include baled wheat or oats straw, ~~or baled grass hay. Alfalfa, clover and salt grass hay are not acceptable~~ free of seed heads. Hay shall not be used. Straw mulch shall be dry and reasonably free from weeds, sticks, or other foreign material.

Acceptance shall be based on the Division's visual inspection of the material.

Wood Mulch for seeding should be 100% recycled materials, biodegradable, thermally refined, plastic-free, and phytosanitized to eliminate potential weed seeds and pathogens.

**715.27.1.2-~~Wood Cellulose Mulch~~ Hydraulic Erosion Control Products (HECP):** Mulch for use with the hydraulic application of grass seed shall consist of a minimum of 70% wood ~~cellulose~~ fiber. It should become insoluble and non- dispersible after drying to limit raindrop impact on soil. Do not use materials composed of paper, cellulose fiber, or any mixture containing paper or cellulose. It shall contain no growth or germination inhibiting factors ~~and~~, shall be dyed green, and shall not form a water-resistant crust.

When the material is agitated in slurry tanks with fertilizers, grass seed, water and other approved additives, the fibers shall become uniformly suspended to form a homogeneous slurry. The hydraulically sprayed slurry shall form a blotter-like ground cover impregnated with grass seed. The ground cover shall permit the absorption of water and allow rainfall or mechanically applied water to percolate to the underlying soil, and it must completely photo-degrade or biodegrade.

The ~~wood cellulose fiber mulch~~ hydraulic erosion control product shall conform to the following requirements:

| | |
|---|---|
| ~~Length of fibers~~ | ~~10 mm. maximum~~ |
| ~~Thickness of Fibers~~ | ~~1 mm. maximum~~ |
| ~~Net Dry Weight Content*~~ | ~~Minimum stated on bag~~ |
| ~~pH*~~ | ~~4.0-8.5~~ |
| ~~Water Holding Capability*~~ | ~~90% Minimum~~ |

~~* Test Procedure MP 715.27.20~~

**TABLE 715.27.1.2**

| Mulch Types | | | | |
|---|---|---|---|---|
| **Property** | **Test Method** | **HECP Type 1** | **HECP Type 2** | **HECP Type 3** |
| **Physical** | | | | |
| Color | Observed | Colored to contrast application area, shall not stain concrete or painted surfaces. | | |
| Organic Matter | ASTM D2974 | 90% minimum | | |
| Water Holding Capacity | ASTM D7367 | 600% Minimum | 800% Minimum | 1200% Minimum |
| Acute Toxicity | ASTM 7101 EPA 2021.0-1 | Non Toxic | | |
| Mass per Unit Area ($g/m^2$) | ASTM D6566 | 150 | 250 | 350 |
| Thickness of Fibers (mm) | ASTM D6525 | 2.5 | 3 | 4 |
| **Endurance** | | | | |
| Functional Longevity | ASTM D5338 | ≥ 90 days | ≥ 180 days | ≥ 365 days |
| **Performance** | | | | |
| Maximum Slope Application | Observed | 4.0H:1V | 2.0H:1V | 0.5H:1V |
| Cover Factor | ASTM D8298 | C ≤ 0.3 | C ≤ 0.05 | C ≤ 0.01 |
| Ground Cover | ASTM D6567 | > 90% | > 95% | > 97% |
| Vegetation Establishment | ASTM D7322 [a] | 300% Minimum | 400% Minimum | 500% Minimum |

a. ASTM test methods developed for Rolled Erosion Control Products (RECPs) that have been modified to accommodate Hydraulic Erosion Control Products (HECPs).

The mulch shall be delivered in packages not to exceed 100 lbs. The package shall bear the name of the manufacturer, the net weight and a supplemental statement of the net dry weight.

The material must be approved prior to being used. Acceptance will be based on sampling and testing by the Division for conformance to specifications.

**715.27.1.3-Chemical Mulch Binder:** A chemical mulch binder shall consist of a polymer~~, synthetic resin, polypectate~~ guar, starch, polyacylamide, or other material which can readily be removed and will give similar adhesive properties as asphalt when sprayed on straw or other fiber mulches.

**715.27.2-Mulch Materials for Landscape Plantings:** Acceptable materials for mulching shall be shredded bark, buckwheat hulls, wood chips or other organic materials approved by the Engineer.

Certain inorganic materials such as calcined clay, crushed rock or coarse gravel will be acceptable when designated on the Plans.

**715.28-SEED:**

The varieties of grass and legume seeds to be furnished to the project shall bear a tag on

each bag of each species showing the lot number, the seedman's name, the percent of purity, the percent of germination and the weed seed content, in accordance with governing State and Federal laws.

All seeds shall be free from noxious weed seeds as set forth in the West Virginia State seed law and in no event shall the total weed content of any lot of seed or seed mixture exceed one-half percent by weight. The minimum percent purity and germination for the various seeds shall be as shown in Table 715.28.

| ~~Seed~~ | ~~Purity Minimum %~~ | ~~Germination~~ | |
|---|---|---|---|
| | | ~~Total Minimum (%)~~ | ~~Minimum Quick Sprouts (%)~~ |
| ~~Crown Vetch~~ | ~~99~~ | ~~*70~~ | ~~35~~ |
| ~~Kentucky Bluegrass~~ | ~~85~~ | ~~75~~ | |
| ~~Kentucky 31 Fescue~~ | ~~98~~ | ~~85~~ | |
| ~~Marion Bluegrass~~ | ~~90~~ | ~~75~~ | |
| ~~Perennial Ryegrass~~ | ~~95~~ | ~~85~~ | |
| ~~Red Fescue~~ | ~~98~~ | ~~85~~ | |
| ~~White Dutch Clover~~ | ~~98~~ | ~~*85~~ | ~~55~~ |

**TABLE 715.28**

**Minimum Seed Purity And Germination**

| Variety of Seed | Minimum Seed Purity (%) | Minimum Seed Germination (%) |
|---|---|---|
| Common Oat *(Avena sativa)* (March 1-Octotber 31) | 98 | 85 |
| Cereal Rye *(Secale cereal)* (November 1 – February 28) | 98 | 85 |
| Autumn Bentgrass *(Agrostis perennans)* | 95 | 85 |
| Chewing's Fescue *(Festuca rubra ssp. commutate)* | 97 | 85 |
| Hard Fescue 'Chariot' *(Festuca brevipila)* | 97 | 85 |
| Hard Fescue 'Heron' *(Festuca ovina var. duriuscula)* | 97 | 85 |
| Creeping Red Fescue *(Festuca rubra)* | 97 | 85 |
| White Clover *(Trifolium repens)* | 99 | 85 |
| Big Bluestem *(Andropogon gerardii)* | 85 | 70 |
| Virginia Wildrye *(Elymus virginicus)* | 85 | 70 |
| Switchgrass *(Panicum virgatum)* | 95 | 75 |
| Indiangrass *(Sorghastrum nutans)* | 85 | 70 |
| Partridge Pea *(Chamaecrista fasciculate)* | 98 | 70 |

| | | |
|---|---|---|
| Black-Eyed Susan *(Rudbeckia hirta)* | 80 | 60 |
| Narrowleaf Mountainmint *(Pycnanthemum tenuifolium)* | 80 | 40 |
| Wild Bergamot *(Monarda fistulosa)* | 80 | 40 |
| Panicledleaf Ticktrefoil *(Desmodium paniculatum)* | 90 | 70 |
| Smooth Oxeye *(Heliopsis helianthoides)* | 80 | 60 |
| Flat-top Goldentop *(Euthamia graminifolia)* | 70 | 40 |
| Redtop *(Agrostis gigantean)* | 92 | 80 |
| Birdsfoot Trefoil *(Lotus corniculatus)* | 98 | 95 |
| Fox Sedge *(Carex vulpinoidea)* | 85 | 60 |
| Fowl Bluegrass *(Poa palustris)* | 90 | 70 |
| Redtop Panicgrass *(Panicum rigidulum)* | 99 | 70 |
| Common Rush *(Juncus effuses)* | 85 | 60 |
| Shallow Sedge *(Carex lurida* | 85 | 60 |
| Blue Vervain *(Verbena hastate)* | 80 | 50 |
| Wingstem *(Verbesina alternifolia)* | 90 | 80 |
| Joe Pye Weed *(Eutrochium purpureum)* | 80 | 60 |
| Swamp milkweed *(Asclepias incarnata)* | 80 | 60 |
| Butterfly Milkweed *(Asclepias tuberosa L.)* | 80 | 60 |
| Common Milkweed *(Asclepias syriaca)* | 80 | 60 |
| Purple coneflower *(Echinacea purpurea)* | 80 | 60 |

~~Crown vetch seed~~ All legumes shall be inoculated according to the supplier's recommendations. However, when seeding with the hydroseeder the inoculant shall be increased to five times the recommended rate.

If test results indicate noncompliance with the above germination or purity requirements, or both, additional seed may be added to give the equivalent germination or purity, or both.

The Division reserves the right to test, reject or approve all seed after delivery on the project.

**715.29-INOCULATING BACTERIA:**

This material shall be used to treat all leguminous seed and shall be a pure culture of

nitrogen fixing bacteria selected for maximum vitality and ability to transform nitrogen from the air into soluble nitrates and deposit them in the soil. It shall not be more than one year old.

~~**715.30 through 715.32:** Blank~~

**715.30-BIOLOGICAL GROWTH STIMULANTS:**

Biological growth stimulants (BGSs) shall be applied to topsoil containing less than 3% organic matter. BGSs shall provide immediate organic matter adjustment to help stimulate seed germination, improve the availability of nutrients to the grass, and generate robust plant growth which is more tolerant of changes in environmental conditions.

Animal by-products, municipal waste products, and liquid fertilizers are not acceptable for use as a BGSs.

BGSs shall not contain germination or growth inhibiting factors or form a water-resistant crust that can inhibit plant growth. BGSs shall come pre-packaged by the manufacturer to assure material performance and compliance with the minimum requirements in Table 715.30.1 No field mixing of components shall occur on site.

**TABLE 715.30.1**

| **Minimum Biological Growth Stimulant Requirements** | | |
|---|---|---|
| **BGS Property** | **Test Method** | **Required Value** |
| **Physical** | | |
| Humate/Humic Acid | | 1% minimum |
| Acute Toxicity | ASTM 7101<br>EPA 2021.0-1 | Non Toxic |
| **Performance** | | |
| Seed Germination | ASTM D7322 [a] | 200% minimum |
| Plant Height | ASTM D7322 [a] | 200% minimum |
| Plant Mass | ASTM D7322 [a] | 110% minimum |

a. ASTM test methods developed for Rolled Erosion Control Products (RECPs) that have been modified for comparison to control at 21 days.

**715.31-HYDRAULIC GROWTH MEDIUM:**

Hydraulic growth mediums (HGMs) may be applied on areas to replace topsoil, by instruction of the Engineer, in areas where little to no organic matter is present in the parent subsoil. The HGMs provides a substance on which plants can be grown that requires no curing time, provides exceptional seeding germination and plant establishment, assists in soil building, and provides erosion control. HGMs may be applied to slopes with a steepness factor of 2H:1V or less.

The HGMs shall consist of a two-part system:

i. A blend of organic and natural fibers with fast-acting soil building and growth components.

ii. Materials and components that increase the water and nutrient holding capacity of the soil and create an environment for growth of beneficial microorganisms while allowing seed germination and vegetation establishment. These shall include at least 10% of the final composition:

   a. Biochar
   b. Humus/Humic Acid
   c. Mycorrhizae Fungi

d. Seaweed Extract
e. Trace Elements
f. Growth Stimulators
g. Beneficial Microorganisms
h. Micronutrients
i. Organic Growth Mediums.

**TABLE 715.31.1**

| **Organic Fiber Requirements** | | |
|---|---|---|
| **Property** | **Test Method** | **Value** |
| **Physical** | | |
| Minimum Organic Fiber Content like a combination of Bark fiber, wood fiber etc. | | 80% |
| Moisture Content | | ≤20% |
| Minimum Total Organic Matter | ASTM D586 | 88% |
| Maximum Carbon: Nitrogen Ratio | ASTM D1508 | 50:1 |
| pH | ASTM D1293 | 5-7 |
| **Performance** | | |
| 21 Day Germination | ASTM D7322 | 500% |
| Minimum Water Holding Capacity | ASTM D7367 | 900% |

The application rates for all components shall be to manufacturer's specifications while following the minimum application rates outlined in Table 715.31.2 and Table 715.31.3.

**TABLE 715.31.2**

| **Organic Fiber Material Minimum Rates** | |
|---|---|
| **Property** | **Minimum Application Rate lbs/acre** |
| **% Organic Matter of Subsoil** | |
| < 0.75 | 5,000 |
| 0.75 – 1.5 | 4,500 |
| 1.5 - 2.0 | 4,000 |
| 2.0 – 5.0 | 3,500 |

**TABLE 715.31.3**

| **Soil Chemistry and Stabilizer Material Minimum Rates** | | |
|---|---|---|
| **Slope** | **Soil Type** | **Minimum Application Rate lbs/acre** |
| <3H:1V | Sand | 35 |
| | Clay | 70 |
| 3H:1V – 2H:1V | Sand | 70 |
| | Clay | 140 |

**715.32-Blank**

DRAFT

February 11, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SPECIAL PROVISION

## FOR

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

## SECTION 642
## TEMPORARY POLLUTION CONTROL

**642.6-TEMPORARY PIPE, CONTOUR DITCHES, BERMS, SLOPE DRAINS, ROCK CHECK DAM, SILT FENCE, AND SUPER SILT FENCE:**

REMOVE AND REPLACE 642.6.5 WITH THE FOLLOWING:

**642.6.5-Silt Fence:** The ~~minimum~~ height above ground for the silt fence shall be sixteen (16) ~~-~~inches and twenty-four (24) inches~~two (2) feet~~. Minimum embedment depth shall be eight (8) inches. ~~The maximum post spacing shall be based on elongation of the geotextile as measured in accordance with Test Method D 4632. Silt fence geotextile with elongation 50 % shall have a maximum post spacing of four (4) feet. Silt fence geotextile with elongation < 50 % shall have a maximum post spacing of 6.5 feet. When silt fence is installed in valleys where water can pond behind the fence then the post spacing shall be half of the maximum post spacing for the geotextile used.~~

~~When silt fence is installed by the trenching method the geotextile at the bottom of the fence shall be buried in a "J" configuration to a minimum depth of eight (8) inches in a trench so that no flow can pass under the silt fence. Backfill the trench and compact the soil over the geotextile.~~

~~When silt fence is installed by the soil slicing method the geotextile shall be installed in a slit in the soil eight (8) to twelve (12) inches deep so that no flow can pass under the silt fence. Create the slit such that a horizontal chisel point (approx. 3 inches wide) at the base of a soil slicing blade (approx. ¾ inches wide) that slightly disrupts soil upward as the blade slices through the soil. This upward disruption minimizes horizontal compaction and creates an optimal soil condition for mechanical compaction against the geotextile. Overturning of the soil shall not be permitted. The geotextile shall be mechanically inserted directly behind the soil slicing blade in a simultaneous operation, achieving consistent placement and depth.~~Soil along the fence shall be compacted to ensure that the fence fabric is well anchored in the soil.

The silt fence geotextile shall be spliced together with a sewn seam only at a support post, or two sections of fence may be overlapped.

Silt fence posts shall be driven to a minimum of twenty (20) inches into the ground. This depth shall be increased to two (2) feet if the fence is placed on a slope of 3:1 or greater. Where the minimum

depth is ~~impossible~~ difficult to attain, the steel posts may be necessary. ~~shall be adequately secured to prevent overturning of the fence due to loading.~~ The geotextile shall be properly fastened to the upslope side of the fence posts.

Silt fences shall be continuous and transverse to the flow. The silt fence shall follow the level contours of the site ~~as closely as possible~~to prevent concentrated flow. ~~Place the fence such that the water cannot runoff around the end of the fence~~To prevent water from flowing around the end of the silt fence, turn the ends of the fence upslope.

~~The silt fence trench shall be compacted on the upstream side first, and then the downstream side. The silt fence trench shall be compacted to a minimum of 90% of the original ground density and the posts must be installed after compaction of the trench. The trench compaction will be based on visual inspection and the engineer may require compaction testing to verify the visual inspection.~~

The contractor shall inspect and maintain all silt fences ~~immediately after each rainfall and at least daily during prolonged rainfall~~in accordance with all applicable permits and the site specific Stormwater Pollution Prevention Plan (SWPPP). The contractor shall immediately correct any deficiencies. The contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist as determined by the Qualified Person or Environmental Monitor,~~engineer,~~ additional silt fence shall be installed as necessary and as directed by the E~~e~~ngineer. Accumulation of sediment along the silt fence indicates inadequate protection of upslope disturbed ground. When this is observed, corrective action shall be taken to reduce erosion. When the sediment deposits reach a depth of six (6) inches sediment shall be removed. Also, remedial BMP measures shall be implemented as red-line changes to the SWPPP to prevent erosion above the silt fence. The cost of sediment removal is incidental to Silt Fence. Remedial BMP's shall be paid in accordance with the provisions of the contract.~~When the sediment deposits reaches half the height of the fence the sediment shall be removed or a second silt fence shall be installed as directed by the engineer. The cost of this work shall be paid as "Sediment Removal" or "Silt Fence".~~

The silt fence shall remain in place until the E~~e~~ngineer directs it ~~be~~to be removed. Upon removal the contractor shall remove and dispose of any excess sediment accumulations~~, dress the area to give it a pleasing appearance~~, and vegetate all bare areas. Removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the E~~e~~ngineer.

Silt fence material shall be selected from the WVDOH Approved Products List for Engineering Fabric for Sediment Control (Silt Fence). Longer duration projects will require stronger silt fence materials with greater UV stability in accordance with the following table.

**Silt Fence Application Table**

| | ASTM Standard | Temporary | Standard | High Performance |
|---|---|---|---|---|
| Application | n/a | 1 construction season | 2 construction seasons | Longer projects and challenging situations |
| Grab Strength Machine Direction (lb) | D-4632 | 120 | 280 | 400 |
| Maximum Elongation (%) | D-4632 | 50 | 50 | 50 |

| | | | | |
|---|---|---|---|---|
| Min. Permittivity ($sec^{-1}$) | D-4491 | 0.05 | 0.05 | 0.05 |
| Max. Apparent opening size (mm) | D-4751 | 0.6 | 0.6 | 0.6 |
| UV Stability (%) | D-4355 | 70 | 80 | 90 |

Refer to the following table for post spacing

| Max. Post Spacing (ft) | | |
|---|---|---|
| | 16" high fence | 24" high fence |
| Steel T-post | | |
| 0.95#/ft | 5 | 3 |
| 1.25#/ft | 6 | 4 |
| 1.33#/ft | 7 | 5 |
| Wood stakes | | |
| 1-1/4" x 1-3/4" | 6 | 4 |
| 1-3/4" x 1-3/4" | 6 | 4 |

Longer and steeper slopes require multiple rows of silt fence for effective protection. Add rows of silt fence in accordance with the following table.

| Maximum Slope Length Above Silt Fence | | |
|---|---|---|
| Slope | | Slope Length (ft) |
| 0% - 2% | Flatter than 50:1 | 250 |
| 2% - 10% | 50:1 - 10:1 | 125 |
| 10% - 20% | 10:1 - 5:1 | 100 |
| 20% - 33% | 5:1 - 3:1 | 75 |
| 33% - 50% | 3:1 - 2:1 | 50 |

**642.9-PAY ITEMS:**

ADD THE FOLLOWING TO THE TABLE:

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 642011-* | Temporary Silt Fence | Linear Foot |
| 642012-* | Standard Silt Fence | Linear Foot |
| 642013-* | High Strength Silt Fence | Linear Foot |

*Sequence number

DRAFT

~~January 1, 2023~~ January 1, 2026

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 642
# TEMPORARY PLLUTION CONTROL

NOTE: This table will be posted at :
https://transportation.wv.gov/highways/TechnicalSupport/specifications/642.7UnitValueMethod/Pages/default.aspx/
(this link will be revised prior to publication of 2026 Supplemental Specifications).

## 642.7-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

**TABLE 642.7.1 – Pollution Control Device Rate Schedule**

| Description | (Item) | Unit | Value per Unit | Specification Note 2 |
|---|---|---|---|---|
| Temporary Berm | (642001-001) | LF | 2 | Yes |
| Slope Drain | (642002-001) | LF | 21 | Yes |
| Seed Mixture, Temporary | (642004-001) | LB | 2 | Yes |
| Seed Mixture, B | (642004-002) | LB | 5 | Yes |
| Seed Mixture, D | (642004-003) | LB | 20 | Yes |
| Seed Mixture, L | (642004-004) | LB | 18 | Yes |
| Mulch, Straw or Hay | (642005-001) | TN | 450 | Yes |
| Mulch, Wood Cellulose Fiber | (642005-002) | TN | 2,500 | Yes |
| Mulch | (642005-003) | TN | 2,500 | Yes |
| Hydraulic Erosion Control Product, function longevity (1 to < 6 months) | | LB | 1 | - |
| Hydraulic Erosion Control Product, function longevity (> 6 months) | | LB | 1 | - |
| Hydraulically Applied Polymers | | LB | 1 | - |
| Biotic Soil Amendment | | LB | 1 | - |
| Fertilizer | (642006-001) | TN | 850 | Yes |
| Fiber Matting | (642007-001) | SY | 2 | Yes |
| Temporary Pipe | (642008-001) | LF | 73 | Yes |
| Contour Ditch | (642009-001) | LF | 2 | Yes |
| Agricultural Limestone | (642010-001) | TN | 68 | Yes |
| Wattle, ≥ 8 IN | | LF | 12 | - |

**TABLE 642.7.1 – Pollution Control Device Rate Schedule**

| Description | (Item) | Unit | Value per Unit | Specification Note 2 |
|---|---|---|---|---|
| Silt Fence | (642012-001) | LF | 4 | Yes |
| Super Silt Fence | (642015-001) | LF | 10 | Yes |
| SMARTFence, 36 IN | | LF | 5 | - |
| SMARTFence, 42 IN | | LF | 10 | - |
| Simplified Diversion Fence | | LF | 5 | - |
| Compost Filter Sock, 8 IN | (642016-001) | LF | 7 | SP |
| Compost Filter Sock, 12 IN | (642016-002) | LF | 8 | SP |
| Compost Filter Sock, 18 IN | (642016-003) | LF | 9 | SP |
| Compost Filter Sock, 24 IN | (642016-004) | LF | 10 | SP |
| Compost Filter Sock, 32 IN | (642016-005) | LF | 11 | SP |
| Rock Check Dam | (642031-001) | EA | 93 | Yes |
| Sediment Trap | (642033-001) | CY | 17 | Yes |
| Sediment Basin | (642034-001) | CY | 17 | Yes |
| Riser | (642035-001) | EA | 9,000 | Yes |
| Skimmer | (642035-002) | EA | 2,800 | SP |
| Sediment Removal | (642036-001) | CY | 7 | Yes |
| Inlet Protection | (642040-001) | EA | 270 | Yes |
| Flocculant Block | (642042-001) | EA | 180 | SP |
| Polyacrylamide | | LB | 1 | - |
| Premanufactured Ditch Check | (642043-001) | EA | 67 | - |
| Turbidity Curtain | (642045-002) | FT | 100 | SP |
| Coir Baffles | | LF | 9 | - |
| Dewatering Device | (642050-001) | EA | 720 | Yes |
| Erosion Control Matting | (642055-001) | SY | 2 | - |
| Coconut Matting | | SY | 4 | - |
| Non-Woven Geotextile Fabric | | SY | 3 | - |
| | | | | |
| Rock Borrow Excavation | (211008-000) | TN | 75 | Yes |
| Impervious Core | (211017-001) | SF | 4 | Yes |
| ~~Seed Mixture, B, C-1, or C-2~~ | ~~(652003-001)~~ | ~~LB~~ | ~~20~~ | ~~Yes~~ |
| ~~Seed Mixture, D~~ | ~~(652003-002)~~ | ~~LB~~ | ~~20~~ | ~~Yes~~ |
| ~~Mulch, Straw or Hay~~ | ~~(652004-001)~~ | ~~TN~~ | ~~450~~ | ~~Yes~~ |
| ~~Mulch, Wood Cellulose Fiber~~ | ~~(652004-002)~~ | ~~TN~~ | ~~850~~ | ~~Yes~~ |
| ~~Fertilizer, 10-20-10~~ | ~~(652002-001)~~ | ~~TN~~ | ~~500~~ | ~~Yes~~ |
| ~~Fertilizer, Urea Formaldehyde~~ | ~~(652002-002)~~ | ~~TN~~ | ~~60~~ | ~~Yes~~ |
| Tied Concrete Block Mattress | (655002-002) | SY | 90 | SP |

Note 1: Units are calculated by multiplying the quantity of temporary pollution control devices installed on project by the rate value.

