20210804 - August's Specifications Committee Meeting

August Specifications Committee Meeting Agenda

Meeting Date

Wednesday, August 4, 2021 @ 9:00am

Microsoft Teams Meeting. E-mail distribution message includes instruction.

Approved Permanent Specification changes from last Committee meeting (6/2/21)

- **405.2.1-Aggregates**
- **211.3.3-Impervious Core**
- **601.3.1.1.1.4.2-Prevention Level W, X, and Y**
- **681.2.10-Forms**
- **715.42.8.7-Technician Accessories**

Approved Project Specific Special Provisions (SP) from last Committee meeting (6/2/21)

- **SP407-Stress Absorbing Membrane Interlayer**
- **SP207-Impervious Membrane**
- **SP207-Soil Monitor Settlement Pins**
- **SP615-Jacking Superstructure**
- **SP627-Finger Expansion Joint**
- **SP642-Turbidity Curtain**
- **SP707-CFB Fly Ash**
- **SP601-ASCM Mitigation**
- **SP695-Mainline Pavement**
- **SP662-High Mast Tower**

Items removed from Committee Agenda

- **None**

Old Business - Provisions discussed at last Committee meeting

SECTION	TITLE	DESCRIPTION
107	**107.21.1-Erosion and Sedimentation Control** Champion: L. Conley-Rinehart	**4th time to Committee. Discussed in February, April, & June.** Proposed specification change to Section 107. The revision to 107.21.1 are updates to the NPDES permit registration process. The specification has been updated, removing restart of 180 days for resubmission. It is redline copy showing the changes from last meeting. Approval is expected in August.

403	**SP403 - Void Reducing Asphalt Membrane** C. Thompson	**4th time to Committee. Discussed in February, April & June.** Project Specific provision for Void Reducing Asphalt Membrane (VRAM), a base asphalt material placed ahead of construction at longitudinal construction joints in asphalt surface courses to decrease deterioration of joint over time. No update to the SP. Approval is expected in August.
410	**Section 410** C. Miller, JF Allen	**4th time to Committee. Discussed in February, April & June.** Proposed specification change to Section 410. This specification suggestions is from Industry (Asphalt Association of WV). It is redline copy showing the proposed changes. No update to the specification.
690	**SP690 - Cross Slope and Superelevation Tolerances** S. Smith	**4th time to Committee. Discussed in February, April & June.** Project Specific provision for final pavement surface tolerances. No update to the SP.
691	**SP691 - Finished Surface Lidar Survey** S. Smith	**4th time to Committee. Discussed in February, April & June.** Project Specific provision for pavement survey. SP has been updated; it is redline copy showing changes from last meeting. Approval is expected in August.
102	**102-Bidding Requirements and Conditions** S. Danberry	**3rd time to Committee. Discussed in April and June.** Proposed specification change to 102. It is a complete section rewrite and revised to be more in line with how we currently operate. No update to the specification. It is a redline copy showing the proposed changes. Approval is expected in August.
103	**103-Award and Execution of Contract** S. Danberry	**3rd time to Committee. Discussed in April and June.** Proposed specification change to Section 102. It is a complete section rewrite and revised to be more in line with how we currently operate. No update to the specification. It is a redline copy showing the proposed changes. Approval is expected in August.

218	**SP218 - Scaling, SP218 - Rockfall Drape, and SP218 - Rock Anchors for Concrete Slabs** S. McGee, TRC	**3rd time to Committee. Discussed in April and June.** Three Project Specific special provisions for Rockfall Mitigation: 1. SP218 – Scaling 2. SP218 – Rockfall Drape 3. SP218 – Rock Anchors for Concrete Slabs. SPs have been updated per comments at the last meeting (clarify working/calendar days); they are all redline copy showing the latest revisions. Approval is expected in August.
636	**636.3-Control of Traffic Through Work Areas** S. Boggs	**3rd time to Committee. Discussed in April and June.** Proposed specification change to Section 636. The revision updates the Traffic Control Supervisor requirement. No update to the specification. It is a redline copy showing the proposed changes. Approval is expected in August.
636	**636.11-Flagger or Traffic Director 636.23.14-Flagger 636.23.15-Traffic Director** S. Boggs	**3rd time to Committee. Discussed in April and June.** Proposed specification change to Section 636. The revision updates the flagger and traffic director requirements. No update to the specification. It is redline copy showing the proposed changes. Approval is expected in August.
698	**SP698-Prefabricated Bridge Element and Systems** D. Estep, GPI	**3rd time to Committee. Discussed in April and June.** Project Specific Provision on prefabricated bridge elements and systems that are built off alignment to accelerate onsite construction. No update to the SP. Approval is expected in August.
601	**SP601 - Patching Concrete Structures** M. Perrow	**Update to previously approved SP; 2nd time to Committee. Discussed in June.** Project Specific Special Provision on rapid set cementitious patching. The revision clarifies use of material and updates initial set time criteria and pay items. No update to the SP. It is redline copy showing the proposed changes. Approval is expected in August.

104 **107** **636** **660**	**104.5-Maintenance of Traffic** **107.10-Barricades and Warning Signs** **636.18-Electric Arrow** **660.4-Maintaning Traffic** M. Khan	**2nd time to Committee. Discussed in June & August.** Four proposed specification changes to remove references to the old MOT book and update to current WVDOH "Manual on Temporary Traffic Control for Streets and Highways". 1. 104.5-Maintenance of Traffic 2. 107.10-Barricades and Warning Signs 3. 636.18-Electric Arrow 4. 660.4-Maintaning Traffic No update to the specification. The specifications are redline copy, showing the proposed changes. Approval is expected in August.
107	**SP107-Environmental Commitment and Mitigation** S. Burke	**2nd time to Committee. Discussed in June.** Project Specific Special Provision on environmental mitigation requirements, which would list site specific items and associated details within provision that are applicable to the designated project. No update to the SP.
201	**Section 201-Clearing and Grubbing** S. Boggs	**2nd time to Committee. Discussed in June.** Specification change to Section 201. The update clarify the requirements. No update to the specification. It is redline copy showing the proposed changes.
307	**307.9.1-Price Adjustment** D. Matics	**2nd time to Committee. Discussed in June.** Specification change to Section 307. The update revises Table (for adjustment of contract price for gradation not within specs). No update to the specification. The specification is redline copy showing the proposed changes.
601	**SP601 - Super Air Meter** M. Perrow	**2nd time to Committee. Discussed in June.** Project Specific Special Provision on Super Air Mater (SAM), which is modified version of the typical pressure method and can measure the bubble size and volume in concrete in about 10 minutes. No update to the SP.
601	**601.3.1-Mix Design Requirements, 601.3.2.4.-Total Solids A, and 601.3.2.4.1-Optimized Aggregate Gradation** S. Thapa	**2nd time to Committee. Discussed in June.** Specification change to Section 601. This Specification change gives Contractor option to use a reduced target cement factor provided the aggregates used in those mix designs meet the requirements for optimized aggregate gradation. The specification has been updated; it is redline copy showing the latest changes (update Table 601.3.2.4.1B).

601	**601.5.5-Bridge Deck Placing and Finishing Equipment and 601.10.4-Placing Concrete Bridge Decks** M. Mance	**2nd time to Committee. Discussed in June.** Specification change to Section 601. The revision adds equipment requirements to finishing of Class H bridge decks. No update to the specification. Approval is expected in August.
604	**604.2-Materials and 604.15-Pay Items** S. Boggs	**2nd time to Committee. Discussed in June.** Specification change to Section 604. The revision adds concrete safety slope end section for elliptical pipe to the specification. No update to the specification. Approval is expected in August.
633	**Section 633-Concrete Gutter and Dumped Rock Gutter** S. Boggs	**2nd time to Committee. Discussed in June.** Specification change to Section 633. The update removes 'Invert Pipe Gutter' references and item from specification, as it has not recent use. No update to the specification. It is redline copy showing the proposed changes.
660 **663** **663**	**SP660-Rectangular Rapid Flashing Beacon Assembly** **SP663 - Stamped Asphalt Crosswalks** **SP663 - Bicycle Lane, Green Thermoplastic** M. Perry, Stantec	**2nd time to Committee. Discussed in June.** Three Project Specific Special Provision for streetscape elements. 1. SP660-Rectangular Rapid Flashing Beacon (RRFB) Assembly: Furnish & install RRFB assembly at designated crosswalk location. 2. SP663-Stamped Asphalt Crosswalks: Stamped and coated crosswalk on asphalt surface. 3. SP663-Bicycle Lane, Green Thermoplastic: Green markings used to designate bicycle lane. SPs have been updated, per comments at the last meeting; they are redline copy showing the proposed changes.

New Business - New Provisions for Spec Committee

SECTION	TITLE	DESCRIPTION
601	**SP601-Ultra High Performance Concrete** A. Mongi	**Update to previously approved SP. 1st time to Committee.** Project Specific Special Provision on UHPC. The revision updates the material, submittal, and constructions methods requirements. The SP is redline copy showing the proposed changes.

642	**SP642-Compost Filter Socks** F. Rose	**Update to previously approved SP. 1st time to Committee.** Project Specific Special Provision on Compost Filter Socks. The revision adds 32" diameter to the SP. The SP is redline copy showing the proposed changes.
420	**Section 405-Chip Seals** C Thompson	**1st time to Committee.** Specification changes to Section 405, it is a complete rewrite. The update is to make the spec more in line with AASHTO spec and industry standards. The specification is redline copy showing the proposed changes.
603	**603.6.4.1-Acceptance Testing of Class S-P Concrete** M. Mance	**1st time to Committee.** Specification changes to Section 603. It modifies the acceptance testing frequency for self-consolidating concrete (SCC) used in prestressed concrete member fabrication. The specification is redline copy showing the proposed changes.
605	**605.5-Basis of Payment** J. Hall	**1st time to Committee.** Specification changes to Section 605. The revision adds positive drainage requirements during construction to inlets or other drainage structures.
606	**Section 606-Underdrains** **714.20-PVC Underdrain Pipe** S. Boggs	**1st time to Committee.** Specification changes to Section 606; it is a complete section rewrite. The update removes outdated language and gets it more in in line with Standard Sheet DR8. 1. 714.20 subsection revision removes semicircular pipe reference and adds PVC underdrain pipe The specification is redline copy showing the proposed changes.
709	**709.1.3-Acceptance of Plain Black Reinforcement for Concrete** D. Lipscomb	**1st time to Committee.** Specification changes to Section 709. The revision adds acceptance requirements for plain black reinforcement.
712	**712.10-Coated Steel Barbed Wire** J. Sizemore	**1st time to Committee.** Specification changes to Section 712. The revision removes the invalid reference (AASHTO M 305) from subsection 712.10. The specification is redline copy showing the proposed changes.

Comments

Comments are requested on these Specifications Changes and Project Specific Special Provisions. Please share your comments by **August 2, 2021**, they help in the decision making process.

Please Send Comments to: DOHSpecifications@wv.gov

Deadline for new items & updates to these provision is September 3, 2021.

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

Next Meeting

Wednesday, **October 6, 2021 at 9:00 a.m.**
Meeting will be held virtually via Microsoft Teams. If in-person meeting is available, information will provided (meeting invite will include details).

2017 Standard Specification Roads and Bridges & 2021 Supplemental Specifications

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

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

2021 Specifications Committee

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

Specifications Committee Website

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

Materials Procedures

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

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

File Format Structure and Progression of items thru Specifications Committee

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

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

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

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

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

Each item should also include a description with:

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

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

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

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

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

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.21-PROTECTION OF RIVERS, STREAMS, AND IMPOUNDMENT:

107.21.1-Erosion and Sedimentation Control:

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

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

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

NPDES registration, modifications, and fees for Alternative Delivery/Design Build Projects with earth disturbing activities of 1 acre or more shall be the Contractor's responsibility. The WVDOH shall not be a NPDES Co-Applicant/Co-Permittee for Alternative Delivery/Design Build Projects.

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

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

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

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

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

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

(if applicable), Tier 2 or Tier 3 Stream Protection Designation (as designated by the WVDEP), Stream with an approved sediment-related Total Maximum Daily Load (TMDL), Cross-sections, Plan and Profile, Slope Stability Analysis, Soils, Location of topsoil stockpiles. Note: As per WVDEP requirements, the site maps and plans shall contain a North arrow with sites oriented to the North, with a minimum of five-foot topographical contours.

7. Soil maps https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.
8. Designating a "Qualified Person" for Stormwater Pollution Prevention Plan development, compliance inspection, and corrections.
    a. "Qualified Person" means a person who is knowledgeable in the principles and practices of sediment and erosion controls, pollution prevention, and possesses the education and abilities to assess conditions at the proposed site that could impact stormwater quality and to assess the effectiveness of proposed stormwater controls to meet the requirements of this permit.
9. Initial inspection by Qualified Person for compliance with proposed plan & proper installation
10. Frequency of inspections:
    a. For Projects discharging into Tier 1 Streams (as designated by the WVDEP) inspection of all erosion and sediment control BMPs within disturbed areas at least once every seven calendar days and within 24 hours after any precipitation event greater than 0.25" per 24 hrs. period
    b. For Projects discharging towards Tier 2, Tier 3, or 303(d) Streams (as designated by the WVDEP) Inspection of all erosion and sediment control BMPs within disturbed areas at least once every four calendar days and within 24 hours after any precipitation event greater than 0.25" per 24 hrs. period.
11. Verification that temporary seeding & mulching is occurring within 4 days when areas will not be re-disturbed for more than 14 days. Any defective controls identified during the inspection must be repaired and/or installed correctly within 24 hours and corrections verified upon re-inspection by the Qualified Person within 48 hours. Permanent seeding and mulching within 4 days of reaching final grade. Final stabilization within 4 days after construction has been completed.
12. Installation of discharge point/outlet signs/markers
13. Waste and Borrow Site Plans
    a. Offsite waste and/or borrow plans and controls
        - Note: Separate NPDES CSW General Permit Registration (if applicable)
    b. Cross-sections, Plan and Profile
    c. Slope Stability Analysis
14. Groundwater Protection Plan; Project Site specific detail (including the design of the concrete washout if applicable)
15. The GPP shall include the following elements:
    a. A description of the operations, processes and materials present at the facility that may affect or contaminate groundwater.
    b. Procedures and containment facilities to protect groundwater resources from the potential contaminants.
    c. MSDS sheets
    d. These processes and facilities shall be identified on a facility map.

e. The GPP must be signed by someone with signature authority for the applicant. Note: Signature Authority: a responsible corporate officer (President, Vice Pres. Secretary, Treasure), principal executive officer or ranking elected official, Senior Executive Director or a letter of delegation of authority for the signatory is provided that is signed by one of the above.

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

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

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

Once submitted to WVDEP, the expected approval time is anticipated to be:

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

West Virginia Code of State Rules Title 47 Series 10 requires any person proposing a new discharge to submit an application at least one hundred eighty (180) days prior to commencing construction of the facility, unless permission for a shorter time period has been granted by the Director of Water and Waste Management. Any person with an existing permit shall submit a new application at least one hundred eighty (180) days before the expiration date of the existing permit unless permission for a shorter time period has been granted by the Director.

The WVDEP determines that a NPDES permit registration is Administratively Complete when the application form is accepted and the permit fee is paid. The WVDEP determines that a NPDES Permit Registration Submission is Complete when Applicant/Permittee has submitted all information required to meet the conditions of the NPDES General Permit and the WVDEP approves said submission. ~~Each resubmission to address WVDEP comments restarts the 180 days.~~ Projects with public notice requirement shall warrant an additional 45 calendar days of review/approval time. Delay in WVDEP approval in excess of the above shall be considered an Excusable Noncompensable Delay in accordance with Section 108.6.2.

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

The Contractor shall implement a Quarterly Employee training program for all on-site personnel directly involved with construction activities at all levels of responsibility that reiterates the components and goal of the SWPPP. At a minimum the training shall address:

i. Spill & leak response and internal reporting, good housekeeping, and routine inspection & maintenance.
ii. Training: Date, Time, Location, Attendees, Subjects Discussed.

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

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

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

Earth disturbing activities shall not be initiated until the WVDEP has approved the NPDES permit modification, SWPPP, GPP, and KMP (if required). The Division will not be responsible for any delays in obtaining WVDEP approval of the NPDES permit modifications due to the timeliness of WVDEP's review or the contractor's failure to provide a complete SWPPP, GPP, KMP (if required) or submit corrections and/or additional information required by WVDEP in a timely manner; however, delays due to WVDEP's failure to review NPDES submissions with regulatory times are considered an Excusable Noncompensable Delay in accordance with Section 108.6.2.

Any additional/future NPDES permit registration modification applications shall be the Contractor's responsibility and shall by submitted by the Contractor through the WVDEP Electronic Submission System (ESS).

During construction the contractor shall be responsible for:

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

In addition to the above, the Contractor shall be familiar with all requirements contained within the WVDEP's General Water Pollution Control Permit, Stormwater Associated with Construction Activities Permit Number WV0115924 or latest applicable replacement permit. The WVDOH will consider the contractor's requests for additional compensation if the reissued or new NPDES Permit has additional requirements that were not in place at the time the bid package was assembled. A copy of this permit can be found at the following internet address: http://www.dep.wv.gov/WWE/Programs/stormwater.

Noncompliance with permit conditions constitutes a violation of the Federal Clean Water

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

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

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

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

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

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

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

The Contractor will be advised if the project is located within an urbanized area with respect to the NPDES Municipal Separate Storm Sewer System (MS4) Permit. The MS4 permit requires on-site management of the runoff from the first one (1) inch of rainfall from the additional impervious area (if >5,000 sf) for an average 24-hour storm preceded by 48 hours of no measurable precipitation or provide equal benefits for water quality. The contractor is advised that any proposed changes or substitutions to the project may require additional

stormwater management mitigation and any costs associated with such mitigation shall be borne by the contractor at no additional cost to the Division. The contractor shall allow seven (7) calendar days for the Division and the local MS4 authority to review and comment on the proposed changes. Additionally, changes or substitutions proposed by the contractor shall be approved by the Division in advance of implementing any changes. Post-construction stormwater management shall comply with the WVDOH MS4 stormwater management plan requirements of NPDES general permit registration no. WVR30004 or the latest applicable registration number.

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 403
VOID REDUCING ASPHALT MEMBRANE

403.1-DESCRIPTION:

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

403.2-MATERIALS:

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

TABLE 403.2 VRAM MATERIAL REQUIREMENTS

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

403.3-EQUIPMENT:

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

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

403.4-CONSTRUCTION:

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

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

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

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

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

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

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

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

TABLE 403.4.3 VRAM APPLICATION RATES

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

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

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

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

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

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

403.5-ACCEPTANCE:

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

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

403.6-METHOD OF MEASUREMENT:

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

403.7-BASIS OF PAYMENT:

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

403.8-PAY ITEM:

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

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

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

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

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

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

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

410.14-PAY ITEMS:

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

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

February 3, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

DELETE SECTION 690 AND REPLACE WITH FOLLOWING:

SECTION 690
CROSS SLOPE AND SUPERELEVATION TOLERANCE

690.1-DESCRIPTION:

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

690.2-EVALUATION CRITERIA:

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

The as-built cross slopes shall be compared to the plan cross-slopes.

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

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

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

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

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

Superelevated Sections: Superelevated sections shall also be evaluated with a .50% tolerance. In general, areas in consecutive length of 250’ or more with variance outside the

tolerance as compared to the plan superelevated cross slopes will require additional evaluation and potential remediation.

