

Materials Procedures Committee Regular Meeting

Meeting Time/Date: November 15th, 10:00 AM

Meeting Location: Technical Support Division (Lower-Level Conference Rm.) - 1334 Smith St.
Charleston WV, 25301

Online Meeting: Google Meet Video Conference

Online Link - (<https://meet.google.com/apa-rvti-ndx?authuser=0>)

Files Available on ProjectWise for DOT users – See Invite or Follow P/W path:

[WVDOH ORGS\MCS&T \(0077\) - FM\Materials Procedure Committee\MP Committee Meeting Files\2023\2023 11 15 - MP Meeting](#)

Files Available on Webpage:

<https://transportation.wv.gov/highways/mcst/Pages/MP-Committee-Page.aspx>

Materials Procedures – Approved at Last Meeting

1. 712.21.26 - Procedure For Determining the Random Location of Compaction Tests
2. 106.00.02 - Procedure for Evaluating Products for Use in Highway Construction
3. 715.09.20 - Standard Method for Determining the Stability of Portable Sign Stands
4. 712.05.57 - Criteria to Approve Fence Producer / Suppliers and their Materials.
5. 100.00.00 - Preparing Materials Procedures
6. 709.15.50 - Certification of Fabricators of Corrosion Resistant Coated Dowel Bars and Coated Dowel Bars in Basket Assemblies
7. 601.03.21 - Los Alamos Staining Method for Alkali Silica Reaction Gel
8. 601.03.22 - Damage Rating Index for Hardened Concrete
9. 658.05.06 - Ancillary Structure Anchor Bolt Tightening

Materials Procedures - Old Business

*Note – Going Forward MCS&T will be using either SI units or Combined English and SI Units. Guidelines are established in the pending updates to MP 100.00.00.

Number	Champion	Title	Description
1 - 106.10.50* Attachment	Brayack	WVDOH Buy America Acceptance Guidelines	Update to attachment, Brayack to discuss.
2 - 106.10.50	Brayack	WVDOH Buy America Acceptance Guidelines	Updates to include new guidance from FHWA and other major edits, still a work in progress.
3 - 601.03.52*	Thaxton	Procedural Guidelines for Maintaining Control Charts for Portland Cement Concrete	Added example of control chart to match text.

4 - 106.03.50* and Handbook (Attachment)	Harper	General Information Guide for Technician and Inspector Certification Program (TICP)	Update due to org structure (State Highway Engineer to Deputy Commissioner). Other minor changes.
5 - 604.02.40*	Thaxton	Inspection and Acceptance Procedures for Precast Concrete Products	Ref docs updated, Update to requirement of final inspection and rejection, Section 7.3
6 - 700.00.53*	Brayack	Acceptance Procedure for Evaluating Independent Assurance Samples with Samples Used for Acceptance	Minor revision from previously approved version which moves the “Work Plan” to its own Materials Procedure.
7 - 700.00.56*	Brayack	Sampling And Testing Procedures for Independent Assurance Sampling	Work plan from 700.00.53 moved to this new document.
8 - 700.00.54*	Brayack	Procedure For Evaluating Quality Control Sample Test Results with Verification Sample Test Results	Update from previously approved version which clarifies the terminology, specifically “Verification” sample which is performed by the DOH.
9 - 715.28.50*	Brayack	Seed Acceptance Criteria	Form from antiquities was referenced, but unavailable, new form created.
10 - 661.02.40*	Brayack	Inspection and Acceptance of Signing Material	Minor updates to align with general format and reference guidelines in MP 100.00.00.

Materials Procedures – Editorial Edits

1 - 401.07.21	Sampling Compacted Asphaltic Mixtures from the Roadway	Addition of SI units
2 - 700.04.10	Determining Application Rate of Ground Agriculture Limestone Based on Ph Tests	Addition of SI units
3 - 711.00.20	Paint Test Methods	Addition of SI units
4 - 711.20.59	Inorganic Zinc Primer Quality Assurance Procedure	Addition of SI units
5 - 714.03.30	Quality Assurance of Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	Addition of SI units

Materials Procedures - New Business with Significant or Process Updates

1 – 100.00.00&	Brayack	Preparing Materials Procedures	Updates to mandate SI or English/SI units for MPs.
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Note 1: * Denotes this MP is up for Vote

Note 2: & Denotes this MP is not up for Vote

Comments

Comments due November 8th, so the Champion may review and address them. Submit comments to Adam Nester (Adam.W.Nester@wv.gov)

Next Meeting

New or Updated MPs due to the MP Chair 3-weeks before the next meeting: November 29th

Meeting Time/Date: 10:00 AM, December 13, 2023

Meeting Location: MCST

Online Meeting: Google Meet Video Conference (Link TBD)

Additional MP Committee Meeting Information

For details of previous meetings, please visit the MCST MP Committee Webpage
<https://transportation.wv.gov/highways/mcst/Pages/MP-Committee-Page.aspx>

Tentative MP Committee Dates for 2023:

December 13

Buy America Certification of Compliance

Acme, ~~Construction Company~~
123 Main Street
Charleston, WV 25302

Deleted: Manufacturing Company

Ship Date: 10/31/2023

Deleted: Customer

Deleted: Stark Construction Company

... [1]

The below listed materials and products meets all the requirements of all Federal and State Laws for Buy America, including but not limited to: Chapter 5, Article 19 and Chapter 5A, Article 3 Section 56 of the West Virginia Code; 23 U.S.C. 313 Buy America, 23 CFR 635.410 Buy America Requirements, and Build America, Buy America Act, Section 70914.

Deleted: In the event where a supplied material does not meet applicable Buy America Requirements, any payments made for the associated materials shall be returned to the Division.

This Certification of Compliance is for the material and project listed below:

CID: 22000005R1
Federal Number: B-0010(000)X
State Number: U002-00-1.00

Line: 0020	~~Widget, Part Qi~~	500 Cubits
Line: 0025	~~Widget, Part Hr~~	300 Cubits

Deleted: 526.003.004 -

Deleted: 596.003.004 -

~~Janie Doe, Contractor President~~

Deleted: Jonathan

Deleted: Quality Assurance Manager

Deleted:

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

WVDOH BUY AMERICA ACCEPTANCE GUIDELINES

1. PURPOSE

- 1.1 To set forth instructions for compliance with both State and Federal Buy America Requirements (henceforth referred to as "Buy America Requirements"), as listed in Sections 2.2, 2.3 and 2.4 of this document.

2. REFERENCED DOCUMENTS

- 2.1 23 U.S.C. 313 and 23 CFR 635.410 "Buy America Requirements."
- 2.2 Chapter 5, Article 19 and Chapter 5A, Article 3, Section 56 of the West Virginia Code, entitled "West Virginia American Steel Act of 2001."
- 2.3 Build America, Buy America Act, Section 70914.
- 2.4 M-24-02: Memorandum for the Heads of Executive Departments and Agencies, Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for InfrastructureOffice of Management and Budget (OMB) Memorandum M-22-11, dated April 18, 2022.
- 2.32.5 West Virginia Notary Handbook, Current Edition.

3. ACCEPTANCE OF MATERIALS

- 3.1 This procedure applies to the following:
1. Steel and Iron
 2. Manufactured Products
 3. Construction Materials
- 3.2 Unless there is an approved exception as outlined in this MP, all applicable materials on construction projects shall conform to the requirements of Section 106.1 of the ~~WVDOH Standard~~ Specifications.
- 3.3 A Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.~~Buy America Requirements only apply to articles, materials, and supplies that are permanently incorporated into the project. It does not apply to materials brought to the~~

Commented [DB1]: General note, I have referenced the page the text was quoted from the OMB. This is mostly for WVDOH references while working on this document. These may be retained in the final document pending discussion among the committee.

~~construction site, and removed at, or before the completion of the infrastructure project, such as tools, equipment, temporary scaffolding, or traffic control devices.¹~~

~~3.2.1~~3.3.1 Buy America preference does not apply to materials such as temporary paint or traffic control devices.

~~3.3.3~~3.3.4 For the purpose of complying with Buy America Requirements, a material or product should only be classified into one of the three categories listed in Section 3.1.

4. STEEL AND IRON.

4.1 Pursuant to Buy America Requirements, all manufacturing processes for steel and iron materials must take place in the United States. This includes all processes from the initial melting stage through application of coatings.

4.1.1 “Iron or steel products” means articles, materials, or supplies that consist wholly or predominantly of iron or steel or a combination of both.

4.1.1.1 “Predominantly of iron or steel or a combination of both” means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron or steel components.