Example: 175 lbs of "Seed Mixture, Temporary" X 2 = 350 Units

Note 2 Items not covered by WVDOH Specification or Special Provision (SP) shall be handled and installed according to the manufacturer's recommendations.

DRAFT

~~May 30, 2019~~ February 4, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SPECIAL PROVISION

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

## SECTION 601
## STRUCTURAL CONCRETE

**601.1-DESCRIPTION:**

ADD THE FOLLOWING SUBSECTION:

**601.1.1-Mass Concrete:** Concrete placements whose least dimension exceeds 48.0 inches, excluding Drilled Caissons and tremie seals, shall be considered mass concrete and shall conform to the details shown on the plans and these special provisions.

Compensation for conforming to these requirements will be at no additional cost and shall be included in Pay Items for individual elements identified in the plans.

**601.2-MATERIALS:**

IN THE TABLE, REPLACE THE PORTLAND CEMENT AND COARSE AGGREGATE ROWS WITH THE FOLLOWING:

| MATERIAL | SECTION OR SUBSECTION |
|---|---|
| * Portland Cement | 701.1, 701.3, ASTM C150 Type II, ASTM C595 Type IT |
| ****** Coarse Aggregate | 703 |

IN THE FOOTNOTE SECTION OF THE TABLE, REPLACE ITEM ***, WITH THE FOLLOWING AND ADD FOOTNOTE ******:

*** The use of a SCM will not be permitted when a blended hydraulic cement is used. For the purposes of cement material substitution with SCMs, Type IL cement shall not be treated as a blended cement, and a SCM may be used with Type IL cement. Sources of each type of SCM shall be approved by the Engineer. Multiple sources of the same type of SCM shall not be permitted.

****** All coarse aggregate used in mass concrete placements shall be limestone

**601.3-PROPORTIONING:**

ADD THE FOLLOWING TO SUBSECTION 601.3.1:

**601.3.1-Mix Design Requirements:** For Mass Concrete placements, the Design Mix shall meet the 28-day compressive strength as specified in the plans. If the 28-day compressive strength obtained in the field does not meet the design 28-day compressive strength requirement, acceptance may be based on a 56-day compressive strength test, if approved by the Engineer after considering the stresses resulting from the construction sequence proposed by the Contractor. Acceptance shall be in accordance with Section 601.4.4 of the Standard Specifications and of this Special Provision, and per the approval of the Engineer.

For Mass Concrete placements, SCMs may be a combination of the following materials at the substitution rate shown in the following table:

| **Cementitious Materials** | **Maximum percent of total cementitious materials by mass**** |
|---|---|
| Class F Fly Ash | 25 |
| Slag Cement | 50 |
| Silica Fume | 10 |
| Total of Fly Ash and Slag Cement | 50* |
| Total of Slag Cement and Silica Fume | 50* |
| Total of Fly Ash and Silica Fume | 35* |

A combination exceeding more than two types of SCMs will not be permitted.

* Fly Ash shall not constitute more than 25-percent of the total cementitious materials.

** Total cementitious materials include the summation of portland cement, fly ash, slag cement, and silica fume.

**601.4-TESTING:**

**601.4.4-Compressive Strength Tests for Acceptance:**

ADD THE FOLLOWING TO SUBSECTION 601.4.4:

Compressive strength acceptance criteria pertaining to mass concrete elements may be based on 56-day compressive strength if approved by the Engineer after considering the stresses resulting from the construction sequence proposed by the Contractor.

**601.12-CURING AND PROTECTING CONCRETE:**

ADD THE FOLLOWING SUBSECTION:

**601.12.4-Mass Concrete:**

**601.12.4.1-Thermal Control Plan:** The Thermal Control Plan shall describe the measures and procedures the Contractor intends to use to satisfy the following Temperature Control Requirements for each mass concrete element:

1. The Maximum Allowable Temperature Differential shall be limited to 35 degrees F. The temperature differential between the hottest interior locations and exterior portions of the designated mass concrete elements during curing will be maintained to be less than or equal to this Maximum Allowable Temperature Differential, and
2. The Maximum Allowable Concrete Temperature shall be limited to 160 degrees F.

A change to the Temperature Control Requirements specified in section i above may be proposed by the Contractor and shall be submitted to the Engineer for approval prior to any pour. This submission will include the new proposed Maximum Allowable Temperature Differential, along with all necessary data providing evidence to satisfactorily demonstrate to the Engineer that the deleterious effects to the concrete can be avoided. The Contractor shall allow seven (7) days for approval.

As a minimum, the Thermal Control Plan shall include the following:

A. Mix design
B. Methodology used to determine the heat of hydration
C. Duration and method of curing.
D. Methods of controlling maximum concrete temperature and temperature differentials.
E. An analysis of the anticipated thermal developments in the mass concrete elements for all expected project temperature ranges using the proposed mix design, casting procedures, and materials. It shall show complete details and determine the maximum allowable temperature differentials between the hottest point of the concrete and the exterior faces.
F. Temperature sensor types and locations including installation details
G. Temperature Monitoring System including system description, operating plan, recording and reporting plan, and remedial action plan
H. Field measures to ensure conformance with the maximum concrete temperature and temperature differential requirements.
I. Field methods of applying immediate corrective action should the temperature differential approach the Maximum Allowable Temperature Differential.

The Contractor shall submit the Thermal Control Plan to the Engineer for approval a minimum of thirty working days prior to concrete placement. Mass concrete placement shall not begin until the Engineer has approved the Thermal Control Plan.

**601.12.4.2-Temperature Monitoring System**: The temperature monitoring and recording system for mass concrete shall consist of temperature sensors connected to a data acquisition system capable of printing, storing, and downloading data to a computer. Temperature sensors shall be located such that the maximum temperature difference within a mass concrete element can be monitored. As a minimum, concrete temperatures shall be monitored at: the

calculated hottest location, within 1 in. of the center, an outside vertical edge of the outer face that is furthest from the center of the element, and at the center and an outside edge of the top surface.

Temperature readings shall be automatically recorded on an hourly or more frequent basis. A redundant set of sensors shall be installed near the primary set. Provision shall be made for recording the redundant set, but records of the redundant sensors need not be made if the primary set is operational.

Methods of concrete consolidation shall prevent damage to the temperature monitoring and recording system. Wiring from temperature sensors cast into the concrete shall be protected to prevent movement. Wire runs shall be kept as short as possible. The ends of the temperature sensors shall not come into contact with either a support or concrete form, or reinforcing steel.

When any equipment used in the temperature control and monitoring and recording system fails during the mass concrete construction operation, the Contractor shall take immediate remedial measures to correct the situation as specified in the Thermal Control Plan.

**601.12.4.3-Construction:** Temperature readings will begin immediately after casting is complete. Temperature readings will continue until the maximum temperature differential (not maximum temperature) is reached and a decreasing temperature differential is confirmed as defined in the Thermal Control Plan and the maximum concrete temperature is within the Maximum Allowable Temperature Differential of the ambient air temperature in the shade. Data shall be printed and submitted to the Engineer daily. A copy shall be submitted to the Materials, Soils and Testing Division for informational purposes.

If monitoring indicates the Temperature Control Requirements have been exceeded, the Contractor shall take immediate corrective action as defined in the Thermal Control Plan.

In the event that the Temperature Control Requirements are exceeded, the Contractor shall conduct an investigation to determine if the concrete element was damaged as a result. The investigation shall be subject to the approval of the Engineer. If the investigation determines that the concrete is not damaged, no further action is required. If the investigation determines that the concrete is, or might be, damaged, the Contractor shall submit a repair plan to return the concrete to acceptable quality. The repair shall be subject to the approval of the Engineer. If the Engineer approves the repair plan, the concrete shall be repaired by the Contractor at his expense. If the Engineer determines that the concrete cannot be repaired, it shall be replaced by the Contractor at his expense.

The Contractor will make the necessary revisions to the approved Thermal Control Plan to satisfy the Temperature Control Requirements without resorting to corrective action on any remaining placements. Revisions to the approved plan must be approved by the Engineer prior to implementation. The revised plan will be used on future placements. No extension of time or compensation will be made for any rejected or repaired mass concrete element or revisions of the Thermal Control Plan.

DRAFT

~~February 11, 2025~~ April 3, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 601
# STUCTURAL CONCRETE

**601.1–DESCRIPTION:**

ADD THE FOLLOWING:

**Class M** concrete shall be used to produce less heat of hydration and intended for use in large concrete bridge substructure elements including pier stems, pier caps, footers, and abutments.

**601.2–MATERIALS:**

ADD THE FOLLOWING AFTER "Class H Concrete Requirements":

**Class M Concrete Requirements:** All coarse aggregate used in Class M concrete shall be limestone. River, manufactured silica , or limestone sand shall be used as fine aggregate in Class M concrete. Slag cement used in Class M concrete shall be Grade 100 or Grade 120. Fly ash used in Class M concrete shall be Class F. Sources of each type of supplemental cementitious material (SCM) shall be approved by the Engineer. Multiple sources of the same type of supplem~~ntal~~entary cementitious material shall not be permitted.

**601.3–PROPORTIONING:**

**601.3.1-Mix Design Requirements:**

ADD CLASS "M" CONCRETE AND UPDATE THE FIRST FOOTNOTE TO TABLE 601.3.1A:

**TABLE 601.3.1A**

| Class of Concrete | Design 28 Day Compressive Strength | Target Cement Factor | Maximum Water Content | Standard Size of Coarse Aggregate*** | Entrained Air |
|---|---|---|---|---|---|
| | Pounds per Square inch | lbs./c.y.* | lb. of water / lb. of cement ** | Number | Percent |

| | | | | | |
|---|---|---|---|---|---|
| M | 3500 | See Table 601.3.1E | 0.42 | 57, 67 | 6.0 |

* An equal mass of a SCM may be substituted for Portland cement up to the maximum amount in Table 601.3.1B. Only one SCM is permitted in a mix design, except for Class H concrete. The target cement factor of Class H concrete shall consist of Option 1 or Option 2 from Table 601.3.1C. The target cement factor of Class M concrete shall consist of Option 1, Option 2, or Option 3 from Table 601.3.1F. The Contractor may choose either option.

ADD THE FOLLOWING TO TABLE 601.3.1B:

**TABLE 601.3.1B**

| Material | Class of Concrete | Quantity |
|---|---|---|
| Fly Ash | All Classes Except H and M | 20% |

ADD THE FOLLOWING TABLE TO SUBSECTION:

**TABLE 601.3.1F**

| Option | Cement | Fly Ash | Slag Cement | Silica Fume |
|---|---|---|---|---|
| 1 | 564 lb/c.y. | | | |
| 2 | 254 lb/c.y. | | 254 lb/c.y. | |
| 3 | 340 lb/c.y. | 168 lb/c.y | | |

**601.3.2-Field Tolerances and Adjustments:**

**601.3.2.2-Air Content:**

REMOVE AND REPLACE THE 2nd PARAGRAPH IN SUBSECTION 601.3.2.2 WITH THE FOLLOWING:

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

ADD THE FOLLOWING SUBSECTION:

**601.3.3-Class M Mix Development:** The chemical reaction of cement and water releases heat which can cause detrimental thermal cracking in large concrete structures. To prevent thermal cracking, Class M concrete shall obtain minimum strength in accordance with 601.3.3.1. The Division will approve Supplementary Cementitious Materials, admixtures, and

Cements based on their chemical, and thermal properties for Class M concrete during mix design approval.

**601.3.3.1–Tests for Strength Acceptance of Class M Concrete:** Class M concrete shall obtain a minimum 1-day and 3-day strength shown in Table 601.3.3.1.

**TABLE 601.3.3.1**

| Minimum Compressive Strength of Class M Concrete | | | |
|---|---|---|---|
| Testing Age | Option 1 | Option 2 | Option 3 |
| 1-Day | 1580 psi (10.9 MPa) | 710 psi (4.9 MPa) | 1010 psi (6.9 MPa) |
| 3-Day | 2700 psi (18.6 MPa) | 1680 psi (11.6 MPa) | 1810 psi (12.5 MPa) |

A strength test shall consist of three test specimens. Specimens shall be cured in a water bath at 73.5 ± 3.5 °F. The test shall be the average of the three specimens, except if one specimen shows manifest evidence of improper sampling, molding, or testing, it shall be discarded, and the remaining two strengths averaged. Should more than one specimen representing a given test show definite defects due to improper sampling, molding, or testing, the entire test shall be discarded. The maximum acceptable range of compressive strengths within a set of three cylinders is 9.5%. This range is found by multiplying 9.5% times the average compressive strength of the three cylinders. If this acceptable range is exceeded, the cylinder that varies the most from the average shall be discarded, and the remaining two cylinders shall be evaluated as outlined in the following paragraph. The maximum acceptable range of compressive strengths within a set of two cylinders is 8.0%. This range is found by multiplying 8.0% times the average compressive strength of the two cylinders. If this acceptable range is exceeded, the entire test shall be discarded. Under no circumstances shall a compressive strength test consist of less than the average of two specimens.

**601.4–TESTING:**

**601.4.1–Sampling and Testing Methods:**

ADD THE FOLLOWING TO THE TABLE:

| | |
|---|---|
| ~~Splitting tensile strength of cylindrical concrete specimens~~ | ~~AASHTO T 198~~ |

**601.8–FORMS:**

**601.8.7-Removal of Forms and Construction of Superimposed Elements:**

ADD THE FOLLOWING PARAGRAPH AT THE END OF SUBSECTION 601.8.7:

Concrete elements cast with Class M or Class B concrete shall have forms remain in place for a minimum of 96 hours. Insulated concrete elements with Class M concrete shall follow 601.8.11. Insulated concrete elements with Class B concrete shall have forms remain in place for a minimum of 11 days.

ADD THE FOLLOWING SUBSECTION:

**601.8.11–Removal of Form Insulation of Class M Concrete:** Insulated forms shall remain in place for a minimum of 96 hours. The insulation may be removed when the temperature difference between the concrete surface and the lowest daily ambient temperature is less than 40 °F after 96 hours. The lowest forecast ambient temperature during the week of formwork removal shall be used as the lowest daily ambient temperature. The concrete surface temperature measurement shall be taken before exposing the concrete surface to the ambient temperature. The concrete surface temperature may be measured using an embedded temperature sensor 2-in from the concrete surface at the center of the side face closest to the center of the element. In the absence of an embedded temperature sensor, other approved temperature devices may be used to measure the concrete side face temperature closest to the center of the element. In lieu of concrete surface temperature measurements, the form insulation removal time for an R = 5 insulation in an ambient temperature ranging from 60 °F to 30 °F is shown in Table 601.8.11. Ambient temperature outside the 60 °F to 30 °F range requires a temperature sensor. The actual minimum dimension shall be rounded up to the nearest tabulated minimum dimension. If the minimum dimension exceeds the minimum dimension tabulated in Table 601.8.11, the structure shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5. Concrete placement outside the 60 °F to 30 °F temperature range and without an embedded temperature sensor specified above shall meet 601.12.2 requirement for insulation removal: "When protection is removed from the structure after the specified curing is complete, the temperature of the concrete shall not be permitted to fall at a greater rate than 20 ˚F per 24-hrs." The specified curing for these cases shall be at least 7-days. Additionally, the temperature difference between the concrete surface and the lowest daily ambient temperature shall not be greater than 40°F.

**TABLE 601.8.11**

| Form Insulation Removal Times (Class M concrete with R = 5 Insulation) | | | | | |
|---|---|---|---|---|---|
| Type | Cross-Section | Minimum Dimension (ft) | Class M Concrete: Option 1 | Class M Concrete: Option 2 | Class M Concrete: Option 3 |
| Pier Stem | Circular | 6 or less | 288-hrs | 216-hrs | 192-hrs |
| | | 7 | See 601.9.3.5 | 240-hrs | 240-hrs |
| | | 8 | See 601.9.3.5 | 288-hrs | 288-hrs |
| | Square | 3.5 or less | 168-hrs | 168-hrs | 144-hrs |
| | | 4.5 | 264-hrs | 216-hrs | 216-hrs |
| | | 5.5 | See 601.9.3.5 | 288-hrs | 264-hrs |
| | Rectangular | 2 or less | 144-hrs | 120-hrs | 120-hrs |
| | | 3 | 240-hrs | 192-hrs | 192-hrs |
| | | 4 | See 601.9.3.5 | 288-hrs | 288-hrs |
| Pier Cap | | 5 or less | 228-hrs | 192-hrs | 204-hrs |

| | | | | | |
|---|---|---|---|---|---|
| | Hammerhead (Less than 14-ft in width and less than 5-ft in height) | 6 | See 601.9.3.5 | 216-hrs | 240-hrs |
| | | 7 | See 601.9.3.5 | 240-hrs | See 601.9.3.5 |
| | Hammerhead (Less than 36-ft in width and less than 10-ft in height) | 2.5 or less | 180-hrs | 180-hrs | 192-hrs |
| | | 3 | 240-hrs | 216-hrs | 228-hrs |
| | | 3.5 | See 601.9.3.5 | 240-hrs | 240-hrs |
| | Two-column pier cap (Less than 23-ft in span, and less than 5-ft in height) | 3 or less | 264-hrs | 204-hrs | 240-hrs |
| | | 3.5 | See 601.9.3.5 | 240-hrs | See 601.9.3.5 |
| | | 4 | See 601.9.3.5 | 264-hrs | See 601.9.3.5 |
| | Three-column pier cap (Less than 16-ft in each span, and less than 5-ft in height) | 3 or less | 240-hrs | 144-hrs | 192-hrs |
| | | 4 | See 601.9.3.5 | 216-hrs | See 601.9.3.5 |
| | | 5 | See 601.9.3.5 | 240-hrs | See 601.9.3.5 |
| Rectangular Footer (Thickness = H x Width x Length) | H X 3H X 4H | 3 or less | 240-hrs | 144-hrs | 144-hrs |
| | | 3.5 | See 601.9.3.5 | 192-hrs | 240-hrs |
| | | 4 | See 601.9.3.5 | 240-hrs | See 601.9.3.5 |
| | H X 4H X 4H | 2.5 or less | 96-hrs | 96-hrs | 120-hrs |
| | | 3 | 240-hrs | 168-hrs | 192-hrs |
| | | 3.5 | See 601.9.3.5 | 240-hrs | 240-hrs |
| | H X 4H X 5H | 2.5 or less | 96-hrs | 120-hrs | 120-hrs |
| | | 3 | 240-hrs | 168-hrs | 240-hrs |
| | | 3.5 | See 601.9.3.5 | 240-hrs | See 601.9.3.5 |
| | H X 4H X 36 | 2.5 or less | 240-hrs | 240-hrs | 240-hrs |
| | | 3 | See 601.9.3.5 | 264-hrs | See 601.9.3.5 |

**601.9 ~~MASS CONCRETE~~TEMPERATURE CONTROL:**

**601.9.1–Cold Weather Concreting:**

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

**Class M Concrete Cold Weather Provisions:** Cold weather periods shall be defined as those periods when temperatures above 50 °F do not occur for more than half of any 24-hour

duration. The temperature of the surface on which the concrete is to be placed shall not be less than 40 °F immediately prior to the placement of the concrete. During the cold weather periods, as defined above, the temperature of the concrete immediately after placement shall be between 50 °F to 65 °F

ADD THE FOLLOWING CONTENT AS A NEW SUBSECTION:

**601.9.3-Mass Concrete:**

**~~601.9.3.1 General:~~** Mass concrete is defined as "Any large volume of cast-in-place concrete with dimensions large enough to require measures to be taken to cope with the generation of heat and attendant volume changes to minimize cracking". A concrete element's dimensions will be classified as mass concrete when the early-age tensile stresses exceed 80% of the tensile strength. Rock socketed drilled shafts shall not be classified as mass concrete.

~~This section describes the requirements for concrete used in mass concrete elements and is intended to produce structures free of thermal cracks caused by the heat of hydration during the curing of large concrete cross-sections. This is accomplished by using appropriate mix designs, cross-section, and managing the structure's temperature differential. This section does not apply to rock socketed drilled shafts.~~ Concrete pier stems, pier caps, footers, and abutments shall be considered mass concrete if they exceed the dimensions in Section 601.9.3.1.1~~2~~, Section 601.9.3.1.2, and Section 601.9.3.1.3~~4~~, respectively.

Compensation for conforming to these requirements will be at no additional cost and shall be included in Pay Items for individual elements identified in the plans.