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

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

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 691
FINISHED SURFACE LIDAR SURVEY

691.1-DESCRIPTION:

A terrain model representing the as-built roadway surface~~,~~ and inside and outside shoulders to the point of intersection (PI) of the inside and outside shoulder is a required deliverable for the project. The area of the median from the PI to the opposite PI is not required to be modeled; however, the data of the final graded median is required as described below. The model shall include cross sections at 50 feet intervals; generated from the modeled surface. The following items are required:

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

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

691.2-DATA COLLECTION:

The terrain models described above shall be developed from data collection meeting these requirements:

Data Collection for Mobile LiDAR and Reduction:

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

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

Project Datum:

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

Data Collection:

1. Minimum of two passes, one on each of the inside lanes collecting data of the median, which includes the inside shoulders, all lanes of the roadway and the outside shoulders to the slope breakover. The median data collection shall apply to parallel roadways with medians of 60 feet or less. On separated roadways, the data collection shall extend 30 feet from the roadway (yellow line) on both sides of the route.
2. Data collection shall not be performed when snow is present on road, shoulder, or median

Deliverables:

1. Individual file sizes shall be for maximum roadway length of five miles.
2. Digital Terrain Model of road surface (inside edge of paved shoulder to outside edge of paved shoulder). The project's plan centerline and curve data shall be used. If no project baseline is included in project plan, it shall be established on the median side of the yellow line.
3. Scan data shall be stored in .las file type.
4. Include all digital calibrated photos (if applicable).
5. Include all survey control points with Name,Northing,Easting,Elevation.
6. All deliverables shall be submitted on an external hard drive compatible with Division hardware.

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

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

691.2.2-Software Requirements: Any spreadsheets must be submitted in acceptable digital format used by the Division. The software utilized in preparation of the various Terrain Models must be compatible with the current Bentley Systems© software products used by the Division.

691.3 THROUGH 691.7: BLANK

691.8-PAY ITEMS:

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

March 12, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 102
BIDDING REQUIREMENTS AND CONDITIONS

DELETE THE ENTIRE CONTENTS AND REPLACE THE FOLLOWING.

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

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

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

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

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

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

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

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

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

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

102.2-~~CONTENTS OF~~PROPOSAL FORMS:

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

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

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

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

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

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

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

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

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

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

102.34-INTERPRETATION OF APPROXIMATE ESTIMATES:

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

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

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

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

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

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

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

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

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

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

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

i. Section A: Free Competitive Bidding Affidavit – Prior to the approval of Federal-Aid Contracts, a sworn statement in the form of an affidavit shall be executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded.

ii. Section B: Certification with Regard to the Performance of Previous Contracts or Subcontracts Subject to the Equal Opportunity Clause and the Filing of Required Reports

iii. Section D: Assurance Requirement Regarding Equal Employment Opportunity for Vendors, Suppliers and Contractors Engaged in Commercial Transactions with the West Virginia Division of Highways

iv. Section F: Certificate of Compliance Involving the Supplying of Aluminum, Glass, Steel or Iron Products

v. Section H: West Virginia Contractor Licensing Act Chapter 21 Article 11 Code of West Virginia License Number – The proposal shall comply with West Virginia Contractor Licensing Act, Chapter 21, Article 11 Code of West Virginia, except that on Federal-Aid Projects a Contractor's license is not required at time of bid, but will be required before a project will be awarded.

vi. Section I: Drug and Alcohol-Free Workplace – An affidavit that the Contractor implements and maintains a written drug-free workplace policy which meets the requirements of Article 1D, Chapter 21 of the Official Code of West Virginia, as amended. The successful bidder must submit a copy of its drug-free workplace policy within ten (10) days following the letting and prior to the awarding of the contract. Any successful bidder who fails to submit the policy within the specified time limit will risk forfeiture of his/her proposal guaranty.

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

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

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

Every contractor shall keep an accurate record showing the names, occupation and safety- sensitive status of all employees, in connection with the construction on the project, and showing any drug tests or alcohol tests performed and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Potential Bidders may ask questions up until the time of the posted letting with no exceptions. However, it should be noted that any questions that may necessitate a change to the Contract should be asked seven (7) days prior to the posted letting date to allow the Division to issue an amendment to modify the Contract, if necessary. Questions received three (3) working days or more in advance of a posted letting should be answered prior to the time of the posted letting.

Questions received within three (3) working days of the posted time of letting may or may not be answered as time allows.

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

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

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

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

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

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

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

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

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

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

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

iv. Failure to sign or properly execute the Proposal.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 103
AWARD AND EXECUTION OF CONTRACT

DELETE THE ENTIRE CONTENTS AND REPLACE THE FOLLOWING.

103.1-CONSIDERATION OF PROPOSALS:

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

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

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

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

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

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

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

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

103.2-BID PROTESTS

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

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

b) Within ~~seven~~ five (~~7~~ 5) calendar days of the notice of intent to protest the protesting Bidder must file with the Division a detailed statement of the grounds, legal authorities, and facts, including all documents and evidentiary statements, in support of the protest. Evidentiary statements, if any, shall be submitted under penalty of perjury. The protesting Bidder shall have the burden of proving its protest by clear and convincing evidence.

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

d) Unless otherwise required by law, no evidentiary hearing or oral argument shall be provided.~~, except the Contract Administration Division Director in its sole discretion, may decide to permit a hearing or argument if it determines that such hearing or argument is necessary for the protection of the public interest.~~ The Division shall issue a written decision regarding the protest within ~~thirty~~ five (~~30~~ 5) calendar days after it receives the detailed statement of protest.

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

f) Should the Bidder wish to appeal the decision of the Contract Administration Division Director, he or she shall submit the appeal to the Secretary of Transportation/Commissioner of Highways within two (2) ~~business~~ calendar days of receiving the decision. The Secretary of Transportation/Commissioner of Highways will then issue a final decision on the appeal within ~~ten~~ five (~~10~~ 5) calendar days from the date of appeal. Such decision shall be final and conclusive.

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

The award of Contract, if it be awarded, will be made within 30 calendar days after the opening of Proposals to the lowest responsible and prequalified bidder. The Commissioner may, with the agreement of the successful bidder, withhold award for any length of time. The successful bidder will be notified ~~by letter, mailed to the address shown on their Proposal,~~ that their bid has been accepted and that they have been awarded the Contract.

103.~~3~~2.1-Contractor's Direct Deposit Requirements: The Contractor shall receive all payments electronically via Direct Deposit. Prior to Award of the Contract, the Contractor shall be approved and registered to accept payments through the West Virginia State Auditor'sOffice electronically (www.wvsao.gov).

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

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

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

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

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

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

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

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

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

and applicable throughout the duration of the contract for which the bond is being submitted and shall be consistent and applicable to all contracts executed between the Division and that particular contractor.

As an alternate, the successful bidder may deposit with the State Treasurer cash bond, United States Treasury bonds, United States Treasury notes, United States Treasury Certificates of Indebtedness, United States Treasury bills or West Virginia Road Bonds in the amount of either 102 percent or 100 percent of the contract amount. A safe keeping receipt from a bank located in the State of West Virginia may be deposited with the State Treasurer in lieu of any of the definitive securities.

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

103~~.6~~.7-INSURANCE REQUIREMENTS:

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

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

103~~.6~~.7.1-Contractor's General Liability Insurance: The Contractor shall maintain commercial general liability (CGL) coverage with limits not less than:

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

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

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

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

103~~.6~~.7.2-Workers' Compensation–Insurance and Employer's Liability Insurance: The contractor shall also give evidence for Workers' Compensation Insurance and Employers Liability Insurance, with a 30-day notice of cancelation. The benefits provided under the Workers' Compensation shall be benefits prescribed by West Virginia Code. The Employer's Liability policy must include coverage to protect the contractor for claims brought under Section 23-4-2(d)(2)(ii) of West Virginia Code. The limits of insurance under this section shall be as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

As soon as possible after the award of each Contract a preconstruction conference will be arranged by the Division. The Contractor, their superintendent, or an authorized agent shall be present at the conference and shall present the proposed schedule of work, list of proposed subcontractors, if any, and a list of suppliers from whom materials are anticipated to be purchased. The information so presented shall be on forms submitted to the Contractor with the letter of contract award. The Division will make arrangements for utility representatives to be present.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

ADD THE FOLLOWING:

218.8-SCALING:

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

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

218.8.2-Construction Requirements:

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

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

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

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

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

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

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

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

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

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

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

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

218.8.5-Design Submittals:

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

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

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

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

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

218.8.8-Pay Items:

ITEM	DESCRIPTION	UNIT
218010-008	Scaling	Hour

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

ADD THE FOLLOWING:

218.9-ROCKFALL DRAPE:

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

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

218.9.2-Material Requirements:

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

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

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

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

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

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

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

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

218.9.3-Construction Requirements:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

218.9.6-Design Submittals:

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

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

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

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

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

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

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

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

218.9.9-Pay Items:

ITEM	DESCRIPTION	UNIT
218010-009	Rockfall Drape	Square Yard

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 218
SLOPE AND FOUNDATION PROTECTION

ADD THE FOLLOWING:

218.10-ROCK ANCHORS FOR CONCRETE SLABS:

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

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

218.10.2-Material Requirements:

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

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

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

218.10.3-Construction Requirements

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

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

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

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

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

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

For rock anchors installed in weathered shale or claystone and utilizing rotary drilling techniques, the ultimate grout to rock bond strength shall not exceed 2,000 psf without load testing to verify use of a higher value, as discussed below. For anchors installed in durable limestone and utilizing rotary drilling techniques, the ultimate grout to rock bond strength should not exceed 6,000 psf without load testing to verify use of a higher value. A minimum factor of safety of 2.0 should be applied to these ultimate grout to rock bond strengths in the design. Pressure grouting techniques may be used to enhance grout-rock bond strength values. The Contractor shall select a drilling method, a grouting procedure and a grouting pressure that is expected to provide the best rock anchor capacity for the subsurface conditions at the rock anchor location.

The Contractor shall determine the anchor length needed to provide the minimum pullout strength to withstand the design working loads. The minimum anchor length shall be 10 feet.

The Contractor shall perform rock anchor capacity proof testing on at least 25 percent of the anchors (minimum one per slab section) using the axial pull test per ASTM D4435 Standard Test Method by Rock Bolt Anchor Pull Test and shall perform the tests against a temporary yoke or load frame capable of applying the testing loads. The Contractor shall not damage the slabs while performing the pullout tests; any damage caused to the slab(s)

by the Contractor will be repaired and paid for by the Contractor. Apply the test load in the following sequence based on the allowable design load (ADL):

LOAD
Alignment Load (0.05 ADL)
0.25 ADL
0.50 ADL
1.00 ADL
1.25 ADL (test load)

Record movement at each load increment. Measure the applied test load using either a calibrated pressure gage or a calibrated load cell. No part of the yoke or load frame should bear within 3 feet of the anchor. Failure is defined as when the movement of the anchor continues without an increase in the load or when the anchor has displaced 0.5 inches. If more than 20 percent of the tested anchors fail, test all of the remaining anchors. The Contractor shall replace any anchors that fail any test or that are rejected by the Engineer prior to testing at no additional cost to the WVDOH by either removing the failed anchors, thoroughly reaming and clearing the hole, and reinstalling a new anchor at the same location or locating the replacement anchor as directed by the Engineer and provide a new anchor hole and material. The results of all anchor load tests conducted on the installed anchors shall be submitted to the Engineer on a pre-approved form within 24 hours (one day) following the completion of the test; provide the location of the anchor(s) tested in the report.

218.10.4-Preconstruction Meeting: The Contractor shall meet with the Engineer before beginning work to clarify construction requirements, coordinate schedules and activities, and identify the responsibilities between the Prime Contractor and the Specialty (Sub)contractors. The Specialty Subcontractor performing the installation of the rock anchors for the concrete slabs shall attend the meeting.

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

a. Site Supervisor - the Site Supervisor must be present at the job site at all times during the performance of work. Employ a Site Supervisor with at least two years of construction experience in the installation of rock anchors and who has supervised the successful installation of at least 10 projects.
b. Drill Operators - employ Drill Operators who have successfully installed at least 50 rock anchors.
c. Provide the name(s) of a registered professional engineer licensed to practice in West Virginia, who will act on behalf of the Contractor.

218.10.6-Design Submittals:

218.10.6.1-Grout Design Submittal: At least 5 ~~business~~ working days before the planned anchor grouting for the concrete slab anchors, the Specialty Contractor should submit the proposed grout design to the Engineer for review and approval, including the following information:

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

218.10.6.2-Anchoring of Existing Concrete Slabs Design Submittal: The Specialty Contractor is responsible for preparing and submitting a design proposal to the Engineer for review and approval describing the rock anchor system for stabilizing the existing concrete slabs. The design proposal shall include:

a. Description of the rock anchor installation (including drilling, grouting, and stressing information).
b. Estimated rock anchor capacity for each rock anchor.
c. Rock anchor type and bearing plate design.
d. Rock anchor minimum bond lengths, minimum unbonded lengths, and total rock anchor lengths.
e. Corrosion protection details for rock anchors and hardware.
f. Detailed plans for proof testing of rock anchors showing loading and measuring devices to be used, supports required for testing, test locations, and testing procedures to be followed..
g. Calculations and construction drawings prepared, stamped and signed by a professional engineer licensed by the State of West Virginia. These drawings must show explicit details to allow expeditious review of the proposed design and construction procedure. The plans and design calculations shall be submitted to the Engineer for review and approval at least 15 working days prior to beginning work, and shall receive approval before starting.

218.10.7-Method of Measurement: The Engineer will measure Rock Anchors for Concrete Slabs by each anchor installed. Anchor tests are incidental to the rock anchor installation and will not be measured separately.

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

218.10.8-Basis of Payment: The quantities, determined as provided above, shall be paid for at the Contract unit prices bid for the items listed below, which price and payment shall be full compensation for doing all the work prescribed in a workmanlike and acceptable manner,

including all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work.

218.10.9-Pay Items:

ITEM	DESCRIPTION	UNIT
218010-010	Rock Anchors for Concrete Slabs	Each

~~March 25, 2021~~ May 10, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.3-CONTROL OF TRAFFIC THROUGH WORK AREAS:

DELETE THE NINTH PARAGRAPH OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

The Contractor shall designate a ~~trained person with~~ Traffic Control Supervisor who shall be responsible for administering the traffic control plan according to the Contract and has the authority to take all actions necessary for the safe control of traffic through the work zone.

~~If noted on the plans, this person~~ The Traffic Control Supervisor shall be American Traffic Safety Services Association (ATSSA) certified as a Traffic Control Technician or a Traffic Control Supervisor or shall demonstrate equal qualifications, approved by the Division~~.~~ , on projects of the following nature:

a) Projects having intermittent or continuous lane closures over the course of more than three consecutive or non-consecutive days on Interstate or expressway routes having an ADT of 25,000 or greater, or non-Interstate, non-expressway routes having an ADT of 15,000 or greater.

b) Projects otherwise noted in the Plans for which this requirement shall apply.

The Contractor shall provide the Engineer with the telephone number and applicable proofs of certification of ~~this person~~ the Traffic Control Supervisor, along with the telephone number of any other person who is in charge of traffic control devices, in case of emergencies ~~at night or on weekends~~ or outside working hours, submitted prior to traffic control device installation.

March 25, 2021

DRAFT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.11-FLAGGER- OR TRAFFIC DIRECTOR:

The flagger- and traffic director are separate functions and therefore, shall not be interchanged. Flagger- or Ttraffic Ddirector required for operations that are not necessary but are initiated by the Contractor for their benefit or ease of operations shall not receive payment ~~under this provision~~. Flagger- or Ttraffic Ddirector required outside of the project limits as a result of any of the Contractor's operations shall not receive payment. Flagger- or Ttraffic Ddirector required within the project limits in regards to the Contractor's transportation to or from waste areas, borrow pits, asphalt/concrete plants or other necessary sites shall receive payment if considered reasonable and necessary ~~as previously discussed~~ by the Engineer. The traffic control plan (TCP) and any approved revisions will be strongly considered in determining the appropriateness of payment.

636.11.1-Flagger: All flaggers shall be furnished by the Contractor, and it shall be the Contractor's responsibility to provide flaggers at any location necessary to assure the safety of the travelling public. ~~When flaggers are required at locations as a result of operations considered reasonable and necessary by the Engineer to complete the project, payment will be made under this provision.~~

Hand signaling devices~~,~~ and ~~approved vests~~ high visibility apparel meeting the requirements of the WVDOH Traffic Control Manual shall be used by the Contractor's personnel assigned to traffic control responsibilities. Approved headgear, if worn, and vests worn by the Contractor's personnel shall not bear the Division symbol. Wireless two-way communication shall be provided to the flaggers when they are out of sight of each other.

~~The traffic control plan (TCP) and any approved revisions will be strongly considered in determining the appropriateness of payment.~~

Flaggers must be certified by passing an American Traffic Safety Service Association (ATSSA) training. The Contractor may use noncertified flagger for their benefit, ease of operations, or other activities not receiving payment.

636.11.2-Traffic Director: ~~Flagger-Traffic Director required for operations that are not necessary but are initiated by the Contractor for their benefit or ease of operations shall not receive payment under this provision. Flagger-Traffic Director required outside of the project limits as a result of any of the Contractor's operations shall not receive payment. Flagger-Traffic Director required within the project limits in regards to the Contractor's transportation~~

~~to or from waste areas, borrow pits, concrete plants or other necessary sites shall receive payment if considered reasonable and necessary as previously discussed.~~ Traffic Director shall be an off duty uniformed police officer in properly identified police vehicle with blue lights. The traffic director shall be from police agency which will have territorial jurisdiction over the project limits. Any officer outside of their vehicle within the roadway right of way, while serving as a Traffic Director, shall be outfitted in a Type P vest meeting the requirements of the latest version of ANSI/ISEA 107.

636.23-METHOD OF MEASUREMENT:

636.23.14-Flagger ~~Traffic Director~~: Flagger shall include the cost of furnishing, installing, maintaining and moving of the "Advance Flagger" signs along with the actual flagging of traffic. The flaggers shall be paid for the actual authorized time controlling traffic and up to 30 minutes travel from a previous assignment.

636.23.15-Traffic Director: The quantity "Traffic Director" shall be the actual number of hours worked in traffic control. The traffic director shall be paid for the actual authorized time controlling traffic which includes the cost for the police vehicle.

~~**636.23.15 through**~ **636.23.16-BLANK**

March 15, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 698
PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS

ADD AS NEW SECTION:

698.1-DESCRIPTION:

Prefabricated Bridge Elements and Systems (PBES) refer to structural elements and systems that are built off the bridge alignment to accelerate onsite construction time relative to conventional practice.

The work shall conform to the West Virginia Department of Transportation, Division of Highways (WVDOH) Standard Specifications, Roads and Bridges, latest version; as amended by the WVDOH Supplemental Specifications, if applicable; and the requirements of the current AASHTO LRFD Bridge Construction Specifications, except as noted herein. WVDOH contract documents shall take precedence over the AASHTO LRFD Bridge Construction Specifications.

698.1.1-Prefabricated Bridge Element Superstructure, Deck Panel: This work consists of the manufacture, storage, delivery, erection, installation, and assembly of precast full-depth reinforced concrete bridge deck panels including all labor, materials, equipment, and incidentals necessary to complete the work as shown on the Plans. The use of cast-in-place concrete will not be considered for substitution.