5. MANUFACTURED PRODUCTS.

5.1 Pursuant to Buy America Requirements, all manufactured products used in the project are produced in the United States; this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product.~~all Manufactured Products must be produced in the United States, and the cost of the components of the Manufactured Product that are mined, produced, or manufactured in the United States shall be greater than 55 percent of the total cost of all components of the Manufactured Product.²~~

5.2 Manufactured products” means:

(1) Articles, materials, or supplies that have been:

(i) Processed into a specific form and shape; or

(ii) Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.

¹ M-24-02: Memorandum for the Heads of Executive Departments and Agencies, Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure, Page 4

² M-24-02: Memorandum for the Heads of Executive Departments and Agencies, Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure, Page 15-16.

(2) If an item is classified as an iron or steel product, or a construction material, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under 2 CFR 184.4(e) and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or Section 70917(c) materials.

5.2.1.1 In determining whether the cost of components for manufactured products is greater than 55 percent of the total cost of all components, use the following instructions:

- (a) For components purchased by the manufacturer, the acquisition cost, including transportation costs to the place of incorporation into the manufactured product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued).
- (b) For components manufactured by the manufacturer, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (a), plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the manufactured product.

5.16. CONSTRUCTION MATERIALS.

5.1.1.1 Pursuant to Buy America Requirements, all Construction Materials are required to be produced in the United States. All manufacturing processes for the Construction Materials shall occur in the United States.

5.1.2 Construction Materials includes any article, material, or supply that is or consists primarily of: non-ferrous metals; plastic and polymer-based products (including PVC, composite building materials, and polymers used in fiber optic cables); glass (including optic glass); lumber; or drywall.

Commented [DB2]: Add new materials

5.1.3 Construction Materials does not include items of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregate such as stone, sand, or gravel; or aggregate binding agents or additives.

5.1.4 Items that consist of two or more of the listed Construction Materials that have been combined together through a manufacturing process shall be treated as a Manufactured Product.

5.1.5 Items that consist of at least one of the listed Construction Materials that have been combined together through a manufacturing process with another material that is not listed shall be treated as a Manufactured Product.

6.1.2 "Construction materials" means articles, materials, or supplies that consist of only one of the items listed in paragraph (1) of this definition, except as provided in paragraph (2) of this definition. To the extent one of the items listed in paragraph (1) contains as inputs other items listed in paragraph (1), it is nonetheless a construction material.³

(1) The listed items and their definitions are:

³ M-24-02: Memorandum for the Heads of Executive Departments and Agencies, Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure, Page 18.

(i) Non-ferrous metals. All manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.

(ii) Plastic and polymer-based products. All manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.

(iii) Glass. All manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.

(iv) Fiber optic cable (including drop cable). All manufacturing processes, from the initial ribboning (if applicable), through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based products, or any others.

(v) Optical fiber. All manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.

(vi) Lumber. All manufacturing processes, from initial debarking through treatment and planing, occurred in the United States.

(vii) Drywall. All manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.

(viii) Engineered wood. All manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

(2) Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.

6.7. BUY AMERICA CERTIFICATION COMPLIANCE.

7.1.1 The Division shall not accept, approve, authorize, or make any payments to any Contractor not fully compliant with Buy America.

~~6.1.3~~ 7.1.2 When Buy America Requirements apply, the Contractor shall furnish a notarized Certificate of Compliance signed by ~~a company official~~ their official with knowledge and authority to certify that all applicable materials and products to be incorporated into the project, including those of any subcontractors and suppliers, are compliant with Buy America Requirements. This shall be done prior to the permanent incorporation of the materials into the project.

~~6.1.2 The Division shall not authorize or make any payments to any Contractor not fully compliant with this requirement. Any payment made to any Contractor who did not fully comply with this requirement shall be recovered by the Division.~~

~~6.1.3~~ 7.1.3 The notarized Certificate of Compliance shall contain the following information:

~~6.1.3.1~~ 7.1.3.1 Title: Buy America Certification of Compliance.

~~6.1.3.27.1.3.2~~ The Name, Address and Contact Information for the ~~Company~~Contractor.

~~6.1.3.3~~ ~~The Name of the Customer.~~

~~6.1.3.4~~ ~~The shipping date of the material.~~

~~6.1.3.57.1.3.3~~ A ~~company-contractor~~ statement that demonstrates compliance with Buy America Requirements.

~~6.1.3.6~~ ~~The statement: "In the event where a supplied material does not meet applicable Buy America Requirements, any payments made for the associated material shall be returned to the Division."~~

~~6.1.3.77.1.3.4~~ The Contract ID for the Material (if applicable).

~~6.1.3.87.1.3.5~~ Both the Federal and State Project Number for the Material (if applicable).

~~6.1.3.97.1.3.6~~ The name of the material ~~and/or material code~~ referenced in the Certificate of Compliance. This material name shall be a clear, common name of the material ~~that is comparable to the AWP Material Name as stated in the proposal~~. Part Numbers, etc., may also be on the document if the ~~company-contractor~~ wishes.

~~6.1.3.107.1.3.7~~ The Line Item for the Material (if applicable).

~~6.1.3.117.1.3.8~~ The ~~Bid and/or Placed~~ Quantity of the Material. ~~Shipped.~~

~~7.1.3.9~~ Signature of the ~~Company Official~~Contractor and date.

~~6.1.3.127.1.3.10~~ A list of materials on the project that "Buy America" applies but are not Buy America compliant.

~~6.1.3.137.1.3.11~~ The document must be notarized ~~as per the "West Virginia Notary Handbook."~~

~~6.1.47.1.4~~ Attachment 1 shows a sample Certificate of Compliance.

~~6.1.5~~ The project shall file this Certificate of Compliance in each respective Line Item Folder in ProjectWise (or the current Division utilized document retention software) for the project.

~~6.1.6~~7.1.5 Multiple items may be listed on the Certificate of Compliance, though all the information for each line must be on the document.

8. BUY AMERICA WAIVERS - <THIS SECTION AS WELL AS FOLLOWING WAIVER SECTIONS ARE STILL A WORK IN PROGRESS>

8.1 Unless delegated by the West Virginia FHWA, the following paragraphs apply for the issuance of Buy America Waivers.⁴

8.2 Pursuant to Section 70914(b) of BABA and 2 CFR 184.7, the head of a Federal agency may waive the application of a Buy America preference under an infrastructure program in any case in which the head of the Federal agency finds that:

1. Applying the Buy America preference would be inconsistent with the public interest (a “public interest waiver”);
2. Types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (a “nonavailability waiver”); or
3. The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (an “unreasonable cost waiver”).

8.3 Federal agencies are responsible for processing and approving all waivers, including waivers requested by recipients and on behalf of subrecipients consistent with the procedures in 2 CFR 184.7. Every waiver must be reviewed by the MIAO. To the greatest extent practicable, waivers should be targeted to specific products and projects.

8.4 A request for a Buy America waiver, accompanied by supporting information, must be submitted in writing to the FHWA West Virginia Division Administrator for consideration.

7.9. BUY AMERICA MINIMAL USE EXCEPTIONS/WAIVERS AND EXCEPTIONS FOR STEEL AND IRON MATERIALS

9.1 Both Federal and State laws require waivers for Buy America. These waivers are independent of each other. Compliance and acceptance of one waiver does not in any way shape or form demonstrate compliance with the other waiver.

9.1.1 As provided for in 23 CFR 635.410(c)(1), WVDOH may request a waiver from Federal Buy America requirements for steel and iron materials if: (1) the application

⁴ M-24-02: Memorandum for the Heads of Executive Departments and Agencies, Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure, Page 6.

MP 106.10.50

Signature Date

PAGE 7 OF 6

| of Buy America requirements would be inconsistent with the public interest; or (2)

steel and iron materials/products are not produced in the United States in sufficient and reasonably available quantities which are of a satisfactory quality.

~~7.1~~ Steel and Iron Materials:

~~7.1.1~~ As provided for in 23 CFR 635.410(e)(1), WVDOH may request a waiver from Federal Buy America requirements for steel and iron materials if: (1) the application of Buy America requirements would be inconsistent with the public interest; or (2) steel and iron materials/products are not produced in the United States in sufficient and reasonably available quantities which are of a satisfactory quality.

~~7.1.2~~ A request for a Buy America waiver, accompanied by supporting information, must be submitted in writing to the FHWA West Virginia Division Administrator for consideration.

~~7.29.2~~ Federal Minimal Use Waiver: Steel and Iron Materials.

~~7.2.19.2.1~~ As provided for in 23 CFR 635.410(b)(4), an exception from Federal Buy America requirements exists for the minimal use of steel and iron materials “if the cost of such materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2,500, whichever is greater. For the purposes of this paragraph, the cost is that shown to be the value of the steel and iron products as they are delivered to the project.”