**601.9.3.1.~~1 Requirements for~~Requiremnts for Miscellaneous Mass Concrete ~~Mass Definition Tables~~:** Tables in Section 601.9.3.1.1~~601.9.2~~, Section 601.9.3.1.2~~601.9.3~~ and Section 601.9.3.1.3~~601.9.4~~ shall be cast with Class M and Class B concrete meeting the requirements in Table 601.3.1A, Table 601.3.1B, and Table 601.3.1F. The placement temperature of a concrete element shall meet the requirements of 601.10.1.4. Concrete forms for non-insulated concrete elements shall remain in place for a minimum of ninety-six (96) hours. Concrete shall be cured following 601.12.1. When insulation is not used, a plastic sheet shall cover the concrete forms to protect the concrete element from excessive wind. Tables labeled as "non-insulated" shall only be used in ambient temperatures above 60 °F. Ambient temperature below the 60 °F range shall require insulation. Insulated concrete elements shall have insulated formworks or blankets with a minimum overall R-value of five (5). The insulation shall remain in place until the requirements in 601.8.11 are met for Class M concrete and the requirements in 601.8.7 are met for Class B concrete.

**601.9.3.1.1-Pier Stems:** Pier stems with minimum dimensions per Table 601.9.3.1.1 – Table 601.9.3.1.6 shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5.

**TABLE 601.9.3.1.1**

| **Class M Option 1 (Non-Insulated)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |

| | |
|---|---|
| Circular | ≥ 3.5 ft |
| Square | ≥2.5 ft |
| Rectangular | ≥1.5 ft |

**TABLE 601.9.3.1.2**

| Class M Option 1 (Insulated R≥5) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| Circular | ≥ 6.0 ft |
| Square | ≥4.5 ft |
| Rectangular | ≥3.0 ft |

**TABLE 601.9.3.1.3**

| Class M Option 2 & 3 | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| Circular | ≥ 4.5 ft |
| Square | ≥3.0 ft |
| Rectangular | ≥2.0 ft |

**TABLE 601.9.3.1.4**

| Class M Option 2 & 3 (Insulated R≥5) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| Circular | ≥ 8.0 ft |
| Square | ≥5.5 ft |
| Rectangular | ≥4.0 ft |

**TABLE 601.9.3.1.5**

| Class B (Non-Insulated) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| Circular | ≥ 3.0 ft |
| Square | ≥2.0 ft |
| Rectangular | ≥1.5 ft |

**TABLE 601.9.3.1.6**

| Class B (Insulated R≥5) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| Circular | ≥ 5.5 ft |
| Square | ≥4.0 ft |
| Rectangular | ≥2.5 ft |

**601.9.3.2~~3~~-Pier Caps:** Pier caps with minimum dimensions (W) per Table 601.9.3.2.1 — Table 601.9.3.2.6 shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5. A hammerhead type pier cap with less than 14-ft in width and less than 5-ft in height shall be treated as a "14-ft Hammerhead". A hammerhead type pier cap with less than 36-ft in width and less than 10-ft in height shall be treated as a "36-ft hammerhead". "Two-column" pier cap shall have the span of less

than 23-ft, and height of less than 5-ft. "Three-column" pier cap shall have the span of less than 16-ft, and height of less than 5-ft. A schematic drawing of a hammerhead, a two-column and a three-column pier cap is shown in Figure 601.9.3.2A.

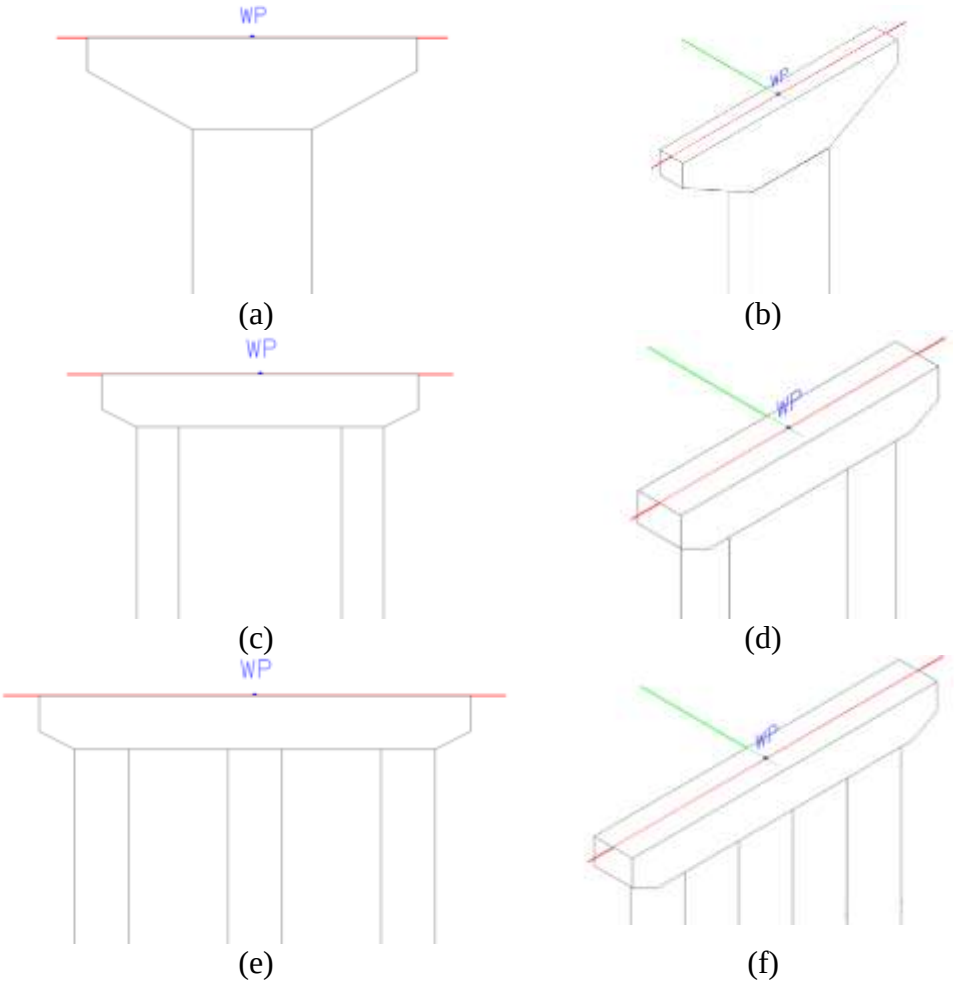


**Figure 601.9.3.2A**: Schematic drawing of a hammerhead pier cap (a) front view (b) isometric view, a two-column pier cap (c) front view (d) isometric view, a three-column pier cap (e) front view (f) isometric view.

Detailed dimensions of each pier cap type are shown in TABLE 601.9.3.2. A schematic of the pier cap geometry and the parameters used in TABLE 601.9.3.2 are shown in Figure 601.9.3.2B. The dimensions shown in TABLE 601.9.3.2 remain the same and only the thickness 'W' changes.

**TABLE 601.9.3.2**

| **Types** | ~~**L (ft)**~~<br>~~**H (ft)**~~<br>~~**HM (ft)**~~ |
|---|---|

| | ~~LD and RD (ft)~~Pier Cap Dimensions | | | |
|---|---|---|---|---|
| | L (ft) | H (ft) | HM (ft) | LD and RD (ft) |
| **Hammerhead (14ft)** | 14 | 5 | 3.5 | 3.5 |
| **Hammerhead (36ft)** | 36 | 10 | 3.625 | 11.5 |
| **Two-Column Pier Cap (30ft)** | 30 | 5 | 3.333 | 3.3 |
| **Three-Column Pier Cap (40ft)** | 40 | 5 | 3.333 | 3.3 |

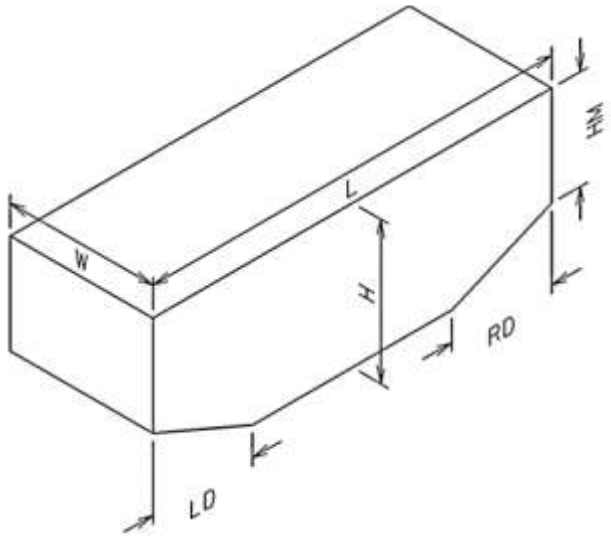


**Figure 601.9.3.2B: Pier Cap Geometry**

**TABLE 601.9.3.2.1**

| Class M Option 1 (Non-Insulated) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| 14 ft Hammerhead | **≥ 2.0 ft** |
| 36 ft Hammerhead | |
| Two-Column | |
| Three-Column | |

**TABLE 601.9.3.2.2**

| Class M Option 1 (Insulated R≥5) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| 14 ft Hammerhead | **≥ 5.0 ft** |
| 36 ft Hammerhead | **≥3.0 ft** |
| Two-Column | **≥2.5 ft** |
| Three-Column | **≥3.0 ft** |

**TABLE 601.9.3.2.3**

| Class M Option 2 & 3 (Non-Insulated) | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| 14 ft Hammerhead | **≥ 2.5 ft** |
| 36 ft Hammerhead | |
| Two-Column | |

| | |
|---|---|
| Three-Column | |

**TABLE 601.9.3.2.4**

| **Class M Option 2 & 3 (Insulated R≥5)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| 14 ft Hammerhead | **≥ 6.0 ft** |
| 36 ft Hammerhead | **≥3.5 ft** |
| Two-Column | **≥3.0 ft** |
| Three-Column | **≥3.5 ft** |

**TABLE 601.9.3.2.5**

| **Class B (Non-Insulated)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| 14 ft Hammerhead | **≥ 2.0 ft** |
| 36 ft Hammerhead | |
| Two-Column | |
| Three-Column | |

**TABLE 601.9.3.2.6**

| **Class B (Insulated R≥5)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| 14 ft Hammerhead | **≥ 4.5 ft** |
| 36 ft Hammerhead | **≥2.5 ft** |
| Two-Column | **≥2.0 ft** |
| Three-Column | **≥2.5 ft** |

**601.9.3.3 ~~3.4~~-Footers:** Footers with minimum dimensions per Table 601.9.3.3.1 – Table 601.9.3.3.6 shall be designated as mass concrete and require a thermal control plan meeting the requirements in 601.9.3.5. "H" in the tables shall be referred to as the minimum dimension in thickness. The actual minimum dimension shall be rounded up to the nearest tabulated minimum dimension.

**TABLE 601.9.3.3.1**

| **Class M Option 1 (Non-Insulated)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| H x 3H x 4H | **≥ 2.5 ft** |
| H x 4H x 4H | |
| H x 4H x 5H | |
| H x 4H x 36 | |

**TABLE 601.9.3.3.2**

| **Class M Option 1 (Insulated R≥5)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| H x 3H x 4H | **≥ 3.0 ft** |
| H x 4H x 4H | |
| H x 4H x 5H | |

| | |
|---|---|
| H x 4H x 36 | **≥2.5 ft** |

**TABLE 601.9.3.3.3**

| **Class M Option 2 & 3 (Non-Insulated)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| H x 3H x 4H | **≥ 3.0 ft** |
| H x 4H x 4H | |
| H x 4H x 5H | |
| H x 4H x 36 | **≥2.5 ft** |

**TABLE 601.9.3.3.4**

| **Class M Option 2 & 3 (Insulated R≥5)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| H x 3H x 4H | **≥ 3.5 ft** |
| H x 4H x 4H | |
| H x 4H x 5H | **≥ 3.0 ft** |
| H x 4H x 36 | **≥2.5 ft** |

**TABLE 601.9.3.3.5**

| **Class B (Non-Insulated)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| H x 3H x 4H | **≥ 2.0 ft** |
| H x 4H x 4H | |
| H x 4H x 5H | |
| H x 4H x 36 | |

**TABLE 601.9.3.3.3**

| **Class M Option 2 & 3 (Insulated R≥5)** | |
|---|---|
| **Geometry** | **Minimum Cross-Section** |
| H x 3H x 4H | **≥ 2.5 ft** |
| H x 4H x 4H | |
| H x 4H x 5H | |
| H x 4H x 36 | **≥2.0 ft** |

**601.9.3.5-Thermal Control Plan:** When it is determined that a Thermal Control Plan is required, as outlined in Section 601.9.2, the following provisions shall apply. The Thermal Control Plan shall describe the measures and procedures the Contractor intends to use to satisfy the following Temperature Control Requirements for each mass concrete element.

i. The Maximum Allowable Temperature Differential shall be limited to 35 °F. The temperature differential between the hottest interior location and exterior portions of the designated mass concrete elements during curing will be maintained to be less than or equal to this Maximum Allowable Temperature Differential, and

ii. The Maximum Allowable Concrete Temperature shall be limited to 160 °F.

A change to the Temperature Control Requirements specified above can be addressed in the Thermal Control Plan through a demonstration that deleterious effects to the concrete can be avoided through adherence to the Thermal Control Plan. Such a change requires approval by the Engineer.

As a minimum, the Thermal Control Plan shall include the following:

A. Mix Design.
B. Methodology used to determine the heat of hydration.
C. Duration and method of curing.
D. Methods of controlling maximum concrete temperature and temperature differentials.
E. An analysis of the anticipated thermal developments in the mass concrete elements for all expected project temperature ranges using the proposed mix design, casting procedure, and materials. It shall show complete details and determine the maximum allowable temperature differentials between the hottest point of the concrete and the exterior faces.
F. Temperature sensor type and location including installation details.
G. Temperature Monitoring System includes description, operating plan, recording, and reporting plan, and remedial action plan.
H. Field measures to ensure conformance with the maximum concrete temperature and temperature differential requirements.
I. Field methods of applying immediate corrective action should the temperature differential approach the Maximum Allowable Temperature Differential.

The Contractor shall submit the Thermal Control Plan to the Engineer for approval a minimum of thirty (30) working days prior to concrete placement. Mass concrete placement shall not begin until the Engineer has accepted the Thermal Control Plan and the demonstration placement has verified the accuracy of the temperature predictions. If the demonstration placement fails to verify the accuracy of the temperature predictions to the satisfaction of the Engineer, the Thermal Control Plan shall be revised and resubmitted. If necessary, a second demonstration placement shall be required by the Engineer.

**601.9.3.5.1–Temperature Monitoring System:** The temperature monitoring and recording system for mass concrete shall consist of temperature sensors connected to a data acquisition system capable of printing, storing, and downloading data to a computer. Temperature sensors shall be located such that the maximum temperature difference within a mass concrete element can be monitored. As a minimum, concrete temperatures shall be monitored: within 1 inch of the calculated hottest location, an outside vertical edge of the outer face that is furthest from the center of the element, and at both the center and an outside edge of the top surface. No temperature sensor shall be placed within the clear distance between the reinforcing steel and the outer concrete surface

Temperature readings shall be automatically recorded on an hourly or more frequent basis. A redundant set of sensors shall be installed near the primary set. Provision shall be made for recording the redundant set, but records of the redundant sensors need not be made if the primary set is operational.

Methods of concrete consolidation shall prevent damage to the temperature monitoring and recording system. Wiring from temperature sensors cast into the concrete shall be

protected to prevent movement. Wire runs shall be kept as short as possible. The ends of the temperature sensors shall not come into contact with either supports or concrete form or reinforcing steel.

When any equipment used in the temperature control and monitoring and recording system fails during the mass concrete construction operation, the Contractor shall take immediate remedial measures to correct the situation. Remedial measures shall be included in the Thermal Control Plan.

**601.9.3.5.2–Construction:** Temperature readings will begin immediately after casting is complete. Temperature reading will continue until the maximum temperature differential (not maximum temperature) is reached and a decreasing temperature differential is confirmed as defined in the Thermal Control Plan and the maximum concrete temperature is within the Maximum Allowable Temperature Differential of the ambient air temperature in the shade. Data shall be submitted to the Engineer daily.

**601.9.3.5.3-Temperature Control Failure:** If monitoring indicates the Temperature Control Requirements have been exceeded, the Contractor shall take immediate corrective action as defined in the Thermal Control Plan. The Contractor will provide all analyses and test results deemed necessary by the Engineer for determining the structural integrity and durability of the mass concrete element. If, in the sole opinion of the Engineer, the concrete placement has been damaged so as not to be serviceable as a result of exceeding the Temperature Control Requirements, then the Contractor shall remove and replace the concrete placement at no additional cost to the project. The Contractor will make the necessary revisions to the approved Thermal Control Plan to satisfy the Temperature Control Requirements on any remaining placements. Revisions to the approved plan must be approved by the Engineer prior to implementation. The revised plan will be used on future placements. No extension of time or compensation will be made for any rejected mass concrete element or revisions of the Thermal Control Plan.

If the monitoring indicates that the Temperature Control Requirements have been exceeded then a penalty shall be assessed for bullets (i) and (ii) above in 601.9.3.5 if the concrete is allowed to remain in place, independently as follows:

$~~100~~?/ °F or fraction there-of the allowable temperature range multiplied by the number of yards in the element.

**601.10–PLACING CONCRETE:**

**601.10.1–General:**

ADD THE FOLLOWING SUBSECTION:

**601.10.1.4–Class M Concrete Placement Limitations:** The maximum concrete placement temperature of Class M concrete shall not exceed 75 °F. Class M concrete shall not be used in cold weather placements, as defined in 601.9.1, without form insulation. The anticipated placement completion time of non-insulated Class M concrete shall be between 12:00 AM to 10:00 AM.

**601.12–CURING AND PROTECTING CONCRETE:**

**601.12.1–Curing Under Normal Conditions:**

DELETE THE SECOND PARAGRAPH IN THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

Concrete surfaces shall be kept completely and continuously moist. Curing shall be continued for a period of at least seven (7) days. This curing period may be reduced if the contractor presents evidence that the in-place concrete has attained 70% of the specified strength for the class of concrete under cure. Under no circumstances shall the period of cure be less than three (3) days. The reduced curing period option does not apply to Class H, Class K, or Class M concrete. When placing concrete elements with a minimum dimension greater than two (2)- feet ~~(0.61 m))~~, the contractor shall not be permitted to add additional cement to the target cement factor in the approved mix design to obtain high-early strength and/or reduce curing time. Water spreading directly on the concrete surface shall not be permitted for concrete elements with a minimum dimension greater than 1.5-feet. Plastic sheets shall be used to protect exposed concrete surfaces from wind and evaporation. Moist burlap shall be placed on the plastic sheets. Mass concrete placement shall be completely protected from exposure to precipitation to prevent cooling of the surface this includes extruding steel reinforcement. Mass concrete placement shall be continuously moist cured for at least seven (7) days. Concrete forms shall be considered to prevent moisture loss for mass concrete placements and be counted as moist curing days. The temperature of any water used for moist curing of concrete shall be controlled to within 10°F of the mean concrete surface temperature. Surfaces may have coverings temporally removed for finishing, but the covering shall be restored as soon as possible. When protection is removed from the structure after the specified curing is complete, the temperature of the concrete shall not be permitted to fall at a greater rate than 20°F per 24- hrs.

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~~January 2, 2025~~ April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 688
# FIELD PAINTING OF METAL STRUCTURES

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

**688.1-DESCRIPTION:**

~~The~~ All field painting (coating) of metal structures shall follow the provided requirements set forth in this specification unless otherwise ~~noted~~ directed ~~in~~within the contract documents. This specification shall apply to surface preparation, ~~coating~~ paint application, paint inspection, contractor responsibilities, environmental and worker protection, and waste handling/disposal. Manufacturer's Recommendation shall be based only on information published in the most current Product Data Sheets (PDS) for the paint material in question.

**688.2-~~GENERAL~~SURFACE PREPERATION:**

All structures shall be washed in accordance with Section 685 Bridge Cleaning prior to performing any of the other surface preparations provided herein. Surface preparation shall be performed in such a manner that no damage is done to partially or entirely completed portions of work.

~~**688.2.1-Bridge Pre-Cleaning and Washing:** All structures shall be pre-cleaned and washed in accordance with Section 685 of the Specifications.~~

~~**688.2.2-Surface Preparation:**~~

**688.~~2.2.1~~2.1-Non-Blasting:** When non-blast cleaning is specified ~~in~~ within the contract documents, any one or any combination of the SSPC method(s) ~~below shall be~~ listed may be used to achieve the specified surface cleanliness and surface profile in accordance with the SSPC method(s) used. ~~The surface and the surface profile after cleaning shall meet the requirements of the methods below. The amount of material, rust scale, and pack rust removed after non-blast cleaning, will meet the requirements of the SSPC methods listed:~~

1. Hand Tool Cleaning shall meet the requirements of SSPC-SP 2 prior to painting.
2. Power Tool Cleaning shall meet the requirements of SSPC-SP 3 prior to painting.
3. Commercial Grade Power Tool Cleaning shall meet the requirements of SSPC-SP 15 prior to painting.

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**688.~~2~~.2.2-Blasting:** ~~The abrasives used for all blasting shall meet the guidelines set forth in SSPC AB1 for mineral and slag abrasives, and AB3 for ferrous metallic abrasives. Any additive mixed with the abrasive shall be approved by the Division prior to use. The abrasives used shall produce a height of profile between 2.0 and 3.0 mils.~~

~~In addition, the container or bag of abrasive shall include the name of the abrasive, the name of the manufacturer, and the size of the abrasive. If any additive has been included with the abrasive, the name and the percentage of the additive shall be on the container or bag.~~

~~The compressed air used for nozzle blasting shall be free of water and oil. The cleanliness of each compressed air system shall be verified at least once per shift using the blotter test in accordance with ASTM D4285, "Standard Test Method for Indicating Oil or Water in Compressed Air".~~ When blast cleaning is specified within the contract documents, any one or any combination of the SSPC/NACE joint surface preparation method(s) listed may be used to achieve the specified surface cleanliness and surface profile in accordance with the SSPC/NACE method(s) used.

**688.2~~.2~~.2.1-Commercial Blast:** Shall meet the requirements of SSPC-SP 6 / NACE 3 prior to painting. ~~The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 6 pictorial standards of SSPC Vis 1.~~

**688.2~~.2~~.2.2-Brush-Off Blast:** Shall meet the requirements of SSPC-SP 7 / NACE 4 prior to painting. ~~The appearance of the steel surface after brush-off blast cleaning shall correspond to the applicable and current SP 7 pictorial standards of SSPC Vis 1.~~

**688.2~~.2~~.2.3-Near White Metal Blast**: Shall meet the requirements of SSPC-SP 10 / NACE 2 prior to painting. ~~The appearance of the steel surface after blast cleaning shall correspond to the applicable and current SP 10 pictorial standards of SSPC Vis 1.~~

**688.2.2.~~3~~4-Water Jetting:** Shall meet the requirements of SSPC-SP WJ-1 / NACE WJ -1~~and visual standard condition WJ-1~~ prior to painting.