698.1.2-Prefabricated Bridge Element Substructure-Abutment Cap: This work consists of the manufacture, storage, delivery, erection, installation, and assembly of precast reinforced concrete substructure elements including abutment caps. This work includes all labor, materials, equipment, and incidentals necessary to complete the work as shown on the Plans. The use of cast-in-place concrete will not be considered for substitution.

698.1.3-Prefabricated Bridge Element Substructure-Abutment, Wingwall: This work consists of the manufacture, storage, delivery, erection, installation, and assembly of precast reinforced concrete substructure elements including wingwalls. This work includes all labor,

materials, equipment, and incidentals necessary to complete the work as shown on the Plans. The use of cast-in-place concrete will not be considered for substitution.

698.2-MATERIALS:

A. Concrete:

1. Prefabricated Bridge Element Superstructure, Deck Panel – Concrete shall conform to Class H as described in Section 601 of the Specifications.
2. Prefabricated Bridge Element Substructure – Abutment, Cap – Concrete shall conform to Class B as described in Section 601 of the Specifications.
3. Prefabricated Bridge Element Substructure – Abutment, Wingwall – Concrete shall conform to Class B as described in Section 601 of the Specifications.

B. Reinforcing Steel:

All reinforcing steel bars shall conform to AASHTO M31 Grade 60 and shall be continuous hot-dip galvanized in accordance with ASTM A1094.

C. Lifting Devices:

1. The Fabricator shall design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (8th Edition). Use devices that provide support for required vertical and horizontal forces with the applicable safety factors as specified in the Component Handling and Erection Bracing requirements in the PCI Design Handbook, 8th Edition.
2. Use a lifting device that will have 2¾-inch top cover and 1-inch bottom cover after installation. This may require partial removal of the device after installation.
3. All lifting devices and hardware shall be galvanized except as noted.

D. Corrugated Metal Pipe:

Use corrugated metal pipe to form pile pockets in prefabricated substructure elements of the diameter and length indicated in the Plans. Corrugated metal pipe shall be galvanized AASHTO M36 Type I, 16 gage, and shall be in accordance with Section 713 of the Specifications.

E. Structural Non-Shrink Grout:

Use structural non-shrink grout for leveling device blockouts and other blockouts as shown. Non-shrink grout material, approved by the Engineer, shall be placed in voids in strict accordance with the specifications and manufacturer's recommendations and instructions.

698.3-SUBMITTALS:

One month prior to the start of fabrication of any precast/prefabricated bridge elements, the Contractor shall notify the Cement and Concrete Group of the WVDOH Materials Control, Soils and Testing (MCS&T) Division of when fabrication is scheduled to begin and where it will take place. MCS&T Division will provide the inspection of the prefabricated bridge elements.

The Submittals requiring written approval from the Engineer are as follows:

A. Assembly Plan:

1. Prepare and submit the Assembly Plan under the seal of a Professional Engineer registered in the State of West Virginia for approval fourteen (14) days prior to fabrication.
2. The Assembly Plan shall include, but not necessarily be limited to the following:
   a. A work area plan depicting items such as temporary earth support or other protective measures, utilities within the immediate vicinity of the work, drainage structures, etc. The Contractor shall coordinate the various subcontractors that may need to occupy the same area and shall ensure that there are no conflicts.
   b. Details of all equipment that shall be employed for the construction of the bridge, including all equipment used to lift prefabricated elements including cranes, excavators, lifting slings, sling hooks, jacks, etc. Include crane locations, operating radii, lifting calculations, etc.
   c. A detailed Critical Path Method (CPM) schedule showing the sequence of construction that the Contractor will follow. The schedule shall include a timeline for installation of all major elements of the bridge accounting for the installation of any required temporary works and cure times of grouts or closure pour concrete and other selected materials.
   d. Methods for providing temporary support of the prefabricated elements. Include methods of adjusting, bracing, and securing the element after placement.
   e. Procedures for controlling tolerance limits.
   f. Methods for forming closure pours and sealing lifting holes.
   g. Methods for curing closure pour concrete and non-shrink grout for sealing lifting holes.
   h. Method for diamond grinding to achieve deck profile and longitudinal grooving.

B. Shop Drawings for Prefabricated Reinforced Concrete Bridge Elements:

1. Prepare and submit shop drawings under the seal of a Professional Engineer registered in the State of West Virginia for approval fourteen (14) days prior to fabrication.
2. Detailed shop drawings shall be prepared in accordance with the relevant provisions of Section 105.2 of the Specifications and shall include, but not necessarily be limited to the following:
   a. Number and type and/or piece mark of the precast concrete bridge element including overall length, width, and depth or thickness.
   b. Location, size, and geometry of all steel reinforcement.
   c. Reinforcement clearance requirements and dimensional tolerances.
   d. Location and details of all inserts, anchors, and any other items required to be cast into the prefabricated elements (whether detailed on the plans by the Engineer of Record or provided for the Contractor's convenience).
   e. Locations and details of the lifting devices, including supporting calculations, type and amount of any additional reinforcing required for lifting.
   f. The minimum concrete compressive strength required prior to removal of forms and handling of the prefabricated elements.
   g. The minimum 28-day concrete compressive strength required for transportation of the prefabricated elements.

h. Exposed concrete surface finishing requirements with reference to Section 601.11 of the Specifications.

The Contractor shall receive final approval of the shop drawings prior to ordering materials or performing any work. WVDOH will reject any prefabricated concrete deck panel fabricated before receiving written approval or any panel which deviates from the approved shop drawings. The Contractor shall bear full responsibility and costs for all materials ordered or work performed prior to the approval of the shop drawings or for costs incurred due to faulty detailing or fabrication.

C. Defects and Breakage of Prefabricated Reinforced Concrete Bridge Elements: Any defects or damage made to the concrete, due to form work, stripping, or handling, shall be subject to repair or rejection. Submit proposed written repair procedures to the Engineer for approval. Do not proceed with repair without written approval from the Engineer.

698.4-CONSTRUCTION METHODS:

698.4.1-Quality Assurance:

A. Prefabricated reinforced concrete deck panels and substructure elements shall be provided by a Fabricator/Contractor with experience in the construction of bridges satisfactory to the Engineer and shall provide documentation demonstrating adequate staff, appropriate forms, experienced personnel, and a quality control plan.

B. Permanently mark each deck panel and substructure element with its number and/or piece mark, date of fabrication, and supplier identification either by stamp markings in fresh concrete, waterproof paint, or other approved means on a surface that will not be exposed after assembly. Markings shall be readily visible for purposes of inspection and erection.

C. Prefabricated reinforced concrete deck panels and substructure elements shall be prevented from cracking, damage, or creep-induced deformation during storage and handling.

D. Replace defects and breakage of prefabricated reinforced concrete deck panels or substructure elements according to the following:

1. Deck panels or substructure elements that sustain concrete damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
2. Obtain approval before performing concrete repairs.
3. Concrete repair work must reestablish the deck panel’s structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
4. Determine the cause of defects or damage and establish a corrective action plan to prevent similar repetitive defects or damage.
5. Failure to take corrective action leading to repetitive defects or damage may be grounds for rejection of prefabricated reinforced concrete deck panels or substructure elements.
6. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.

E. Rejectable defects as determined by the Engineer may be cause for rejection. Prefabricated reinforced concrete deck panels or substructure elements may be rejected for any of the following reasons:
   1. Fabrication not in conformance with the Contract Documents.
   2. Fabricated dimensions not within the allowable tolerances specified in the Contract Documents.
   3. Full-depth cracking of concrete or concrete breakage that is not repairable to 100% conformance to the requirements of this Special Provision.
   4. Honeycombed texture that extends to a depth greater than the size of the coarse aggregate and/or exposes reinforcing steel.
   5. Damaged ends or appreciable irregularities preventing satisfactory joint.
   6. Defects that indicate concrete proportioning, mixing, molding and/or consolidation not conforming to the Contract Documents.
   7. Any damage during storage, transportation, erection, or construction determined to be significant by the Engineer.

F. Fabrication of reinforced concrete deck panels and substructure elements shall comply with tolerances specified on the plans. Tolerances for steel reinforcement placement and deck finish shall be in accordance with the Specifications.

G. The plant (or Fabricator) shall document all test results for structural concrete. The quality control file shall contain, at a minimum, the following information:
   1. Element identification
   2. Date and time of concrete placement
   3. Concrete cylinder test results
   4. Quantity of used concrete and the batch printout
   5. Form stripping date and repairs (if applicable)
   6. Location and number of blockouts, inserts, and lifting devices (if applicable)
   7. Temperature and moisture conditions during curing period

698.4.2-Fabrication:

698.4.2.1-Prefabricated Bridge Element Superstructure, Deck Panel: Prefabricated reinforced concrete deck panels shall conform to Section 601 of the Specifications.

Concrete shall be cast in rigidly constructed forms, which will maintain the specified tolerances to the shapes, lines and dimensions shown on the approved shop drawings. Deck panel forms shall be well constructed, carefully aligned, clean, substantial, and firm, and securely braced and fastened together sufficiently tight to prevent leakage of mortar and provide a level, true riding surface. Holes, cutouts, anchorage, reinforcement, and any other related details shall be provided for in the panels. All items encased in the concrete shall be accurately placed in the position shown on the approved Shop Drawings. The casting beds and all form work and materials will be approved by the Engineer before any concrete is placed.

The Engineer shall be provided with a tentative casting schedule at least fourteen (14) days in advance of concrete placement to make inspection and testing arrangements. A similar notification is required in advance of the anticipated date of shipping of prefabricated elements to the project site.

Cement concrete for prefabricated reinforced concrete deck panels shall be 4000 psi, Class H structural concrete and shall meet the requirements of Section 601 of the Specifications.

Finish the prefabricated reinforced concrete deck panels according to Section 601.11.4.2 of the Specifications. Finish surface as cast-in-place. Deck panels that will receive a cast-in-place safety curb, barrier, or sidewalk shall have a raked finish with a ¼ inch amplitude applied longitudinally along the length of the panel.

The closure pour shear key cast in the sides of the concrete deck panels shall have an exposed aggregate finish. The closure pour reinforcing steel shall not be damaged by the process for creating the exposed aggregate surface. Fabricator may utilize a surface retarder with water blast, abrasive blast, or a combination of both to achieve the desired shear key finish. The abrasive blast shall use oil free compressed air. The proposed method for creating the exposed aggregate surface shall be indicated on the approved shop drawings.

The Fabricator shall not strip forms or handle the prefabricated concrete deck panel until the concrete has attained a minimum compressive strength of 70% of the design compressive strength (f'c) or the value indicated on the approved shop drawings.

Commencing immediately after final finishing, all exposed concrete surfaces shall continue to be cured for a period of at least seven (7) days with all exposed surfaces covered. All prefabricated reinforced concrete elements shall be cured in accordance with Section 601.12 or 603.8 of the Specifications except that curing may be discontinued once 70% of the design strength is achieved. Cure time from initial pouring to placement shall be a minimum of fourteen (14) days.

698.4.2.2-Prefabricated Bridge Element Substructure-Abutment: Concrete shall be cast in rigidly constructed forms, which will maintain the specified tolerances to the shapes, lines and dimensions shown on the approved shop drawings. Forms shall be well constructed, carefully aligned, clean, substantial, and firm, and securely braced and fastened together sufficiently tight to prevent leakage of mortar. Holes, cutouts, anchorage, reinforcement, and any other related details shall be provided for in the elements. All items encased in the concrete shall be accurately placed in the position shown on the approved Shop Drawings. Corrugated metal pipe for pile pocket formed voids shall be prevented from extending above the finished surface of the precast concrete portion of the prefabricated substructure element. The casting beds and all form work and materials will be approved by the Engineer before any concrete is placed.

The Engineer shall be provided with a tentative casting schedule at least fourteen (14) days in advance of concrete placement to make inspection and testing arrangements. A similar notification is required in advance of the anticipated date of shipping of prefabricated elements to the project site.

Cement concrete for prefabricated reinforced concrete substructure elements shall be 3000 psi, Class B structural concrete and shall meet the requirements of Section 601 of the Specifications.

Finish the prefabricated reinforced concrete substructure elements according to Section 601 of the Specifications. Finish surface as cast-in-place.

The Fabricator shall not strip forms or handle the prefabricated concrete substructure element until the concrete has attained a minimum compressive strength of 75% of the design compressive strength (f'c) or the value indicated on the approved shop drawings.

Commencing immediately after final finishing, all exposed concrete surfaces shall continue to be cured for a period of at least seven (7) days with all exposed surfaces covered. Cure time from initial pouring to placement shall be a minimum of fourteen (14) days.

698.4.3-Handling, Storage, and Transportation:

698.4.3.1-Handling and Storage:

A. Care shall be exercised in the handling of the prefabricated reinforced concrete elements to prevent damage. Prefabricated reinforced concrete elements damaged during handling and storage will be repaired or replaced at the Engineer's direction at no cost to WVDOH.
B. Prefabricated reinforced concrete elements shall be lifted at the designated points by approved lifting devices properly attached to the element and by proper lifting procedures.
C. Storage areas shall be smooth and well-compacted to prevent damage due to differential settlement. Prefabricated elements shall be supported on the ground by means of continuous blocking during storage.
D. Concrete shall be cured in accordance with Section 601.12 of the Specifications. A seven (7) day wet cure using burlap shall be required per Section 601.12 of the Specifications. The surface of the prefabricated reinforced concrete deck panels shall be protected from drying and cracking by prompt covering with wet burlap. Prefabricated reinforced concrete elements shall be protected from freezing temperatures (below 32°F) for five (5) days or until concrete attains the design compressive strengths (f'c) designated on the plans, whichever comes first. Do not remove protection any time before the elements attain the specified compressive strength when the surrounding air temperature is below 20°F.
E. Prefabricated reinforced concrete elements shall be loaded on a trailer using the approved lift points as described above. Shock-absorbing cushioning material shall be used at all bearing points during transportation. Tie-down straps shall be located at the lines of blocking only.
F. The prefabricated reinforced concrete elements shall not be subject to damaging torsional, dynamic, or impact stresses at any point during handling or storage.

698.4.3.2-Transportation:

A. Prefabricated reinforced concrete elements shall not be transported from the casting site until the concrete attains the minimum 28-day compressive strength specified in the Contract Documents as shown by test cylinders, and a minimum of seven (7) days has elapsed from casting of the concrete. The test cylinders shall be fabricated at the time of placement and cured under conditions comparable to the prefabricated element for which the cylinders represent.
B. A 48-hour notice of the loading and shipping schedule shall be provided to the Engineer.
C. The Contractor shall inspect prefabricated reinforced concrete elements upon receipt at the site. Prefabricated bridge elements damaged during delivery shall be repaired or replaced at the Engineer's direction at no cost to WVDOH.

698.4.4-General Procedures for Installation:

A. General Procedures for Installation of Prefabricated Bridge Element Superstructure, Deck Panel:

1. Prior to placement of prefabricated reinforced concrete deck panels, the Contractor shall survey the top elevation of the girders and install the welded support angles to meet the required plan profile. Joints between the support angle and girder top flange shall be watertight and shall be sealed with an approved material to prevent leakage of Ultra High Performance Concrete (UHPC). Install self-adhesive compressible sealer along the top edge of the support angles.
2. Immediately prior to erecting the prefabricated reinforced concrete deck panels, the closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the deck panels shall be protected from damage during the cleaning of the keyways.
3. Lift and erect the deck panels per the Contractor's means and methods and in accordance with the approved Assembly Plan. Any damage to the deck panels incurred during erection or assembly may be cause for rejection and removal of the panels at the Contractor's expense.
4. Adjust the deck panels to the proper location and elevation. Minor vertical adjustment may be made by adjusting the thickness of the self-adhesive compressible sealer to achieve the correct profile elevation and cross slope. Differences in elevation between adjacent panels shall not exceed 1/8 inch at the edge of the panel. The Contractor may propose alternative measures to ensure proper constructability and fit. Any changes must be provided on the approved shop drawings.
5. Place formwork for transverse assembly joints and seal lifting holes as required by the approved Assembly Plan. Ensure all formwork is watertight to prevent leakage of UHPC by performing a water-tightness integrity test in accordance with the Contract Documents prior to concrete placement.
6. Pre-wet all closure pour surfaces to a saturated surface dry (SSD) state in accordance with the Contract Documents.
7. Cast UHPC transverse assembly joints and shear troughs in accordance with the Section 601 Special Provision for UHPC and the Contract Documents. Cure closure pours and lifting holes. Any remaining concrete defects or lifting device holes shall be repaired as directed by the Engineer.
8. Remove any remaining formwork that is not stay-in-place. Check for voids via visual inspection and tapping. If voids are found, repair using approved methods.
9. Do not apply superimposed dead loads or construction live loads to the prefabricated superstructure until the compressive test result of the cylinders for the UHPC closure pour concrete has reached the specified minimum compressive strength of 15 ksi.

10. Diamond grind the bridge deck for profile improvement as required by the plans. Diamond grinding of the bridge deck shall not begin until the UHPC closure pour concrete has reached the specified minimum compressive strength of 15 ksi. Contractor to bid diamond grinding based on the type of coarse aggregate in the concrete mix for bridge decks. Coarse aggregate shall be in accordance with Section 601 of the Specifications.
11. Saw cut longitudinal grooves into top of bridge deck using a mechanical cutting device after diamond grinding.
12. Install High Friction Surface Treatment (HFST) in accordance with the Section 406 Special Provision.

B. General Procedures for Installation of Prefabricated Bridge Element Substructure-Abutment:

1. Establish working points, working lines, and benchmark elevations prior to placement of all prefabricated substructure elements. The Contractor is responsible for field survey as necessary to complete the work.
2. Immediately prior to erecting the prefabricated reinforced concrete substructure elements, all closure pour shear keys shall be cleaned at the job site of all dust, dirt, carbonation, laitance, and other potentially detrimental materials which may interfere with the bonding of the closure pour concrete and precast concrete using a high-pressure water blast. The exposed reinforcing steel in the substructure elements shall be protected from damage during the cleaning of the keyways.
3. Lift and erect the prefabricated substructure elements per the Contractor's means and methods and in accordance with the approved Assembly Plan. Any damage to the substructure elements incurred during erection or assembly may be cause for rejection and removal of the panels at the Contractor's expense.
4. Set the prefabricated substructure element in the correct horizontal and vertical location. Prefabricated substructure elements shall be supported on a level and sufficiently firm (minimum 2,000 psf) prepared bearing foundation, unless other means of support are approved in the Assembly Plan. Carefully align the pile pocket voids in the precast elements over the supporting steel bearing piling. Utilize adjustment devices (jigs, templates, shims, leveling devices, etc.) as detailed in the approved Assembly Plan and as required to establish the design horizontal and vertical position of the prefabricated substructure element. The Contractor shall ensure that the element is in the proper horizontal and vertical location prior to releasing it from the crane and setting the next unit.
5. Install temporary bracing as specified and as required in the Assembly Plan. Stability of the precast substructure elements and comprehensive substructure system shall be the responsibility of the Contractor for the duration of construction.
6. Ensure that piles extend into the pile pockets at least the minimum embedment length specified in the plans. Ensure pile pocket voids are properly and sufficiently formed for placement of self-consolidating concrete materials.

7. Install formwork for vertical wingwall closure pour and seal lifting holes as required by the approved Assembly Plan. Ensure all formwork is mortar tight to prevent leakage of concrete during casting of the closure pour.
8. Place approved self-consolidating Class H High Early Strength concrete within the pile pocket voids and wingwall closure pours in accordance with the Contract Documents. Finish the top of the pile pocket pour with a smooth, troweled finish. Allow concrete for filling pile pockets to flow partially under the prefabricated substructure element.
9. Temporary supports and/or bracing required by the Assembly Plan for the purposes of prefabricated substructure element placement shall remain in place until self-consolidating concrete used for permanent attachment of the component has achieved the specified minimum compressive strength as shown by test cylinders.