~~7.2.29.2.2~~ Authority for determining applicability and issuance of a minimal use exception for steel and iron materials has been delegated to the West Virginia Department of Transportation through its Stewardship and Oversight Agreement with the FHWA West Virginia Division Office.

~~7.2.39.2.3~~ Procedure for granting a minimal use exception from Federal Buy America requirements for the minimal use of steel and iron materials.

~~7.2.3.19.2.3.1~~ The Contractor shall submit a letter to the District Construction Engineer requesting a minimal use exception for the use of foreign steel or iron materials. The letter shall demonstrate that the cost of the foreign steel or iron materials to be incorporated into the project do not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2,500, whichever is greater. Attached to the letter shall be documentation (e.g., invoices) which demonstrates that the cost of the foreign steel or iron materials requested to be used is the cost of the materials as they are delivered to the project.

~~7.2.3.29.2.3.2~~ If the District Construction Engineer determines a minimal use exception is applicable and appropriate, they will respond to the Contractor via letter granting a minimal use exception.

~~7.2.3.39.2.3.3~~ All documentation related to the granting of a minimal use exception shall be maintained in the project files.

~~7.39.3~~ State Minimal Use Waiver: Steel Products.

~~7.3.19.3.1~~ As provided for in Chapter 5A, Article 3 Section 56 of the West Virginia Code, an exception from West Virginia domestic steel preference requirements exists for the minimal use of foreign steel products, when authorized in writing by the director of Purchasing Division, if “The cost for each contract item used does not exceed one

MP 106.10.50

Signature Date

PAGE 9 OF 6

tenth of one percent of the total contract cost or \$2,500, whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project.”

7.3.29.3.2 Procedure for granting a minimal use exception from West Virginia domestic steel requirements:

7.3.2.19.3.2.1 The Contractor shall submit a letter to the District Construction Engineer requesting a minimal use exception for the use of foreign steel products. The letter shall demonstrate that the cost of the foreign steel products to be incorporated into the project do not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2,500, whichever is greater. Attached to the letter shall be documentation (e.g.,

invoices) which demonstrates that the cost of the foreign steel products requested to be used is the cost of the materials as they are delivered to the project.

~~7.3.2.29~~3.2.2 If the District Construction Engineer determines a minimal use exception is applicable and appropriate, they will draft a letter to the director of Purchasing Division requesting the minimal use exception. The letter shall demonstrate that the cost of the foreign steel products to be incorporated into the project do not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2,500, whichever is greater. Attached to the letter shall be documentation (e.g., invoices) which demonstrates that the cost of the foreign steel products requested to be used is the cost of the materials as they are delivered to the project.

~~7.3.2.39~~3.2.3 If approved by the director of Purchasing Division, the District Construction Engineer will respond to the Contractor via letter granting a minimal use exception.

~~7.3.2.49~~3.2.4 All documentation related to the granting of a minimal use exception shall be maintained in the project files.

WAIVERS AND EXCEPTIONS

~~10.1~~ There are currently no ~~minimal use~~ exceptions for Federal Buy America Requirements for Construction Materials.

~~10.2~~ Is Buy America delegated like steel and iron (federal) and iron (state)?

11. BUY AMERICA WAIVERS AND EXCEPTIONS FOR MANUFACTURED MATERIALS

~~11.1~~ The Federal Highway Administration (FHWA) has a longstanding waiver in effect exempting Manufactured Products from Buy America Requirements.

~~11.2~~ There are currently no additional exceptions for Federal Buy America Requirements for Construction Materials.

~~8.4~~~~11.3~~ Is Buy America delegated like steel and iron (federal) and iron (state)?

9. BUY AMERICA WAIVERS

~~10.12.~~ BUY AMERICA MATERIALS

~~10.1~~ Attachment 1 includes a sample Certificate of Compliance

~~10.2~~~~12.1~~ Attachment 2 includes a list of materials and products used in WVDOT construction projects and the applicability of Buy America Requirements.

~~12.1.1~~ This materials and products list may be updated by the Director of MCS&T as needed to ensure compliance with Buy America Requirements. Any update to this form will

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be in accordance with guidance from and through an affirmation process with FHWA.

~~10.2.1~~ 12.1.2 Though the material is not addressed in the Specifications, any glass that is added to a permanent paint product requires a Certificate of Compliance.

12.1.3 Attachment 3 includes OMB Memorandum M-~~2224-110,2~~ dated ~~April 18, 2022~~ October 25, 2023, for additional guidance and as the source material for WVDOH's compliance.

13. DOCUMENTATION OF BUY AMERICA CERTIFICATION OF COMPLIANCE

13.1 The CoC shall be placed in the QC Plan Folder in ProjectWise (or the current WVDOH approved document retention software) under the contract.

Ronald L. Stanevich, P.E.
Director
Materials Control, Soils & Testing Division

MP 106.10.50 Steward – Materials Control Section
RLS:B
ATTACHMENTS

Buy America Certification of Compliance

Acme ~~Manufacturing~~
~~Company~~Construction
~~Company~~
123 Main Street
Charleston, WV 25302

Customer	Ship Date:	10/31/2023
~~Stark Construction Company~~		
~~413 Kanawha Boulevard~~		
~~Charleston, WV 25305~~		

The below listed materials and products meets all the requirements of all Federal and State Laws for Buy America, including but not limited to: Chapter 5, Article 19 and Chapter 5A, Article 3 Section 56 of the West Virginia Code; 23 U.S.C. 313 Buy America, 23 CFR 635.410 Buy America Requirements, and Build America, Buy America Act, Section 70914. ~~In the event where a supplied material does not meet applicable Buy America Requirements, any payments made for the associated materials shall be returned to the Division.~~

This Certification of Compliance is for the material and project listed below:

CID: 22000005R1
Federal Number: B-0010(000)X
State Number: U002-00-1.00

Line: 0020	~~526.003.004~~	Widget, Part Q ⁱ	500 Cubits
Line: 0025	~~596.003.004~~	Widget, Part H ^r	300 Cubits

<u>Non-Compliant Buy America Materials</u>			
<u>Line: 0055</u>	<u>Widget, Part I^r</u>	<u>300 Cubits</u>	

Jonathan Janie Doe, Quality Assurance
ManagerContractor President

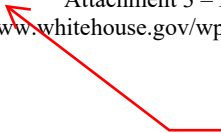
Attachment 2: A sample from M-22. Full document is available at the [WVDOH MCST Toolbox](#)⁵.

⁵ <https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx>

MP 106.10.50
Signature Date
ATTACHMENT 3

Attachment 3 – M-22-11 –

Link to file: <https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf>



Link needs updated

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
211.004.000	Unclassified, Borrow Excavation	No	
211.005.000	Rock Borrow Excavation	No	
212.002.000	Select Material for Backfill	No	
218.003.003	Riprap, Grouted	No	
218.003.006	Slope Protection, Concrete	No	
219.003.000.0X	CLSM -Type A,B,C - Controlled Low Strength Material	No	
311.002.000.X	Free Draining Base Course, Open Graded - Asphalt/Cement	No	
401.002.00X	Asphalt Mix, All Types	No	
405.002.001.X	Type A,B,C - Chip Seal Aggregate	No	
406.PSP.000	High Friction Surface Treatment	No	
412.002.001	Bituminous Patching Winter Grade	No	
420.001.001	Asphalt, Micro Surfacing	No	
420.002.002.X	Aggregate, 2,3FA, Fine, Micro-Surfacing	No	
494.PSP.001	Asphalt, Cold In-Place Recycled	No	
601.003.00X.0X	Concrete, All Classes	No	
601.PSP.001	Polymer, Fiberglass Reinforced (FRP)	No	
603.006.002.2	Concrete, Class S-P, Self Consolidating	No	
604.002.000	Concrete for Pipe Culvert	No	
605.002.000	Concrete Manholes & Inlets (Precast)	No	
610.002.000	Asphalt Curb	No	
614.007.000	Lagging, Concrete	No	
616.009.000	Piles, Concrete (Precast)	No	
622.001.000	Timber Bridges-delete	No	
623.002.000	Shotcrete, Monofilament Polypropylene Fibers for Pneumatically Applied Mortar	No	
627.PSP.001	Expansion Joint, Foam	No	
633.004.000	Gutter, Concrete	No	
633.006.000	Gutter, Dumped Rock	No	
636.002.001.01	Traffic Control Devices	No	
636.002.001.02	Warning Lights	No	
636.002.001.03	Traffic Cones	No	
636.004.000	Dust Palliatives	No	
645.002.002	Backfill Material	No	
651.002.000	Topsoil	No	
661.002.001.1	Signs, Aluminum, Flat Sheet Finished	No	
662.002.007.1	Luminaires, Roadway, Area, Underpass, Sign Light	No	
662.002.007.2	Signs, Internally Illuminated LED	No	
662.002.014	Navigation Lighting System	No	
667.PSP.000	LED Dynamic Message Sign	No	
679.002.002.1	Concrete, Latex Modified	No	
679.002.002.2	Concrete, Microsilica	No	
688.005.004	Soluble Salt Removers	No	
701.001.000.7	Cement, Type UHR	No	
701.001.000.8	Cement, Portland, Type 1 Low - Alkali	No	
701.001.000.X	Cement, Portland, All Types	No	
701.003.000	Cement, Type 1L - Blended Hydraulic	No	
701.004.000	Cement, Masonry	No	
704.00X.00X.0X	Aggregate - All Types/Classes	No	
705.004.000.0X	Asphalt, Emulsion, All Types	No	
705.005.000.0X	Asphalt, Liquid, All Types	No	
705.007.000	Asphalt, Dampproofing and Water-Proofing	No	
705.008.000	Asphalt, Dampproofing and Water-Proofing, Primer	No	
705.011.000.0X	Asphalt, Liquid, All Types	No	
707.001.001	Type M Admixture, Concrete, Air-Entraining	No	
707.002.002.01.1	Type D Admixture, Concrete Water-Reducing And Retarding	No	
707.002.002.01.2	Type G Admixture, Concrete Water-Reducing And Retarding,	No	
707.002.002.01.3	Admixture, Citric Acid (Retarder)	No	
707.003.001.1	Type A Admixture, Concrete, Water-Reducing	No	
707.003.001.2	Type F Admixture, Concrete, Water-Reducing	No	
707.004.001	Fly Ash - SCM, Supplementary Cementitious Material	No	
707.004.002	Slag Cement - SCM, Supplementary Cementitious Material	No	
707.004.003	Silica Fume - SCM, Supplementary Cementitious Material	No	
707.004.004	Natural - SCM, Supplementary Cementitious Material	No	
707.005.000	Admixture, Latex	No	