**688.2.2.~~4~~5-Post-Surface Preparation:** ~~Surface prep operations shall be performed in such a manner that no damage is done to partially or entirely completed portions of the work. After surface prep,~~ Upon completion of surface preparations, any area~~s~~ repaired by welding, grinding, or other destructive means, shall have the surface cleanliness and anchor pattern restored prior to paint application in accordance with Section 688.2. ~~that are repaired by welding shall be prepped again. Areas repaired by grinding or other means shall have the anchor pattern restored. Visible deposits of oil, grease, or other contaminants shall be removed according to SSPC-SP 1 "Solvent Cleaning" prior to painting. Dust, loose residues, and the removal of abrasives from pockets and corners shall be removed from prepared surfaces by brushing, blowing off with clean, dry air, vacuum cleaning. The prepped surface shall be checked for cleanliness by wiping a clean, dark cloth across the surface. If residue is present, the surface shall be cleaned again and rechecked. All blast cleaned surfaces shall be painted prior to any rust bloom or flash rust occurring or within 24 hours, whichever comes first.~~

All dust, loose residues, and abrasives shall be removed from prepared surfaces by brushing, blowing off with clean, dry air, or vacuum cleaning. All blast cleaned surfaces

shall be painted prior to any rust bloom or flash rust occurring or within 24 hours, whichever occurs first. In the event rust bloom or flash rusting occurs, the affected areas shall be prepared again to achieve the specified cleanliness in accordance with the SSPC/NACE methods(s) previously used.

**688.2.3-Abrasives:** The abrasives used for all blasting shall meet the guidelines set forth in SSPC AB1 for mineral and slag abrasives, and AB3 for ferrous metallic abrasives. Any additive mixed with the abrasive shall be approved by the Division prior to use. The abrasives used shall produce a height of profile between 2.0 and 3.0 mils.

The container/bag of abrasive shall include the name of the abrasive, the name of the manufacturer, and the size of the abrasive. If any additive has been included with the abrasive, the name and the percentage of the additive shall be included on the container/bag.

The compressed air used for nozzle blasting shall be free of water and oil. The cleanliness of each compressed air system shall be verified at least once per shift using the blotter test in accordance with ASTM D4285, "Standard Test Method for Indicating Oil or Water in Compressed Air".

~~**688.2.3 Paint Application Requirements**~~

**688.3-PAINT (COATING) APPLICATION REQUIREMENTS:**

Proper surface preparation in accordance with contract plans and section 688.2 of this specification shall be obtained prior to any paint application. The chosen paint system shall meet the requirements of Section 711, Protective Coatings, Stains, and Traffic Paints. The paint shall be applied by spray methods. Areas that are inaccessible to spray methods may be brushed or rolled. The paint application method used must achieve the specified film thickness and coverage in accordance with the manufacturer's recommendations. Application requirements and drying times between coats shall be in accordance with the manufacturer's recommendations.

**688.~~2.~~3.1-Weather Conditions:** Weather conditions shall be in accordance with the paint manufacturers recommendations. ~~Painting shall not be done when the ambient temperature is below 40°F or above 100°F, or the relative humidity above 90 percent (90%). The temperature of the steel must be at least 5°F above the dew point. Painting shall not be performed when the surface to be coated is sufficiently hot to cause blistering of the film or too rapid solvent release. Painting will only be permitted between the dates of April 15th through October 15th. There will be no painting permitted to occur in a heated containment.~~ Heated containment may be used at the direction of the Engineer. If heated containment is used, the minimum Temperature (substrate, air, and material) and all other environmental restrictions shall be maintained as specified:

i. If heat is to be used to reach environmental conditions, use only an indirect heat source that will disperse the heat evenly throughout containment area. If combustion type heating units are used, vent the units away from the containment area and do not allow exhaust fumes to enter the containment area. Do not use open combustion in the containment area.

ii. Maintain heat according to the manufacturer's recommendations for cure time after the coating is completed in the desired areas.

iii. Install an operational automatic temperature data recorder inside the containment area until the paint has cured per manufacturer's recommendations. The placement will be determined by the Engineer.

**688.~~2~~.3.2-Paint Storage:** Paint and thinners shall be stored in accordance with the manufacturers recommendations.~~a temperature-controlled environment between 40°F and 100°F.~~ At no time will paint be permitted to be used beyond the manufacturer's shelf life.

~~**688.2.3.3 Paint Application:** The blast cleaned surface shall be painted within 24 hours. In the event rust bloom or flash rusting occurs, the affected members shall be re-cleaned by blasting. The paint shall be applied by spray methods, except those areas inaccessible to spray application may be brushed or rolled. Brushes or rollers, when used, shall have sufficient body and length of bristle or roller nap to spread a uniform coat. Small touch-up areas may be brushed or rolled, if approved by the Engineer.~~

~~Use of an agitated pot shall be mandatory in spray application of zinc-rich primer. The agitator or stirring rod shall reach within one (1) inch, of the bottom of the pot and shall be in motion at all times during paint application. Coatings shall be mixed in strict accordance with the coating manufacturer's written instructions. Under certain conditions, it may be necessary to thin or adjust the solvent balance of the paint. The type and amount of solvent to be used shall be that listed on the coating manufacturer's product data sheet for that material. Upon thinning, the dry film thickness requirement shall still be met by appropriately increasing the wet film thickness.~~

~~Application requirements and drying times between coats shall be in accordance with the manufacturer's recommendations. Exposed steel surfaces of expansion dams shall be painted as specified for structural steel.~~

~~Spray guns must be equipped with the recommended size tip for the paint product being applied and shall be held perpendicular (90 degrees) to, and at, the proper distance from the receiving surface. Complete protection shall be provided by the contractor against paint spatter, spillage, overspray, wind-blown paint, or similar releases.~~

~~Appropriate containment shall be placed around the work area to protect public and private property. Staging must be adequate to provide access to all areas being painted. Violation of these requirements causing excessive paint waste will be justification for the WVDOH Engineer to order the Contractor to cease all work on the project until corrective action has been taken. The method of cleaning and/or replacement shall be submitted to the Engineer in advance for approval.~~

**688.3.3-Mixing and Thinning:** Paint shall be mixed and thinned in strict accordance with the manufacturer's written instructions. When thinning is necessary the dry film thickness requirement shall still be met by appropriately increasing the wet film thickness.

**688.3.4 Galvanized Surfaces**: Painting Galvanized surfaces shall be in accordance with the paint manufacturer's recommendations. Repair of galvanized surfaces shall be in accordance with ASTM A780

**688.3.5 Paint Containment**: Appropriate containment shall be placed around the work area to protect public and private property. Complete protection shall be provided by the contractor against paint spatter, spillage, overspray, wind-blown paint, or similar releases. Staging must be adequate to provide access to all areas being painted.

Any violation of these requirements resulting in excessive paint material waste will be justification for the Engineer to order the Contractor to cease all work on the project until corrective action has been taken. The method of corrective action shall be submitted to the Engineer in advance for approval. Any corrective actions taken, or replacement of paint material will be at the Contractor's expense.

~~**688.2.3.3.1 Paint Systems:**~~

~~**3 COAT:** Primer, Intermediate, Top Coat~~

~~**2 COAT:** Primer, Top Coat~~

~~**1 COAT:** Epoxy Mastic only~~

~~**688.2.3.3.2 Painting over Galvanized Surfaces**: Painting Galvanized surfaces shall be in accordance to the paint manufacturer's recommendations.~~

~~**688.2.3.3.3 Damage to Galvanized Surfaces:** The Contractor is to exercise care while cleaning and painting around expansion joints and galvanized surfaces. Any damage to the expansion joints or galvanized surfaces found by the Engineer, as a result of the cleaning and painting operation shall be repaired and/or replaced, to the satisfaction of the Engineer, at the Contractor's expense.~~

**688.3.6-Paint Systems:**

3 COAT SYSTEM: Organic Zinc Primer, Intermediate, Top Coat

2 COAT SYSTEM: Organic Zinc Primer, Top Coat (2 coats of the Top Coat)

1 COAT SYSTEM: Organic Zinc Primer or Epoxy Mastic Primer

**688.3.7-Painting Sequence:**

FULL PRIME COAT:

The structure shall receive one coat of an Organic Zinc primer meeting the requirements of the applicable sections of Specification 711. The full prime coat shall be applied in accordance with the manufacturer's recommendations. Dry film thickness requirements shall be in accordance with the manufacturer's recommendations.

STRIPE COAT:

All edges, outside corners, seams, bolt heads and nuts, all rivet heads, edges of flanges and plates, welds, sharp edges, in general all edges, shall receive one stripe coat. The stripe coat shall be applied in accordance with the manufacturer's recommendations. The stripe coat shall extend a minimum of one (1) inch from the edge. The stripe coat shall be a contrasting color to the full prime coat, as well as the coat of paint applied following the stripe coat. The contractor will be responsible for consulting with the paint manufacturer to obtain a primer in a contrasting color for the stripe coat. The prime coat shall at a minimum, be set-to-touch before the stripe coat is applied. No dry film thickness is specified for this coat.

INTERMEDIATE COAT:

The structure may receive one uniform intermediate coat of paint meeting the requirements of the applicable sections of Specification 711. The intermediate coat shall be a contrasting color to the full prime, stripe coat and top coat. The contractor will be responsible for consulting with the paint manufacturer to obtain an intermediate coat in a contrasting color to the other coats being applied. The intermediate coat shall be applied in accordance with the

manufacturer's recommendations. Dry film thickness requirements shall be in accordance with the manufacturer's recommendations.

CAULKING:

The caulking material shall be compatible with the paint system being applied and shall be by written recommendation of the paint manufacturer. The caulking material shall be tested for compatibility with the paint system during the time that the paint is tested for intercoat compatibility. Caulking shall be applied prior to the application of the topcoat and in accordance with the manufacturer's recommendations.

This includes all seams between diaphragm connections to stiffeners and splices and seams between any connection that is riveted or bolted. Any welded connections that are not fully sealed by the weld shall be caulked with a paste type caulk. The caulk shall be pressed into the seams between the adjoining surfaces, by wetted finger or specialty tool, to ensure bond and provide a smooth uniform surface. Bottom seams shall not be caulked on vertical surfaces.

TOP COAT:

The structure shall receive one uniform coat of paint as designated in the plans meeting the requirements of the applicable sections of Specification 711. The color shall be as designated in the plans and shall be in accordance with current SAE-AMS-STD-595. Dry film thickness requirements shall be in accordance with the manufacturer's recommendations.

**688.3.7-Vegetation:** Vegetation may need to be trimmed or removed to accomplish the cleaning and painting of the structure. If permitted by the Contract Documents, the Contractor may waste vegetation within the Right-of-Way. Otherwise, any such vegetation cut shall be removed from the site by the contractor. No direct payment will be made for this work but shall be included in the contract price for the item in connections with which it is used .

**688.3.8-Utilities:** Shall be in accordance with Section 105.5 Cooperation with Utilities and Section 107.17, Contractor Responsibility for Utility Property and Services.

**688.~~2~~.4-INSPECTION ~~REQUIREMENTS~~:**

The Contractor shall furnish suitable, safe access for the Division's inspection of ALL bridge cleaning, surface preparation and painting operations. Rubber rollers or other protective devices shall be used when providing inspection access to avoid damage to previously painted surfaces. No temporary attachment supports for access, or forms, shall be allowed to damage the paint system. Any damage that occurs from such devices shall be repaired to the satisfaction of the Engineer at the Contractors expense.

**688.~~2.~~4.1-Inspection of Cleaning and Painting Operations~~Applied Paint~~**: The contractor shall provide the Engineer an inspection plan outlining "Hold Points" to occur during the bridge cleaning, surface preparation and paint application operations.

If ~~in the opinion of~~ the Engineer determines at any time, there are inadequacies during bridge cleaning and surface preparation, or defects in the applied coats of the paint system, ~~the coating has flaws other than~~ the Contractor shall repair those areas ~~deficiencies in the prescribed dry film thickness, the material shall be repaired~~ to the satisfaction of the Engineer at the Contractors expense.~~or shall be removed and replaced.~~ ~~Defects in the film, including~~

~~but not limited to runs, sags, mud-cracking, lifting, overspray, dry spray, pinholes, and holidays shall be corrected until a continuous uniform film has been applied.~~

~~Excessive film thickness shall be reduced and insufficient film thickness shall be increased. If the thickness of the finish coat is reduced, a thin coat of the finish shall be reapplied to seal the surface and to blend the area into the surrounding coating. Depending on the defect, total removal and replacement of the effected coating may be required. No unsightly runs or sags shall be visible. All "mud-cracking" and/or "dry overspray" in the paint film shall be removed. Excessive bubbles or pinholes shall not be visible in the coat after examination under 8X magnification. Calibration of the thickness gage and dry film thickness measurements shall be in accordance with MP 708.40.00.~~

~~**688.2.4.2 Access for Inspection**: The Contractor shall furnish suitable safe access and shall provide a time mutually agreed to for inspecting the structural steel prior to and after each coating. The Division's inspector shall approve all repairs. When providing suitable safe access, rubber rollers or other protective devices shall be used. Metal rollers or clamps and other types of fastenings that will mar or damage freshly coated surfaces shall not be used. No temporary attachments, supports for access, or forms, shall damage the coating system. In particular, on the fascias where bracing is used, sufficient size support pads must be provided. Any damage that occurs from such devices shall be repaired to the satisfaction of the Engineer at the Contractors expense.~~

**688.~~2.~~4.~~3~~2-Repair Procedures for Field Paint Deficiencies**: All field repairs to the ~~coating~~ paint system shall be made in strict accordance with the ~~coating~~ paint manufacturer's recommendations, except where the requirements listed in this specification are more stringent. The Contractor shall provide the Engineer with a repair plan to be approved prior to any repairs being made.

~~Any products~~Paint Materials used during repairs ~~to the coating deficiencies~~ shall be the same paint materials ~~from the same manufacturer~~ as ~~the coating being repaired~~ applied according to the Contractors Quality Control Plan for Painting, Section 688.5.1.

~~.~~ All welds from which the ~~coating of~~ paint has been damaged or is otherwise defective shall be cleaned and repaired in accordance with Section 688.2.

~~-~~Surfaces that will be inaccessible for ~~coating~~ painting after erection shall be repaired and/or ~~recoated~~ repainted prior to erection. ~~The Engineer is to review and accept a repair plan before deficient areas are repaired.~~

The Contractor is to exercise care during bridge cleaning and painting operations around expansion joints, weathering steel, and galvanized surfaces. Any damage to these areas found by the Engineer, as a result of the bridge cleaning, surface preparation or painting operations, shall be repaired and/or replaced, to the satisfaction of the Engineer, at the Contractor's expense.

~~The requirements specified herein for provisions for inspection, mixing, thinning, temperature and humidity, and application shall govern the coating of the repaired areas.~~ Depending on the severity of the defect, total removal, and replacement of the effected coat of paint may be required. In order to avoid abrupt changes in paint thickness, the area adjacent to repair areas shall transition from zero paint thickness to full system thickness within not less than three (3) inches of the repair area by means of sanding the transition area.

No unsightly runs or sags shall be visible. All "mud-cracking" and/or "dry overspray" in the paint film shall be removed. Excessive bubbles or pinholes shall not be visible in the coat after

examination under 8X magnification. Calibration of the thickness gage and dry film thickness measurements shall be in accordance with MP 708.40.00. ~~In order to avoid abrupt changes in paint thickness, the area adjacent to repair areas shall transition from zero paint thickness to full system thickness within not less than three (3) inches of the repair area by means of sanding the transition area.~~

The requirements for the dry film thickness of the repair ~~coats~~ areas are the same as those specified for the paint system. The requirements specified herein for provisions for inspection, mixing, thinning, temperature and humidity, and application shall govern the painting of the repaired areas.

**688.~~2~~.5-CONTRACTOR CERTIFICATIONS AND SUBMITTALS:**

Certifications and Submittals shall be forwarded through the Prime Contractor and be accepted by the Engineer prior to commencement of the subject work. This is the responsibility of both the Fabricator and the Field Contractor. Electronic submittals will be accepted.

**688.5.1-SSPC QP-1:** The Contractor shall be certified to perform coating applications according to *SSPC QP-1, Standard Procedure for Evaluating Qualifications of Industrial/Marine Painting Contractors, Field Applications in Complex Structures* in order to perform coating operations on all new and existing steel structures. The Contractor shall submit proof of such current certification to the Engineer before starting the Work.

**688.5.2-SSPC QP-2**: The Contractor shall be certified to perform coating removal operations according to *SSPC QP-2, Standard for Evaluating Painting Contractors, Removal of Hazardous Coatings from Industrial/Marine Steel Structures* in order to perform coating removal operations. The Contractor shall submit proof of this certification to the Engineer before starting the Work.

The SSPC QP-2 certified contractor shall assign a SSPC QP-2 qualified Competent Person to oversee removal activities to protect the environment and workers safety and health while performing removal activities under the contract. For the purposes herein a Competent Person is an individual who meets the qualifications defined in the document SSPC-QP2 – Qualifications, Section 2. The SSPC QP-2 Competent Person shall be present during startup, surface preparations, removal operations, and waste removal/disposal activities to ensure and verify environmental protection and worker safety and health practices and procedures comply with the prepared plans.

The SSPC QP-2 Competent Person shall submit written certification to the Engineer that the Contractor's work operations are meeting the environmental and worker safety and health plans requirements weekly. The SSPC QP-2 Competent Person shall submit written certification at the completion of the project that the environmental and worker safety and health plans fully complied with all applicable regulations and was fully implemented by the Contractor. If any noncompliance is noted, the Competent Person shall submit in writing, within 24 hours of the noncompliance, the corrective actions taken by the Contractor to remedy the noncompliance.

**688.~~2~~.5.~~1~~3-Quality Control Plan for Painting**: Minimum requirements and document form are set forth in MP 688.02.20.

**688.~~2~~.2.5.~~2~~4-Containment/Disposal Control Plan for Existing Steel Structures:** Minimum requirements and document form are set forth in MP 688.03.20.

**688.~~3~~6-~~COMPLETE~~CLEANING AND PAINTING OF EXISTING STRUCTURES:**

The complete removal and replacement of existing paint systems shall follow the provided requirements set forth in this specification unless otherwise directed within the contract documents.

~~**688.3.1 General:** The field coats (total system) of paint shall meet the requirements of Section 711. The applicable sections of 711, the dry film thickness and the color shall be as specified in the contract documents. Each coat shall be a contrasting color to the one previously applied.~~

**688.~~3.2~~6.1-Surface Preparation:** ~~All structural steel shall undergo a near-white blast cleaning in accordance with SSPPC SP 10.~~ All contracts for the complete removal and replacement of the previous paint system shall undergo a "Near-White" blast cleaning in accordance with SSPPC SP 10/NACE 2. All structural steel is to include 100% of the girders, stringers, diaphragms, floor beams, upper and lower chord members, drains, bearing devices, etc. In general, all accessible steel surfaces not galvanized, aluminum, or weathering steel shall be blast cleaned. ~~-~~All laminar and stratified rust that has formed on the existing steel surfaces shall be removed. Pack rust formed along the perimeter of mating surfaces of connected plates or shapes shall be removed to the extent feasible without mechanically detaching the mating surface. ~~The Contractor is to exercise care while cleaning and painting around expansion joints, weathering steel, and galvanized surfaces. Any damage to these surfaces found by the Engineer as a result of the cleaning and painting operation shall be repaired and/or replaced, to the satisfaction of the Engineer, at the Contractor's expense.~~

~~**688.3.3 Paint Application Requirements:** Painting shall be in accordance with Section 688.2.3.3.~~

~~**688.3.4 Painting Sequence:**~~

~~FULL PRIME COAT:~~

~~The structure shall receive one coat of a primer meeting the requirements of Section 711. The full prime coat shall be applied before the stripe coat. The primer used for the full prime coat and the stripe prime coat shall be of the same type and shall be from the same manufacturer. Dry film thickness requirements shall be as specified by the manufacturer's recommendations, or as specified in the contract documents.~~

~~STRIPE COAT:~~

~~All edges, outside corners, seams, bolt heads and nuts, all rivet heads, edges of flanges and plates, welds, sharp edges, in general all edges, shall receive one stripe coat, by brush or roller application, of the same primer as the Full Prime Coat. Striping shall extend a minimum of one (1) inch from the edge. The prime coat shall at a minimum, be set-to-touch before the stripe coat is applied. No dry film thickness is specified for this coat. This coat shall be tinted as allowed by the manufacturer to be in contrast to the full prime coat and intermediate coat. The tinting agent shall be the paint manufacturer's approved tinting agent.~~

~~INTERMEDIATE COAT:~~

~~The structure shall receive one uniform coat of a paint meeting the requirements of Section 711. The color shall be in contrast to the prime and top coats. If tinting is required, the tinting agent shall be the paint manufacturer's approved tinting agent. The intermediate coat shall not be applied until the primer and stripe coat have fully cured according to the manufacturer's recommendations. Dry film thickness requirements shall be as specified by the manufacturer's recommendations, or as specified in the contract documents.~~

~~CAULKING:~~

~~Caulking shall be applied before the application of the topcoat. This includes all seams between diaphragm connections to stiffeners and splices and seams between any connection that is riveted or bolted. Any welded connections that are not fully sealed by the weld shall be caulked with a paste type caulk. The caulk shall be pressed into the seams between the adjoining surfaces, by wetted finger or specialty tool, to insure bond and provide a smooth uniform surface. Bottom seams shall not be caulked on vertical surfaces.~~

~~Caulking in a 3-coat system shall be applied after the intermediate coat has cured. Caulking on a 2-coat system shall be applied after prime coat has cured. The top coat shall not be applied until the caulking has fully cured in accordance with the manufacturer's recommendations.~~

~~The caulking material shall be compatible with the paint system being applied and shall be by written recommendation of the paint manufacturer. The caulking material shall be tested for compatibility with the paint system at the same time that the paint is tested for intercoat compatibility. Caulking operations shall be performed only when weather conditions are within the parameters as specified in section 688.2.3.1.~~

~~TOP COAT:~~

~~The structure shall receive one uniform coat of paint as designated in the plans meeting the requirements of Section 711. The color shall be as designated in the plans and shall be in accordance with current SAE-AMS-STD-595. Dry film thickness requirements shall be as specified by the manufacturer's recommendations, or as specified in the contract documents.~~

~~**688.3.5 Vegetation:** Vegetation may need to be trimmed or removed in order to accomplish the cleaning or painting of the structure. If allowed by the Contract Documents, the Contractor may waste vegetation within the Right-of-Way. Otherwise, any such vegetation cut, shall be removed from the site by the contractor. No direct payment will be made for this work, but shall be included in the contract price for the item in connections with which it is used.~~

~~**688.3.6 Utilities:** Shall be in accordance with Section 107.17, Contractor Responsibility for Utility Property and Services or any other applicable sections of Section 107.~~

**688.~~3.7~~6.2-Paint Designation Label:**

**688.3.7.1 Description:** The bridge paint designation label shall consist of painting on the fascia web of the exterior girder with the following information; will only be utilized during the complete removal and replacement of the paint system on existing or new structures. The paint designation label shall be located at abutment number one on the fascia web of the exterior girder with a southern or eastern orientation. The paint color will be semi-gloss black paint and shall be the same paint material/manufacturer as the full paint system applied, with the following information: the paint system, contractor, and the month-year the project was completed. This paint designation label will only be utilized during the complete removal and painting of existing or new structures. The acronyms and details for the paint designation label will be assigned to the Contractor by the Materials Control, Soils and Testing Division when the Quality Control Plan for Painting is approved. All work performed regarding the paint designation label shall be considered incidental to the painting of the structure.