698.5-METHOD OF MEASUREMENT:

A. Prefabricated Bridge Element Superstructure, Deck Panel. The Engineer will determine the number of deck panels from actual count (Each).

B. Prefabricated Bridge Element Substructure-Abutment, Cap. The Engineer will determine the number of abutment cap elements from actual count (Each).

C. Prefabricated Bridge Element Substructure-Abutment, Wingwall. The Engineer will determine the number of wingwall elements from actual count (Each).

698.6-BASIS OF PAYMENT:

A. Prefabricated Bridge Element Superstructure, Deck Panel. Payment will be full compensation for the manufacturing, furnishing, and placement of each deck panel, in place and accepted by the Engineer. All items required to assemble each panel into a prefabricated bridge deck per the plans, including labor, materials, and equipment, shall be considered incidental to this item, and will not be paid for separately.

B. Prefabricated Bridge Element Substructure-Abutment, Cap. Payment will be full compensation for the manufacturing, furnishing, and placement of each abutment cap element, in place and accepted by the Engineer. All items required to assemble each abutment cap element into a prefabricated concrete abutment per the plans, including labor, materials, and equipment, shall be considered incidental to this item, and will not be paid for separately.

C. Prefabricated Bridge Element Substructure-Abutment, Wingwall. Payment will be full compensation for the manufacturing, furnishing, and placement of each wingwall element, in place and accepted by the Engineer. All items required to assemble each wingwall element into a prefabricated concrete abutment per the plans, including labor, materials, and equipment, shall be considered incidental to this item, and will not be paid for separately.

698.5-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
698001-001	Prefabricated Bridge Element Superstructure,	Each
698002-001	Prefabricated Bridge Element Substructure - Abutment,	Each

~~May 6, 2010~~ May 5, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 601
STRUCTURAL CONCRETE

601.1-DESCRIPTION:

ADD THE FOLLOWING SECTION:

601.1.1 Rapid Set Cementitious or Polymer Concrete Patching: The work shall consist of removing the existing concrete, sandblasting the exposed steel reinforcing bars, cleaning the bonding surfaces of the existing concrete to remain, replacing any damaged or severed reinforcing, and furnishing and placing Rapid Set Cementitious or Polymer Concrete Patching Material at the locations indicated on the plans and any other location designated by the engineer. The construction shall be in accordance with this Specification and in reasonably close conformity with the Plans or as established by the Engineer.

601.2-MATERIALS:

ADD THE FOLLOWING SECTIONS:

601.2.1-Rapid Set Cementitious or Polymer Concrete Patching Material:

601.2.1.1: Rapid Set Cementitious or Polymer Concrete Patching Material shall be a high early strength structural repair material capable of patching deep holes, shallow feathering, able to be poured in forms, ~~and~~ or being ~~trowelled~~ troweled vertically or overhead. Material shall not shrink on cure, ~~be self-priming,~~ and be capable of providing a strong bond to concrete and steel reinforcing bars. It shall be a non-toxic product and clean up with water.

601.2.1.2: All Rapid Set Cementitious or Polymer Concrete Patching Materials shall be shipped in strong substantial containers sealed in a manner acceptable to the Engineer. Each container shall be plainly marked with the following:

1) Product name
2) Component part
3) Batch number
4) Date of manufacture
5) Date of expiration of acceptance
6) Name & address of the manufacturer
7) Material safety data sheet

601.2.1.3: The product selected shall be from the WVDOH approved list of concrete repair materials and shall conform to all criteria of section 715.4.1 or 715.4.2. ~~in addition to any specification data listed as follows:~~

~~Initial Set Time: 15 Minutes at 68° Fahrenheit~~

601.2.1.4: Clean, dry aggregates may be allowed in order to increase yield on deep placements per the Manufacturer's recommendations.

601.2.1.5: An Accelerator may be allowed in Low Temperature environments to improve workability per the Manufacturer's recommendations.

601.2.1.6: A Retarder may be allowed in High Temperature environments to improve workability per the Manufacturer's recommendations.

601.3-PROPORTIONING:

ADD THE FOLLOWING SUBSECTION:

601.3.3-Preparation of Bonding Surface: The contractor shall remove all loose, soft, honeycombed, and disintegrated concrete, plus an additional three (3) inches of sound concrete around the perimeter of the repair areas by means of sawcutting or other approved method that will not damage the sound concrete adjacent to the repair area. The surface of the existing concrete to remain is free of all loose or foreign matter, dirt, grime, oil, grease, or any other materials that would diminish the bonding surface. Sandblasting, grinding, jack hammering, or the use of wire brushes may be needed to acquire the necessary bonding surface.

The existing exposed reinforcing steel bars shall be cleaned by sandblasting to a SSPC-SP-6 finish. After sandblasting, a rust inhibitor approved by the Manufacturer of the Rapid Set Cementitious or Polymer Concrete Material for compatibility shall be applied to all exposed reinforcing steel bars.

Any exposed reinforcing bar that is, per the Engineer's judgment, severed, missing, or damaged shall be replaced with a bar of the same diameter and coupled to the sound reinforcing that will remain with a Division approved mechanical splice. Reinforcing bar material shall be intermediate grade billet steel in accordance with AASHTO M31, Grade 60. This work shall be included under the pay item(s) included herein.

The bonding surface shall be dry and free of moisture and a representative of the Manufacturer shall be on site to approve of all bonding surfaces immediately prior to and during application of the Rapid Set Cementitious or Polymer Concrete Material.

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

601.10 PLACING CONCRETE

ADD THE FOLLOWING SUBSECTION:

601.10.6-Rapid Set Cementitious or Polymer Concrete Patching Installation: An experienced technical representative of the Manufacturer of the Rapid Set Cementitious or Polymer Concrete Material shall be present during all phases of substrate preparation and material installation. All placements shall be under the direction of the Manufacturer's representative.

The Manufacturer's representative shall advise both the Engineer and the Contractor regarding proper installation procedures to assure the Rapid Set Cementitious or Polymer Concrete Material is installed correctly. The material shall be installed in accordance with the recommendations of the Manufacturer's representative. In the event of a conflict, the Engineer's final decision will be binding.

Prior to placing the Rapid Set Cementitious or Polymer Concrete Material, all areas shall be coated with the Manufacturer's recommended bonding compound if applicable.

After installation is completed, the Manufacturer's representative shall certify to the Engineer, in writing, that the Rapid Set Cementitious or Polymer Concrete Material was installed in accordance with the Manufacturer's requirements.

601.10.6.1-Rapid Set Cementitious or Polymer Concrete Patching Acceptance Criteria: The Engineer shall not accept the Contractor's work if, in his judgment, the following criteria are not met:

a. The Contractor stores, handles, mixes, and installs the materials according to the Manufacturer's recommendations and as specified herein.
b. Representative of the Manufacturer is on site during mixing and placing of Rapid Set Cementitious or Polymer Concrete Patching Material.
c. No degradation of material properties under field conditions is detected. The Contractor shall replace any material showing degradation.
d. All loose, soft, honeycombed, and disintegrated concrete, plus an additional three (3) inches of sound surface concrete around the perimeter of the repair areas is removed with no damage to adjacent sound concrete.
e. The surface of the existing concrete to remain is free of loose or foreign matter, dirt, grime, oil, grease, or any other materials that would diminish the bonding surface.
f. Existing exposed reinforcing steel bars are free of dirt, grime, oil, grease, corrosion, or any other foreign matter that would prevent a good bonding surface or allow future corrosion of the reinforcing steel bars.
g. No reinforcing bars to remain in place are damaged or severed.
h. All work done as a result of the acceptance criteria shall be done at no additional cost to the Division.

601.14-METHOD OF MEASUREMENT:

ADD THE FOLLOWING SUBSECTION:

601.14.1-Rapid Set Cementitious or Polymer Concrete Patching: Cementitious Patching or Polymer Concrete Material will be measured in place complete and accepted as determined by the dimensions on the Plans or contract documents, and will be per the method established by the pay items in the Proposal, ~~(~~per cubic foot ~~yard (CY),~~ or square foot ~~(SF), linear foot (LF), or each (EA),~~ subject to adjustment as provided for in 104.2 and 109.2.

601.15-BASIS OF PAYMENT

ADD THE FOLLOWING SUBSECTION:

601.15.1.1-Rapid Set Cementitious or Polymer Concrete Patching: The removal of existing concrete, to the limits shown in the plans or as directed by the Engineer, the cleaning of existing concrete to remain, the cleaning of exposed reinforcing bars, and the placement of specified materials to make the necessary repairs shall be included in the payment for the items below. The quantities, determined above, will be paid for at the contract unit price bid for the items below, which price and payment shall be full compensation for furnishing all materials and doing all the work herein prescribed, including all the Manufacturer's cost, labor, tools, equipment, supplies and incidentals necessary to complete the work.

601.16-PAY ITEM:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
601030-000	Patching Concrete Structures	Square Foot
~~601030-002~~	~~Patching Concrete Structures~~	~~LF~~
~~601030-003~~	~~Patching Concrete Structures~~	~~EA~~
601030-004	Patching Concrete Structures	Cubic Foot

May 4, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 104
SCOPE OF WORK

104.5-MAINTENANCE OF TRAFFIC:

DELETE THE FIRST PARAGRAPH AND REPLACE WITH THE FOLLOWING:

The Project, while undergoing improvement, shall be kept open to all traffic by the Contractor in such condition that both local and through traffic will be adequately and safely accommodated. All construction operations shall be scheduled to keep traffic delay to a minimum. The Division has adopted, and the Contractor shall follow the Standard, "~~Traffic Control for Street and Highway Construction and Maintenance Operations~~ Manual on Temporary Traffic Control for Streets and Highways," published by the West Virginia Division of Highways.

May 4, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

107.10-BARRICADES AND WARNING SIGNS:

DELETE THE THIRD PARAGRAPH AND REPLACE WITH THE FOLLOWING:

All barricades, warning signs, lights, temporary signals, and other protective devices must conform with the Standard "~~Traffic Control for Street and Highway Construction and Maintenance Operations~~ Manual on Temporary Traffic Control for Streets and Highways," Published by the West Virginia Division of Highways, and the provisions of 715.9.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 636
MAINTAINING TRAFFIC

636.18-ELECTRIC ARROW:

DELETE THE FIRST PARAGRAPH AND SUBSTITUTE THE FOLLOWING:

The electric arrow panel shall be located as shown in the manual, "~~Traffic Control for Street and Highway Construction and Maintenance Operations~~Manual on Temporary Traffic Control for Streets and Highways," published by the Division, or as shown on the Plans. For construction areas, the electric arrow shall be portable, trailer mounted on a nonreflective flat black panel 48 inches high by 96 inches (1.2 meters high by 2.4 meters) wide with a minimum legibility distance of one mile (1.6 km). Minimum mounting height, measured from the roadway to the bottom of the panel, shall be 7 feet (2.1 m) except on vehicle mounted panels which shall be as high as practicable. The electric arrow shall have the capability of the following mode selection: Left Arrow, Right Arrow, Left and Right Arrow and Caution, with Caution mode consisting of four or more lamps arranged in a pattern which will not indicate a direction. Arrow panels shall automatically dim 50 percent from their rated lamp voltage during hours of darkness. The flashing rate of the lamps shall be between 25 and 40 flashes per minute. Minimum lamp "on time" shall be 50 percent.

May 4, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 660
TRAFFIC SIGNALS

660.4-MAINTAINING TRAFFIC:

DELETE THE FIRST PARAGRAPH AND SUBSTITUTE THE FOLLOWING:

During the installation of traffic signals and appurtenances, the roadway shall be kept open to all traffic by the Contractor in such a way that both local and through traffic will be adequately and safely accommodated through the work area. See the Manual, "Manual on Temporary Traffic Control for Streets and Highways~~Traffic Control for Street and Highway Construction and Maintenance Operations~~", and applicable sections of the Standard Specifications.

May 11, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107.27-CONSTRUCTION ACCESS AND ENVIRONMENTAL PERMITS:

ADD THE FOLLOWING SUBSECTION:

107.27.3-Environmental Commitment and Mitigation: The Contractor is advised that this project is located within an area for which the Division has made previous environmental commitments. These commitments were outcomes of the environmental process and are contained in the project's NEPA document, in which the Division has pledged and/or has an agreement to perform an activity at a future time, in effort to avoid, minimize or mitigate impacts.

The fulfillment of these commitments and the associated mitigation are essential requirements that must be incorporated into the construction of the project. The Division has translated the mitigation items so that they are clearly understandable to Contractors and inspectors. The project's Environmental Mitigation Requirements are listed below:

[Insert project specific Environmental Mitigation Requirements from the Environmental Commitment Checklist in the NEPA document here.]

The NEPA documents are included in the contract documents for the project and the Contractor is responsible for adhering to commitments relating to construction activities.

The Contractor is responsible to ensure that the project is constructed in accordance with and incorporates all committed Environmental Mitigation Requirements. Any Contractor proposed changes to the project require additional appropriate agency coordination. Any modification to the Environmental Mitigation Requirements must have agency written approval prior to submitting to the Engineer for approval. No time extensions or additional payments will be made for the Contractor to obtain additional approvals or permits or for changes.

If any of the Environmental Mitigation Requirements are not satisfied or are adversely impacted, construction work shall be stopped until the situation is resolved in coordination with resource agencies.

Unless otherwise stated, all costs of Environmental Mitigation Requirements shall be included in the unit prices on the various pay items, and the Contractor will not be paid an additional amount for such work except as otherwise provide in 104.5.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 201
CLEARING AND GRUBBING

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

201.1-DESCRIPTION:

This work shall consist of clearing, grubbing, removing, and disposing of all vegetation and debris within the construction limits and in other areas within the right-of-way or easement limits, as set forth in the Contract or as designated by the Engineer, including selective clearing of areas; site grading of public and private roadways, lanes, vehicular paths or any other existing man made improvements which lie between the construction and right-of-way limits; except such objects as are designated to remain or to be removed in accordance with other sections of these Specifications. This work shall also include preservation from injury or defacement of all vegetation and objects to remain.

201.2-MATERIALS:

Asphaltum base paint for tree surgery shall conform to the requirements of Section 715.36.

CONSTRUCTION METHODS

201.3-GENERAL:

The Engineer will designate the trees, shrubs, plants and other items ~~to be removed or~~ to remain. All items designated to remain shall be preserved by the Contractor. All alignment stakes, grade stakes, guard stakes, boundary markers, bench marks, and tie points disturbed shall be replaced at Contractor expense and preserved until such time as their usefulness has ceased and permission for their destruction is given by the Engineer.

201.4-CLEARING:

Areas indicated on the Plans, and borrow and waste sites furnished by the Division, shall be cleared of the obstructions described. In areas where the proposed embankment is to be ~~5 ft. (1.5 meters)~~ 3 feet or more in depth, measured below the subgrade, all stumps shall be cut off as close to the ground as is practicable but not to exceed 6 inches ~~(150 mm)~~ above the ground surface at the base of the stumps. When stumps are located in the area of the backslope rounding of cut sections, they are to be cut flush with or below the final slope line. Areas where the proposed embankment is to be less than ~~5 ft. (1.5 meters)~~ 3 feet shall be treated as prescribed in 201.6.

All merchantable timber and wood in the clearing area, except trees designated to remain,

which has not been removed from the right-of-way prior to the letting date ~~of advertising for bids~~ shall become the property of the Contractor, unless otherwise provided.

Unsound ~~or unsightly~~ and low-hanging branches ~~of~~ from remaining trees and shrubs ~~which are designated to remain, and are not specified to be removed under another item~~, shall be removed as directed. Branches of trees extending over ~~the area occupied by~~ the roadbed shall be trimmed to give a clear height of at least 20 feet~~. (6 meters)~~ above the road and shoulder pavement surface. All trimming shall be done ~~by skilled workers and in accordance~~ with ~~good~~ proper tree surgery practices.

In all areas where stumps and shrubs are to remain, the surface of the ground shall not be unduly disturbed or compacted. Existing ground cover shall be preserved insofar as possible, and the area shall be left neat and clear and in a condition which is reasonably consistent with the surroundings.

All abandoned utility poles within the limits of the right-of-way shall be removed and disposed of by the Contractor. The removal shall be treated in a similar manner as the clearing and grubbing of trees. The poles to be abandoned will be marked by the Project Engineer.

201.5-SELECTIVE CLEARING AND THINNING:

Selective clearing and thinning areas will be designated on the plans. In order that the trees may be properly marked in advance of thinning operations, the Contractor shall give the Engineer at least two weeks' notice prior to starting work or prior to resuming work after suspending operations. Trees or bushes not designated to remain shall be cut. In no event shall selective clearing and thinning operations begin until the Engineer has given approval.

All dead or diseased trees or shrubs, junk, trash, litter, or foreign matter of any kind shall be removed from the areas to be treated. This shall include uprooted stumps and all branches, tops, trunks, and dead wood resulting from woodcutting operations or from any other causes.

Trees and shrubs to be preserved shall be carefully pruned to remove all dead wood and diseased or injured tops or branches. In addition, in certain areas the Engineer may require the branches of designated trees to be removed to a height of 20 feet~~. (6 meters)~~ above ground as directed in order to improve sight distance, provide head clearance, open vistas, or improve appearance of the tree. Complete clearing may be required in certain areas for the purpose of removing shade hazards, improving sight distances, or improving appearance. Such clearing shall be included under this Section.

The Contractor shall avoid disturbing or compacting the existing ground surface, as well as avoid damage to plant growth. The use of tractors, cranes, winches, or any other heavy equipment, operating anywhere within the area to be selectively thinned, will not be allowed unless exceptions are specifically authorized.

Any injury to trees and shrubs which are to be preserved shall be carefully repaired. Disturbed ground surface shall be restored as nearly as possible to natural condition.

All pruning and repair to live trees and shrubs shall be done by skilled workers according to approved arboricultural practice. All pruning scars and all cuts and wounds 1 inch ~~(25 mm)~~ in diameter or over shall be painted with an asphaltum base paint. The Engineer may permit such cuts on evergreen trees to remain unpainted. All stumps, new or old, shall be cut to a maximum height of 6 inches ~~(150 mm)~~ above the surrounding ground or as directed by the Engineer. Undesirable trees leaning or falling over the highway right-of-way from outside shall be cut at the property line.

201.6-GRUBBING:

In areas where embankments are to be constructed less than ~~5 ft. (1.5 meters)~~ 3 feet in depth, measured below the subgrade, complete grubbing of all trees, stumps, roots, bushes or hedge fences shall be accomplished.

In areas where embankments are to be constructed ~~5 ft. (1.5 meters)~~ 3 feet or more in depth, measured below the subgrade, stumps which have not been loosened by clearing and grubbing operations, and nonperishable solid objects, need not be grubbed or removed provided they are cut off ~~so~~ as close to ground as practical but not ~~to protrude more~~ greater than ~~6 inches (150 mm)~~ 1 foot above the original ground surface. Near the toe of embankment slopes, remove all ~~no~~ stumps ~~shall extend above a point 1 ft. (300 mm)~~ to a depth of at least 1 foot beneath the embankment slope surface.

In areas not included within construction limits or selective clearing areas, all stumps shall either be grubbed or cut flush with or below the original ground line. Brush, shrubs, down timber, rotten wood, rubbish and other objectionable objects and vegetation shall be cleared flush with the ground. Such areas will be clearly indicated on the Plans.