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
707.006.000	Burlap, Polyethylene Coated	No	
707.007.000	Burlap, Jute or Kenaf	No	
707.008.000	Curing, Concrete, Waterproof Paper	No	
707.009.000	Curing, Concrete, Liquid Membrane Compound	No	
707.010.000	Curing, Concrete, White Poly Sheeting	No	
707.013.001	Type C Admixture, Concrete, Accelerating	No	
707.014.001	Admixture, Concrete, Water-Reducing & Accelerating, Type E	No	
707.015.001	Type D - Admixture, Concrete, Hydration Control Stabilizing	No	
707.017.001	Type S Admixture, Concrete, Specialized	No	
707.018.001	Admixture, Concrete, Foaming Agent	No	
708.001.001	Expansion Joint, Cork	No	
708.001.002	Expansion Joint, Bituminous Fiber	No	
708.002.002	Expansion Joint, Sponge Rubber	No	
708.004.002	Joint, Back-up Material	No	
708.009.000	Bitumen Sealant, Concrete and Masonary	No	
708.PSP.001	Neoprene Sheet for Semi-Integral Abutments	No	
710.002.004	Graded Material	No	
710.003.000	Preservative Treatment	No	
711.040.000	Paint, Temporary, White, Yellow Traffic	No	
715.001.000	Chloride, Calcium	No	
715.002.000	Chloride, Sodium	No	
715.004.001	Cementitious Materials, PCC Concrete Repair Materials	No	
715.004.002	Non-Cementitious Materials, Concrete Repairs	No	
715.005.000	Cement Grout, Pakaged Dry, Hydraulic, Non-Shrink	No	
715.005.000.1	Plant Produced Grout	No	
715.006.000	Lime, Hydrated	No	
715.007.000	Water for Hydraulic Cement	No	
715.009.003.6	Delineator Post, Soil Mounted Plastic	No	
715.009.003.7	Delineator Post, Guardrail Mounted Plastic	No	
715.009.003.8	Delineator - Type B1	No	
715.011.010	Engineering Fabric for Pumped Sediment and Erosion Control (Dewatering Device)	No	
715.012.000	Concrete, Miscellaneous Uses	No	
715.016.000.001	Brick, Clay or Shale, Sewer Brick	No	
715.016.000.002	Brick, Clay or Shale, Building Brick	No	
715.017.000	Brick, Concrete	No	
715.018.000	Concrete Units, Masonry	No	
715.025.000	Limestone, Ground Agricultural	No	
715.026.001	Fertilizer, Seeding	No	
715.026.002	Fertilizer, Landscape Planting	No	
715.027.001.1	Mulch, Straw, Seeding	No	
715.027.001.2	Mulch, Wood Cellulose, Seeding	No	
715.027.001.3	Mulch Binder, Chemical, Seeding	No	
715.027.002	Mulch Materials, Landscape Plantings	No	
715.028.000	Seed	No	
715.029.000	Inoculating Bacteria	No	
715.033.000	Vines and Ground Cover Plants	No	
715.034.000	Seedling Plants	No	
715.035.000	Trees and Shrubs	No	
715.036.000	Asphaltum Base Paint for Tree Surgery	No	
715.037.003	Hose, Guying and Staking Plants	No	
715.037.004	Twine, Tying Wrapped Tree Trunks	No	
715.037.005	Tree Wrap	No	
715.037.006	Anti-Desiccant - Emulsion Protective Film	No	
715.040.002	Pavement Preformed Marking Material, Type V	No	
715.041.001.02	Channelizer Cones	No	
715.045.000	Bentonite	No	
716.001.001	Random Material	No	
716.001.001.1	Soil	No	
716.001.001.2	Granular Material	No	
716.001.001.3	Shale, Soft	No	
716.001.002	Rock	No	
716.001.003	Shale, Hard	No	
716.001.004	Borrow Material	No	

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
206.003.003.X	Base Reinforcement, Geogrid, Type 1,2	Yes	
501.003.001.0X	Concrete, Pavement, All Types	Yes	*1
514.003.000	Concrete, Roller Compacted	Yes	*1
601.008.009	Stay-in-Place Fabricated Metal Forms	Yes	
601.PSP.002	Epoxy Resin Injection System	Yes	
601.PSP.003	Epoxy Bonding Compound	Yes	
602.002.000.3	Reinforcing Bars, Uncoated Corrosion Resistant Rebar	Yes	
602.007.003	Reinforcing Bars, Splice Connector	Yes	
603.002.000.0X	Concrete Members (All Precast/Prestressed)	Yes	*1
603.PSP.001	Post Tension Rod, Steel	Yes	
604.PSP.001	Pipe, Polyethylene Liner	Yes	
605.002.000	Concrete Manholes & Inlets (Precast)	Yes	*1
605.002.000.01	Steel, Welded Grates for Inlets	Yes	
605.002.000.0X	Manhole, All Types	Yes	*1
605.002.000.0X	Inlet, All Types	Yes	*1
605.002.000.14	Slot Inlet Riser, Perforated	Yes	
605.002.000.16	Lift Station & Valve Vault	Yes	
607.002.000.01	End Terminal, Flared or Tangent Steel	Yes	
607.002.000.02	Blockout, Polymer	Yes	
607.002.000.03	Blockout, Non Plastic	Yes	
607.PSP.000	High Tension Cable Barrier	Yes	
607.PSP.001	Cable End Terminal	Yes	
609.002.000	Concrete, Sidewalk	Yes	*1
609.002.001	Detectable Warning Surface	Yes	
612.002.001.X	Tunnel Liner, Steel Plate Pipe, 2/4 Flange	Yes	
615.000.000.01	Steel Superstructure, Truss/Arch	Yes	
615.000.000.02	Steel Superstructure	Yes	
615.000.000.03	Expansion Dam, Steel, Tooth Type	Yes	
615.000.000.04	Expansion Dam, Steel, Strip Seal Type	Yes	
615.000.000.05	Expansion Dam, Steel, Modular Type	Yes	
615.000.000.06	Bearing Assemblies, Steel	Yes	
615.000.000.07	Steel Girders	Yes	
615.000.000.08	Steel Crossframes	Yes	
615.000.000.09	Steel Diaphragms	Yes	
615.003.003	Shear Stud Connector, Steel	Yes	
617.004.000	Pipe Railing, Steel	Yes	
617.005.000	Railing, Steel, Ferrous Metal	Yes	
617.006.000	Railing, Aluminum, Pedestrian	Yes	
620.000.000.01	Culvert, Concrete, Reinforced, Cast In Place, All Types	Yes	*1
620.000.000.02	Culvert, Concrete, Three-Sided Structure (Precast)	Yes	*1
620.000.000.03	Culvert, Concrete, Arch-Topped, (Precast)	Yes	*1
620.000.000.04	Culvert, Concrete, Flat-Topped, (Precast)	Yes	*1
620.000.000.05	Culvert, Concrete, Reinforced, Two Piece, (Precast)	Yes	*1
621.002.001	Flooring Steel Grid, Open Type	Yes	
621.002.002	Flooring, Steel Grid, Filled	Yes	
625.004.003	Steel, Casing Pipe for Drilled Caissons	Yes	
625.004.004	CSL (Crosshole Sonic Logging) Testing Tubes for Caissons	Yes	
626.004.003	Retaining Wall, Cast In Place	Yes	*1
626.005.001	Retaining Wall (Precast)	Yes	*1
626.005.001.01	Retaining Wall, MSE, Wall Panels	Yes	*1
626.005.001.02	Retaining Wall, MSE Modular Block	Yes	*1
626.005.001.03	Retaining Wall, MSE Wire Face	Yes	*1
626.005.001.123	Modular Block Sealant	Yes	
626.006.001.3	Retaining Wall, Granular Backfill	Yes	*1
626.006.002	Retaining Wall, Concrete, Cast in Place	Yes	*1
631.002.000	Electrical, Miscellaneous	Yes	*1
632.002.001	Horizontal Drain	Yes	
633.002.000	Gutter, Invert Pipe	Yes	
634.002.000	Cribbing, Concrete	Yes	*1
638.002.000	Survey Marker	Yes	
638.006.000	Outlet Marker	Yes	
642.006.000	Compost Filter Sock	Yes	
645.001.001	Elasticized Expanded Polystyrene - E-EPS	Yes	