**688.3.7.1 Location:** The paint designation label will be located at abutment number one on the fascia web of the exterior girder with a southern or eastern orientation, and paint color shall be a semi-gloss black paint compatible with the topcoat material.

**688.3.7.2 General:** All work performed regarding the paint designation label shall be considered incidental to the painting of the structure.

**688.47-ZONE CLEANING AND PAINTING OF EXISTING STRUCTURES:**

The zone cleaning and painting of existing structures shall follow the provided requirements set forth in this specification unless otherwise directed within the contract documents. The contract documents shall specify the areas to be preparedprepared, and zone painted.

**688.4.1 General**: The field coats (total system) of paint shall meet the requirements of Section 711. The applicable sections of 711, the dry film thickness shall be in accordance with the manufacturer's recommendations and the color shall be as specified in the contract documents. Each coat shall be a contrasting color to the one previously applied. The contract documents shall specify the areas to be prepared and zone painted.

**688.4.27.1-Surface Preparation:** The surface shall be prepared as specified in the contract documents. Specific instructions will be given on the amount of surface area required to be cleaned in accordance with the specific standards identified in subsection section 688.2.2. All laminar and stratified rust that has formed on the existing steel surfaces shall be removed. Pack rust formed along the perimeter of mating surfaces of connected plates or shapes shall be removed to the extent feasible without mechanically detaching the mating surface. Any rust remaining after cleaning shall be tight and intact when examined using a dull putty knife. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the surface preparation or removal of rust results in nicks or gouges, the work shall be suspended, and the damaged areas repaired to the satisfaction of the Engineer, at the Contractor's expense. The Contractor is to exercise care while cleaning and painting around expansion joints and galvanized surfaces. Any damage to the expansion joints or galvanized surfaces found by the Engineer, as a result of the cleaning and painting operation shall be repaired and/or replaced, to the satisfaction of the Engineer, at the Contractor's expense.

~~**688.4.3 Paint Application Requirements:** Painting shall be in accordance with Section 688.2.3.3.~~

~~**688.4.4 Painting Sequence:** Painting shall be in accordance with Section 688.3.4.~~

~~**688.4.5 Vegetation:** - Shall be in accordance with Section 688.3.5~~

~~**688.4.6 Utilities:** Shall be in accordance with Section 107.17, Contractor Responsibility for Utility Property and Services or any other applicable sections of Section 107.~~

**688.~~5~~8-FIELD CLEANING AND PAINTING OF SHOP PRIMED ~~COATED~~ STEEL**:

~~**688.5.1 General:**~~ Field cleaning and painting of ~~new~~ shop primed ~~coated structures:~~steel shall follow the provided requirements set forth in this specification unless otherwise directed within the contract documents.

**688.8.1-Surface Preparation:** The surface shall be prepared as specified in the contract documents and shall include~~, unless otherwise specified in the contract,~~ the preparation of the primed surface for field painting, ~~the procurement of all materials to meet the necessary specifications~~ and the application of the ~~coatings~~ remaining coats of the paint system. Prior to field coats, surface contamination such as rust, dirt, mud, oil, concrete, loose zinc, salts, or other foreign matter shall be removed in accordance with section 688.2 of this specification Touch up of the primer shall be in accordance with section 688.4.2.~~ In addition, the Contractor shall protect pedestrian, vehicular, and other traffic on or underneath the structure from splattering, splashing, or dripping paint. Railings, curbs and all other superstructure and substructure shall be protected against spatters, splashes, and the like.~~

**688.~~5~~8.2-Sheer Studs:** When shear studs are applied in the field, repair to the Prime Coat shall be completed in accordance with section 688.4.2, to the satisfaction of the Engineer and prior to any and adjoining concrete work.

**688.~~5~~8.3-Materials:** The ~~field coats (~~Intermediate and/or Top Coats~~)~~ of paint shall meet the requirements of specification 711~~.22.3 and 711.22.4~~. Dry film thickness requirements shall be ~~as specified by the manufacturer's recommendations, or as specified in the contract documents~~ in accordance with the manufacturer's recommendations. Each coat shall be a contrasting color to the previous coat. In addition, the field intercoat adhesion shall be at least 3A when tested in accordance with MP 711.00.20.

~~**688.5.4 Surface Preparation:** Prior to field coats, surface contamination such as rust, dirt, mud, oil, concrete, loose zinc, salts, or other foreign matter shall be removed. The shop primed structural steel shall be pressure washed, with a soluble salt remover from the division's approved product list, at 2000 – 3000 psi. Touch up of the primer shall be in accordance with section 688.2.3.3.~~

~~**688.5.5 Paint Application Requirements:** Painting shall be in accordance with Section 688.2.3.~~

~~**688.5.6 Paint Sequence:** Painting shall be in accordance with Section 688.3.4, with the exception of the Full Prime Coat and Stripe Coat. Paint containment shall be a minimum of Class 3P as specified in the current edition of SSPC Guide 6.~~

**688.~~6~~9-ENVIRONMENTAL, WORKER PROTECTION, AND WASTE HANDLING:**

~~**688.6.1 General:**~~ Environmental and worker protections shall be used when cleaning, painting, welding or cutting an existing bridge. The containment class, emission assessment methods and levels as defined by the current ~~revision edition~~ publication of SSPC Guide 6 shall be as stated in the contract documents. The specific pollution control system which is proposed for the complete capture, containment, collection, and disposal of the "Spent Material" generated by the work shall be included in the plan.

**688.9.1-"Spent Material":** This shall include all material generated by bridge cleaning and surface preparation operations. The "Spent Material" shall be sampled and tested in accordance with the current edition of SSPC Guide 7, and all other applicable State and Federal regulations. The Contractor shall, at the Contractor's expense, select a laboratory that will sample and analyze the "Spent Material" to determine if the spent material is hazardous or non-hazardous. The laboratory shall be certified by the WVDEP in accordance with *47CSR32 - Regulations Governing Environmental Laboratories Certification and Standards of Performance*. The laboratory certification shall be provided to the Engineer prior to the beginning of work. The waste transporter for both hazardous and non-hazardous waste shall be listed on the Contractor's Containment/Disposal Control Plan.

**688.~~6~~9.2–Permits for Disposal of "Spent Material":** Shall be in accordance with all State and Federal regulations and Section 107.2, Permits, Licenses, and Taxes~~. or any other applicable sections of Section 107~~. The "spent material" shall not be disposed of until authorized by the Engineer and in no case shall "spent material" be allowed to accumulate longer than 90 days prior to transport.

~~**688.6.2.1 "Spent Material":** This shall include material generated by surface preparation operations and shall be sampled and tested in accordance with the current revision of SSPC Guide 7 The Contractor shall, at the Contractor's expense, select a laboratory that will sample and analyze the "spent materials". The laboratory must be certified by the WVDEP, EPA or by another state's DEP equivalent. Certification will be provided to the Engineer prior to the beginning of work. The waste transporter for both hazardous and non-hazardous waste will be listed on the Contractor's Containment/Disposal Control Plan.~~

**688.9.3-Temporary Waste Storage:** The Division (WVDOH) will obtain a provisional (temporary) EPA waste generator number for the project prior to the beginning of the work. The location of the temporary waste storage site at the project shall be noted in the Contractor's Containment/Disposal Control Plan. This location must be approved by the Division prior to beginning work.

**688.~~6~~9.~~3~~4-Additional Requirements for All Classes of Containment:** The Contractor ~~will~~ shall provide ground covers beneath the containment area and all equipment where spills

are possible to capture inadvertent spills or leaks of debris. Extend the covers a minimum of five (5) feet beyond the area to be covered. Debris shall be removed from the covers at least once per shift, or as directed by the Engineer. If the ground beneath the structure serves as the base of the containment, install and maintain air and dust impenetrable materials such as solid plywood panels or flexible materials such as tarpaulins. Provide explosion–proof lighting inside containment for all paint application. Maintain a minimum of ten (10) foot-candles for surface preparation and painting, and a minimum of thirty (30) foot-candles for inspection. Water booms shall be used to contain inadvertent releases of debris unless prohibited by navigation lanes. In these cases, a boat with a skimmer shall be available to collect fugitive materials. Remove all project-related debris from the surface of the water or from the stream sediment at the end of each working day at a minimum unless directed otherwise by the Engineer.

~~**688.6.4 Temporary Waste Storage:** The Division (WVDOH) will obtain a provisional (temporary) EPA waste generator number for the project prior to the beginning of the work. The location of the temporary waste storage site at the project shall be noted in the Contractor's Containment/Disposal Control Plan. This location must be approved by the Division prior to beginning work.~~

**688.~~6~~9.5-Worker Protection:** Shall be in accordance with Section 107.7, Public Convenience and Safety, ~~or~~ and any other applicable sections of Section 107. The Contractor shall have a Certified Industrial Hygienist (CIH) develop, review, and approve their written compliance plan. The CIH shall be certified by the American Board of Industrial Hygiene. The CIH, or a technician working under the direction of the CIH, shall be present during the first three days of work and at least twice a month thereafter. The CIH shall certify in writing during the first week of work and at the end of the work that the worker protection plan fully complied with all regulations and that the plans were fully implanted. Daily inspections of the work area shall be made by the project "competent person". The Contractor shall have identified the "competent person" by name in both the CIH's written compliance plan and the Contractor's Containment/Disposal Control Plan. The compliance plan shall also include the "competent person's" qualifications and the frequency of inspections to be taken. The CIH requirements will not apply to those zone painting projects where only SP 2 and SP 3 surface preparation is being done.

**688.~~6~~9.6-Division Employee Worker Protection:** The Contractor shall provide respiratory protection and protective clothing and other necessary equipment for up to 2 Division employees at each site.

**688.~~7~~10-METHOD OF MEASUREMENT:**

The unit of measurement for "Clean and Paint Existing Steel Bridges", "Containment and Disposal of Spent Material", "Field Painting of Shop Primed Steel" shall be lump sum. The unit of measurement for "Zone Cleaning and Painting Steel Bridges" shall be square foot.

**688.~~8~~11-BASIS OF PAYMENT:**

Basis of Payment for "Clean and Paint Existing Steel Bridges", "Containment and Disposal of Spent Material", "Field Painting of Shop Primed Steel" shall be lump sum price bid. "Zone

Cleaning and Painting Steel Bridge" shall be square foot price bid. The cost for the items listed below, which price and payment shall be full compensation for furnishing all the materials and doing all the work herein prescribed in workmanlike and acceptable manner, including all labor, tools, equipment, supplies and incidentals necessary to complete the work.

**688.~~9~~12-PAY ITEMS:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 688001-* | Clean and Paint Existing Steel Bridge | Lump Sum |
| 688003-* | Containment and Disposal of Spent Material | Lump Sum |
| 688005-* | Zone Cleaning and Painting Steel Bridge | Square Foot |
| 688007-* | Field Painting of Shop Primed Steel | Lump Sum |

* Sequence number

DRAFT

~~June 19, 2018~~ April 10, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SPECIAL PROVISION

## FOR

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

## WEST VIRGINIA JOBS ACT

### 1.0-GENERAL REQUIREMENTS:

This special provision shall not apply to any project in which federal funds are used, in whole or in part, for its construction.

If the Contract Bid Amount is equal to or greater than $500,000.00, the West Virginia Jobs Act ~~(Chapter 21 Article 1C of the West Virginia Code)~~ (W. Va. Code § 21-1C-1, *et seq.*), and the following shall apply.

### 2.0-PROCEDURES:

The Prime Contractor and all Subcontractors are required to hire at least 75% of the workers for the project from the local labor market. The local labor market as defined by the Act includes all counties in West Virginia and any county outside of West Virginia if any portion of that county is within fifty (50) miles of the West Virginia border. Each employer is permitted to have two workers from outside the local labor market. If workers are not available from inside the local labor market, the contractor shall ~~obtain an employment wavier certificate from the local office of the West Virginia Job Service.~~ contact the nearest office of Workforce West Virginia and provide the following information: the number of qualified employees needed and a job description of the vacant positions. If Workforce ~~Workforce~~ West Virginia is unable to refer any qualified applicants for the vacant positions within 3 business days, Workforce West Virginia~~Workforce~~ shall issue a waiver to the Prime or Subcontractor.

The Prime Contractor and all Subcontractors who work onsite shall provide to the ~~Division of Highways' District Office~~ West Virginia Division of Labor a certified payroll and all employment waiver certificates for each week worked. The certified payroll must contain the occupation, County, and State of primary residence for each employee.

~~All subcontracts shall contain provisions conforming to the requirements of this Act.~~

Any Prime Contractor or Subcontractor found to be in violation of ~~any provision of~~ the Act will be subject to a civil penalty of ~~one hundred dollars per day of violation~~ $250 per each employee less than the required threshold of 75% per day. Any Prime Contractor or Subcontractor in violation for more than 14 calendars days after receipt of a "Notice of Violation" from the West

Virginia Division of Labor is subject to a civil penalty of $500 per each employee less than the required threshold of 75% per day.

The West Virginia Division of Labor is responsible for establishing procedures for the collection of civil penalties.

All subcontracts shall contain provisions conforming to the requirements of the West Virginia Jobs Act.

DRAFT

April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SUPPLEMENTAL SPECIFICATION

## FOR

## SECTION 101
## DEFINITION OF TERMS

**101.2-DEFINITIONS:**

DELETE THE DEFINITION OF ENGINEER AND REPLACE WITH THE FOLLOWING:

**Engineer-** The ~~Chief Engineer~~ State Highway Engineer of the Division, assigned by the Commissioner, or a designated representative, who acts within the scope of particular duties or authority given to them by West Virginia State Code, the Commissioner, these Specifications, or the Contract Documents.

DRAFT

April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SUPPLEMENTAL SPECIFICATION

## FOR

## SECTION 109
## MEASUREMENT AND PAYMENT

**109.20-WEIGH TICKETS:**

**109.20.1-Electronic Ticket Delivery:**

DELETE THE CONTENTS OF SUBSECTION 109.20.1 AND REPLACE WITH THE FOLLOWING:

In addition~~,~~ for aggregate, asphalt, concrete, pipe, precast concrete products, ~~and~~ reinforcing steel, steel superstructure components (pre-fab or construct on site) and stay-in-place forms~~,~~ electronic ticket delivery (e-tickets) shall be required with the standard information provided as on the paper ticket. The e-ticketing system must interface with the WVDOH e-ticketing portal and provide WVDOH field personnel the ability to access tickets from a smartphone, tablet, or laptop and ~~to~~ make notes associated with each ticket if needed. The service must also provide a daily summary report. A digital signature of the weigh person on an e-ticket or daily summary report shall be considered the equivalent as a hand-signed/initialed, printed ticket.

DRAFT

April 9, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

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

**401.13-BASIS OF PAYMENT:**

DELETE THE ENTIRE CONTENTS OF SUBSECTION 401.13.3 AND REPLACE WITH THE FOLLOWING:

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

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

All longitudinal joints shall be overbanded in accordance with the requirements of Section 403 on the entire project. If the longitudinal joint density in any Lot is determined to be less than 90%, the pay item as originally specified shall be considered "non-performed" and the cost for such sealing shall be at the Contractor's expense. If the longitudinal joint density is determined to be greater than or equal to 90%, the originally specified pay item shall be paid for by the Division.

FORMULA-1: Lots requiring only mat density testing:

Lot Price Adjustment (Mat only) = (unit price) X (Lot quantity) X (mat density price adjustment % from Table 401.13.3A)

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

Lot Price Adjustment (Mat + Joint) = (unit price) X (Lot quantity) X [(mat density price adjustment % from Table 401.13.3A) + (joint density price adjustment % from Table 401.13.3B)]

**TABLE 401.13.3A**

| Adjustment of Contract Price for Pavement Mat Density | |
|---|---|
| Percent of Density | Percent of Contract Price to be Paid |
| Greater than 97% | Note 1 |
| 93% to 97% | 100 |
| 92% | 99 |
| 88% to 91% | = 99 – 4*(92% - Percent density) |
| Less than 88% | = 83 – 10*(88% - Percent density) Note 2 |

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

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

**TABLE 401.13.3B**

| Adjustment of Contract Price for Pavement Joint Density | |
|---|---|
| Percent of Joint Density | Percent Adjustment |
| Greater than 97% | Note -3 |
| 90% to 97% ~~Note 4~~ | 0% |
| 89% ~~Note 5~~ | -1.0% |
| 88% ~~Note 5~~ | -3.0% |
| Less than 88% | Note ~~5 and 6~~4 |

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

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

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

Note ~~6~~4: Density values less than the minimum specified 90% will be more susceptible to accelerated deterioration of both the joint and the surrounding pavement. For Joint densities less than 88%, the percent of adjustment will be decreased by an additional 6% per percentage of joint density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action.

DRAFT

April 9, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SPECIAL PROVISION

## FOR

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

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

**401.13-BASIS OF PAYMENT:**

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

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

All longitudinal joints shall be overbanded in accordance with the requirements of Section 403 on the entire project. If the longitudinal joint density in any Lot is determined to be less than 90%, the pay item as originally specified shall be considered "non-performed" and the cost for such sealing shall be at the Contractor's expense. If the longitudinal joint density is determined to be greater than or equal to 90%, the originally specified pay item shall be paid for by the Division.

FORMULA-1: Lots requiring only mat density testing:

Lot Price Adjustment (Mat only) = (unit price) X (Lot quantity) X (mat density price adjustment % from Table 401.13.3A)

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

Lot Price Adjustment (Mat + Joint) = (unit price) X (Lot quantity) X [(mat density price adjustment % from Table 401.13.3A) + (joint density price adjustment % from Table 401.13.3B)]

**TABLE 401.13.3A**

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

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

**TABLE 401.13.3B**

| Adjustment of Contract Price for Pavement Joint Density | |
|---|---|
| Percent of Joint Density | Percent Adjustment |
| Greater than 97% | Note -3 |
| 90% to 97% ~~Note 4~~ | 0% |
| 89% ~~Note 5~~ | -1.0% |
| 88% ~~Note 5~~ | -3.0% |
| Less than 88% | Note ~~5 and 6~~4 |

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

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

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

Note ~~6~~4: Density values less than the minimum specified 90% will be more susceptible to accelerated deterioration of both the joint and the surrounding pavement. For Joint densities less than 88%, the percent of adjustment will be decreased by an additional 6% per percentage of joint density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action.

DRAFT

April 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

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

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

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

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

All longitudinal joints shall be overbanded in accordance with the requirements of Section 403 on the entire project. ~~If the longitudinal joint density in any Lot is determined to be less than 90%, the pay item as originally specified shall be considered "non-performed" and the cost for such sealing shall be at the Contractor's expense. If the longitudinal joint density is determined to be greater than or equal to 90%, the originally~~ The specified pay item ~~shall~~ will be paid for by the Division.

FORMULA-1: Lots requiring only mat density testing:

Lot Price Adjustment (Mat only) = (unit price) X (Lot quantity) X (mat density price adjustment % from Table 401.13.3A)

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

Lot Price Adjustment (Mat + Joint) = (unit price) X (Lot quantity) X [(mat density price adjustment % from Table 401.13.3A) + (joint density price adjustment % from Table 401.13.3B)]

DRAFT

**TABLE 401.13.3A**

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|---|---|
| Percent of Density | Percent of Contract Price to be Paid |
| Greater than 97% | Note 1 |
| 93% to 97% | 100 |
| 92% | 99 |
| 88% to 91% | = 99 – 4*(92% - Percent density) |
| Less than 88% | = 84 – 10*(88% - Percent density) Note 2 |

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

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

TABLE **401.13.3B**

| Adjustment of Contract Price for Pavement Joint Density | |
|---|---|
| Percent of Joint Density | Percent Adjustment |
| Greater than 97% | Note -3 |
| 90% to 97% ~~Note 4~~ | 0% |
| 89% ~~Note 5~~ | -1.5 ~~1.0~~% |
| 88% ~~Note 5~~ | -3.5 ~~3.0~~% |
| Less than 88% | Note ~~5 and 6~~4 |

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

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

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

Note ~~6~~4: ~~Density values less than the minimum specified 90% will be more susceptible to accelerated deterioration of both the joint and the surrounding pavement.~~ For Joint densities less than 88%, the percent of adjustment will be decreased by an additional ~~7~~6% per percentage of joint density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action~~.~~

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**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION**

**DIVISION OF HIGHWAYS**

**SPECIAL PROVISION**

**FOR**

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

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

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

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

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

All longitudinal joints shall be overbanded in accordance with the requirements of Section 403 on the entire project. ~~If the longitudinal joint density in any Lot is determined to be less than 90%, the pay item as originally specified shall be considered "non-performed" and the cost for such sealing shall be at the Contractor's expense. If the longitudinal joint density is determined to be greater than or equal to 90%, the originally~~ The specified pay item ~~shall~~ will be paid for by the Division.

FORMULA-1: Lots requiring only mat density testing:

Lot Price Adjustment (Mat only) = (unit price) X (Lot quantity) X (mat density price adjustment % from Table 401.13.3A)

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

Lot Price Adjustment (Mat + Joint) = (unit price) X (Lot quantity) X [(mat density price adjustment % from Table 401.13.3A) + (joint density price adjustment % from Table 401.13.3B)]

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**TABLE 401.13.3A**

| Adjustment of Contract Price for Pavement Mat Density | |
|---|---|
| Percent of Density | Percent of Contract Price to be Paid |
| Greater than 97% | Note 1 |
| 93% to 97% | 100 |
| 92% | 99 |
| 88% to 91% | = 99 – 4*(92% - Percent density) |
| Less than 88% | = 84 – 10*(88% - Percent density) Note 2 |

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

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

TABLE **401.13.3B**

| Adjustment of Contract Price for Pavement Joint Density | |
|---|---|
| Percent of Joint Density | Percent Adjustment |
| Greater than 97% | Note -3 |
| 90% to 97% ~~Note 4~~ | 0% |
| 89% ~~Note 5~~ | -1.5 ~~1.0~~% |
| 88% ~~Note 5~~ | -3.5 ~~3.0~~% |
| Less than 88% | Note ~~5 and 6~~4 |

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

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

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

Note ~~6~~4: ~~Density values less than the minimum specified 90% will be more susceptible to accelerated deterioration of both the joint and the surrounding pavement~~. For Joint densities less than 88%, the percent of adjustment will be decreased by an additional ~~7~~6% per percentage of joint density less than 88%, unless a Special evaluation performed by the Division determines a more appropriate action

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April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 403
# JOINT AND CRACK SEALING OF ~~IN~~ ASPHALT PAVEMENTS

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

**403.1-DESCRIPTION:**

The work shall consist of ~~the~~ cleaning, crack sealing, and crack filling in asphalt pavement or overbanding the longitudinal joint in the manner and subject to the conditions and regulations prescribed.