201.7-DISPOSAL:

All wood, trash, debris, stumps, and other foreign matter shall be removed and disposed of by the Contractor. Material may be disposed of at approved waste areas or in accordance with the provisions prescribed. Non-combustible material may be disposed of in embankments in accordance with the applicable provisions.

All burning of vegetative material shall be done in accordance with the applicable laws, ordinances, regulations, and requires an approval from the West Virginia Department of Environmental Protection, Division of Air Quality (DEP) as defined in the Code of State Rules, Title 45, Series 6. If the Contractor plans to burn during Forest Fire Season (March 1-May 31 and October 1-December 31) a permit is also required from the West Virginia Division of Forestry (No permit from the West Virginia Division of Forestry is required for burning between 4:00PM and before nightfall during Forest Fire Season). Copies of these approvals and permits are to be provided to the Engineer.

Open burning shall be extinguished prior to nightfall unless previously approved by DEP, Division of Air Quality. It is the intent of this Specification that the health, safety, comfort, and the property of persons in the vicinity are protected from the effects of such burning. Open burning of Construction/Demolition Waste as defined in Section 207.6.5 will not be allowed. The disposal of Construction/Demolition Waste Materials shall be in accordance with Section 207.6.5.

Clearing and grubbing materials (vegetative material only) shall be disposed of by chipping or burning using a pit burner/air curtain. Vegetative material may also be used in conjunction with erosion and sediment control features.

If the Contractor chooses the chipping option, vegetative material may be reduced to chips of a maximum size of 2 inch ~~(50 mm)~~. The chips may be disposed of in areas where erosion control is required, as a substitute for straw mulch in accordance with the applicable provisions of 642 and 652, or between slope lines and right-of-way lines in areas/locations as determined by the Engineer.

When the pit burner/air curtain method of disposing of vegetative material is utilized, the Contractor will have two options. The first being an above ground fire box. If this option is chosen, the Contractor shall follow the ~~manufactures~~ manufacturer's recommendations.

The second option is an in ground trench. If this option is chosen, the Contractor shall

construct a minimum trench of 20feet ~~(6m)~~ in length X 10feet ~~(3m)~~ wide X 10feet ~~(3m)~~ deep with vertical walls~~-~~. The air curtain shall be sufficient that post burn vegetated material will be no larger than 6 inches ~~(150mm)~~ in any direction. The air curtain shall have a flow of air in order to prevent continuous smoke pillars from escaping the trench.

The in ground trench is to be placed outside the roadway prism, unless otherwise approved by the Engineer. If the trenches are not to be eliminated in the subsequent excavation operation, they shall be backfilled. All backfill within the roadway prism shall be accomplished in accordance with the requirements of Section 207. Compaction of backfill outside the roadway prism shall be performed so as to obtain a minimum density equal to that of the surrounding ground.

The prevailing winds during open burning should be away from any roadway, airport, city, or occupied residence likely to be affected by the smoke to the best extent possible. Open burning of vegetative material shall not be allowed during periods of air stagnation advisories or alerts.

The Contractor will be held responsible for any damage caused by fires. The Contractor shall remove and dispose of burned material; replace trees, shrubs, fences or other objects designated or described to remain, but which have been damaged; and seed burned areas beyond construction limits; all in an acceptable manner. Upon completion of the work, nothing shall remain within the right-of-way limits, nor along the land adjacent thereto, which was deposited by the Contractor as the result of any of the operations of construction unless approved by the Engineer.

201.8-METHOD OF MEASUREMENT:

The quantity of work done, will be on a lump sum basis.

Clearing and grubbing for waste sites or borrow pits furnished by the Contractor shall be included in the bid price for Item 207001-*, "Unclassified Excavation"; Item 211001-*, "Unclassified Borrow Excavation"; Item 211002-*, "Rock Borrow Excavation"; or Item 211003-*, "Select Borrow Excavation".

The removal of trees outside of clearing and grubbing and selective clearing areas designated on the Plans shall be accomplished under the provisions of 109.4.

201.9-BASIS OF PAYMENT:

The quantities, determined as provided above, shall be paid for at the contract price bid for the item listed below, which price and payment shall be full compensation for doing all the work prescribed in a workmanlike and acceptable manner, including all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work. The lump sum bid price will be full compensation for the estimated quantities shown in the Plans. Any increase or decrease from estimated quantities will be adjusted for total compensation on a prorate basis consistent with areas that have been added or deleted.

All salvable material including merchantable timber shall become the property of the Contractor unless otherwise indicated on the Plans or in the Proposal, and any salvage expected shall be computed as a credit before arriving at the bid price for this item.

201.10-PAY ITEM:

ITEM	DESCRIPTION	UNIT
201001-*	Clearing and Grubbing	Lump Sum

* Sequence number

March 4, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 307
CRUSHED AGGREGATE BASE COURSE

307.9 BASIS OF PAYMENT:

307.9.1-Price Adjustment:

DELETE TABLE 307.9.1 AND REPLACE WITH THE FOLLOWING:

TABLE 307.9.1

Adjustment of Contract Price for Gradation not Within Specifications	
Degree of Nonconformance	Percent of Contract Price to be Reduced
1.0 to 3.0	2
3.1 to 5.0	~~4~~ 5
5.1 to 8.0	~~7~~ 8
8.1 to 12.0	~~11~~ 12
12.1 to 16.0	16
Greater than ~~12~~ 16	*

* The Division will make a special evaluation of the material and determine the appropriate action.

May 14, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 601
STRUCTUAL CONCRETE

601.3–PROPORTIONING:

ADD THE FOLLOWING PARAGRAPH AT THE END OF THE SUBSECTION:

Design mixture testing for all classes of concrete shall be in accordance with MP 711.03.23 and shall include air content, slump, compressive strength, and super air meter (SAM) tests. For establishment of mixture proportions, SAM testing shall be performed in accordance with AASHTO TP 118. The SAM test results (SAM Number), shall be for information purposes only, but ideally the SAM number should be less than or equal to 0.20 for mix design qualification. The cost of all test mix requirements for new mix designs shall be considered incidental to the cost of the concrete.

For existing mix designs, which have already been approved by the Division, SAM meter testing shall be performed on a laboratory trial batch at a Division Approved Concrete Mix Design Laboratory. The cost of conducting this SAM test shall be paid as a separate Pay Item.

ADD THE FOLLOWING SUBSECTION AND PARAGRAPH:

601.3.2.2.1-Sequential Pressure Method-Super Air Meter (SAM): During the progress of the work, SAM testing shall be performed at the same frequency as the normal air content tests. The results of this SAM testing will be for informational purposes only. The target value of the SAM number at the point of placement should ideally be as shown in Table 601.3.2.2.1. However, SAM numbers obtained from this field testing are not required to meet the requirements of Table 601.3.2.2.1. Ideally, if the SAM number does not conform to the target values of Table 601.3.2.2.1, the Contractor would take immediate steps to adjust the concrete mix, so that the SAM Number of succeeding loads is within the acceptable limits shown in Table 601.3.2.2.1. The entrained air content shall still be maintained within the tolerances specified in Section 601.3.2.2.

For each SAM test performed, the SAM Number shall be recorded by the Contractor on the same T600 form on which the corresponding normal air content test result is recorded. An electronic copy of that T600 form and an electronic copy of the Concrete Batch Ticket for that concrete shall be sent to the following e-mail address within 72 hours of the completion of the test: DOHConcreteMixDesign@wv.gov.

TABLE 601.3.2.2.1

SAM Number	Required Action
Less than 0.25	Accept Concrete
0.25 to 0.30	Accept with Corrective Action Needed
Greater than 0.30	Reduced payment for concrete

601.4-TESTING:

601.4.1–Sampling and Testing Methods:

ADD THE FOLLOWING TO THE TABLE IN SUBSECTION 601.4.1:

Sequential Pressure Method - Super Air Meter (SAM)	AASHTO TP 118

601.4.2-Contractor's Quality Control:

ADD THE FOLLOWING AFTER THE FIRST PARAGRAPH IN THE SUBSECTION:

Prior to any testing with the SAM by Contractor QC Personnel, those Contractor QC Personnel must be certified by MCS&T Division Personnel for testing with the SAM. This certification will validate their ability to test with the SAM following the guidelines of AASHTO TP 118. MCS&T Division will maintain a database of all personnel who have been certified to perform the SAM test. Only the SAM results from these certified individuals will be accepted.

601.16-PAY ITEMS:

ADD THE FOLLOWING PAY ITEM:

ITEM	DESCRIPTION	UNIT
601100-005	SAM Testing of Existing Class H Concrete Mix Design	Each

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 601
STRUCTURAL CONCRETE

601.3-PROPORTIONING:

601.3.1-Mix Design Requirements:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

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

TABLE 601.3.1D

Class of concrete	Design 28 Day Compressive Strength	Target Cement Factor	Maximum Water Content	Nominal Maximum Aggregate Size	Entrained Air
	Pounds per Square inch	lbs./c.y. Note 1	lb. of water/lb. of cement Note 2	Inches	Percent
A	3500	642	0.51	1/2	7.5
K	4000	618	0.44	1	7.0
B	3000	524	0.49	1	7.0
C	2500	454	0.58	1	6.0
D	2000	360	0.62	1	5.5
H	See Table 601.3.1E	618	0.40	1	6.5
DC Note 3	4500	665	0.44	1/2	6.0

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

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

Note 3 Nominal maximum aggregate size of $^{3}/_{4}$ inches may be used in Class DC concrete, provided the Engineer approves the use of that size aggregate for the specific project on which it is to be used. That approval will depend on the minimum spacing of the reinforcing steel in the drilled caisson.

TABLE 601.3.1E

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

601.3.2-Field Tolerances and Adjustment:

601.3.2.4-Total Solids Ā:

ADD THE FOLLOWING AT THE END OF FIRST PARAGRAPH

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.

601.3.2.4-Total Solids Ā:

ADD THE FOLLOWING SUBSECTION

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 ~~cumulative~~ combined percent retained from all aggregate gradation shall conform Table 601.3.2.4.1A. The ~~cumulative~~ 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%
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
~~1½ in~~	~~± 5% of the % retained on this sieve in the Design Mix~~
1 in	± ~~5~~10% of the % retained on this sieve in the Design Mix
¾ in	± ~~5~~10% of the % retained on this sieve in the Design Mix
½ in	± ~~5~~10% of the % retained on this sieve in the Design Mix
⅜ in	± ~~5~~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	± ~~4~~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	± ~~3~~4% of the % retained on this sieve in the Design Mix
No. 100	± ~~2~~3% of the % retained on this sieve in the Design Mix
No. 200	± ~~2~~3% 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.

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.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 603
PRESTRESSED CONCRETE MEMBERS

603.6.4-Sampling and Test Methods:

603.6.4.1–Acceptance Testing of Class S-P Concrete:

DELETE THE FIRST PARAGRAPH OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

During production, ~~each batch of~~ Class S-P concrete shall be tested to determine the air content, slump-flow, passing ability using the J-Ring, rapid segregation resistance, and temperature. All five of those tests shall be performed on at least the first three batches of concrete produced each day, and thereafter until satisfactory control is established. Satisfactory control is established when all the results of three consecutive sets of tests meet the performance criteria in Table 603.6.4.1, without any mix adjustments. Once satisfactory control is established, the testing frequency may be reduced to one set of tests for each member cast in a form that day. If any mix adjustments are required or performed, testing shall continue until three consecutive sets of tests meet the performance criteria without any mix adjustments. Unit Weight and Yield tests shall be conducted on the first batch of concrete each day and thereafter, as deemed necessary by the Quality Control or Quality Assurance Personnel. The fresh concrete properties shall meet performance criteria as shown in Table 603.6.4.1.

May 4, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 604
PIPE CULVERTS

604.2-MATERIALS:

DELETE CONCRETE END SECTION FOR ARCH, ELLIPTICAL, OR ROUND PIPE FROM THE TABLE:

MATERIAL	SUBSECTION
~~Concrete End Section for Arch, Elliptical, or Round Pipe~~	~~714.8~~
Concrete Safety Slope End Section for ~~Arch,~~ Elliptical~~,~~ or Round Pipe	714.8

604.15-PAY ITEMS:

ADD THE FOLLOWING TO THE TABLE:

ITEM	DESCRIPTION	UNIT
604073-*	"size" Concrete Safety Slope End Section for Elliptical Pipe	Each

May 5, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 633
CONCRETE GUTTER, INVERT PIPE GUTTER, OR DUMPED ROCK GUTTER

DELETE THE ENTIRE CONTENTS AND REPLACE WITH THE FOLLOWING:

SECTION 633
CONCRETE GUTTER, ~~INVERT PIPE GUTTER, OR~~ AND DUMPED ROCK GUTTER

DELETE THE ENTIRE CONTENTS AND REPLACE WITH THE FOLLOWING:

633.1-DESCRIPTION:

This work shall consist of the construction of open flow-ways for surface drainage, using concrete gutter or~~,~~ dumped rock gutter, ~~or invert pipe sections of cast iron, corrugated metal, precast concrete, or vitrified clay,~~ in accordance with these Specifications and in reasonably close conformity with the lines, grades, dimensions, and cross sections shown on the Plans or established by the Engineer.

633.2-MATERIALS:

Materials shall conform to the following Subsections of Division 700, except as modified:

MATERIAL	SUBSECTION
Aggregate Filter Layer	704.7
Cement for Grout	701.1 or 701.3
Crushed Aggregate	704.6, Class 10
Dumped Rock Gutter	704.4
Expansion Joint Material (Preformed)	708.1, 708.2
Joint Sealing Material	708.3
Reinforcing Steel	709.1, 709.4

MATERIAL	SUBSECTION
Sand for Grout	702.1.1 through 702.1.5 and 702.2 or 702.6
Waterstops (Elastomer Materials)	708.10

Class B concrete for gutters shall meet the requirements of 601.

~~Invert pipe gutter shall be of the shape, size and materials shown on the Plans, conforming as nearly as practicable to the Specifications for whole pipe of similar radius and material.~~

CONSTRUCTION METHODS

633.3-GENERAL:

Excavation for all gutters shall be made to the required depth. For ~~invert pipe and~~ concrete gutters, the base upon which the gutter is to be constructed shall be compacted to a firm, even surface. All soft and unsuitable material shall be removed and replaced with suitable material which shall be thoroughly compacted. Where the location of any gutter falls on rock of a suitable nature, the Engineer may eliminate the gutter within the limits of the rock. When necessary, the rock shall be shaped to direct the flow of water back to the gutter beyond the limits of the rock.

633.4-CONCRETE GUTTER:

633.4.1-Forms: Forms shall be of wood or metal of sufficient strength to retain the concrete and shall be set and securely fastened in place, true to the lines and grades given.

633.4.2-Placing and Finishing Concrete: Class B concrete shall be placed and screeded true to profile and contour either by hand or machine methods. The surface finish shall be a wood float finish when placed by hand methods. When placed by machine method, the hand finishing shall be held to the minimum required to attain the Plan profile and cross section.

633.4.3-Joints and Cut-Off Walls: Expansion joints of the type and thickness specified on the Plans shall be installed at intervals not to exceed 50-ft unless otherwise shown. If adjacent to a pavement in which joints have been used, expansion joints shall be placed opposite those in the pavement. Contraction joints shall be provided at approximately 12½ feet ~~(4 meter)~~ intervals. Contraction joints shall have a minimum depth of one-fourth of the specified gutter thickness plus ¼ inch ~~(6 mm)~~ tolerance, shall be 5/8 inch ~~(3 mm)~~ (nominal) in width, and shall be formed by using removable templates, scoring, sawing, or other methods approved by the Engineer. No filler material will be required for construction or contraction joints.

A concrete cut-off wall, reinforced as detailed on the Plans, shall be constructed at the beginning and at the end of each gutter and at locations designated on the Plans or by the Engineer. Cut-off walls shall be constructed at approximately 150 feet ~~(45 m)~~ intervals along the gutter for grades 5 to 25 percent and at approximately 50 feet ~~(15 m)~~ intervals for grades greater than 25 percent.

633.4.4-Curing: The concrete gutter shall be protected and cured by wetting for a period of three days after placing, or it shall be cured by white membrane curing materials in accordance with 501.14.4.

633.4.5-Waterstops: Waterstops shall be placed at all expansion joints in the gutter and where a concrete gutter abuts a proposed structure. Provisions shall be made to properly place the waterstop in the structure. In case of a concrete gutter which abuts an existing structure, a groove 3/4 inch ~~(20 mm)~~ by 2 inches ~~(50 mm)~~ shall be left and filled with joint sealer. Waterstops shall conform to the requirements shown on the Plans.

~~**633.5 INVERT PIPE GUTTER:**~~

~~Sections of gutter of the type called for on the Plans, conforming to the segment of circular arc of the dimensions designated, shall be set in a manner conforming to the applicable requirements of 604, unless otherwise modified by the Engineer. If set in concrete, the base shall be of Class C concrete of the dimensions and sections shown and shall be cured as specified for concrete gutter.~~

633.5-BLANK

633.6-DUMPED ROCK GUTTER:

Unless otherwise noted in the plans, a 4 inch thick filter layer shall be constructed on the bottom of dump rock gutter to prevent erosion at the soil/rock interface. The filter layer material shall meet the quality and gradation requirements of 704.7 or Class 10 aggregate.

Dumped rock gutter may be dumped from trucks and bulldozed into place in a manner similar to the placing of rock fill. Hand placement will not be required. The rock gutter shall be constructed to the thickness and grade shown on the Plans. A thickness deficiency in excess of 10 percent will not be permitted.

The dumped rock gutter may be obtained from the unclassified excavation. If suitable material is not available from the unclassified excavation, it shall be the responsibility of the Contractor to furnish this material at no additional cost. Locations of probable sources for dumped rock gutter will be listed in the Plans.

633.6.1-Grout for Dumped Rock Gutter: Grout for Dump Rock Gutter shall be defined as per Section 633.2 with interstices filled with spalls and grouted cement grout. The grout filler shall be composed of a mixture of one part Portland cement and three parts sand, mixed with water to produce a workable consistency. The amount of water shall be that designated by the Engineer. The stone shall be thoroughly wet immediately before grout is applied. As soon as the grout is deposited on the surface, it shall be thoroughly worked into the joints. The stones shall then be brushed so that their top surfaces are exposed.

Grouted Dump Rock Gutter shall be cured in accordance with any of the methods specified in 501.15, with a blanket of earth kept wet for 72 hours, or by sprinkling with a fine spray of water every two hours during the day-light hours for a period of three days.

633.7-METHOD OF MEASUREMENT:

The quantity of work done for "Concrete Gutter" will be measured in square yards ~~(meters)~~, complete in place and accepted, determined by the length, measured along the centerline, time the width. All measurements will be made on the surface of the gutter.

~~The quantity of work done for "Invert Pipe Gutter" will be measured in linear feet (meters), complete in place and accepted, measured along the centerline and upon the surface of the gutter.~~

The quantity of work done for "Dumped Rock Gutter: will be measured in cubic yards ~~(meters)~~, complete in place and accepted, determined by the dimensions shown on the Plans or established by the Engineer. No excess thickness will be measured for pay quantity.

The quantity of work done for "Grouted Dump Rock Gutter" will be measured in cubic yards ~~(meters)~~, complete in place and accepted as determined by the dimensions as shown on the Plans or established by the Engineer. No excess thickness will be measured for pay quantity and no separate payment will be made for the cement grout.