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
645.001.003	Impervious Membrane	Yes	
645.002.001	Soil Reinforcement, Geosynthetic	Yes	
657.002.001	Supports, Beams	Yes	
657.002.006	Supports, Pipe, Steel	Yes	
657.002.008	Support, Sign, Steel, Anchor Bolt, Roadway	Yes	
657.002.010	Supports, Tubular, Steel	Yes	
657.002.011.1	Supports, Steel, Channel Bar (U Channel)	Yes	
657.002.011.2	Supports, Steel, Breakaway Splice Devices	Yes	
658.002.000	Sign Support, Steel, Overhead	Yes	
658.002.007	Sign Support, Steel, Anchor Bolt O-H	Yes	
661.002.001.2	Signs, Aluminum, Extruded Panel Finished	Yes	
661.002.001.3	Sign Hardware	Yes	
661.002.015	Delineators, XS1 Bicycle Rail	Yes	
662.002.013.1	Pole, Steel, Lighting Support	Yes	
662.002.013.1.6	Lighting Support, Steel, Anchor Bolt	Yes	
662.002.013.2	Lighting Support, Steel, High Mast Type	Yes	
662.002.013.4	Luminaire Support Arm, Steel, Type 1 & 2	Yes	
662.002.013.5	Luminaire Support Arm, Steel, Type 3	Yes	
662.002.013.6	Lighting Pole, Aluminum	Yes	
662.002.013.7	Luminaire Support Arm, Aluminum	Yes	
689.000.000	Metalizing, Steel Coating	Yes	
707.011.000	Coating, Epoxy Resin Protection, Type 3, Grades 1 or 2, Class B or C	Yes	
707.012.002	Sealer, Concrete	Yes	
707.016.001	Coating Materials, Concrete Protection	Yes	
708.002.001	Joint Seals, Preformed Elastomeric, Neoprene	Yes	
708.003.000	Joint Sealant, Hot-Poured for Concrete and Asphalt Pavements	No	
708.004.001.X	Sealant, Silicone Joint, All Types	Yes	
708.010.001	Waterstops (Elastomer Material), Polyvinylchloride	Yes	
708.010.002	Waterstops (Elastomer Material), Rubber	Yes	
709.000.000	Steel, Miscellaneous	Yes	
709.000.000.0	Welding Electrodes, Piles	Yes	
709.001.000.1	Reinforcing Bar, Steel Rebar	Yes	
709.001.000.2	Reinforcing Bar, Steel, Epoxy Coated, Coaters Rebar	Yes	
709.001.000.3	Epoxy Powders for Rebar	Yes	
709.002.000.1	Reinforcement, 7-Wire Strand, Prestressing	Yes	
709.002.000.2	Reinforcement, Steel Bar, High Strength, Prestressing	Yes	
709.003.000	Bolt, Steel, Wire Mesh, Hook, Expansion	Yes	
709.004.000.1	Wire, Steel, Reinforcement	Yes	
709.004.000.2	Welded Wire, Steel, Reinforcement	Yes	
709.005.000	Pavement Reinforcement, Expanded Metal	Yes	
709.006.000	Bar or Rod Mats, Steel, Fabricated	Yes	
709.007.000	Bolt, Joint Tie Bolt Assembly, (J-Hook)	Yes	
709.008.000	Structural Metal, Steel, High Strength Low Alloy	Yes	
709.010.000.1	Gray Iron Castings	Yes	
709.010.000.2	Iron Castings, Ductile Iron Castings	Yes	
709.012.000.1	Structural and Eyebar, Steel, (Piling)	Yes	
709.012.000.2	Lagging, Steel	Yes	
709.015.000	Dowel Bars and Dowel Baskets, Assemblies, Coated	Yes	
709.017.000	Pipe, Steel, Welded & Seamless	Yes	
709.018.002	Copper Alloy Castings for Name Plates For Bridges	Yes	
709.021.000	Pipe, Steel, Floor Drains & Down-Spouts	Yes	
709.024.002	Bolt, Steel, High Strength A325 / A449	Yes	
709.024.003	Nut, Steel, High Strength	Yes	
709.024.004	Washer, Steel, High Strength	Yes	
709.036.000	Aluminum Alloy, Bolts, Nuts, and Set Screws	Yes	
709.037.000	Aluminum Alloy, Washers	Yes	
709.042.000	Steel, Galvanized Pipe or Tubing for Horizontal Drains	Yes	
709.045.000	Guardrail Posts, Galvanized Steel	Yes	
709.046.000	Post, Braces & Grate Frames, Fence, Steel	Yes	
709.046.000.1	Post, Studded Tee	Yes	
709.050.000	Pile Points, Steel (Piling)	Yes	
709.051.000	Sign Support Surface Mount Bracket, Breakaway Device	Yes	
709.052.000	Sign Support, Omni-Directional Breakaway Device, Steel Beam,	Yes	