**403.2-MATERIALS:**

M~~The m~~aterial for crack sealing shall be hot-~~-~~poured crack sealant and conform to the requirements of Section 708.3 of the Specifications. The material must be compatible with asphalt pavement recycling.

Material for overban~~m~~ding the longitudinal joint shall be a PG 64S-22 binder and conform to the requirements of Section 705.5 of the Specifications.

**403.3-WEATHER RESTRICTIONS**:

M~~The sealant m~~aterial for these items shall not be applied when the weather is foggy, rainy or when the ambient or~~and~~ pavement temperature~~s~~ is~~are~~ below 40°F.

**403.4-CRACK SEALANT~~ONSTRUCTION~~:**

**403.4.1-Preparation of Material for Use:** Before charging the compound into the melting unit, the unit shall be free from all foreign material. If the type of heater to be used requires that the sealing material, as shipped, be cut into smaller pieces before melting, the cutting method used is subject to the approval by the Engineer.

The heating kettle used for melting sealing materials shall be of the indirect heating or double boiler type, using oil as the heat transfer medium. It shall have a thermostatically controlled heat source, a built-in automatic agitator, and thermometers installed to indicate both the temperature of the melted sealing material and that of the oil bath. Other methods of indirect heating approved by the Engineer may be used. A positive means of controlling the temperature of the heat transfer at all points in the system shall be incorporated in the heater. Sealing material shall be uniformly heated until the pouring temperature recommended by the

manufacturer is reached. Should the maximum pouring temperature recommended be exceeded, the material will be rejected. The material shall be poured as soon as possible after the pouring temperature is reached. Only sufficient material for the day's operation shall be heated each day.

**403.4.2-Preparation of Joints and Cracks for Sealing:** The cracks shall be thoroughly cleaned of all loose scale, dirt, dust, vegetation, or other foreign matter prior to placing hot poured crack sealant. This shall be accomplished by use of a hot air lance, and any other tools necessary to complete the work. The use of any tool which results in damage to the pavement is prohibited.

**403.4.3-Equipment for Applying Sealer:** The equipment used shall conform to the manufacturers' recommendations and consist of heating units from which material may be discharged into the crack through the use of flexible lines and suitable shoes.

**403.4.4-Placement Requirements:** Any spillage of sealing material on pavements shall be immediately removed. A neat and workmanlike job will be required at all times. At no time shall sealing material be placed in a crack which is either dirty or wet. The crack shall be clean and surface dry at the time of placement. Work will be suspended when cracks are wet or damp and when the atmospheric temperature is below 40 degrees. The standard overband shall be three (3) inches centered over the crack. After the sealant has cooled, settling shall not exceed 3/8 inch below the surface. Any damage to uncured sealant shall be repaired at the contractor's expense. Cracks wider than one (1) inch and deeper than three (3) inches shouldn't be sealed to avoid improper sealing. If no overlay work is being performed then no more than 25% of the surface area is to be crack sealed, due to danger of diminished skid resistance. Spalling, adhesive failure, or cohesive failure within 96 hours of installation shall be replaced at no additional cost.

**403.4.5-Equipment, Personnel, and Documentation Requirements:** The Contractor (two (2) days prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment to be used for crack sealing on the project. The Contractor shall also provide certification from the Sealing material manufacturer that the Contractor is qualified to apply the manufacturer's material in conformance with these specifications and the manufacture's recommendations.

The Contractor is responsible for Qquality Ceontrol, and shall submit a Qquality Ceontrol Pplan in accordance with these specifications to the Engineer at the Pre-Construction Conference.

**403.5-OVERBANDING OF LONGITUDINAL JOINT:**

Heat and maintain asphalt binder between 265°F-320°F. Clean longitudinal joint area, as necessary, prior to application. Apply only to joints in pavement surfaces that are clean, dry, and free of any loose material or debris. Utilize a pressure applicator with a wand or nozzle capable of applying hot asphalt sealant in a straight and consistent width band. Apply binder a minimum of 6 inches in width (3 inches on each side of the joint), centered over the joint, at a thickness of 1/16 inch. Removal and disposal of excess material shall be at no additional cost to the Division. Repair of areas of incomplete or inconsistent coverage shall be at no additional cost to the Division.

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**403.65-METHOD OF MEASUREMENT:**

The quantity of work shalldone will be measured in linear feet of "Crack Sealing in Asphalt Pavement" or "Overbanding of Longitudinal Joint", applied and accepted.

**403.76-BASIS OF PAYMENT:**

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

**403.87-PAY ITEM:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 403001-* | Crack Sealing in Asphalt Pavement | Linear Foot |
| 403002-* | Overbanding of Longitudinal Joint | Linear Foot |

* Sequence Number

DRAFT

April 8, 2025

**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION**

**DIVISION OF HIGHWAYS**

**SPECIAL PROVISION**

**FOR**

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

# SECTION 403
# JOINT AND CRACK SEALING OF ~~IN~~ ASPHALT PAVEMENTS

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

**403.1-DESCRIPTION:**

The work shall consist of ~~the~~ cleaning, crack sealing, and crack filling in asphalt pavement or overbanding the longitudinal joint in the manner and subject to the conditions and regulations prescribed.

**403.2-MATERIALS:**

M~~The m~~aterial for crack sealing shall be hot-~~-~~poured crack sealant and conform to the requirements of Section 708.3 of the Specifications. The material must be compatible with asphalt pavement recycling.

Material for overban~~m~~ding the longitudinal joint shall be a PG 64S-22 binder and conform to the requirements of Section 705.5 of the Specifications.

**403.3-WEATHER RESTRICTIONS**:

M~~The sealant m~~aterial for these items shall not be applied when the weather is foggy, rainy or when the ambient or~~and~~ pavement temperature~~s~~ is~~are~~ below 40°F.

**403.4-CRACK SEALANT~~ONSTRUCTION~~:**

**403.4.1-Preparation of Material for Use:** Before charging the compound into the melting unit, the unit shall be free from all foreign material. If the type of heater to be used requires that the sealing material, as shipped, be cut into smaller pieces before melting, the cutting method used is subject to the approval by the Engineer.

The heating kettle used for melting sealing materials shall be of the indirect heating or double boiler type, using oil as the heat transfer medium. It shall have a thermostatically controlled heat source, a built-in automatic agitator, and thermometers installed to indicate

both the temperature of the melted sealing material and that of the oil bath. Other methods of indirect heating approved by the Engineer may be used. A positive means of controlling the temperature of the heat transfer at all points in the system shall be incorporated in the heater. Sealing material shall be uniformly heated until the pouring temperature recommended by the manufacturer is reached. Should the maximum pouring temperature recommended be exceeded, the material will be rejected. The material shall be poured as soon as possible after the pouring temperature is reached. Only sufficient material for the day's operation shall be heated each day.

**403.4.2-Preparation of Joints and Cracks for Sealing:** The cracks shall be thoroughly cleaned of all loose scale, dirt, dust, vegetation, or other foreign matter prior to placing hot poured crack sealant. This shall be accomplished by use of a hot air lance, and any other tools necessary to complete the work. The use of any tool which results in damage to the pavement is prohibited.

**403.4.3-Equipment for Applying Sealer:** The equipment used shall conform to the manufacturers' recommendations and consist of heating units from which material may be discharged into the crack through the use of flexible lines and suitable shoes.

**403.4.4-Placement Requirements:** Any spillage of sealing material on pavements shall be immediately removed. A neat and workmanlike job will be required at all times. At no time shall sealing material be placed in a crack which is either dirty or wet. The crack shall be clean and surface dry at the time of placement. Work will be suspended when cracks are wet or damp and when the atmospheric temperature is below 40 degrees. The standard overband shall be three (3) inches centered over the crack. After the sealant has cooled, settling shall not exceed 3/8 inch below the surface. Any damage to uncured sealant shall be repaired at the contractor's expense. Cracks wider than one (1) inch and deeper than three (3) inches shouldn't be sealed to avoid improper sealing. If no overlay work is being performed then no more than 25% of the surface area is to be crack sealed, due to danger of diminished skid resistance. Spalling, adhesive failure, or cohesive failure within 96 hours of installation shall be replaced at no additional cost.

**403.4.5-Equipment, Personnel, and Documentation Requirements:** The Contractor (two (2) days prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment to be used for crack sealing on the project. The Contractor shall also provide certification from the Sealing material manufacturer that the Contractor is qualified to apply the manufacturer's material in conformance with these specifications and the manufacture's recommendations.

The Contractor is responsible for Qquality Ccontrol, and shall submit a Qquality Ccontrol Pplan in accordance with these specifications to the Engineer at the Pre-Construction Conference.

**403.5-OVERBANDING OF LONGITUDINAL JOINT:**

Heat and maintain asphalt binder between 265°F-320°F. Clean longitudinal joint area, as necessary, prior to application. Apply only to joints in pavement surfaces that are clean, dry, and free of any loose material or debris. Utilize a pressure applicator with a wand or nozzle capable of applying hot asphalt sealant in a straight and consistent width band. Apply binder a minimum of 6

inches in width (3 inches on each side of the joint), centered over the joint, at a thickness of 1/16 inch. Removal and disposal of excess material shall be at no additional cost to the Division. Repair of areas of incomplete or inconsistent coverage shall be at no additional cost to the Division.

**403.65-METHOD OF MEASUREMENT:**

The quantity of work shalldone will be measured in linear feet of "Crack Sealing in Asphalt Pavement" or "Overbanding of Longitudinal Joint", applied and accepted.

**403.76-BASIS OF PAYMENT:**

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

**403.87-PAY ITEM:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 403001-* | Crack Sealing in Asphalt Pavement | Linear Foot |
| 403002-* | Overbanding of Longitudinal Joint | Linear Foot |

* Sequence Number

DRAFT

April 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 403
# JOINT AND CRACK SEALING OF~~IN~~ ASPHALT PAVEMENTS

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

**403.1-DESCRIPTION:**

The work shall consist of ~~the~~ cleaning, ~~crack~~ sealing, and ~~crack~~ filling cracks or constructed joints in asphalt pavement ~~or overbanding the longitudinal joint~~ in the manner and subject to the conditions and regulations prescribed.

**403.2-MATERIALS:**

M~~The m~~aterial for crack sealing shall be hot-~~-~~poured crack sealant and conform to the requirements of Section 708.3 of the Specifications. The material must be compatible with asphalt pavement recycling.

Material for overban~~m~~ding the constructed~~longitudinal~~ joint shall be a PG 64S-22 binder and conform to the requirements of Section 705.5 of the Specifications.

**403.3-WEATHER RESTRICTIONS**:

M~~The sealant m~~aterial for these items shall not be applied when the weather is foggy, rainy or when the ambient or~~and~~ pavement temperature~~s~~ is~~are~~ below 40°F.

**403.4-PREPARATION OF CRACKS AND JOINTS FOR SEALING:**

Cracks and joints shall be thoroughly clean of all loose scale, dirt, dust, vegetation, or other foreign matter at time of sealant placement. Cracks and joints shall be surface dry at time of placement. This shall be accomplished by use of a hot air lance, and any other tools necessary to complete the work. The use of any tool which results in damage to the pavement is prohibited.

Any spillage of sealing material on pavement shall be immediately removed. A neat and workmanlike job shall be required at all times. Work will be suspended when cracks and joints are wet or damp.

**403.5-PREPARATION OF MATERIAL FOR USE:**

Sealing material shall be uniformly heated until the pouring temperature is in conformance with these specifications and the manufacturer's recommendations. Should the maximum pouring temperature specified be exceeded, the material will be rejected. The material shall be poured as

soon as possible after the pouring temperature is reached. Only sufficient material for the day's operation shall be heated each day.

**403.6-EQUIPMENT, PERSONNEL, AND DOCUMENTATION REQUIREMENTS:**

The Contractor (two (2) days prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment to be used for crack and joint sealing on the project. The Contractor shall provided certification from the sealing material manufacturer that the Contractor is qualified to apply the specified material in conformance with these specification and the manufacture's recommendations.

The Contractor is responsible for Quality Control, and shall submit a Quality Control Plan in accordance with these specifications to the Engineer at the Pre-Construction Conference.

**403.74-CRACK SEALANT~~ONSTRUCTION~~:**

**403.74.1-Preparation of Material ~~for Use~~:** Before charging the compound into the melting unit, the unit shall be free from all foreign material. If the type of heater to be used requires that the sealing material, as shipped, be cut into smaller pieces before melting, the cutting method used is subject to the approval by the Engineer.

The heating kettle used for melting sealing materials shall be of the indirect heating or double boiler type, using oil as the heat transfer medium. It shall have a thermostatically controlled heat source, a built-in automatic agitator, and thermometers installed to indicate both the temperature of the melted sealing material and that of the oil bath. Other methods of indirect heating approved by the Engineer may be used. A positive means of controlling the temperature of the heat transfer at all points in the system shall be incorporated in the heater. ~~Sealing material shall be uniformly heated until the pouring temperature recommended by the manufacturer is reached. Should the maximum pouring temperature recommended be exceeded, the material will be rejected. The material shall be poured as soon as possible after the pouring temperature is reached. Only sufficient material for the day's operation shall be heated each day.~~

~~**403.4.2-Preparation of Joints and Cracks for Sealing:** The cracks shall be thoroughly cleaned of all loose scale, dirt, dust, vegetation, or other foreign matter prior to placing hot poured crack sealant. This shall be accomplished by use of a hot air lance, and any other tools~~

~~necessary to complete the work. The use of any tool which results in damage to the pavement is prohibited.~~

**403.74.23-Equipment ~~for Applying Sealer~~:** The equipment used shall conform to the manufacturers' recommendations and consist of heating units from which material may be discharged into the crack through the use of flexible lines and suitable shoes.

**403.74.3 4-Placement Requirements:** ~~Any spillage of sealing material on pavements shall be immediately removed. A neat and workmanlike job will be required at all times. At no time shall sealing material be placed in a crack which is either dirty or wet. The crack shall be clean and surface dry at the time of placement. Work will be suspended when cracks are wet or damp and when the atmospheric temperature is below 40 degrees.~~ The standard overband shall be three (3) inches centered over the crack. After the sealant has cooled, settling shall not exceed 3/8 inch below the surface. Any damage to uncured sealant shall be repaired at the contractor's expense. Cracks wider than one (1) inch and deeper than three (3) inches shouldn't

be sealed to avoid improper sealing. If no overlay work is being performed then no more than 25% of the surface area is to be crack sealed, due to danger of diminished skid resistance. Spalling, adhesive failure, or cohesive failure within 96 hours of installation shall be replaced at no additional cost.

~~**403.4.5 Equipment, Personnel, and Documentation Requirements:** The Contractor (two (2) days prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment to be used for crack sealing on the project. The Contractor shall also provide certification from the Sealing material manufacturer that the Contractor is qualified to apply the manufacturer's material in conformance with these specifications and the manufacture's recommendations.~~

~~The Contractor is responsible for Qquality Ccontrol, and shall submit a Qquality Ccontrol Pplan in accordance with these specifications to the Engineer at the Pre-Construction Conference~~.

**403.85 OVERBANDING OF ~~LONGITUDINAL~~CONSTRUCTED JOINT:**

**403.8.1 Preparation of Material**: ~~—~~Heat and maintain asphalt binder between 265°F-320°F. ~~Clean longitudinal joint area, as necessary, prior to application. Apply only to joints in pavement surfaces that are clean, dry, and free of any loose material or debris.~~

**403.8.2 Equipment:** Utilize a pressure applicator with a wand or nozzle capable of applying hot asphalt sealant in a straight and consistent width band.

**403.8.3 Placement Requirements:** Apply binder a minimum of 6 inches in width (3 inches on each side of the joint), centered over the joint, at a thickness of 1/16 inch. Removal and disposal of excess material shall be at no additional cost to the Division. Repair of areas of incomplete or inconsistent coverage shall be at no additional cost to the Division.

**403.9~~6~~ METHOD OF MEASUREMENT:**

The quantity of work shall~~done will~~ be measured in linear feet of "Crack Sealing in Asphalt Pavement" or "Overbanding of Constructed~~Longitudinal~~ Joint", applied and accepted.

**403.10~~7~~ BASIS OF PAYMENT:**

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

**403.11~~8~~ PAY ITEM:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 403001-* | Crack Sealing in Asphalt Pavement | Linear Foot |
| 403002-* | Overbanding of ~~Longitudinal~~Constructed Joint | Linear Foot |

* Sequence Number

DRAFT

April 2025

**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION**

**DIVISION OF HIGHWAYS**

**SPECIAL PROVISION**
**FOR**

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

# SECTION 403
# JOINT AND CRACK SEALING OF~~IN~~ ASPHALT PAVEMENTS

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

**403.1-DESCRIPTION:**

The work shall consist of ~~the~~ cleaning, ~~crack~~ sealing, and ~~crack~~ filling cracks or constructed joints in asphalt pavement ~~or overbanding the longitudinal joint~~ in the manner and subject to the conditions and regulations prescribed.

**403.2-MATERIALS:**

M~~The m~~aterial for crack sealing shall be hot-~~-~~poured crack sealant and conform to the requirements of Section 708.3 of the Specifications. The material must be compatible with asphalt pavement recycling.

Material for overban~~m~~ding the constructed~~longitudinal~~ joint shall be a PG 64S-22 binder and conform to the requirements of Section 705.5 of the Specifications.

**403.3-WEATHER RESTRICTIONS**:

M~~The sealant m~~aterial for these items shall not be applied when the weather is foggy, rainy or when the ambient or~~and~~ pavement temperature~~s~~ is~~are~~ below 40°F.

**403.4-PREPARATION OF CRACKS AND JOINTS FOR SEALING:**

Cracks and joints shall be thoroughly clean of all loose scale, dirt, dust, vegetation, or other foreign matter at time of sealant placement. Cracks and joints shall be surface dry at time of placement. This shall be accomplished by use of a hot air lance, and any other tools necessary to complete the work. The use of any tool which results in damage to the pavement is prohibited.

Any spillage of sealing material on pavement shall be immediately removed. A neat and workmanlike job shall be required at all times. Work will be suspended when cracks and joints are wet or damp.

**403.5-PREPARATION OF MATERIAL FOR USE:**

Sealing material shall be uniformly heated until the pouring temperature is in conformance with these specifications and the manufacturer's recommendations. Should the maximum pouring temperature specified be exceeded, the material will be rejected. The material shall be poured as

soon as possible after the pouring temperature is reached. Only sufficient material for the day's operation shall be heated each day.

**403.6-EQUIPMENT, PERSONNEL, AND DOCUMENTATION REQUIREMENTS:**

The Contractor (two (2) days prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment to be used for crack and joint sealing on the project. The Contractor shall provided certification from the sealing material manufacturer that the Contractor is qualified to apply the specified material in conformance with these specification and the manufacture's recommendations.

The Contractor is responsible for Quality Control, and shall submit a Quality Control Plan in accordance with these specifications to the Engineer at the Pre-Construction Conference.

**403.74-CRACK SEALANT~~ONSTRUCTION~~:**

**403.74.1-Preparation of Material ~~for Use~~:** Before charging the compound into the melting unit, the unit shall be free from all foreign material. If the type of heater to be used requires that the sealing material, as shipped, be cut into smaller pieces before melting, the cutting method used is subject to the approval by the Engineer.

The heating kettle used for melting sealing materials shall be of the indirect heating or double boiler type, using oil as the heat transfer medium. It shall have a thermostatically controlled heat source, a built-in automatic agitator, and thermometers installed to indicate both the temperature of the melted sealing material and that of the oil bath. Other methods of indirect heating approved by the Engineer may be used. A positive means of controlling the temperature of the heat transfer at all points in the system shall be incorporated in the heater. ~~Sealing material shall be uniformly heated until the pouring temperature recommended by the manufacturer is reached. Should the maximum pouring temperature recommended be exceeded, the material will be rejected. The material shall be poured as soon as possible after the pouring temperature is reached. Only sufficient material for the day's operation shall be heated each day.~~

~~**403.4.2-Preparation of Joints and Cracks for Sealing:** The cracks shall be thoroughly cleaned of all loose scale, dirt, dust, vegetation, or other foreign matter prior to placing hot poured crack sealant. This shall be accomplished by use of a hot air lance, and any other tools~~

~~necessary to complete the work. The use of any tool which results in damage to the pavement is prohibited.~~

**403.74.23-Equipment ~~for Applying Sealer~~:** The equipment used shall conform to the manufacturers' recommendations and consist of heating units from which material may be discharged into the crack through the use of flexible lines and suitable shoes.

**403.74.3 4-Placement Requirements:** ~~Any spillage of sealing material on pavements shall be immediately removed. A neat and workmanlike job will be required at all times. At no time shall sealing material be placed in a crack which is either dirty or wet. The crack shall be clean and surface dry at the time of placement. Work will be suspended when cracks are wet or damp and when the atmospheric temperature is below 40 degrees.~~ The standard overband shall be three (3) inches centered over the crack. After the sealant has cooled, settling shall not exceed 3/8 inch below the surface. Any damage to uncured sealant shall be repaired at the contractor's expense. Cracks wider than one (1) inch and deeper than three (3) inches shouldn't

be sealed to avoid improper sealing. If no overlay work is being performed then no more than 25% of the surface area is to be crack sealed, due to danger of diminished skid resistance. Spalling, adhesive failure, or cohesive failure within 96 hours of installation shall be replaced at no additional cost.

~~**403.4.5 Equipment, Personnel, and Documentation Requirements:** The Contractor (two (2) days prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment to be used for crack sealing on the project. The Contractor shall also provide certification from the Sealing material manufacturer that the Contractor is qualified to apply the manufacturer's material in conformance with these specifications and the manufacture's recommendations.~~

~~The Contractor is responsible for Qquality Ccontrol, and shall submit a Qquality Ccontrol Pplan in accordance with these specifications to the Engineer at the Pre-Construction Conference~~.

**403.85 OVERBANDING OF ~~LONGITUDINAL~~CONSTRUCTED JOINT:**

**403.8.1 Preparation of Material**: ~~—~~Heat and maintain asphalt binder between 265°F-320°F. ~~Clean longitudinal joint area, as necessary, prior to application. Apply only to joints in pavement surfaces that are clean, dry, and free of any loose material or debris.~~

**403.8.2 Equipment:** Utilize a pressure applicator with a wand or nozzle capable of applying hot asphalt sealant in a straight and consistent width band.