Cut-off walls at the beginning and end of the concrete gutter, those cut-off walls constructed on steep grades (five percent or over) in accordance with these specifications and any other cut-off walls designated on the Plans will not be measured separately but will be included in the cost of the gutter. If additional cut-off walls are required by the Engineer during construction, they will be paid for as square yards ~~(meters)~~ of concrete gutter; the area will be measured on the vertical face of the cut-off wall and will be the area bounded by the lower extremity of the gutter and the sides and bottom of the wall.

633.8-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, including reinforcing steel, expansion joint material, joint sealer, waterstops, ~~concrete base for invert pipe gutter~~ when called for on the Plans, and all labor, tools, equipment, supplies, and incidentals necessary to complete the work. No separate payment will be made for the excavation.

633.9-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
633001-*	Concrete Gutter	Square Yard ~~(Meter)~~
~~633002-*~~	~~"size" Invert Pipe Gutter, Type "type"~~	~~Linear Foot (Meter)~~
633003-*	Dumped Rock Gutter	Cubic Yard ~~(Meter)~~
633004-*	Grouted Dump Rock Gutter	Cubic Yard ~~(Meter)~~

* Sequence number

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 660
TRAFFIC SIGNALS

660.1-DESCRIPTION:

ADD THE FOLLOWING SUBSECTION:

660.1.1- Rectangular Rapid Flashing Beacon Assembly: This work shall consist of furnishing and installing the Rectangular Rapid Flashing Beacon (RRFB) Assembly complete with RRFB; solar power supply; signal support; foundation; pedestrian detector; warning signs and plaques; controller andcabinet; and wireless communication equipment as shown on the plans. All equipment and hardware required to mount the RRFB and associated equipment to the assembly shall be included in the unit cost of this item.

660.2-MATERIALS:

ADD THE FOLLOWING SUBSECTION:

660.2.1-RRFB: All components shall be manufactured and assembled as a complete system and consist of thefollowing:

A. **Rectangular Rapid Flashing Beacon:** Each RRFB assembly shall satisfy the FHWA InterimApproval of Rectangular Rapid Flashing Beacons (IA-21), dated March 20, 2018, and all subsequent FHWA Official Interpretation Letters and the 2009 edition of the MUTCD, including the unit size, mounting location, flash rate, and operational parameters unless modified herein by this special provision.

1. The RRFB assembly shall be programmable to allow setting the duration of the flashing beacon display based on the crossing time requirements established in the MUTCD.
2. The Contractor shall furnish and install two direction RRFB units with far side indicator light mounted to the sign structure as indicated on the plans. The

minimum size of the LED beacon shall be 5 inches by 2 inches with a minimum spacing betweenthe two indications of at least 7 inches. The RRFB shall have an operating temperature meeting NEMA specifications.

B. **Solar Power Supply:** The solar power supply shall be easy to install, fully self-containedweather, corrosion, and vandal-resistant, with a UV-resistant solar panel. The solar power supply shall be power autonomous without need of an external power supply. The batteries shall be sealed, maintenance free, and field-replaceable independently of other components.
   1. The battery pack shall have a minimum rated lifespan of three years.
   2. The solar power supply system shall have the capacity to operate the RRFB for 30 days at a normal use of 400 activations of 30 seconds per day without solar charging.
   3. The RRFB shall have an automatic light control to provide useful light during extreme conditions that prevent charging over an extended period of time. The manufacturer shall provide documentation for each installation consisting of solar power calculationsto verify load, duty cycle and battery capacity based on location.
   4. The solar panel shall be installed at the highest point on the assembly structure, or as directed by the Engineer, and away from the travelled way. The solar panel shall be installed at an angle specified by the manufacturer facing the equator (due south) with afull unobstructed solar exposure for optimum performance of the system, or as recommended by the manufacturer and directed by the Engineer.

C. **Controller and Cabinet:** The RRFB controller shall meet the requirements of Section 660 of the Specifications except where modified herein:
   1. **Power Options:** The controller unit shall be available in solar powered option.
   2. **Controller to Controller Communication:** At each location all installed RRFB assemblies shall communicate wirelessly using an unlicensed radio band so as to simultaneously commence operation of their alternating rapid flashing indications and cease operation simultaneously. The communication equipment shall comply with FCC requirements and the vendor representative shall field test the equipment prior to placing the units in operation to demonstrate the RRFBs ability to achieve proper operation under the requirements of FHWA Memorandum IA-21 and all subsequent interpretation letters. Up to ten optional RF channels shall be available to allow multipleRRFB Systems to operate within close proximity of each other.
   3. **Timing:** The controller shall provide the full programmed timing upon all push buttonactivations.

D. **Signal Support:** The signal support shall be "crashworthy" and meet the requirements of Section 660 of the Specifications. "Crashworthy", as specified herein, shall be defined as compliance with the crash testing requirements of the AASHTO Manual for Assessing Safety Hardware (MASH) at Test Levels I, II, and III for projects let after

December 31, 2019.

E. **Foundation:** Concrete foundation shall meet the requirements of Section 660.8 of the Specifications.

F. **Pedestrian Detector:** The pedestrian detector shall meet the requirements of Section 660 of the Specifications.

G. **Beacon Flashing Requirements:** As a specific exception to the requirements for the flash rate of beacons provided in the 2009 edition of the MUTCD, Paragraph 3 of Section 4L.01, RRFBs shall use a much faster flash rate and shall provide 75 flashing sequences per minute. During each 800 millisecond flashing sequence, the leftand right RRFB indications shall operate using the following sequence:

a. The RRFB indication on the left-hand side shall be illuminated for approximately50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
b. The RRFB indication on the right-hand side shall be illuminated for approximately50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
c. The RRFB indication on the left-hand side shall be illuminated for approximately50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
d. The RRFB indication on the right-hand side shall be illuminated for approximately50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
e. Both RRFB indications shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 50 milliseconds.
f. Both RRFB indications shall be illuminated for approximately 50 milliseconds. Both RRFB indications shall be dark for approximately 250 milliseconds.

H. **Signs:** Each RRFB assembly shall include one Pedestrian Crossing sign (W11-2) 36 inch by 36 inch dimension, one Diagonal Downward Pointing Arrow (W16-7P) plaques 24 inch by 12 inch dimension, and a Push Button to Turn on Warning Lights sign (R10-25) 9 inch by 12 inch dimension, mounted as part of or above the pedestrian push button. All signs shall meet the latest requirements of theMUTCD.

I. **Warranty:** All materials shall be warranted for 3 years from date of acceptance or turn on bythe West Virginia Department of Highway.

CONSTRUCTION METHODS

660.3-GENERAL:

ADD THE FOLLOWING:

A. The RRFB Assembly shall be installed strictly according to the manufacturer's recommendations, the applicable portions of the Specifications as modified herein, and as shown on the plans.
B. The final elevation and location of the beacons shall be approved by the Engineer prior to theContractor beginning work.

660.19-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

Rectangular Rapid Flashing Beacon Assembly shall be measured by each unit complete in place and accepted.

660.20-BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

The unit price shall include all labor, equipment, materials and documentation required to furnish and install the RRFB assembly (includes two complete signs)with solar power supply; traffic signal support; foundation; pedestrian detector; warning signs and plaques; controller; wireless communication equipment; and mounting hardware.

660.21-PAY ITEM:

ADD THE FOLLOWING ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
660007-002	Rectangular Rapid Flashing Beacon Assembly	Each

~~May 7, 2021~~ June 30, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SPECIAL PROVISION

FOR

STATE PROJECT NUMBER: _____

FEDERAL PROJECT NUMBER: _____

SECTION 663
STAMPED ASPHALT CROSSWALKS

663.1-DESCRIPTION:

ADD THE FOLLOWING SUBSECTION:

663.1.4-Stamped Asphalt Crosswalks: This work consists of constructing a stamped and coated crosswalk on an asphalt roadway surface in accordance with the details and notes on the plans, or referenced herein. All materials, equipment, and labor required to complete the stamped asphalt crosswalks shall be included in the unit cost of this item.

663.2-MATERIALS:

ADD THE FOLLOWING SUBSECTION:

663.2.2-Stamped Asphalt Crosswalks: Use one of the following products: StreetprintXD, ~~FrictionPave, Stamped Asphalt or PatternPrint~~TrafficpatternsXD or an approved equal to be approved by the engineer and City of Huntington. Only one product will be permitted to be used on this project. Stamped asphalt pattern and coating will consist of a Diagonal Herringbone Pattern with Brick Red ~~Brick (or similar)~~ color (or similar, color and pattern to be approved by the City of Huntington) thermoplastic surface treatment. Surface coating shall be an aggregate reinforced thermoplastic and shall be installed according to manufacturer's recommendations.

CONSTRUCTION METHODS:

663.5-APPLICATION:

ADD THE FOLLOWING:

663.5.11-Stamped Asphalt Crosswalks: Construct stamped asphalt crosswalks at the

locations shown in the plans. Install in accordance with the manufacturer's recommendations.

Stamped asphalt crosswalks shall be constructed using flexible templates, by stamping the pattern into the asphalt using a vibratory plate compactor. Stamping can be performed on freshly placed asphalt surface when the asphalt is still pliable or into an existing asphalt surface. An existing asphalt surface must be heated using an infrared heating apparatus insuring to heat the surface above 325°F (163°C). Use slow cycled heat to ensure the surface does not burn. The surface should be heated to a depth of at least ¾" to ensure compaction (not crushing of the aggregate) below the template. Install in accordance with the manufacturer's recommendations.

663.6-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

663.6.4-Stamped Asphalt Crosswalks Stamped Asphalt crosswalk shall be measured and paid as actual number of square feet of roadway surface that has been stamped and coated, completed and accepted.

663.7-BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SECTION:

Stamped Asphalt quantities, determined as provided above, will be paid for at the contract unit price bid, which price and payment shall be full compensation for all labor, materials, tools, equipment and incidentals necessary to complete the work.

663.8-PAY ITEMS:

ADD THE FOLLOWING ITEM TO THE TABLE:

ITEM	DESCRIPTION	UNIT
663026-001	Stamped Asphalt Crosswalk	Square Foot

May 7, 2021

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SPECIAL PROVISION

FOR

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SECTION 663
PAVEMENT MARKINGS AND RUMBLE STRIPS

663.1-DESCRIPTION:

ADD THE FOLLOWING SUBSECTION:

663.1.3-Bicycle Lane, Green Thermoplastic: Green thermoplastic is to be used to highlight lane separation and correct position for user of bicycle lane and is to be installed within bicycle lanes as a supplement to the other pavement markings that are required for the designation of a bicycle lane.

663.2-MATERIALS:

ADD THE FOLLOWING SUBSECTION:

663.2.1-Green Thermoplastic:

A. Daytime chromaticity coordinates for the color used for green colored pavement markings shallbe as follows:

1		2		3		4	
x	y	x	y	x	y	x	y
0.230	0.754	0.266	0.500	0.367	0.500	0.444	0.555

The daytime luminance factor (Y) shall be at least 7, but no more than 35.

B. The nighttime chromaticity coordinates for the color used for green colored pavement markings shall be as follows:

1		2		3		4	
x	y	x	y	x	y	x	y
0.230	0.754	0.266	0.500	0.367	0.500	0.444	0.555

C. Green colored pavement markings shall be retroreflective.

D. Materials shall not contain lead or hexavalent chromium. The contractor shall provide a manufacturer's certification to this effect to the Engineer prior to installation.

E. After installation, the material shall provide a surface skid resistance greater than or equal to 60 British Pendulum Number (BPN) using ASTM E303 testing method. Labtesting of typical product installation is acceptable. The contractor shall provide a manufacturer's certification to this effect to the Engineer prior to installation.

CONSTRUCTION METHODS

Construction methods are as set out in WVDOH Standard Specification Section 663.

663.6-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

Green Thermoplastic will be measured and paid as the actual area in square feet of pavement markings satisfactorily placed and accepted by the Engineer.

663.7-BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SECTION:

Green Thermoplastic quantities, determined as provided above, will be paid for at the Contract unit price, which shall constitute full compensation for furnishing all materials and doing all the work prescribed in a workmanlike and acceptable manner, including the furnishing of all the auxiliary vehicles, labor, tools, equipment, supplies and incidentals necessary to complete the work.

663.8-PAY ITEM:

ADD THE FOLLOWING ITEMS TO THE TABLE:

ITEM	DESCRIPTION	UNIT
663025-001	Bicycle Lane, Green Thermoplastic	Square Feet

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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 for transverse, longitudinal and vertical closure pours.

All UHPC shall be produced using "Ductal" concrete materials manufactured by Lafarge North America. See contract plan sheets for UHPC placement locations.

601.2-MATERIALS:

ADD THE FOLLOWING:

A. Ductal JS1000 Concrete: Use the concrete mix supplied by Lafarge North America with the following proportions of mix parameters based on the supplier's recommendations.

Premix	3,700 lb/cy
Water	219 lb/cy
Super Plasticizer Liquid	51 lb/cy.
Steel Fiber	263 lb/cy
Min. Compressive Strength at 4-days	14 KSI
Min. Compressive Strength at 28-days	21 KSI

B. Ductal JS1212 Concrete: Use the concrete mix supplied by Lafarge North America with the following proportions of mix parameters based on the supplier's recommendations.

Premix	3,700 lb/cy
Water	219 lb/cy
Super Plasticizer Liquid	51 lb/cy
Steel Fiber	263 lb/cy
Accelerator	39 lb/cy
Min. Compressive Strength at 24-hours	10 KSI
Min. Compressive Strength at 48-hours	14 KSI
Min. Compressive Strength at 28-days	19 KSI

~~B.~~**C. Qualification Testing:** The Contractor shall complete the qualification testing of the UHPC two months before placement of joint. ~~The minimum concrete compressive strength shall be 12 KSI at 96 hours and 15 KSI for opening the bridge to traffic.~~ The compressive strength shall be measured by modified AASHTO T22/ASTM C39. Only a concrete mix design that passes these tests may be used to form the joint or link slab. Testing shall be performed by an approved testing lab. The casting of mockups, as described in 601.5.D, also apply.

Material supplier for Ductal Concrete:

Lafarge~~Holcim~~ North America
8700 W Bryn Mawr Ave, Ste 300
Chicago, IL 60631
Phone:~~-~~ 734-489-9555
E-mail: ductal-na@lafargeholcim.com

~~C.~~**D. Water:** Water used for mixing shall be potable. If ice is to be used in place of water for cooling it should make up no more than 25% of the total water weight.

~~D.~~**E. Admixtures:** Chryso Premia 150, ~~(30% solid content)~~ Optima 100 and Turbocast 650A.

~~E.~~**F. Fiber Reinforcement:** Steel chord type Bekaert OL 13/0.2 inches or equivalent – high carbon fibers with a minimum tensile strength 300,000 psi.

601.3-PROPORTIONING:

ADD THE FOLLOWING SUBSECTION:

601.3.4-UHPC Submittals: The Contractor shall submit his batching sequence including the start time of the day within a 4 hour time frame, forming, placing, curing, and testing procedures to the Engineer for review seven (7) working days prior to casting. The mixing sequence shall include the order and time of introduction of the materials, mixing time and QA/QC procedure for the verification of the mix uniformity.

601.5-CONSTRUCTION METHODS:

ADD THE FOLLOWING:

A. Quality Assurance:

1. The Contractor shall be pre-qualified by Lafarge North America that they have the capability to mix and place Ductal concrete. Proof of pre-qualification shall be submitted in writing from the Contractor to the Engineer seven (7) working days before any UHPC is cast.
2. The surface of the UHPC field joints shall be filled ~~flush with the precast deck to within a tolerance of plus or minus~~ 1/8 inch higher than adjacent surfaces. Other tolerances shall be in compliance with PCI Manual – 116 or otherwise specified on plans.

B. Pre-Pour Meeting: A day before the initial placement of the Ductal, the Contractor shall arrange for an onsite meeting with the Lafarge Representative and Engineer. The Contractor's staff shall attend the site meeting. The objective of the meeting will be to clearly outline the procedures for mixing, transporting, finishing and curing of the UHPC material. The Contractor shall arrange for a Representative of Lafarge to be on site during the placement of the UHPC. The Lafarge representative shall be knowledgeable in the supply, mixing, delivery, placement, and curing of the Ductal material. Mockup requirements will be performed per the recommendations of the Lafarge representative.

C. Storage: The Contractor shall assure the proper storage of Ductal premix including power, fibers, and additives, obtained from Lafarge North America, as required by the Lafarge specifications in order to protect materials against loss of physical and mechanical properties.

D. Forming, Batching, Placement, And Curing: The Contractor shall work together with Lafarge to ensure appropriate initial strength gains to meet the desired project schedule. An initial strength gains to meet the desired project schedule. ~~An initial strength of 12 KSI can be achieved by adding accelerators and by maintaining the ambient temperature above 60°F for 96 hours after placement.~~ Grinding of the UHPC surface can be performed upon recommendations from Ductal. If significant fiber pullout is observed during grinding operations, grinding shall be suspended and not resumed until approved by the Engineer.

The bridge can be opened to traffic when strength of ~~15 KSI~~ 14 KSI has been achieved.

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 Lafarge and as submitted and accepted by the Engineer.

The design and fabrication of forms shall follow approved installation drawings and shall follow the recommendations of Lafarge. All the forms for UHPC shall be constructed from medium density overlay plywood.

Mockups of each UHPC pour shall be performed prior to actual UHPC construction and conducted per the requirements of this special provision and the recommendation of the Lafarge Representative. Mockups of the 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 Lafarge Representative.

Two portable batching units will be supplied by Lafarge to the Contractor for mixing of the UHPC. The Contractor shall follow the batching sequence as specified by Lafarge and approved by the Engineer.

Each UHPC placement shall be cast using one continuous pour. No cold joints are permitted unless previously agreed upon by the Lafarge Representative and the Engineer.

The concrete in the form shall be cured according to manufacturer's recommendations at minimum temperature of 60°F to attain the design strength.

E. Testing: The following tests shall be performed following casting of the mockup and for each day of UHPC placement:

1. Concrete compressive strength test according to modified ASTM C 39. Use twelve (12) specimens 3 inch diameter by 6 inches. Prior to Contractor grinding UHPC, three (3) specimens shall be tested to validate the achievement of 10 KSI compressive strength. Three (3) specimens shall be tested to validate the achievement of ~~15 KSI~~ 14 KSI compressive strength prior to opening the bridge to traffic. ~~Thermally threated three final~~ Three (3) specimens shall be tested at 28 days to verify final strength. WVDOH will reject portion or all of the UHPC closure pour should testing indicate not meeting required minimum strengths. The remaining three (3) specimens shall be treated as reserves.

   All specimens shall be tested at Lafarge North America or by an approved testing lab. Each specimen shall have ends ground to 0.5 degree planeness.

   Testing by Lafarge shall be sent to their facilities as directed by Lafarge representatives.
2. Cast three (3) additional 4" diameter by 8" cylinders and provide to Cement and Concrete Group of the WVDOH, MCS&T Division for their evaluation.
3. Determination of flow performed on a flow table constructed according to ASTM C230. The measured diameter of the concrete after 20 table drops shall be within the limits: minimum 7 inches; maximum 10 inches. The test shall be performed on every concrete batch. The flow must be in an area free of vibration to give the most accurate results.

Note: All specimens shall be exposed to the same process as the mockup and each UHPC placement and shipped to Lafarge North America and an approved testing lab accordingly for testing. A flow table may be obtained from Lafarge North America to conduct testing.