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
709.053.000	Supports, Steel, Tubular	Yes	
709.054.000	Sign Support Back to Back U-Channel, Breakaway Device	Yes	
709.055.000	Sign Support Bracket - Barrier Wall	Yes	
710.002.002	Hardwood, Structural	Yes	
710.002.003	Hardwood, Bridge Decking	Yes	
710.004.000	Wood Preservers	Yes	
710.005.000	Post, Wood, Guardrail, Rectangular	Yes	
710.005.000.4	Post, Wood for Fence and Signs	Yes	
710.006.000	Plywood	Yes	
710.007.000	Common Lumber	Yes	
710.008.000	Poles, Service and Lighting, Wood	Yes	
711.005.000	Concrete Protective Coatings And Stain	Yes	
711.006.000.1	Paint, Zinc Primers, Organic	Yes	**2
711.006.000.2	Paint, Zinc Primers, Inorganic	Yes	**2
711.012.000	Paint, Epoxy Coatings	Yes	**2
711.022.000	Paint, Zinc Rich Low VOC System	Yes	**2
711.022.003	Paint, Intermediate Coat	Yes	**2
711.022.004	Paint, Top Coat	Yes	**2
711.041.000.1	Paint, White or Yellow, Fast-Dry Traffic	Yes	**2
711.041.000.2	Paint, Yellow, Fast-Dry Traffic	Yes	**2
712.004.000	Guardrail, Fasteners and Anchor Bolts, Stains for Galvanized Steel	Yes	
712.004.001	Guardrail Splice Bolt	Yes	
712.004.002	Guardrail Post Bolt	Yes	
712.004.003	Guardrail Nuts	Yes	
712.004.004	Guardrail Washers	Yes	
712.004.005	Guardrail Beam, Steel	Yes	
712.004.007	Guardrail End, Steel	Yes	
712.005.000	Guardrail, Fasteners and Anchor Bolts, Zinc-Aluminum-Magnesium Alloy Coating	Yes	
712.008.001	Fence, Steel, Chain-Link	Yes	
712.009.000.1	Fence, Wire, Steel, Right of Way, Zinc Coated (Galvanized) Class 1 Coating	Yes	
712.009.000.2	Fence, Wire, Steel, Right of Way, Zinc Coated (Galvanized) Class 3 Coating	Yes	
712.010.000	Barbed Wire, Coated Steel	Yes	
712.011.000	Fence, Safety	Yes	
713.002.000	Pipe and Pipe Arch, Metallic Coated Corrugated Steel	Yes	
713.003.000	Pipe and Pipe Arch, Asphalt Coated Corrugated Steel	Yes	
713.005.001	Pipe, Fiber Bonded Full Bituminous Coated Steel	Yes	
713.018.000	Box Culvert, Aluminum Alloy Structural Plate	Yes	
713.020.000	Pipe, End Sections for Corrugated Steel Pipe and Pipe Arch	Yes	
713.024.000	Pipe and Pipe Arch, Aluminum Coated Corrugated Steel	Yes	
714.002.000	Pipe, Reinforced Concrete Culvert, Storm Drain & Sewer, Class III, IV, V	Yes	*1
714.003.000	Pipe, Concrete, Arch, Storm Drain & Sewer	Yes	*1
714.004.000	Pipe, Reinforced Concrete, Elliptical Culvert, Storm Drain & Sewer	Yes	*1
714.005.000	Pipe, Perforated Concrete	Yes	*1
714.007.000	Box Culverts, Reinforced Concrete, Precast	Yes	*1
714.008.000	Concrete End Sections	Yes	*1
714.017.000	Pipe, Polypropylene, Dual Wall, 12-60 Inches	Yes	
714.018.000	Pipe, High Density Polyethylene, Steel Reinforced	Yes	*1
714.019.000.1	3-6 inches Perforated Pipe, High Density Polyethylene, Profile Wall	Yes	
714.019.000.2	3-10 inches Non Perforated Pipe, High Density Polyethylene, Profile Wall	Yes	
714.019.000.3	12-60 inches Pipe, High Density Polyethylene, Profile Wall	Yes	
714.020.000	Pipe, Perforated Plastic Semicircular	Yes	
714.022.000	Pipe, Polyvinyl Chloride (PVC)	Yes	
714.023.000	Box Culverts, Concrete, Precast Reinforced	Yes	*1
714.024.000	Pipe, Storm Drain, Non-Asbestos, Fiber-Cement	Yes	
715.008.000	Fabric, Waterproofing	Yes	
715.011.00X	Geotextile - Eng Fabric, All Types	Yes	
715.013.000	Fabric Pads, Preformed	Yes	
715.014.000	Bearing Pads, Elastomeric, Plain & Reinforced	Yes	*1
715.015.000	Neoprene Sheeting for Miscellaneous Items	Yes	
715.019.000.01	Concrete Units, Manholes and Inlets (Precast) Special	Yes	*1
715.019.000.04	Inlet, All Types	Yes	*1
715.019.000.0X	Manhole, All Types (Precast)	Yes	*1
715.019.000.14	Lift Station & Valve Vault (Precast)	Yes	*1

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
715.020.000	Precast Concrete Median Barriers (Temporary)	Yes	*1
715.022.000	Precast Concrete Median Barriers (Permanent)	Yes	*1
715.023.000	Gabion Baskets	Yes	*1
715.024.002.X	Matting for Erosion Control, All Types	Yes	
715.037.001	Tree Stakes	Yes	
715.037.002	Wire, Guying and Staking Plants	Yes	
715.038.000	Manhole Steps	Yes	
715.039.000	Elastomeric Gasket & Sealing Material	Yes	
715.040.006.1	Raised Pavement Markers, Type P-2, RPM	Yes	*1
715.040.006.2	Raised Pavement Marker, Type R-4, RPM	Yes	*1
715.041.001	Traffic Safety Devices, Attenuating Type V	Yes	*1
715.041.001.01	Reflective U-Channel Strips	Yes	
715.041.00X	Traffic Safety Devices, Attenuating All Types	Yes	*1
715.042.000.1	Traffic Signal Materials & Equipment	Yes	*1
715.042.000.2	Traffic Signals, Miscellaneous	Yes	*1
715.042.005.2	Loops (LPS)	Yes	*1
715.042.005.3	Closed Circuit Television (PAS-CCTV)	Yes	*1
715.042.005.4	Pedestrian Detector with Audible	Yes	*1
715.042.005.5	Radar Advance Digital Detection (RADDD)	Yes	*1
715.042.005.6	Video Detection Cameras (VTDS)	Yes	*1
715.042.006.2	Signal Sections (V12) (V12P) (G16)	Yes	*1
715.042.009.1.2	Signal Supports, Mast Arm	Yes	
715.042.009.1.3	Supports, Signal, Video Arm	Yes	
715.042.009.2	Signal Supports, Strain Types C1, C1L, C2 and C2L	Yes	
715.042.009.2.2	Signal Supports, Anchor Bolts	Yes	
715.042.009.4.1	Signal Supports, Aluminum, Pedestal E-1	Yes	
715.042.009.4.2	Signal Support, Steel, Pedestal E-2	Yes	
715.042.009.4.3	Signal Support, Steel, Pedestal E-3	Yes	
715.042.010.1	Conduit, Rigid, Type R	Yes	
715.042.010.2	Conduit, Flexible, PVC Cover	Yes	
715.042.010.3	Conduit, Type P (Polyvinyl Chloride)	Yes	
715.042.011.X	Junction Box, All Types, All Duty, Cast in Place	Yes	*1
718.000.000.1	Waterline Items	Yes	
718.000.000.2	Sewerline Items	Yes	
718.001.000	Pipe, Ductile Iron	Yes	
718.005.000	Pipe, Plastic (PVC) Waterline	Yes	
718.007.000	Pipe, Plastic (Polyethylene) Waterline	Yes	
718.009.000	Service Line, Copper	Yes	
718.010.000	Gate Valves	Yes	*1
718.011.000	Valve Box	Yes	*1
718.012.000	Pipe, Casing, Water/Sewer	Yes	*1
718.013.000	Fire Hydrants	Yes	*1
718.014.000	Meters	Yes	*1

Note *1 - Only Steel/Iron<DELETE>/Non-Ferrous Components<DELETE> in this Material are Subject to Buy America Requirements.

Note **2 - Glass Beads in Paint Require a CoC

Note: A CoC is only required if the material is permanently incorporated into the project.

Note: AWP Material Code is for internal use only.



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

October 25, 2023

M-24-02

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Shalanda D. Young 
SUBJECT: Implementation Guidance on Application of Buy America Preference in
Federal Financial Assistance Programs for Infrastructure

This memorandum provides supplemental implementation guidance to Federal agencies on: (1) the application of a Buy America preference¹ to Federal financial assistance programs for infrastructure; and (2) the process for waiving such a Buy America preference — including the circumstances under which waivers may be justified as consistent with applicable law and policy.² This memorandum rescinds and replaces Office of Management and Budget (OMB) Memorandum M-22-11. In addition, this memorandum removes direct conflicts between the earlier Memorandum M-22-11 and subsequent guidance issued by OMB in part 184 of Title 2 of the Code of Federal Regulations (“CFR”).³ This memorandum also provides updated guidance on a limited number of topics — including the waiver process — which modifies earlier guidance provided by OMB in Memorandum M-22-11. To the extent that any guidance provided in this memorandum conflicts with guidance in 2 CFR part 184, the guidance in part 184 prevails.

On November 15, 2021, President Biden signed into law the Infrastructure Investment and Jobs Act (“IIJA”), Pub. L. No. 117-58, which includes the Build America, Buy America Act (“BABA”). Pub. L. No. 117-58, §§ 70901-27. BABA strengthens Buy America preferences associated with Federal financial assistance for infrastructure and will bolster America’s industrial base, protect national security, and support high-paying jobs. BABA requires that the head of each covered Federal agency⁴ must ensure that none of the funds made available for a Federal financial assistance program for infrastructure are obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.⁵

BABA affirms, consistent with Executive Order 14005, *Ensuring the Future Is Made in All of America by All of America’s Workers* (“the Executive Order”), this Administration’s priority to

¹ 2 CFR 184.3.

² 2 CFR 184.7; Executive Order 14005, “Ensuring the Future Is Made in All of America by All of America’s Workers,” 86 FR 7475 (Jan. 28, 2021).

³ 88 FR 57750 (Aug. 23, 2023).

⁴ For the purposes of this guidance, the terms “Federal agency” and “agency” mean any authority of the United States that is an “agency” (as defined in section 3502 of title 44, United States Code), other than an independent regulatory agency (as defined in that section). IIJA, § 70912(3).

⁵ IIJA, § 70914(a).

“use terms and conditions of Federal financial assistance awards to maximize the use of goods, products, and materials produced in, and services offered in, the United States.”⁶

On April 18, 2022, OMB issued Memorandum M-22-11, “Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.” Memorandum M-22-11 provided initial implementation guidance to Federal agencies on the application of the Buy America preference to Federal financial assistance programs for infrastructure, the Buy America waiver process, and other topics.