**403.8.3 Placement Requirements:** Apply binder a minimum of 6 inches in width (3 inches on each side of the joint), centered over the joint, at a thickness of 1/16 inch. Removal and disposal of excess material shall be at no additional cost to the Division. Repair of areas of incomplete or inconsistent coverage shall be at no additional cost to the Division.

**403.9~~6~~ METHOD OF MEASUREMENT:**

The quantity of work shall~~done will~~ be measured in linear feet of "Crack Sealing in Asphalt Pavement" or "Overbanding of Constructed~~Longitudinal~~ Joint", applied and accepted.

**403.10~~7~~ BASIS OF PAYMENT:**

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

**403.11~~8~~ PAY ITEM:**

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 403001-* | Crack Sealing in Asphalt Pavement | Linear Foot |
| 403002-* | Overbanding of ~~Longitudinal~~Constructed Joint | Linear Foot |

* Sequence Number

DRAFT

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SUPPLEMENTAL SPECIFICATION

## FOR

## SECTION 420
## SINGLE / MULTIPLE COURSE MICRO SURFACING

**420.2-MATERIALS:**

**420.2.2-Fine Aggregates, 2FA and 3FA:**

DELETE THE SECOND TABLE OF 420.2.2 AND REPLACE WITH THE FOLLOWING TABLE

| Material | Percent Passing | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ⅜ in | No. 4 | No. 8 | No. 16 | No. 30 | No. 50 | No. 100 | No. 200 |
| 2FA[(a)] | 100 | 90-100 | 60-85 | 45-70 | 25-45 | 18-30 | 10-21 | 5-15 |
| 3FA[(a)] | 100 | 70-95 | 45-70 | 28-50 | 19-34 | 12-25 | 7-18 | 5-15 |

[(a)] Gradation represents the final blended product.

DRAFT

April 8, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 601
# STRUCTURAL CONCRETE

**601.13-PROTECTIVE SURFACE TREATMENT:**

**601.13.3-Concrete Protective Coating:**

**601.13.3.3-Paint Application Requirements:**

**601.13.3.3.1-Weather Conditions:**

REMOVE AND REPLACE THE FOLLOWING SUBSECTION WITH THE FOLLOWING:

Painting shall not be done when the ambient temperature is below 40°F or above 100°F, or the relative humidity above 90 percent (90%). ~~Painting will only be permitted between the dates of April 15th through October 15th. There will be no painting permitted to occur in a heated containment.~~ Painting is permitted to occur in a heated containment and shall be in accordance with Section 688.3.1-Weather Conditions.

DRAFT

January 16, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 601
# STRUCTURAL CONCRETE

## 601.3-PROPORTIONING:

### 601.3.2-Field Tolerances and Adjustments:

INSERT DIRECTION HERE:

**601.3.2.1-Consistency~~: Concrete~~: Concrete** shall have the consistency which will allow proper placement and consolidation in the required position. Every attempt shall be made to obtain a uniform consistency. The optimum consistency for various types of highway structures shall be as indicated in Table 601.3.2. Concrete for any "Slump Test" shall be deposited in a manner and location that excludes the effects of vibrations caused by traffic and concrete placement operations.

An approved Type F or Type G admixture may be used to increase the consistency and improve the workability of the concrete as long as the requirements of section 707.2.2.1 or section 707.3.2.1 are met, regardless of whether that admixture ~~if the superplasticizer~~ was included in the approved Mix Design~~.~~. When an admixture is used for this purpose, it may be referred to as a superplasticizer.

No more than a total of two additions of a superplasticizer shall be permitted in any one batch of concrete. If a superplasticizer is used at the batch plant, then only one field addition is permitted. ~~.~~ The total quantity of the superplasticizer shall not exceed the manufacturer's recommended dosage rate.

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

When a superplasticizer is used, the optimum consistency target value may be increased by four (4) inches, but under no circumstances shall the slump exceed eight (8) inches.

Acceptance tests for consistency (slump), air content, compressive strength, etc. shall be made after all additions and mixing of the superplasticizer. Slump tests shall be

performed on every batch of concrete to which additional superplasticizer is added to in the field (one test before and one test after the addition of superplasticizer).

The Contractor shall obtain a written statement from the manufacturer of the superplasticizer stating:

i. The manufacturer is satisfied with the compatibility of the combination of materials and the sequence in which they are combined.
ii. The recommended maximum admixture dosage rate.
iii. Immediately after mixing, the air content and slump shall be measured by a certified Portland Cement Concrete Inspector.

This written statement from the admixture manufacturer shall be made available to project personnel before any superplasticizer is added at the job site.

**TABLE 601.3.2 CONSISTENCY**

| TYPE | *Optimum Consistency Inches of Slump |
|---|---|
| **i.** For structures which have exposed, inclined surfaces such as concrete gutters, cast in place concrete slope protection, etc., requiring low slump concrete to allow proper placement and consolidation and the maintenance of the prescribed geometry; those structures which are placed by slip form construction methods where a low slump is required to maintain the prescribed geometry; and mass nonreinforced concrete. | 1 inch |
| **ii.** For reinforced concrete structures which are sufficiently massive and generally have sufficient clearances to allow the access of workers into the immediate area of concrete placement, such as bridge piers, column and abutment footings; piers, large columns, and other similar type structures into which workers may enter for the purpose of placing and consolidating the concrete. | 2 inches |
| **iii.** a. For reinforced concrete structures which are not easily accessible for spading and vibrating and offer a fair degree of difficulty in the placement and consolidation of the concrete, such as pier caps and abutments, beams and girders, box culverts, miscellaneous structure footings and other slab type structures, wall or vertical sections 8 inches or greater in width with one line of reinforcement or 12 inches or greater in width with two lines of reinforcement. | 3 inches |
| b. For bridge decks | 2 ½ inches |
| **iv.** For structures which are inaccessible to workers and generally offer a considerable degree of difficulty in the placement and consolidation of the concrete, such as long slender columns and thin-walled 3 ½ sections less than 8 inches thickness. | 3 ½ inches |
| **v.** For structures which present peculiar conditions under which concreting must be done, such as structural steel encasement; other special structures which contain small openings through which the concrete must pass; tremie concrete which must be placed and | ** |

**TABLE 601.3.2 CONSISTENCY**

| TYPE | *Optimum Consistency Inches of Slump |
|---|---|
| consolidated into all spaces without mechanical disturbances; and other special structures which would require high consistency concrete for proper placement and consolidation. | |

* If the consistency exceeds the target value plus one inch, the Contractor shall take immediate steps to reduce the slump of succeeding loads by making necessary adjustments in the mixture. The Contractor will be allowed a reasonable time for the trucks already on the road for a central mix or truck mix operation. Failure to comply will be cause for rejection of the concrete. If the consistency exceeds the target value plus 1 ¾ inches, the concrete will be rejected.

** The optimum consistency shall be that consistency which will allow a proper placement and consolidation of the concrete into all spaces.

**601.3.2.2-Air Content:** The target value of the entrained air at the point of placement shall be as shown in Table 601.3.1A. However, when pumping concrete, the air content shall be measured before the concrete pump, and the target value of the entrained air shall be as shown in Table 601.3.1A at that point. If the entrained air does not conform with the target value within plus or minus 2.5 percentage points, the Contractor shall take immediate steps to adjust the air content of succeeding loads by making necessary adjustments in the mixture. The air content shall be measured on loads already batched and enroute, as well as the first load to which any adjustments were made in batching procedures. If the air content exceeds the target value plus 3.0 percentage points the concrete shall be rejected. When the concrete is delivered in a truck mixer and the air content is less than the target value minus 2.5 percentage points the concrete shall be rejected, or the Contractor may use additional air entraining agent in 31 an amount that is intended to achieve the target value specified. The addition is permitted under the conditions listed below.

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

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

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

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

**601.3.2.3-Yield:** The approved mix design shall be subject to modification under the conditions prescribed.

After the start of the first concreting operation and immediately after the specified consistency and entrained air have been established, three unit weight determinations shall be made from different batches and the average of the three determinations shall be considered the unit weight of the concrete. The actual yield shall be determined from the average unit weight. The design mix shall be adjusted as required to correct the actual yield to correspond to the theoretical.

During the progress of the work, the actual yield shall be verified at the frequency noted in MP 601.03.50; and, if the yield, based on a single unit weight determination, should differ from the theoretical yield by more than plus or minus two percent (2%), two additional unit weight determinations shall be made, and the average of the three determinations shall be considered the unit weight of the concrete. The actual yield shall be determined from that average unit weight, and the design mix shall be adjusted as required to correct the actual yield to correspond to the theoretical yield.

The Division shall perform Yield tests randomly throughout the progress of work to verify the accuracy of the Contractor's tests.

In addition to the mix design adjustments specified above to correct for yield, other adjustments in the design mix proportions shall be made as necessary to maintain a plastic, workable mix with suitable finishing characteristics.

No change in the brands or sources of material shall be made without prior approval of the Engineer. Methods for determining-the properties enumerated above shall be in accordance with 601.4.

**601.3.2.4-Total Solids Ā:** The combined grading of the coarse aggregate, fine aggregate, and cement used in the structural concrete shall conform to the design mix Ā plus or minus the tolerance specified in the following table for the coarse aggregate size used.

This subsection will not apply for mix designs with optimized aggregate gradation. Subsection 601.3.2.4.1 shall be used in lieu of subsection 601.3.2.4.

**TABLE 601.3.2.4-Total Solids Ā**

| Coarse Aggregate Size Number | Design Mix Ā Tolerance |
|---|---|
| 3 or 4 | ± 0.35 |
| 57 or 67 | ± 0.25 |
| 7, 78 or 8 | ± 0.15 |

Ā is the value obtained by grading of the total solids (coarse aggregate, fine aggregate, and cement). The Ā shall be determined by the Contractor (in accordance with MP 601.03.51) at least once for every 50 cubic yards of concrete that are produced from the same mix design. However, not more than one Ā test (for each mix design) shall be

required per calendar day as long as not more than 400 cubic yards of concrete are produced in a single day from the same mix design. In situations when more than 400 cubic yards of concrete are produced in a single day from the same mix design, two Ā tests shall be required (one in the AM and one in the PM) for that mix design.

During any calendar week (Sunday through Saturday) in which concrete is being produced, a minimum of one Ā test shall be required (for each mix design from which concrete is being produced). This Ā test shall be conducted on the first day of production of that calendar week. For days on which concrete is being produced, but no Ā test is required, laboratory number 1392885 shall be used for Ā test documentation purposes.

Should the moving average of any five consecutive grading tests of the total solids have an Ā outside the specified mix design tolerance limits, production shall be discontinued until appropriate corrections are made. Corrections shall be made either in the proportions of the concrete (the mix design), the gradation of the aggregates, or the storage and loading of the aggregate, as the Contractor may elect.

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

When, in a concrete mix, gradations tests show that the percentage of material which passes the No. 200 (75 µm) sieve, exceeds the amount permitted in Sections 702.1.2 and 703.4, and provided the Engineer permits the material to remain in place and the Contractor elects to leave the material in place, then a penalty shall be applied in the manner outlined in the following paragraph.

It shall be determined which material (coarse aggregate, fine aggregate, or both) caused the total material finer than the No. 200 (75 µm) sieve to exceed the specification limits as determined in Sections 702.1.2 and 703.4. The mass of the material(s) in the concrete mix ($M_{ca}$, $M_{fa}$, or both, as defined in MP 601.03.51), which caused the total material finer than the No. 200 (75 µm) sieve to exceed the specification limits shall be divided by $M_t$ (as defined in MP 601.03.51). The resulting number shall be multiplied by the unit price of the concrete, as billed by the Concrete Supplier and by the quantity of non-specification concrete placed. That value shall be the penalty applied for the use of the material which did not meet the specification requirements.

**601.3.2.4.1-Optimized Aggregate Gradation:** The optimized aggregate gradation is performed by mechanical analysis on all of the coarse and fine aggregates used in any mix design. The combined percent retained from all aggregate gradation shall conform Table 601.3.2.4.1A. The combined percent retained from all aggregate gradations in Table 601.3.2.4.1A is based on the Tarantula Curve for optimized aggregate gradation. The contractor shall determine optimized aggregate gradation in accordance with MP 601.03.53.

**Table 601.3.2.4.1A**

| Sieve Size | Combined % Retained |
|---|---|
| 1½ in | 0% |

**Table 601.3.2.4.1A**

| Sieve Size | Combined % Retained |
|---|---|
| 1 in | ≤ 16% |
| ¾ in | ≤ 20% |
| ½ in | 4 - 20% |
| ⅜ in | 4 - 20% |
| No. 4 | 4 - 20% |
| No. 8 | ≤ 12% |
| No. 16 | ≤ 12% |
| No. 30 | 4 - 20% |
| No. 50 | 4 - 20% |
| No. 100 | ≤ 10% |
| No. 200 | ≤ 2% |
| Coarse Sand % Retained (No.8 to No. 30 Sieve) | > 15% |
| Fine Sand % Retained (No. 30 to No. 200 Sieve) | 24% - 34% |

The combined aggregate gradation test shall be performed by the contractor (in accordance with MP 601.03.53) at least once for every 50 cubic yards of concrete that are produced from the same mix design. The working range on each sieve from cumulative combined percent retained from aggregate gradation shall be in accordance with Table 601.3.2.4.1B. However, not more than one combined aggregate gradation test (for each mix design) shall be required per calendar day as long as not more than 400 cubic yards of concrete are produced in a single day from the same mix design. In situations when more than 400 cubic yards of concrete are produced in a single day from the same mix design, two combined aggregate gradation tests shall be required (one in the AM and one in the PM) for that mix design.

**Table 601.3.2.4.1B**

| Sieve Size | Allowable variation from Combined % Retained in Design Mix [Note 1] |
|---|---|
| 1 in | ± 10% of the % retained on this sieve in the Design Mix |
| ¾ in | ± 10% of the % retained on this sieve in the Design Mix |
| ½ in | ± 10% of the % retained on this sieve in the Design Mix |
| ⅜ in | ± 10% of the % retained on this sieve in the Design Mix |
| No. 4 | ± 5% of the % retained on this sieve in the Design Mix |
| No. 8 | ± 5% of the % retained on this sieve in the Design Mix |
| No. 16 | ± 4% of the % retained on this sieve in the Design Mix |
| No. 30 | ± 4% of the % retained on this sieve in the Design Mix |
| No. 50 | ± 4% of the % retained on this sieve in the Design Mix |
| No. 100 | ± 3% of the % retained on this sieve in the Design Mix |
| No. 200 | ± 2% of the % retained on this sieve in the Design Mix |

Note 1 The maximum and minimum allowable % retained on each sieve size noted in Table 601.3.2.4.1A shall not be exceeded during production. For example, if the ½" sieve has a combined % retained of 15% in design mix, then the allowable % retained on ½" sieve during production would be 5% to 20%.

During any calendar week (Sunday through Saturday) in which concrete is being

produced, a minimum of one combined aggregate gradation test shall be required (for each mix design from which concrete is being produced). This combined aggregate gradation test shall be conducted on the first day of production of that calendar week.

Should the moving average of any five consecutive combined aggregate gradation tests have a working range outside of the limits sets forth on Table 601.3.2.4.1B, for any of the sieve sizes listed, production shall be discontinued until appropriate corrections are made. Corrections shall be made either in the aggregate proportions in the concrete mix (the mix design), the gradation of the aggregates, or the storage and loading of the aggregate, as the Contractor may elect.

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

When, in a concrete mix, gradations tests show that the percentage of material which passes the No. 200 (75 μm) sieve, exceeds the amount permitted in Sections 702.1.2 and 703.4, and provided the Engineer permits the material to remain in place and the Contractor elects to leave the material in place, then a penalty shall be applied in the manner outlined in the following paragraph.

It shall be determined which material (coarse aggregate, fine aggregate, or both) caused the total material finer than the No. 200 (75 μm) sieve to exceed the specification limits as determined in Sections 702.1.2 and 703.4. The mass of the material(s) in the concrete mix (Mca, Mfa, or both, as defined in MP 601.03.53), which caused the total material finer than the No. 200 (75 μm) sieve to exceed the specification limits shall be divided by Mt (as defined in MP 601.03.53). The resulting number shall be multiplied by the unit price of the concrete, as billed by the Concrete Supplier and by the quantity of non-specification concrete placed. That value shall be the penalty applied for the use of the material which did not meet the specification requirements.

DRAFT

March 18, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SUPPLEMENTAL SPECIFICATION

## FOR

## SECTION 604
## PIPE CULVERTS

**604.8-BACKFILLING:**

**604.8.1-Initial Backfill Zone:**

DELETE THE CONTENTS OF THE THIRD PARAGRPH OF 604.8.1 AND REPLACE WITH THE FOLLOWING:

Box culvert initial backfill material shall be ~~suitable granular material free from particle sizes larger than 1-½ inch or crushed aggregate.~~designed per ASTM 1675. Unless otherwise noted on the plans, it shall be placed to a minimum of twelve (12) inches over the top of box culvert.

# SECTION BREAK

# NEW BUSINESS ITEMS

DRAFT

May 15, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 106
# CONTROL OF MATERIALS

**106.3-SAMPLES:**

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

All materials will be inspected, tested and approved prior to incorporation into the work. Any work which incorporates materials prior to the above evaluation shall be performed at the Contractor's risk, and may subsequently be considered as unacceptable. Unless otherwise specified, the materials shall meet the applicable Standard or Interim Specifications of the American Association of State Highway and Transportation Officials (AASHTO), the Standard or Tentative Specifications of the American Society for Testing and Materials (ASTM), or Standards adopted by other specifying agencies, with preference given in the same order in which the above agencies are listed. The specification which is current at the time of advertisement for bids shall govern, except that, with the approval of the Engineer, subsequent revisions or adoptions may govern. All materials being used are subject to inspection, testing or rejection at any time prior to final acceptance of the completed work.

The Contractor shall be responsible for the quality of construction and materials incorporated. When called for in the Specifications and/or Materials Procedure, the Contractor shall perform all necessary process control inspection, sampling and testing. All materials will be approved for acceptance through the Division's acceptance procedures. The Division has the exclusive right and responsibility for determining the acceptability of the construction and materials incorporated. The Division may use the results of the Contractor's inspection, sampling and testing for acceptance purposes.

Tests shall not be considered complete until they are submitted by the Contractor to the Division. The submission of test results shall be provided in a timely manner as specified in MP 109.00.21. Failure to submit test results by the established guideline will result in a price penalty assessed based on MP 109.00.21.

The Contractor may submit for acceptance, materials that appear on the Division Approved Source/Product Listing (APL). These submissions shall include a clear and legible invoice from the manufacturer and contain the product’s approved lab number. Products that are not on the approved product list may be used on projects as long as these products meet the requirements for that material. Prospective new products for the approved product list shall follow the guidelines of MP 106.00.02 and MP 106.00.03.

Acceptance of materials via the APL shall be in accordance with MP 106.00.05. APL acceptance documentation shall include E-ticketing for the ~~following materials: all precast concrete products, all~~

~~pipe, and all reinforcing steel~~materials specified in 109.20.1. These E-tickets shall follow all guidelines established in Section 109.20.

Lot or sublot sizes will normally be designated. In the event that operational conditions cause work to be interrupted, or only partially completed before the lot size designated has been achieved, the lot or sublot may be redefined by the Engineer as being either the amount of work accomplished within the day or that work partially completed combined with the next lot or sublot of work. It is the intent of these Specifications that the number of samples required to evaluate each lot or sublot will be unchanged even when the lot or sublot is redefined.

When an acceptance plan is cited, it shall be in accordance with 106.3.1.

April 21, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 107
# LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

**107.26-NOTIFICATION OF ABATEMENT, DEMOLITION OR RENOVATION:**

**107.26.2-Demolition:**

**107.26.2.2-No Asbestos Containing Materials Reported:**

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

For buildings or bridges that do not contain asbestos, only the notification form must be submitted to the West Virginia Division of Environmental Protection (DEP) and the United States Environmental Protection Agency (EPA) at the address given in 107.26.4.

~~If an asbestos inspection report indicates that there is no asbestos present on a bridge scheduled for demolition or renovation, the need for a trained individual to be on site during either process is waived.~~ However, the Contractor shall have an individual trained in accordance with the provisions as set forth in 40 CFR Part 61, Subpart M on site to observe building demolition and file a report with the Project Engineer indicating if any suspect (asbestos containing) material was encountered during demolition. A copy of the individual's current training certification must be attached to this report.

DRAFT

May 25, 2025

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SUPPLEMENTAL SPECIFICATION

# FOR

# SECTION 311
# OPEN GRADED FREE DRAINING BASE COURSE

**311.2-MATERIALS:**

ADD THE FOLLOWING TO THE SUBSECTION

Depending on the alternative chosen, (asphalt or Portland cement) the materials shall conform to the requirements of the following subsections of Division 700.

| MATERIAL | SUBSECTION | UNIT |
|---|---|---|
| Aggregate* | 703.1, 703.2, 703.3, 703.4 | AASHTO 57, 67, 357, or 467 |
| Curing Material*** | 707.10 | |
| Performance Graded Binders** | 705.5 | Standard grade for area |
| Portland cement*** | 701.1 | Type 1L |
| Water*** | 715.7 | |

* If river gravel is used, the crushed particle requirement shall be 100% two face fracture.
** Asphalt stabilized applications only.
*** Portland cement applications only.

## CONSTRUCTION METHODS

**311.3-GENERAL:**

General requirements shall comply with the applicable portion of 401.3 of the Specifications.

**311.4-COMPOSITION OF OPTIONAL STABILIZING MIXTURES:**

If the asphalt stabilized alternative is used, the asphalt cement shall be confined to 2.0%, plus or minus 0.5% by weight of the mix if Blast Furnace Slag is used the asphalt cement may be increased.

If the Portland cement stabilized alternative is chosen, the cement shall be Type 1L and shall have a minimum cement content of 150 ± 5 pounds per cubic yard. This base

course shall be capable of withstanding construction operations without showing any detrimental effects.

DRAFT

June 24, 2025~~February 2, 2022..~~

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

# DIVISION OF HIGHWAYS

# SPECIAL PROVISION

# FOR

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

## SECTION 601
## STRUCTURAL CONCRETE

**601.1-GENERAL:**

ADD THE FOLLOWING SUBSECTION:

**601.1.1-Ultra High Performance Concrete:** The Contractor shall furnish all materials, tools, and labor necessary for the performance of all work to form, cast, finish, and cure Ultra High Performance Concrete (UHPC) where required per plan. Before casting UHPC for actual construction, the Contractor will cast mockups to demonstrate the ability to properly cast the UHPC.