F. Contacts: Material Supplier and Cylinder Testing:

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

601.14-METHOD OF MEASUREMENT:

ADD THE FOLLOWING:

The concrete quantities ~~shown on the plan, measured by the cubic yards, are for contractor's information only.~~ 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 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

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, DITCH CHECKS, SILT FENCE, PREMANUFACTURED DITCH CHECKS AND SUPER SILT FENCE:

DELETE THE HEADING AND REPLACE WITH THE FOLLOWING:

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

ADD THE FOLLOWING SUBSECTION:

642.6.6-Compost Filter Socks: Compost filter socks are a three-dimensional tubular sediment control and storm water runoff filtration device typically used for perimeter control of sediment on and around construction activities.

Compost filter socks are also used to reduce runoff flow velocities on sloped surfaces (slope interruption), as curb and drain inlet protection, and as ditch checks. They are placed on the down slope of any disturbed area, perpendicular to the slope where there is sheet or low concentrated flows. They can be utilized in any area that is acceptable to use a silt fence.

Compost filter socks are to have a diameter of 8” to ~~24”~~ 32”. An 8” sock may be used in the areas of curb and drain inlets once approved by the Engineer.

642.6.6.1-Materials: The netting for the compost filter socks shall be made of High Density Polyethylene (HDPE), Multi-Filament Polypropylene (MFPP), Heavy Duty Multi-Filament Polypropylene (HDMFPP) or other equivalent material that may become available in the future. The material shall be photo- or bio-degradable and have a minimum functional longevity of 6 month or more.

All materials for the compost filter sock must be knitted. Extruded materials will not be permitted. Compost used for the filter sock shall be weed free and derived from a well-decomposed source of organic matter. The compost shall be produced using an aerobic composting process meeting 40 CFR 503 regulations including time and temperature data. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted. Test methods for the items below should follow US Composting Council Test Methods for the Examination of Composting and Compost guidelines for laboratory procedures:

A. PH – 5.0-8.0 in accordance with TMECC 04.11-A, "Electrometric pH Determinations for Compost"
B. Particle size – 99% passing a 2 in (50 mm) sieve and 30% - 50% passing a 3/8 in (10 mm) sieve.
C. Moisture content of less than 60% in accordance with standardized test methods for moisture determination.
D. Material shall be relatively free (<1% by dry weight) of inert materials.
E. A sample shall be submitted to the Engineer for approval prior to being used and must comply with all local, state and federal regulations.

642.6.6.2-Installation: The compost filter sock shall be installed according to this specification and per the manufacturer's recommendations.

1. Compost filter socks should be installed parallel to the base of the slope or disturbed area. In addition, a compost filter sock shall be installed at an interval based on the slope specified in Table 6.6.1.

TABLE 6.6.1
Maximum Slope Length Above Filter Sock and Recommended Diameter

Slope	Ratio	8"	12"	18"	24"	32"
Less than 2.0%	0 - 50:1	~~125~~ 400	~~250~~ 520	~~300~~ 700	~~350~~ 1000	1300
2.1% - 10.0%	50:1 - 10:1	100	~~125~~ 150	~~200~~ 250	~~250~~ 300	400
10.1% - 20.0%	10:1 - 5:1	~~75~~25	~~100~~ 70	150	200	250
20.1% - 49.9%	5:1 - 2:1	10	~~50~~ 15	~~75~~ 20	~~100~~ 25	40
50% and over	> 2:1	n/a	~~25~~n/a	~~50~~ n/a	~~75~~ n/a	n/a

2. Stakes shall be installed through the middle of the compost filter sock on 10 ft. ~~(3 m)~~ centers, using 2 in ~~(50 mm)~~ by 2 in ~~(50 mm)~~ by 3 ft. ~~(1 m)~~ wooden stakes. In the event staking is not possible, i.e., when compost filter socks are used on pavement, concrete blocks heavy enough to prevent movement of the compost filter sock shall be placed behind the compost filter socks to help stabilize during rainfall/runoff events.
3. Staking depth for sand and silt loam soils shall be 12 in ~~(300 mm)~~.
4. If necessary, loose compost may be used to backfilled along the upslope side of the compost filter sock, filling the seam between the soil surface and the device improving filtration and sediment retention.

5. Compost filter socks may be left in place as a permanent filter or part of the natural landscape unless directed by the Engineer to remove them. It may be seeded at time of installation for establishment of permanent vegetation.
6. Compost filter socks shall not be placed in streams.

642.7-METHOD OF MEASUREMENT:

ADD THE FOLLOWING AS PARAGRAPH ELEVEN:

Compost filter socks will be measured by the linear foot ~~(meter)~~ in place.

642.9-PAY ITEMS:

ADD THE FOLLOWING PAY ITEM.

642016-001	Compost Filter Sock, 8 In.	Linear Foot ~~(meter)~~
642016-002	Compost Filter Sock, 12 In.	Linear Foot ~~(meter)~~
642016-003	Compost Filter Sock, 18 In.	Linear Foot ~~(meter)~~
642016-004	Compost Filter Sock, 24 In.	Linear Foot ~~(meter)~~
642016-005	Compost Filter Sock, 32 In.	Linear Foot

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 405
CHIP SEALS

405.1-DESCRIPTION:

This work shall consist of the construction of a wearing course, composed of asphalt emulsion immediately followed by a single layer of aggregate, in one or more applications, followed by a fog seal. The type of Chip Seal will be indicated on the Plans.

The contractor shall notify the Engineer a minimum of two weeks prior to starting any Chip Seal operation. In addition, the contractor shall submit proposed sources of all materials.

405.2-MATERIALS:

405.2.1-Aggregate: The aggregate shall be from a WVDOT approved source and shall conform to the requirements of the Section 703.1-4. ~~It is expected that t~~The aggregate ~~will~~ shall be washed to reduce dust content. The aggregates shall be crushed with a minimum of 80% two face fracture. Aggregates shall meet the gradation requirements of Table 405.2.1:

Table 405.2.1
Aggregate Gradation Requirements for Chip Seal

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

405.2.2-Asphalt Emulsion: The asphalt emulsion for Chip Seals and the emulsion for the fog seal shall be from a WVDOT approved source and shall meet the requirements of

AASHTO M316, Table 1. Other asphalt emulsions may be used with testing and approval prior to construction. Testing shall be done a minimum of two weeks prior to the projected start date and follow the process outlined in Materials Procedure 401.02.25 Certification of Asphalt and Tar Shipping Terminals.

405.2.3-Application Rate Design: The contractor shall perform a Chip Seal Design according to AASHTO PP 82 and submit to the Engineer at least one week prior to starting work.

405.3-WEATHER RESTRICTIONS:

Chip Seal shall be constructed only when the condition of the existing surface is satisfactory to the Engineer, when the ambient and existing pavement temperature ~~of the existing pavement~~ is 50° F (10° C) or above and rising, and when ~~the following day is not showing potential for rain~~rain is not forecast for the next 12 hours. Surface shall be dry to damp. ~~, and when other weather conditions are satisfactory for construction.~~ The temperature may be waived but only when approved by the Engineer. No Chip Seal shall be performed between October 1 and May 1.

Chip Seal operations shall be suspended immediately when rain begins or when the Engineer determines that a rain event is imminent.

405.4-EQUIPMENT:

Equipment shall include equipment for emulsion distribution, aggregate spreading, compaction, and sweeping before and after application. Equipment shall also include scrapers, hand brooms, shovels, and other items as may be necessary to thoroughly clean the existing surface.

405.4.1-Emulsion Distributor: The distributor shall be so designed, equipped, maintained and operated that asphalt material may be applied uniformly on variable widths up to 16 ft. (4.6 m) at readily determined and controlled rates from 0.05 to 2.0 gal. per sq. yd. (0.22 to 9.3 liters sq. m) with uniform pressure and with an allowable variation from any specified rate not to exceed 0.015~~02~~ gal. per sq. yd. (0.09 liter sq. m).

The distributor shall also have a cab-metering system that will automatically adjust the flow of the asphalt material as the speed of the truck changes and allow the operator to adjust the rate of application from the cab of the truck.

Distributor equipment shall include a tachometer, pressure gages, and a thermometer for measuring temperatures of tank contents.

Distributors shall be equipped with a power unit for the pump, and full circulation spray bars adjustable laterally and vertically. A manifold connection shall be provided and hand spraying equipment shall be available to cover areas and patches inaccessible to the distributor.

Nozzle angles shall be positioned at an angle of 15°-30° from the horizontal of the spray bar. Application shall achieve a triple overlapping spray pattern.

Verification of distributor truck calibration within the past 12 months shall be available on the project site, preferably located within the cab of the truck.

Equipment shall be calibrated according to AASHTO guide specification or manufacturers recommendations.

~~Nozzle angles shall be adjusted from 15° 30° to achieve a triple overlapping spray pattern.~~

405.4.2-Aggregate Spreader: The aggregate spreader shall be self-propelled with front discharge capable of adjusting to evenly and accurately distribute at the required placement rates. Aggregate spreader calibration according to ASTM D5624 shall be performed prior to starting work. Check the veil throughout the process. Recalibrate after any maintenance, repairs, or modifications that could affect spread rate. ~~Check the veil throughout the process.~~

405.4.3-Compaction Equipment: A minimum of ~~two~~ three self-propelled pneumatic tire rollers shall be used, at a minimum of 6~~12~~ tons each. Roller tires shall have a minimum pressure of ~~60~~ 80 psi.

405.4.4-Sweepers: Power sweepers, pickup sweepers, or rotary brooms shall be used for surface preparation as well as removing any loose aggregate after compaction. Steel bristles shall not be used on the Chip Seal after compaction.

405.5-PREPARING AND REPAIRING EXISTING SURFACE:

No chip seal shall be applied until breaks, holes, depressions, and other irregularities in the existing surface have been repaired and cured sufficiently to permit the asphalt material to be placed in a uniform application. Patching and leveling material shall be plant mixed. Hand patching will be permitted where necessary. Remove all existing thermoplastic markings and raised pavement markers. Protect any drains or other utility covers. Apply a light fog seal to asphalt patched surfaces less than 2 months old, using an asphalt emulsion that is compatible with the emulsion being used for the chip seal.

405.6-CLEANING AND SWEEPING:

~~Immediately~~ Within 30 minutes prior to construction, the existing surface shall be swept and thoroughly cleaned to remove all mud, dirt, dust, vegetation, and other caked or loose foreign material. Cleaning shall be done to a minimum width of one foot on each side beyond the width of the surface to be placed excluding the shoulder. Materials collected in the cleaning operation shall be removed and disposed of as directed.

405.7-APPLICATION OF ASPHALT MATERIAL:

After the existing surface has been cleaned, and is in a dry condition, the asphalt material shall be applied by means of a pressure distributor. The spray bar shall be raised to a sufficient height so as to uniformly and completely coat the entire surface. The rate of application of asphalt material shall be in accordance with section 405.12, or as modified by the plans. Application temperatures of the asphalt material shall be within the range specified in Subsection 705 for the particular material being used, or as documented by the manufacturer. Application rate shall be taken from the design.

Except when required to maintain traffic, Chip Seal operations shall be done upon the full width of the section.

After application, asphalt material shall completely and uniformly cover the underlying pavement and be free of streaks, voids, and puddles.

405.8-APPLICATION OF AGGREGATE:

Immediately following each application of asphalt material, aggregate at the rate or rates called for in 405.12 shall be spread with the spreader in such a manner that the entire area being

treated is uniformly covered. No traffic, construction or otherwise, shall be allowed on the asphalt material before placing aggregate. Additional aggregate shall be spread if necessary, and hand spreading shall be done to cover areas inaccessible to the spreading equipment. The aggregate shall be dried or moistened as required in order to obtain a near Surface Saturated Dry condition.

If the process must stop during that application any asphalt material that has been applied to the surface shall be covered with aggregate to prevent breaking of the emulsion prior to embedment of the aggregate. Application rate shall be taken from the design.

405.9-ROLLING AND SWEEPING:

~~Immediately~~ Within 2 minutes following spreading of the aggregate, the entire surface of the aggregate shall be rolled until the aggregate is keyed into the asphalt material. Any area that ravels shall be repaired and rerolled. Rolling shall be parallel to the centerline and shall begin at the edges of the treatment and progress toward the center, each trip uniformly overlapping the preceding trip. There shall be at least three passes made with a pneumatic tire roller.

Rolling shall cease before the aggregate is crushed to any appreciable extent. Rollers shall be the type and weight specified in 405.4.3. To ensure aggregate embedment before the emulsion has set, the minimum number of rollers shall be ~~two~~ three (~~3~~2). More rollers may be used to obtain compaction to the satisfaction of the Engineer.

The roller speed shall not exceed ~~10~~ 3 miles per hour to prevent aggregate pick up and ensure embedment. Water, to prevent adhesion of the asphalt material to the roller wheels, shall not be used in excessive amounts. The use of fuel oil, paraffin oil, and kerosene on rollers or other equipment, for the purpose of preventing material from picking up or sticking, is prohibited.

After the emulsion has cured, sweeping can commence. The status of being cured shall be determined by the ability to sweep all loose aggregate from the surface without removing any aggregate adhered to the asphalt emulsion.

TABLE 405.9
Project's Annual Average Daily Traffic (AADT) - Sweeping Requirements

Less than 500 AADT	501 to 5000 AADT	Greater than 5000 AADT
Within 24 hours after rolling	No later than the following morning	Before traffic is allowed without traffic control

405.10-JOINTS:

The longitudinal construction joints between adjacent lanes shall be kept clean of material foreign to the surface being treated. The joints shall be constructed without overlaps or gaps between the materials.

The beginning of the project and all transverse joints shall be covered with paper to prevent overlapping of the seal and provided a uniform joint. Following its use, the paper shall be removed and disposed of satisfactorily.

405.11-PROTECTION OF PAVEMENT AND TRAFFIC CONTROL:

The Contractor shall be responsible for the protection of the surface against damage by their equipment and personnel. Traffic shall not be permitted on any part of the work under construction until sweeping has been completed. The applicable provisions of 636 shall apply for regulating traffic.

405.12-SEQUENCE OF OPERATIONS AND QUANTITIES OF MATERIALS:

The quantities and kinds of materials to be used and the sequence of applications and operations for the various treatments shall be as follows. Application rates shall be according to the Contractor's provided chip seal design. Typical rates are shown below. Maximum quantities of asphalt emulsion may be used only when the old surface is open or porous. Sweep each layer when applying multiple layers. The rates of aggregate and asphalt emulsion may be adjusted by the Engineer. ~~The contractor may suggest different application rates to the Engineer for consideration by submitting a project specific Chip Seal design based on McLeod or Modified Kearby Design Methods.~~

Table 405.12.1

Type	Layer	Asphalt Emulsion (gal/SY)	Aggregate (lb/SY)	Gradation Type
Light	First	0.15 to 0.25	8 to 10	C
Single	First	0.25 to 0.40	15 to 25	B
Double	First	0.25 to 0.40	25 to 35	B
	Second	0.25 to 0.35	10 to 20	C
Triple	First	0.30 to 0.50	25 to 45	A
	Second	0.30 to 0.50	25 to 35	B
	Third	0.25 to 0.35	10 to 20	C

405.13-FOG SEAL:

Unless otherwise specified, a fog seal shall be applied on the final surface according to Section 407. This shall be done no less than 3 but no more than 7 calendar days after the application of the Chip Seal. The surface must be dry before application, and the surface shall be swept to remove loose material. An asphalt emulsion shall be applied uniformly at a rate of 0.09 ± 0.03 gallons per square yard to the surface. Any raveled areas, flushed areas, or other defects in the chip seal shall be repaired prior to the application of the fog seal.

405.14-TESTING AND ACCEPTANCE:

405.14.1-Quality Control Testing: Quality Control Testing: Quality Control is the responsibility of the Contractor, as specified in 106.1. The Contractor shall design and submit a quality control plan in accordance with applicable section of MP 307.00.50 detailing the methods by which the quality control program will be conducted.

405.14.2-Acceptance Testing: ~~Acceptance sampling and testing is the responsibility of the Division.~~ Acceptance for aggregate will be based on the uniformity of the aggregate and the dust content. Samples shall be taken from the conveyor belt on the chip spreader in accordance with MP 700.00.06 or from the roadway in accordance with ASTM D5624. Samples may be split with the contractor. Sampling frequency shall be one sample for every lane mile per layer. This sample shall be the lot. Fractions of a mile less than 0.5 will be included in the previous lot, and fractions of a mile greater than 0.5 will be a separate lot. Contractor must sample in presence of the Engineer.

405.14.2.1-Acceptance of Aggregate Uniformity: The more uniform the material, the better performance potential of the chip seal. Uniformity of the aggregate will be measured by the Coefficient of Uniformity, C_u, as defined in ASTM D2487. Adjustments per lot will be as follows.

TABLE 405.14.2.1

Adjustment of Contract Item Price for Aggregate Uniformity	
Cu	**Percent Adjustment**
<1.7	1% incentive per 0.1 below
1.7 – 3.0	No Adjustment
3.1 – 4.0	2% disincentive per 0.1 above
>4.1	*Special evaluation to consider remove and replace

405.14.2.2-Acceptance of Aggregate Dust Content: Dust content will be determined by AASHTO T11. Adjustments per lot will be as follows.

TABLE 405.14.2.2

Adjustment of Contract Item Price for Dust Content	
% Dust	**Percent Adjustment**
0 – 1.0	2% incentive
1.1 – 2.0	No Adjustment
2.1 – 3.0	2% disincentive
3.1 – 3.5	5% disincentive
3.6 – 4.0	8% disincentive
4.1 – 4.5	12% disincentive
>4.5	*Special evaluation to consider remove and replace

405.15-METHOD OF MEASUREMENT:

The quantity of "Asphalt Emulsion Material" shall be the number of gallons (liters) incorporated into the completed work, which volume will be measured as described in 109.1.

The quantity for "Chip Seal, Aggregate Type" shall be paid for by the Square Yard (Square Meter). The quantity will be determined by the Plan Quantity as provided for in the proposal unless otherwise directed by the Engineer.

405.16-BASIS OF PAYMENT:

The quantities, determined as provided above, will be paid for at the contract unit prices and shall be full compensation for the furnishing, hauling, and placing of all materials, all cleaning and sweeping, compaction and for all other materials, labor, tools, equipment, supplies, and incidentals necessary to complete the work.

405.17-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
405007-*	Chip Seal Aggregate, Type **	Square Yards ~~(Square Meters)~~
405010-*	Asphalt Emulsion Material	Gallon ~~(Liter)~~

* Sequence number

** Type of Aggregate Gradation from Section 405.2.1, either A, B, or C. Each aggregate gradation will have its own pay item. For example, a Double Chip Seal would have two pay items; one for Type B and one for Type C gradations.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 603
PRESTRESSED CONCRETE MEMBERS

603.6.4-Sampling and Test Methods:

603.6.4.1–Acceptance Testing of Class S-P Concrete:

DELETE THE FIRST PARAGRAPH OF THE SUBSECTION AND REPLACE WITH THE FOLLOWING:

During production, ~~each batch of~~ Class S-P concrete shall be tested to determine the air content, slump-flow, passing ability using the J-Ring, rapid segregation resistance, and temperature. All five of those tests shall be performed on at least the first three batches of concrete produced each day, and thereafter until satisfactory control is established. Satisfactory control is established when all the results of three consecutive sets of tests meet the performance criteria in Table 603.6.4.1, without any mix adjustments. Once satisfactory control is established, the testing frequency may be reduced to one set of tests for each member cast in a form that day. If any mix adjustments are required or performed, testing shall continue until three consecutive sets of tests meet the performance criteria without any mix adjustments. Unit Weight and Yield tests shall be conducted on the first batch of concrete each day and thereafter, as deemed necessary by the Quality Control or Quality Assurance Personnel. The fresh concrete properties shall meet performance criteria as shown in Table 603.6.4.1.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 605
MANHOLES AND INLETS

605.5-BASIS OF PAYMENT:

ADD THE FOLLOWING TO THE END OF THE SUBSECTION:

When inlets or other drainage structures are to be constructed to Final Grade, as shown by the Plans, the Contractor shall provide positive drainage in coordination with their means and methods throughout the duration of the project to protect the roadway and all other areas that are within the limits of the project. There will be no direct payment by the Division for partial inlet construction or other intermediate drainage structure construction to maintain positive drainage that the contractor is in control of.