On August 23, 2023, OMB issued a Notification of Final Guidance revising title 2 of the Code of Regulations (“CFR”) to add a new part 184 and revise section 200.322.⁷ Part 184 provides guidance to Federal agencies on how to apply the “Buy America” preference set forth in BABA to Federal awards for infrastructure projects.⁸ The revised section 200.322 clarifies existing provisions within part 200 on domestic preferences for procurements made under Federal financial assistance awards, and specifies that Federal agencies providing Federal financial assistance for infrastructure projects must implement the Buy America preferences set forth in 2 CFR part 184.⁹ OMB issues this memorandum to provide Federal agencies with supplemental guidance on implementing BABA and 2 CFR part 184.

I. Rescission of OMB Memorandum M-22-11

This memorandum rescinds and replaces OMB Memorandum M-22-11. OMB’s primary guidance related to implementation of BABA is contained in 2 CFR part 184. This memorandum summarizes certain aspects of 2 CFR part 184, and provides supplemental guidance for infrastructure projects subject to BABA. Federal agencies should refer to 2 CFR 184.2 for the effective date and applicability of part 184.¹⁰

II. Scope

In 2 CFR part 184, OMB identifies a limited set of infrastructure projects that will remain subject to certain requirements established in Memorandum M-22-11. See 2 CFR 184.2(b)-(c). For such projects, refer to Appendix II for applicable requirements originally contained in Memorandum M-22-11.

This memorandum modifies the guidance in Section VII of OMB Memorandum M-22-11 on “Issuing Buy America Waivers” for all infrastructure projects, including both projects subject to part 184 of 2 CFR and projects subject to the requirements of the rescinded OMB Memorandum M-22-11. Thus, Section VI of this Memorandum, entitled “Issuing Buy America Waivers,” is the effective OMB guidance on waivers for all infrastructure projects subject to BABA.

III. Summary of 2 CFR part 184

⁶ Exec. Order No. 14005 (see footnote 1).

⁷ See 88 FR 57750 (Aug. 23, 2023).

⁸ IIJA § 70912(a)(5)(7).

⁹ See 88 FR 57750 (Aug. 23, 2023).

¹⁰ 2 CFR 184.2(b).

2 CFR part 184 includes definitions for key terms, including iron or steel products, manufactured products, construction materials, and materials identified in section 70917(c) of BABA (section 70917(c) materials). These definitions at 2 CFR 184.3 provide a common system for Federal agencies to distinguish between the product categories established under the statutory text in BABA.

2 CFR 184.4(c)-(d) provides guidance on the meaning of infrastructure under BABA. Section 184.4(c) explains that “infrastructure” encompasses public infrastructure projects in the United States. The term includes, at a minimum, the structures, facilities, and equipment for roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property; and structures, facilities, and equipment that generate, transport, and distribute energy including electric vehicle (EV) charging.

OMB also provides a definition of “infrastructure project” at 2 CFR 184.3. Section 184.4(d) explains that Federal agencies should interpret the term “infrastructure” broadly and consider the description provided in section 184.4(c) as illustrative and not exhaustive. Section 184.4(d) also explains that, when determining if a particular construction project of a type not listed in section 184.4(c) constitutes “infrastructure,” agencies should consider whether the project will serve a public function, including whether the project is publicly owned and operated, privately operated on behalf of the public, or is a place of public accommodation, as opposed to a project that is privately owned and not open to the public. Through this memorandum, OMB notes that projects with the former “public” qualities have greater indicia (or distinguishing features) of “infrastructure,” while projects with the latter “private” quality have fewer. As a result, projects consisting solely of the purchase, construction, or improvement of a private home for personal use, for example, would not constitute a public infrastructure project for purposes of BABA. Federal agencies are strongly encouraged to consult with OMB when making such determinations or if they are uncertain about the applicability of this guidance to any particular infrastructure program.

2 CFR part 184 also includes —

- Information on the applicability and effective date of part 184 (2 CFR 184.2);
- Information on the non-applicability of part 184 to certain existing Buy America preferences implemented by Federal agencies (2 CFR 184.2(a));
- Guidance on the applicability of the Buy America preference to infrastructure projects and including the preference in Federal awards (2 CFR 184.4(a)-(b));
- Guidance on categorizing articles, materials, and supplies into the appropriate category (2 CFR 184.4(e));
- Guidance on applying the Buy America preference by category (2 CFR 184.4(f));
- Guidance for determining the cost of components of manufactured products (2 CFR 184.5);
- Standards that define “all manufacturing processes” in the case of construction materials (2 CFR 184.6);

- Guidance on proposing and issuing Buy America waivers (2 CFR 184.7);
- Guidance on how Federal agencies should allow recipients to request waivers (2 CFR 184.7); and
- Guidance on exemptions to the Buy America preference (2 CFR 184.8).

IV. Guidance on Applicability to Federal Financial Assistance Programs

The Buy America preference under BABA and 2 CFR part 184 applies to all Federal financial assistance as defined in 2 CFR 200.1 or successor regulations¹¹ — whether or not funded through IIJA — where funds are appropriated or otherwise made available and used for a project for infrastructure. See 2 CFR 184.2(a), 200.1, and 200.322(c). For the purposes of this memorandum, Federal financial assistance means assistance that non-Federal entities receive or administer in the form of grants, cooperative agreements, non-cash contributions or donations of property, direct assistance, loans, loan guarantees, and other types of financial assistance. The term “non-Federal entity” includes States, local governments, territories, Indian tribes, Institutions of Higher Education (IHE), and nonprofit organizations.¹²

For purposes of this guidance, for-profit organizations are not considered non-Federal entities. However, this guidance does not alter legal authorities that agencies may have to include the Buy America preference, or other domestic content requirements, in awards of Federal financial assistance issued to for-profit organizations. Federal agencies may consider applying this guidance to for-profit entities consistent with their legal authorities. For example, 2 CFR 200.101(a)(2) allows Federal agencies to apply certain subparts of part 200 to for-profit entities. See also the discussion of for-profit entities in the preamble for 2 CFR part 184; and discussion below in this memorandum on requirements that “flow down” to “subrecipients.”

A Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

A Buy America preference only applies to the iron and steel, manufactured products, and construction materials incorporated into an infrastructure project receiving a Federal award. If an agency has determined that no funds from a particular project receiving a Federal award will be used for infrastructure, a Buy America preference does not apply to that project. A Buy America preference does not apply to non-infrastructure components or expenditures under an infrastructure project receiving a Federal award.

A Buy America preference applies to *an entire infrastructure project*, even if it is funded by both Federal and non-Federal funds under one or more awards. In other words, if an

¹¹ IIJA § 70912(4)(A)

¹² See 2 C.F.R. § 200.1.

infrastructure project receives a Federal award, the Buy America preferences applies to both the Federal funds and non-Federal funds used for the infrastructure project.

Part 184 clarifies that it does not apply to a Buy America preference meeting or exceeding the requirements of section 70914 of BABA applied by a Federal agency to Federal awards for infrastructure projects before November 15, 2021 (when IIJA was signed into law). Federal agencies must make necessary changes to come into compliance with BABA's requirements, unless such agencies have policies and provisions that already meet or exceed the standards required by BABA. For example, a program in which the standards for iron and steel already meet the standards in BABA may nevertheless be required to adopt new standards for manufactured products and construction materials. Maintaining current policies where appropriate avoids unnecessary disruption to programs, or elements of programs, that already meet or exceed BABA requirements. For additional information, see 2 CFR 184.2(a) and associated discussion of that section in the preamble to the final guidance.¹³

Unless the Federal award specifically indicates otherwise, subawards should conform to the terms and conditions of the Federal award from which they flow.¹⁴ For example, if a Federal agency obligates an award to a State government as a direct recipient, and the State issues a subaward to a for-profit entity to carry out the project as a subrecipient, then the Buy America preference requirements included in the Federal award would flow down to the for-profit entity.

Through Memorandum M-22-11, OMB explained that, before applying a Buy America preference to a covered program that will affect Tribal communities, Federal agencies should follow the consultation policies established through Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, and consistent with policies set forth in the Presidential Memorandum of January 26, 2021, on Tribal Consultation and Strengthening Nation-to-Nation Relationships. Federal agencies should continue to strengthen Nation-to-Nation relationships through regular and meaningful consultation and collaboration with Tribal communities in accordance with the Presidential Memorandum of January 26, 2021 and the Presidential Memorandum of November 30, 2022, on Uniform Standards for Tribal Consultation.

Agencies with questions regarding the application of a Buy America preference to agency programs, including questions about the possible use of waivers, are advised to reach out to OMB's Made in America Office ("MIAO") for technical assistance and advice.