All UHPC shall be premixed/prebagged product provided ready for site mixing and installation by one of the following manufacturers:

1. ceEntek, Inc.
2. Cor-Tuf UHPC
3. ~~Holcim US~~AMERIZE, Ductal®
4. Steelike, Inc.
5. ~~4.~~5. National Cement Co. Inc. , SMARTUP®

UHPC manufacturers shall submit product data sheets and test reports from an AASHTO accredited independent testing laboratory for UHPC testing showing that the product meets the requirements of this Special Provision. Any change of materials or material sources shall require a submission of new test reports by an AASHTO accredited independent testing laboratory for UHPC testing showing conformance of the UHPC with this Special Provision. The UHPC concrete mixture described in this Special Provision shall be used at all locations specified in the Contract Plans.

**601.2-MATERIALS:**

ADD THE FOLLOWING:

**A. UHPC:** Use a UHPC premixed/prebagged product supplied by one of the manufacturers identified in 601.1.1. The UHPC shall have an optimized gradation of granular constituents, super plasticizer, and water, and shall have a minimum steel fiber content of 2% by volume and be able to achieve the following material and durability properties:

| Material Characteristic Description | Test Method | Pre-Constr. Testing | Constr. Testing | Testing Frequency | Acceptance Criteria |
|---|---|---|---|---|---|
| Flow** | ASTM C1437 (as modified by ASTM C1856) | Yes | Yes | Once per batch | 7 to 10 inches |
| Min. Compressive Strength at 4-days | ASTM C39 (as modified by ASTM C1856) | Yes | Yes | At least once per lot (15 $yd^3$) or once per 12-hr shift | 14 KSI |
| Min. Compressive Strength at 28-days | ASTM C39 (as modified by ASTM C1856) | Yes | Yes | At least once per lot (15 $yd^3$) or once per 12-hr shift | 20 KSI |
| Flexural Tension Stress, first crack strength, minimum | ASTM C1609 (as modified by ASTM C1856) | Yes | Not Required | N/A | 1.5 KSI |
| Flexural Tension Stress, peak strength, minimum | ASTM C1609 (as modified by ASTM C1856) | Yes | Not Required | N/A | 2.0 KSI |
| Long-Term Shrinkage | ASTM C157 (as modified by ASTM C1856) | Yes | Not Required | N/A | ≤ 800 microstrain at 28-days |
| Scaling Resistance | ASTM C672-12 | Yes | Not Required | N/A | y < 3 |
| Abrasion Resistance | ASTM C944 (2x weight; ground surface) | Yes | Not Required | N/A | < 0.025 oz. lost |
| Chloride Ion Penetrability | ASTM C1202 | Yes | Not Required | N/A | ≤ 500 coulombs by 28-days |
| Freeze-Thaw Resistance | ASTM C666A | Yes | Not Required | N/A | RDM ≥ 95% after 300 cycles |
| Alkali-Silica Reaction | ASTM C1567 | Yes | Not Required | N/A | Innocuous at 28-days |

NOTE: RDM = Relative Dynamic Modulus of Elasticity
** Flow tests are to be performed on a vibration free area

**B. Accelerated Curing UHPC:** Use a UHPC premixed/prebagged product supplied by one of the manufacturers identified in 601.1.1. The UHPC shall have an optimized gradation of granular constituents, super plasticizer, accelerator, and water, and shall have a

minimum steel fiber content of 2% by volume and be able to achieve the following material and durability properties:

| Material Characteristic Description | Test Method | Pre-Constr. Testing | Constr. Testing | Testing Frequency | Acceptance Criteria |
|---|---|---|---|---|---|
| Flow** | ASTM C1437 (as modified by ASTM C1856) | Yes | Yes | Once per batch | 7 to 10 inches |
| Min. Compressive Strength at 24-hours | ASTM C39 (as modified by ASTM C1856) | Yes | Yes | At least once per lot (15 $yd^3$) or once per 12-hr shift | 10 KSI |
| Min. Compressive Strength at 48-hours | ASTM C39 (as modified by ASTM C1856) | Yes | Yes | At least once per lot (15 $yd^3$) or once per 12-hr shift | 14 KSI |
| Min. Compressive Strength at 28-days | ASTM C39 (as modified by ASTM C1856) | Yes | Yes | At least once per lot (15 $yd^3$) or once per 12-hr shift | 20 KSI |
| Flexural Tension Stress, first crack strength, minimum | ASTM C1609 (as modified by ASTM C1856) | Yes | Not Required | N/A | 1.5 KSI |
| Flexural Tension Stress, peak strength, minimum | ASTM C1609 (as modified by ASTM C1856) | Yes | Not Required | N/A | 2.0 KSI |
| Long-Term Shrinkage | ASTM C157 (as modified by ASTM C1856) | Yes | Not Required | N/A | ≤ 800 microstrain at 28-days |
| Scaling Resistance | ASTM C672-12 | Yes | Not Required | N/A | y < 3 |
| Abrasion Resistance | ASTM C944 (2x weight; ground surface) | Yes | Not Required | N/A | < 0.025 oz. lost |
| Chloride Ion Penetrability | ASTM C1202 | Yes | Not Required | N/A | ≤ 500 coulombs by 28-days |
| Freeze-Thaw Resistance | ASTM C666A | Yes | Not Required | N/A | RDM ≥ 95% after 300 cycles |
| Alkali-Silica Reaction | ASTM C1567 | Yes | Not Required | N/A | Innocuous at 28-days |

NOTE: RDM = Relative Dynamic Modulus of Elasticity
** Flow tests are to be performed on a vibration free area

**C. Qualification Testing:** A minimum of two months prior to placement of UHPC, the Contractor shall complete qualification testing to demonstrate that the material and durability properties in 601.2.A or 601.2.B are met. Only a UHPC mix design that passes these tests may be used. Testing shall be performed by an AASHTO accredited independent testing laboratory for UHPC testing approved by the UHPC manufacturer and the Engineer. The casting of mockups as described in 601.5.D shall also apply.

**D. Water:** Water used for mixing shall meet the requirements of 715.7 and the manufacturer's specifications. Ice may be used to displace a proportion of the water as determined by the UHPC manufacturer.

**E. Admixtures:** Admixtures shall be determined by the UHPC manufacturer.

**F. Fiber Reinforcement**: Fibers shall be 0.5 to 1.0-inch long and 0.008 ± 0.002-inch diameter made from ASTM A820, Type I steel wire with a minimum tensile strength of 290,000 psi. Steel fibers shall be Buy America Act compliant with all steel and iron components originating from the United States of America as documented by steel mill certifications.

**601.3-PROPORTIONING:**

ADD THE FOLLOWING SUBSECTION:

**601.3.4-UHPC Submittals**: The Contractor shall submit a detailed work plan to the Engineer for review and approval a minimum of thirty (30) days prior to casting. As a minimum, the following items shall be included in the work plan:

1. Quality control plan in accordance with Section 601.4.2.
2. UHPC mix design including mix ingredients and their proportions, water-to-cementitious ratio, mixing time, flow, set time, and compressive strength properties of the mix at the times shown in 601.2.A or 601.2.B.
3. Submission of qualification testing in accordance with Section 601.2.C.
4. Location of storage areas and storage requirements of UHPC material in accordance with 601.5.C.
5. Bridge plans with dimensions showing connection joints, suggested sequence of UHPC placement, and project schedule requirements. Include placement drawings with location of bulkheads and stages (if staged construction is used).
6. Working drawings and calculations for all proposed formwork, including materials and procedure for maintaining watertight joints in accordance with 601.5.D.
7. Details of top forms for deck-level connections and adequate hold downs. Top forms for deck-level connections are set at a minimum of 1/4-inch higher than adjacent surfaces to allow for all overfilling in accordance with 601.5.A.2.
8. Number, location, and details of all equipment to be used to batch, mix, and place UHPC materials.
9. Schedule and duration of traffic control measures required for completion of the work.

10. Method to attain an exposed aggregate finish with an average amplitude of 1/8-inch minimum for all precast concrete surfaces in contact with UHPC. The use of paste retarders is required to provide the required aggregate finish of precast concrete surfaces in contact with UHPC surfaces.
11. Surface preparation plan of existing concrete surfaces and pre-wetting of the existing concrete interface to a saturated surface-dry (SSD) condition immediately prior to UHPC placement.
12. Detailed plan and procedure for casting of a demonstration UHPC mockup meeting the requirements of 601.5.D.
13. Provisions for acceptable ambient temperature, batch temperatures, ambient relative humidity, batch consistency, and batch times.
14. Mixing, batching, delivery, placement, finishing, and curing procedures for UHPC.
15. Proposed schedule and procedure for watertight integrity testing of completed UHPC bridge deck joints.
16. Pre-pour meeting agenda, including UHPC Manufacturer's recommended topics.

**601.5-CONSTRUCTION METHODS:**

ADD THE FOLLOWING:

**A. Quality Assurance:**

1. The Contractor must follow the directions of the UHPC manufacturer when assisting with mixing the UHPC and must work with the UHPC manufacturer to fully understand the properties of the UHPC so that the Contractor is able to effectively place the UHPC. The Contractor shall have a UHPC Manufacturer Technical Representative on site during all batching and placement of the UHPC material. Notify the Engineer at least 48 hours prior to the anticipated UHPC placement.
2. The top surface of the UHPC shall be formed and filled 1/4-inch higher than adjacent surfaces to allow for consolidation and then ground flush after curing, unless the entire deck surface is to be ground after placement in which case the UHPC may be placed flush with the precast surface. Other tolerances shall be in compliance with PCI Manual – 116 or otherwise specified in the Contract Plans.

**B. Pre-Pour Meeting:** The Contractor shall arrange for an onsite meeting with the UHPC Manufacturer Technical Representative, Construction Inspector, and Engineer to take place a minimum of one day prior to the UHPC mockup demonstration. The Contractor's staff and Construction Inspectors shall attend the site meeting. The objective of the meeting will be to clearly outline the procedures for mixing, testing, transporting, finishing, and curing of the UHPC material. The Contractor shall arrange for a UHPC Manufacturer Technical Representative to be on site during the casting of the mockup and during placement of all UHPC material. The UHPC Manufacturer Technical Representative shall be knowledgeable in the supply, mixing, batching, testing, delivery, placement, and curing of the UHPC material. Mockup shall be representative of the required placement as demonstrated in the approved work plan and shall be performed per the recommendations of the UHPC manufacturer.

**C. Storage:** The Contractor shall assure the proper storage of the UHPC premixed/prebagged product including powder, fibers, and additives as required by the UHPC manufacturer's specifications in order to protect materials against loss of physical and mechanical properties. Material must be used within the manufacturer's recommended shelf life.

**D. Forming, Batching, Placement, And Curing:** The Contractor shall work together with the UHPC manufacturer to ensure appropriate initial strength gains to meet the desired project schedule. Grinding of the UHPC surface shall be performed once the UHPC has reached a minimum compressive strength of 10 KSI as validated in accordance with 601.5.E. If significant fiber pullout is observed during grinding operations, grinding shall be suspended and not resumed until approved by the Engineer. The finished surface of the UHPC shall match the proposed profile to within a tolerance specified in 601.11.4.3.

The bridge can be opened to traffic when the UHPC has been properly cured and achieved a minimum compressive strength of 14 KSI.

Construction loads applied to the bridge during UHPC placement and curing are the responsibility of the Contractor. Contractor shall submit the weight and placement of concrete buggies, grinding equipment, or other significant construction loads to the Engineer for review prior to the pre-pour meeting describe above.

Forming, batching, placing, and curing shall be in accordance with the procedures recommended by the UHPC manufacturer and as submitted and accepted by the Engineer. The design and fabrication of forms shall follow the approved work plan submission and shall follow the recommendations of the UHPC manufacturer. All the forms for UHPC shall be constructed from marine-grade plywood and shall have nonabsorbent surfaces that are properly sealed and capable of resisting hydrostatic pressure from UHPC in the unhardened state.

The surfaces of all concrete against which UHPC will be placed shall have an exposed aggregate finish with an average amplitude of 1/8-inch minimum and shall be continuously wetted for a minimum of 12 hours and be in a saturated surface-dry (SSD) condition immediately prior to UHPC placement. The interface surface shall be cleaned of all laitance and other deleterious materials prior to the placement of UHPC.

Mockups of each UHPC placement shall be performed prior to actual UHPC construction and conducted per the requirements of this Special Provision and the recommendation of the UHPC Manufacturer Technical Representative. Mockups of horizontal closure pours shall be four feet in length with all other dimensions to match those required by the plans. Mockups for vertical closure pours shall be two feet in length with all other dimensions to match those required by the plans. The mockup process shall be observed by the UHPC Manufacturer Technical Representative and the Engineer.

A minimum of two portable batching units will be supplied by the UHPC manufacturer to the Contractor for mixing of the UHPC. Alternatively, the use of a ready-mix concrete truck may be approved at the discretion of the Engineer if successful implementation can be demonstrated by the Contractor. Any loss of material or equipment caused by alternate batching and placement methods shall be remediated at the Contractor's expense. The UHPC shall be mixed in equipment that has been recommended and approved by the UHPC manufacturer. The Contractor shall follow the batching sequence as specified by the UHPC manufacturer and approved by the Engineer.

Each UHPC placement shall be cast using one continuous pour wherever possible per each stage of construction. No cold joints are permitted unless previously agreed upon by the UHPC Manufacturer Technical Representative and the Engineer.

The UHPC in the forms shall be cured according to manufacturer's recommendations at a minimum temperature of 50°F to attain the design strength.

**E. Acceptance Testing:** The following tests shall be performed following casting of the mockup and during construction for every lot of UHPC. A lot of UHPC is defined as 15 cubic yards or one day of production, whichever comes first.

1. Concrete compressive strength test according to ASTM C39 as modified by ASTM C1856. From every lot, take four (4) sets of three (3) compressive strength test cylinders for a total of twelve (12) specimens. One set will be taken at the beginning and one set at the end of each lot. In an evenly distributed manner, take two (2) intermediate sets from the middle portion of the lot. All cylinders shall measure 3-inch diameter by 6-inches in length and shall be cured using the same method of curing proposed to be used in the field. For traceability, track all sets of specimens to lot numbers. Prior to the Contractor removing forms and initiating grinding operations, three (3) specimens shall be tested to validate the achievement of 10 KSI compressive strength. Additionally, three (3) specimens shall be tested to validate the achievement of 14 KSI compressive strength prior to opening the bridge to traffic. Lastly, three (3) specimens shall be tested at 28-days to verify final strength. WVDOH may reject a portion or all the in-place UHPC should testing indicate that it does not meet required minimum strengths. The rejected UHPC shall be removed and replaced or remediated to the satisfaction of the Engineer at the Contractor's expense. The remaining three (3) specimens shall be treated as reserves for resolution testing, if needed. Final acceptance will be based on the 28-day compressive strength. Field coring of UHPC for dispute resolution is not allowed.

   All UHPC specimens shall be tested by an AASHTO accredited independent testing laboratory for UHPC testing approved by the UHPC manufacturer and the Engineer. A WVDOH representative shall be present to witness the testing of the acceptance samples and report the results to Cement and Concrete Group of the WVDOH, MCS&T Division. Each UHPC cylinder sample shall have both ends ground in accordance with ASTM C1856 prior to compressive strength testing.
2. Determination of static flow shall be in accordance with ASTM C1437 as modified by ASTM C1856. The measured diameter of the UHPC at the end of the test shall be within the limits: minimum 7-inches; maximum 10-inches. The test shall be performed on every UHPC batch. The flow test must be performed in an area free of vibration to give the most accurate results.

**F. Manufacturers Contacts Information:** All UHPC shall be premixed/prebagged product from one of the following manufacturers:

1. ceEntek, Inc.
   38510 Crimm Rd.
   Scio, OH 43988
   Phone: 403-669-8632
   Email: USA@ceEntek.com

2. Cor-Tuf UHPC
   11128 Industrial Road
   Manassas, VA 20109
   Phone: 540-270-9239
   Email: info@cor-tuf.com

3. Holcim US
   8700 W Bryn Mawr Avenue, Suite 300
   Chicago, IL 60631
   Phone: 734-489-9555
   Email: ductal-na@lafargeholcim.com

4. Steelike, Inc.
   7631 Fullerton Road 7G
   Springfield, VA 22153
   Phone: 703-520-2763
   US Toll Free: 1-888-364-2541
   Email: info@steelike.com

**601.14-METHOD OF MEASUREMENT:**

ADD THE FOLLOWING:

The UHPC quantities will be measured in cubic yards, complete in place, and accepted as determined by the dimensions on the Plans or Contract Documents.

**601.15-BASIS OF PAYMENT:**

ADD THE FOLLOWING:

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

**601.16-PAY ITEM:**

ADD THE FOLLOWING:

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 601800-001 | Ultra High Performance Concrete | Cubic Yard |

DRAFT

August 6, 2020

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SPECIAL PROVISION

## FOR

**STATE PROJECT NUMBER:** S331-81-6.29 00

**FEDERAL PROJECT NUMBER:** STBG-0081(042)D

## SECTION 601
## STRUCTURAL CONCRETE

**601.1–DESCRIPTION:**

ADD THE FOLLOWING PARAGRAPH AFTER CLASS DC CONCRETE:

**Class H Lightweight** concrete shall be used for bridge decks and other bridge elements when designated in the Plans.

**601.3 –PROPORTIONING:**

ADD THE FOLLOWING AFTER THE FIFTH PARAGRAPH:

Surface Resistivity-testing shall be a requirement for establishment of the mixture proportions. Specimens for surface resistivity tests shall be made on representative samples prepared and tested in accordance with AASHTO T 358. A set of three 4-inch x 8-inch cylinders shall be fabricated and moist cured from both of the batches at the minimum cement factor as outlined in Section 3.3 of MP 711.03.23, as specified in AASHTO R 39, for 28 days prior to testing, and the results of this test shall not be less than 40 kΩ-cm.

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

Class H Lightweight Concrete shall have an oven-dry density of 115 ± 5 lb/ft$^3$ when tested in accordance with ASTM C567. The average result of the rapid chloride permeability tests performed on both batches in the mix design shall not exceed 1750 coulombs.

**601.3.1 –Mix Design Requirements:**

ADD THE FOLLOWING AFTER THE FIRST PARAGRAPH IN THE SUBSECTION:

Oven-dry density testing, in accordance with ASTM C567, shall be performed on each batch of Class H Lightweight Concrete during the mix design development process. The average oven-dry density of the two mix design batches shall be 115 ± 5 lb/ft$^3$ and shall be noted as $DENS_{OD}$. The average unit weight of the plastic concrete, determined in accordance with AASHTO T121, of both batches of Class H Lightweight Concrete, determined during the mix design development process, shall also be recorded and noted as $UW_{Design}$.

The following formula shall be used to determine the maximum allowable unit weight of fresh concrete when tested in the field:

$$UW_{Max} = 120 \times (UW_{Design} \div DENS_{OD})$$

Where:

$UW_{Max}$ = Maximum allowable unit weight of fresh concrete when tested in the field ($lb/ft^3$)
$UW_{Design}$ = Average unit weight of fresh concrete from both mix design batches ($lb/ft^3$)
$DENS_{OD}$ = Average oven dry density from both mix design batches ($lb/ft^3$)

**601.3.2-Field Tolerances and Adjustments: 601.3.2.4– Total Solids Ā:**

ADD THE FOLLOWING PARAGRAPH AFTER THE TABLE:

The Design Mix Ā Tolerance for Class H Lightweight concrete shall be based on the nominal maximum size (NMS) of the lightweight coarse aggregate in the mix. The tolerance used in Table 601.3.2.4 for the standard AASHTO Size Number Aggregate with the same NMS as the NMS of the lightweight coarse aggregate in the mix shall apply.

**601.4 –TESTING:**

**601.4.1 –Sampling and Testing Methods:**

ADD THE FOLLOWING TO THE TABLE:

| | |
|---|---|
| Standard Test Method for Determining Density of Structural Lightweight Concrete | ASTM C567 |
| Surface Resistivity Test | AASHTO T 358 |

ADD THE FOLLOWING AT THE END OF THE SUBSECTION:

Air content testing of Class H Lightweight Concrete shall be performed in accordance with AASHTO T196 (Air Content of Freshly Mixed Concrete by the Volumetric Method).

ADD THE FOLLOWING SUBSECTION:

**601.4.6–Additional Field Tests for Class H Lightweight Concrete:** A unit weight test, in accordance with AASHTO T121, shall be conducted in the field on the first three batches of Class H Lightweight concrete produced on a project and then at least once per half-day of operation after that. If the result of any of these field unit weight tests exceeds the average unit weight of the plastic concrete established in the approved mix design ($UW_{Design}$) by more than 2%, the Contractor shall take immediate corrective action to lower the unit weight of the concrete (adjustment to the lightweight coarse aggregate proportion in the mix shall be permitted), and additional unit weight tests shall be performed on subsequent batches of concrete until the unit weight of the concrete is not more than 2% greater than $UW_{Design}$. If the result of any unit weight test conducted in the

field exceeds $UW_{Max}$ (as defined in Section 601.3.1), the concrete shall be rejected, and a unit weight test shall be performed on the following batch of concrete.

Each time that a set of cylinders is fabricated in the field for compressive strength testing, the Contractor shall fabricate an additional set of cylinders for oven-dry density in accordance with ASTM C567. The Contractor shall have these specimens tested by a Laboratory which is accredited by AASHTO re:source for ASTM C567. The average oven-dry density of that set of cylinders shall be considered the density of the same quantity of concrete which is represented by the compressive strength cylinders. Any quantity of concrete with an oven-dry density of more than 120 lb/ft$^3$ shall be considered as not meeting specification requirements. The Engineer shall evaluate the concrete with this oven-dry density and decide whether to allow it to remain in place.

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

**Table 601.4.6**

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

**601.15-BASIS OF PAYMENT:**

**601.15.2–Price Adjustments:**

ADD THE FOLLOWING PARAGRAPH AT THE END OF THE SUB-SECTION:

If the Engineer allows Class H Lightweight Concrete with an oven-dry density exceeding 120 lb/ft$^3$, as determined by oven-dry density tests conducted on samples fabricated in the field as outlined in Section 601.4.6, to remain in place, a price adjustment of 2.0% of the unit bid price of Class H Lightweight Concrete shall be assessed to the quantity of concrete in question

for every 1 lb/ft$^3$ by which it exceeds 120 lb/ft$^3$.

**601.16-PAY ITEMS:**

ADD THE FOLLOWING TO THE TABLE:

| ITEM | DESCRIPTION | UNIT |
|---|---|---|
| 601009-015 | Class H Lightweight Concrete | Cubic Yard (Meter) |

DRAFT

February 23, 2021

# WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## SPECIAL PROVISION

## FOR

**STATE PROJECT NUMBER:** _____

**FEDERAL PROJECT NUMBER:** _____

## SECTION 662
## ROADWAY LIGHTING

**6622.12-FOUNDATION**

ADD THE FOLLOWING:

**6622.12.1-High Mast Tower:**

**6622.12.1.1-High Mast Tower Foundation:** High Mast Foundation shall be constructed per Standard Detail sheet TEL-16B.

**6622.12-1.2-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.

**6622.12.1.3-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,

**662.15.15.3-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.