July 13, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 606
UNDERDRAINS

DELETE THE CONTENTS AND REPLACE WITH THE FOLLOWING:

606.1-DESCRIPTION:

This work shall consist of constructing underdrains and free draining base trenches using pipe and granular material, ~~blind drains,~~ aggregate filled engineering fabric, ~~prefabricated pavement edge drain~~ and underdrain pipe outlets in accordance with these Specifications and in reasonably close conformity with the lines, grades, dimensions and locations shown on the Plans or established by the Engineer.

When Item 606025-*, "size" Underdrain Pipe, is included as a pay item in the Contract, any of the following pipe types may be furnished for construction of the underdrain: corrugated polyethylene underdrain pipe, or ~~perforated plastic semicircular~~ PVC underdrain pipe.

606.1.1-Free Draining Base Trench: This work shall consist of constructing free draining base trenches and Outlet Pipes in accordance with these specifications and in reasonably close conformity to Standard Details – Volume I with the lines, grades, dimensions, and locations shown on the plans or established by the Engineer.

606.2-MATERIALS:

The materials shall conform to the following requirements:

MATERIAL	SUBSECTION	TYPE OR GRADATION
Concrete for Miscellaneous Uses	715.12	
Corrugated Polyethylene Underdrain	714.19	
Crushed Aggregate for Free Draining Base Trench ~~2~~ 1	703.1, 703.2, 703.3, 703.4	AASHTO 57, 67, 357, or 467
Gravel for Aggregate Filled Fabric Underdrains ~~2~~ 1	703.2 & 703.4 or 703.2.3	AASHTO #2 thru #57 or Pea Gravel
Gravel for Underdrains ~~2~~ 1	703.2 & 703.4	AASHTO Size # 57, 67, 7 or 78
Crushed Stone for Aggregate Filled Fabric Underdrains ~~2~~ 1	703.1 & 703.4	AASHTO #2 thru #57 inclusive
Crushed Stone for Underdrains ~~2~~ 1	703.1 & 703.4	AASHTO Size # 57, 67, 7 or78

Engineering Fabric for Subsurface Drainage	715.11.4	
Miscellaneous Concrete	715.12	
Outlet Pipe	715.10.1.5	
~~Perforated Plastic Semicircular Pipe [1]~~	~~714.20~~	
PVC Underdrain Pipe	714.20	
~~Prefabricated Pavement Edge Drain~~	~~715.10.1~~	
~~Silica Sand for Underdrains~~	~~702.1.2, 702.1.3 & 702.6~~	

~~1~~ ~~Plastic semicircular pipe may be furnished only when six inch (150 mm) diameter is called for on the Plans.~~

~~2~~ 1 Only one size may be used at any one installation.

When the locations of manufacturing plants allow, the plants may be inspected periodically for compliance with specified manufacturing methods, and material samples may be obtained for laboratory testing for compliance with material quality requirements. This may be the basis for acceptance of manufacturing lots as to quality. All materials will be subject to inspection for acceptance as to condition at the latest practicable time the Engineer has the opportunity to check for compliance prior to or during incorporation of materials in the work.

606.2.1-Quality Control Testing: Quality control is the responsibility of the Contractor as specified in 106.1. The contractor shall develop a quality control plan in accordance with applicable sections of MP 307.00.50 excluding the attachment page.

Samples will be obtained at a minimum frequency of one sample per day of aggregate placement. Aggregate for underdrain shall be evaluated for specification compliance in accordance with MP 606.03.50. Aggregate for aggregate filled underdrain shall be evaluated for specification compliance in accordance with MP 606.03.50 except Section 6.0 through 6.2 are excluded.

606.2.2-Acceptance Testing: Acceptance sampling and testing of aggregates used for underdrain is the responsibility of the Division, Except for furnishing the necessary materials. Quality control sampling and testing performed by the Contractor may be used by the Division for Acceptance.

606.2.3-Free Draining Base Trench Materials: The perforated pipe and outlet pipe as detailed ~~on~~ in Standard Details – Volume I, or the plans, and shall meet the requirements of this Section.

606.3-CONSTRUCTION METHODS:

606.3.1-Pipe ~~Installation~~ Underdrain:

~~**606.3.1.1 Trenching:**~~ Trenches for pipe underdrain shall be excavated to a width of the outside diameter of the pipe plus 1 ft. ~~(300 mm)~~, to a depth of 4 inches ~~(100 mm)~~ below the flow line, and to the grade required by the Plans or as directed. Trench walls shall be as nearly vertical as practicable.

606.3.1.~~2~~1-Bedding and Placing Pipe: A minimum 4 inch ~~(100 mm)~~ bedding layer of gravel or crushed stone shall be placed in the bottom of the trench for its full width and length.

Subdrainage pipe of the type and size specified shall be embedded firmly in the bedding material. Upgrade ends of all underdrainage pipe installations shall be closed with suitable plugs to prevent entry of soil materials.

Perforated pipe shall normally be placed with the perforations down. Flexible pipe sections shall be joined with couplings or bands as recommended by the manufacturer. Non-perforated pipe and rigid pipe shall be firmly set and laid with the bell and groove ends upgrade and with open joints, wrapped with suitable material when specified, to permit entry of water.

606.3.1.~~3~~2-Placing Filter Material: After the pipe installations have been inspected and approved, crushed stone or gravel shall be placed ~~to a height of 6 inches (150 mm) above the top of pipe~~. ~~The trench shall then be filled with silica sand to a minimum thickness of 12 inches (300 mm) over the top of the filter stone or gravel. In the event damp trench sides indicate the necessity; the Engineer may direct an increase in the thickness of the silica and cover. When the underdrain is used to drain the base or subbase, course, the sand filter shall be carried vertically to the bottom of the base or subbase.~~ Care shall be taken not to displace the pipe or the covering at open joints. When there is a heavy percolation of water into the trench at underdrain level, the Engineer may substitute sand for the crushed stone or gravel bedding, cover and filter.

606.3.1.~~4~~3-Backfill: ~~Above the sand filter, w~~When underdrains are not used to drain the base or subbase, the trench shall be filled with suitable random material, as shown on the Plans or as directed by the Engineer, in layers not exceeding 4 inches ~~(100 mm)~~ after compaction. The use of bulldozers or other blade equipment in backfilling is expressly prohibited.

The quality control testing and acceptance of suitable soil, soft shale or granular material will be according to applicable sections of 207 and 716, with the following exceptions:

1. A lot normally consist of the quantity of backfill material required to backfill 100 linear ft. ~~(30 m)~~ of the installation, or as directed by the Engineer.
2. For underdrain installations in an embankment, where existing tests are on file for the adjacent embankment material, the target percentage of dry density for the suitable random backfill will be equal to the X value of the tests in the adjacent lot of embankment material or a minimum value of 95, whichever is greater. For embankments where no tests are on file, the target percentage of dry density will be 95.

606.3.1.5-Underdrain Outlets: Trenches for underdrain outlets shall be excavated as for underdrains, except that the depth of the trench shall be limited to the flow line. Pipe shall be laid in the trench with all ends firmly joined by the applicable methods and means. ~~The use of perforated pipe may be omitted or, if used, it shall be laid with perforations up.~~ No filter material shall be used. After inspection and approval of the pipe installation, the

trench shall be backfilled with suitable material in layers and compacted as provided for underdrains.

606.3.2-Underdrain Structures:

606.3.2.1-~~Underdrain Junction Boxes:~~ ~~Underdrain junction boxes shall be constructed to the dimensions and elevations at locations as shown on the Plans or as directed.~~Blank

606.3.2.2-Slope Walls for Underdrains: Slope walls for underdrains shall be constructed of concrete conforming to the requirements of 715.12 of the Specifications and shall be constructed in accordance with Standard Details – Volume I and to the dimensions and elevations at locations as shown on the Plans or as directed.

606.3.2.3-Spring Control: Underdrain spring boxes and underdrain for spring control shall be constructed to the dimensions and elevations at locations as shown on the Plans, or as directed. Any remaining upper portion of the trench shall be filled and compacted as for underdrains.

606.3.3-Aggregate Filled Fabric Underdrain ~~and Blind Drains~~: Trenches for aggregate filled fabric underdrains ~~and blind drains~~ shall be excavated to the width and depth in Standard Details – Volume I, or as shown on the plans. The trench shall be prepared to a relative smooth state, free of sharp protrusions, depressions, and debris.

When fabric is used, it shall be placed with the long dimension parallel to and centered with the alignment of the trench. It shall be placed in the trench in reasonable conformance with the shape of the trench and shall be smooth and free of tension, stress, folds, wrinkles or creases. The fabric shall be installed so that any splice joints have a minimum overlap of at least 2 feet ~~(600 mm)~~ in the direction of flow. The overlap of the closure at the top shall be approximately the width of the trench and shall be temporarily used to cover the excavated material on either side of the trench.

The aggregate shall be placed by any method which will result in the trench being completely filled to the line shown. The filling process shall not cause the permeability of fabric to be impeded.

The fabric, when used, shall be overlapped at the top of the aggregate. Any portion of the trench not filled with aggregate shall be backfilled in accordance with 606.3.1.~~4~~3.

~~**606.3.4 Prefabricated Pavement Edge Drain:** Trenches for prefabricated pavement edge drain shall be excavated to the dimensions and grade shown on the Plans.~~

~~The edge drain shall be placed against the pavement side of the trench and held firmly in place while backfill is placed to a compacted height of not more than 6 inches (150 mm). For one-sided drains, the more open side shall be placed toward the pavement. After the first lift is compacted and any tears in the fabric have been satisfactorily repaired, the remainder of the backfill shall be placed and compacted in layers not exceeding 6 inches (150 mm) deep. All compaction shall be accomplished with a vibratory compaction system. The backfill shall be the material excavated from the trench. Unless otherwise approved by the Engineer, the excavation of the trench, the placement of the edge drain, and the placement of the first lift of backfill shall be accomplished in a single continuous operation.~~

~~Each segment of edge drain shall be joined to the adjacent segment prior to installation. Splices shall keep the adjoining edge drain in proper alignment and shall not separate during installation.~~

~~Four inch (100 mm) diameter non-perforated outlet pipes shall be installed to provide positive drainage at low points of sags, at the low ends of all runs and at intervals not exceeding 500 ft. (150 m) on continuous runs, except edge drains with two separate flow channels shall have a crossover coupling at approximately 250 ft (75 m). The manufacturers' recommended fitting shall be provided for attaching the edge drains to the outlet pipes. A standard underdrain concrete slopewall shall be used at each pipe outlet unless the pipe is connected to a drainage structure. Slopewalls shall be fitted with a galvanized rodent screen.~~

~~The outlet pipe trench shall be constructed in accordance with 606.3.1.4 and 606.3.1.5 using as backfill the material excavated from the trench.~~

606.3.~~5~~4-Free Draining Base Trench Construction Methods:

606.3.~~5~~4.1-Trench: The Free Draining Base (FDB) trench shall be excavated to the width and depth as detailed on the plans. Unless otherwise noted, ~~T~~trench walls shall be as nearly vertical as practicable.

606.3.~~5~~4.2-Bedding and Placing Perforated Pipe: After excavating the trench, Engineering fabric shall be placed in the trench in reasonable conformance with the shape of the trench. The Engineering fabric shall be smooth and free of tension, stress, folds, wrinkles, or creases. The Engineering fabric shall be installed so that any splice joints have a minimum overlap of at least ~~1 foot (300 mm)~~ 2 feet in any direction. Enough Engineering fabric will be placed in order to properly tie to the mainline placement of Engineering fabric (Item 207034 -*). A 2 inch ~~(50 mm)~~ bedding layer of crushed stone or gravel aggregate shall be placed in the bottom of the trench for its full width and length. The pipe shall then be placed in the trench. The pipe sections shall be joined with couplings or bands as recommended by the manufacturer. After pipe installation, the remainder of the trench will be backfilled with crushed stone or gravel aggregate. (refer to table in section 606.2 for material requirements of aggregate)

606.3.~~5~~4.3-Outlet Pipe:

606.3.~~5~~4.3.1-Connection to Perforated Pipe: At locations designated on the plans or as directed by the Engineer, rigid outlet pipe will be connected to the perforated pipe. A drop connection utilizing a tee or wye or other means as satisfactory to the Engineer will be used for this connection. This operation may be performed concurrently with the placement of the perforated pipe or separately.

606.3.~~5~~4.3.2-Trenching: The outlet pipe trench shall be excavated to the depth of the flow line of the outlet pipe. Minimum slope of the outlet pipe is to be 3%. Width of the trench will be that width which will allow proper room for pipe placement and backfilling operations.

606.3.~~5~~4.3.3-Placing and Backfilling Pipe: The outlet pipe shall be placed in the trench with all ends firmly joined by couplings or bands as recommended by the manufacturer. The outlet pipe shall be backfilled with random material in accordance with Subsection 606.3.1.4.

606.3.~~5~~4.3.4-Pipe End Treatment: The outlet end of all outlet pipes not tied to drainage structures shall be equipped with a slopewall. Outlet pipes shall be tied to inlets or culverts by the use of pipe saddles, grouting Cementing, or other means satisfactory to the Engineer.

606.4-METHOD OF MEASUREMENT:

The quantity of work done will be measured by the linear foot ~~(meter)~~ for pipe, including outlet pipe, for each of the types and sizes as specified, installed, complete, in place and accepted. Length will be determined from actual measurements after the pipe is in place. Angles, tees, and wyes, and other branches which may be required will be measured from centerline of main pipe along the centerline of the branch to the end and the length included in the pipe length. Crushed stone, or crushed gravel~~, or silica sand~~ for underdrains, bedding~~, filter,~~ and spring control will be measured by the volume; the volume will be the product of the specified trench width and depth, and the length in place, less the volume of the pipe computed on the basis of the outside diameter of the barrel or corrugations. ~~Blind drains will be measured by the volume of granular material.~~ The quantity of work done for "Aggregate Filled Fabric Underdrains" will be measured in linear feet ~~(meters)~~ of trench, complete in place and accepted. ~~The quantity of work done for "Prefabricated Edge Drain" will be measured in linear feet (meters) of edge drain and outlet pipe, complete in place and accepted.~~ Volume will be computed on the basis of the specified trench depth and width, and the length in place. ~~Underdrain junction boxes will be measured by the unit.~~ Slopewalls for underdrains will not be paid for separately, but shall be included in the cost of the underdrain pipe.

606.4.1-~~-~~Free Draining Base Trench Method of Measurement:

606.4.1.1- Free Draining Base (FDB) Trench: The quantity of work done will be measured by the ~~LF (m)~~ linear foot of FDB ~~606.3.5.1~~ trench installed, complete, in place, and accepted. The perforated pipe is a component of the FDB trench. Length will be determined from actual measurements once the FDB trench is in place. No deductions will be made for placement of the drop connection required at outlet pipe locations.

606.4.1.2-Outlet Pipe: The quantity of work done will be measured by the ~~LF (m)~~ linear foot of rigid pipe complete in place and accepted. Angles, tees, wyes, and other branches which may be required will be included in the length of the outlet pipe. Measurement shall begin at the intersection of the perforated pipe and the rigid pipe. Slopewalls for outlet pipe and the connection of outlet pipes to drainage structures will not be paid for separately, but shall be included in the cost of the outlet pipe.

606.5-BASIS OF PAYMENT:

The quantities, determined as provided above, will be paid for as provided below, which prices and payments shall be full compensation for furnishing the materials, excavation, placing pipe, filter material, edge drain, outlet pipe, backfill, disposing all surplus material and doing all the work, including all labor, tools, equipment, supplies and incidentals necessary to complete the work. Payment for engineering fabric for Free Drain Base Trench will be as Item 207034-*.

606.6-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
606020-*	Aggregate Filled Fabric Underdrains, “size”	Linear Foot ~~(Meter)~~

ITEM	DESCRIPTION	UNIT
606022-*	Crushed Stone~~,~~ or Crushed Gravel~~, or Silica Sand~~ for Underdrains	Cubic Yard ~~(Meter)~~
606025-*	"size" Underdrain Pipe	Linear Foot ~~(Meter)~~
606027-*	Corrugated Polyethylene Underdrainage Pipe	Linear Foot ~~(Meter)~~
606029-*	Free Draining Base Trench	Linear Foot ~~(Meter)~~
606030-*	Outlet Pipe, "size"	Linear Foot ~~(Meter)~~

* Sequence number

July 13, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 714
CONCRETE AND PLASTIC PIPE

DELETE THE ENTIRE CONTENTS AND REPLACE THE FOLLOWING:

~~**714.20-PERFORATED PLASTIC SEMICIRCULAR PIPE:**~~

~~Perforated plastic semicircular pipe shall be extruded or molded using a high density, flexible plastic.~~

~~The pipe shall have a smooth or corrugated top and a smooth semicircular bottom, averaging 4-5/8 inches (116 mm) in diameter, with perforations uniformly distributed along the top of the semicircular section. The perforations shall be not less than ¼ inch (6 mm) nor more than 3/8 inch (10 mm) in diameter, and shall provide a minimum intake area of one square inch per linear foot (2100 sq. mm per m). Minimum material thickness shall be 1/8 in. (3 mm). The top flange shall extend a minimum of ½ in. (13 mm) beyond the top of the semi-circular section.~~

~~A one foot (300 mm) section of pipe shall deflect no more than 1½ at an applied load of 900 lb. (38 mm), using the Parallel Plate Load Test of ASTM D 2412. Fifteen minutes after removal of the load, the pipe section shall have recovered not less than 50 percent of its deflection at 900 lb. (4 kN).~~

714.20-POLYVINYL CHLORIDE (PVC) UNDERDRAIN PIPE:

Corrugated PVC underdrain pipe shall conform to ASTM F949. Smooth-wall PVC underdrain pipe shall confirm to ASTM F758 or AASHTO M 278, Class PS 46.

June 4, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 709
METALS

709.1-STEEL BARS FOR CONCRETE REINFORCEMENT:

ADD THE FOLLOWING:

709.1.3-Acceptance of Plain Black Reinforcement for Concrete: Upon delivery of black plain reinforcing steel bars "rebar" at the project site, the contractor shall obtain from the reinforcing steel supplier documentation indicating the manufacturer of the rebar is a current active participant of the National Transportation Product Evaluation Program (NTPEP). It should be noted that other types of rebar other than plain black rebar that is not within the scope of NTPEP may be covered by other procedures.

July 12, 2021

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SUPPLEMENTAL SPECIFICATION

FOR

SECTION 712
GUARDRAIL AND FENCE

712.10-COATED STEEL BARBED WIRE:

DELETE THE CONTENTS OF THE SUBSECTON AND REPLACE THE FOLLOWING.

Barbed wire shall meet the requirements of AASHTO M 280, Class 1~~ or AASHTO M 305, Type I~~.