V. Consistency with International Agreements

Pursuant to Section 70914(e) of BABA, this guidance must be applied in a manner consistent with the obligations of the United States under international agreements. Federal financial assistance awards are generally not subject to international trade agreements because these international obligations only apply to direct Federal procurement activities by signatories to such agreements. The Federal Acquisition Regulation ("FAR") addresses how international trade agreements implemented by the Trade Agreements Act apply to direct Federal procurement activities of the U.S. at FAR subpart 25.4.¹⁵ In the case of Federal financial assistance, a number of

¹³ 88 FR 57750 (Aug. 23, 2023).

¹⁴ 2 CFR 200.101(b)(2).

¹⁵ See also FAR 25.1101, 25.1103, and 52.225-5.

U.S. States have opted to obligate their procurement activities to the terms of one or more international trade agreements and, as such, are included in schedules to the international trade agreements. If a recipient is a State that has assumed procurement obligations pursuant to the Government Procurement Agreement or any other trade agreement, a Federal agency that applies a BABA preference to Federal awards may propose to waive BABA requirements in the public interest to allow a State to comply with its obligations. Federal agencies should follow the procedures in Section 184.7 of the OMB guidance in 2 CFR part 184 and relevant supplemental guidance in this memorandum. For additional information, interested entities may also consult with the State in question or the Federal agency providing the funds.

VI. Issuing Buy America Waivers

Pursuant to Section 70914(b) of BABA and 2 CFR 184.7, the head of a Federal agency may waive the application of a Buy America preference under an infrastructure program in any case in which the head of the Federal agency finds that —

- Applying the Buy America preference would be inconsistent with the public interest (a “public interest waiver”);
- Types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (a “nonavailability waiver”); or
- The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (an “unreasonable cost waiver”).

Federal agencies are responsible for processing and approving all waivers, including waivers requested by recipients and on behalf of subrecipients consistent with the procedures in 2 CFR 184.7. Every waiver must be reviewed by the MIAO. To the greatest extent practicable, waivers should be targeted to specific products and projects.¹⁶

Before issuing a final waiver, the Federal awarding agency must make the proposed waiver and the detailed written explanation publicly available in an easily accessible location on a website designated by the Federal awarding agency and OMB. The Federal agency must also provide a period of not less than 15 calendar days for public comment on the proposed waiver.¹⁷ General applicability waivers are subject to a minimum 30-day public comment period when reviewed for modification or renewal.¹⁸ The MIAO may request that Federal agencies use a 30-day comment period for other waivers on a case-by-case basis when circumstances warrant — for example when a waiver covers items of special importance to American supply chains (such as those identified in section 3(b) of the Executive Order 13953) or involves a substantial amount of Federal funding.

Agencies are required to provide the website address where they will be posting proposed waivers for public comment to OMB at MBX.OMB.MadeInAmerica@omb.eop.gov. Pursuant to sections 70914(c) and 70937 of IIJA, the waiver must also be cross-posted to a

¹⁶ See Section VI of this guidance for information on waiver principles and criteria.

¹⁷ 2 CFR part 184.7(d).

¹⁸ IIJA § 70914(d)(2)(A)(ii). See Section VII of this guidance for information on general applicability waivers.

centralized waiver transparency website managed by the General Services Administration (GSA), [BuyAmerican.gov](https://www.buyamerican.gov),¹⁹ in addition to the agency website. To minimize duplication and promote efficiency, MIAO and GSA will continue to coordinate with agencies on the expansion of the existing website's functionality to display waivers for Federal financial assistance and provide further instructions to agencies as necessary.

Federal agencies are responsible for performing due diligence, including market research, and approving or rejecting waivers consistent with BABA, 2 CFR part 184, this guidance, and any other applicable Buy America laws.

Federal agencies should notify the MIAO, and are encouraged to consult with the MIAO when possible, in advance of posting an award- or project-level proposed waiver for public comment. However, Federal agencies must consult with the MIAO for proposed waivers with broader applicability (such as a general applicability waiver) before posting them for public comment. The purpose of the consultation is to identify any opportunities to structure the waiver in order to maximize the use of goods, products, and materials produced in the United States to the greatest extent possible consistent with law. Federal agencies should send proposed waivers for review to MBX.OMB.MIAwaivers@omb.eop.gov.

Federal agencies must submit to the MIAO a draft of the waiver for review after the public comment period has concluded. MIAO will review the draft waiver to determine if it is consistent with applicable law and policy,²⁰ and will notify the Federal agency of its determination.

All waiver requests must include a detailed justification for the use of goods, products, or materials mined, produced, or manufactured outside the United States²¹ and a certification that there was a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, or nonproprietary communications with potential suppliers.²² In addition, at a minimum and to the greatest extent practicable, each proposed or draft final waiver submitted to the MIAO should include the following information, as applicable:

- Waiver type (nonavailability, unreasonable cost, or public interest).
- Recipient name and Unique Entity Identifier (UEI).
- Federal awarding agency organizational information (e.g., Common Government-wide Accounting Classification (CGAC) Agency Code).
- Financial assistance listing name and number.
- Federal financial assistance program name.
- Federal Award Identification Number (FAIN) (if available or applicable).
- Federal financial assistance funding amount.
- Total estimated infrastructure expenditures, including all Federal and non-Federal funds (if applicable).
- Infrastructure project description and location (to the extent known).

¹⁹ [BuyAmerican.gov](https://www.buyamerican.gov) redirects to [MadeInAmerica.gov](https://www.madeinamerica.gov).

²⁰ Executive Order 14005, § 4(c).

²¹ IIJA, § 70937(c)(2)(A).

²² IIJA, § 70937(c)(2)(D).

- In the case of general applicability waivers, a description of the relevant Federal program(s)—including information on the size and scale of the program(s), an estimate of the dollar amount of Federal financial assistance that would be subject to the waiver, and an estimate of how many infrastructure projects would be subject to the waiver.
- List of iron or steel item(s), manufactured products, and construction material(s) proposed to be excepted from Buy America requirements, including name, cost, country(ies) of origin (if known), and relevant Product and Service Code (PSC) and North American Industry Classification System (NAICS) code for each.
- A description of efforts made (e.g., market research, industry outreach, etc.) by the Federal awarding agency and, in the case of a project or award specific waiver, by the recipient, in an attempt to avoid the need for a waiver. Such a description may cite, if applicable, the absence of any Buy America-compliant bids received in response to a solicitation.
- Market research, where applicable, should include relevant details, including who conducted the market research, when it was conducted, sources that were used, and the methods used to conduct the research.
- Anticipated impact if no waiver is issued.
- For final waivers, any relevant comments received through the public comment period, and the agency's response to those comments.

The purpose of the information is to demonstrate the agency's due diligence, and provide the MIAO with sufficient information to determine whether the proposed waiver is consistent with law and policy. For proposed waivers, agencies should also ensure that sufficient information is available for public review. Information provided for public review should help interested manufacturers gauge the demand for products for which agencies are considering waiving a Buy America preference.

To avoid a need for duplicative waiver requests from entities that receive funding for one infrastructure project through multiple Federal agencies, the Federal agency contributing the greatest amount of Federal funds for the project may be considered the Cognizant Agency for Made in America ("Cognizant Agency") and may take responsibility for coordinating with the other Federal awarding agencies. Such coordination has the benefit of providing uniform waiver criteria and adjudication processes, minimizing duplicative efforts among Federal agencies, and reducing burdens on recipients. Based on the statutory waiver authority at section 70914(b) of BABA, each Federal agency waiving a BABA preference must make their own waiver determination. In other words, a Cognizant Agency cannot independently issue a waiver that applies to other agencies, but other agencies may rely on the work performed by the Cognizant Agency when proposing and issuing waivers for a single infrastructure project. When appropriate, agencies may consider proposing a joint waiver including two or more agencies relying on the work performed by the Cognizant Agency. Any Federal agency that did not jointly issue the proposed and final waivers will need an individual waiver, but it may also potentially rely on work performed by the Cognizant Agency when appropriate under the circumstances. The Cognizant Agency is responsible for consulting with the other Federal agencies, publicizing the proposed joint waiver, and submitting the proposed joint waiver for review to the MIAO.

a. Waiver Principles and Criteria

To ensure they are scrupulously monitoring, enforcing, and complying with applicable Buy America Laws and minimizing the use of waivers,²³ agencies must apply consistent criteria to determine whether to grant a waiver in a given circumstance. Agencies should establish policies and practices to ensure consistency with this guidance.

Agencies may reject or grant waivers in whole or in part. To the greatest extent practicable, waivers should be issued at the project level and be product-specific. As appropriate, a project-level waiver may be further narrowed to apply only to a single product or product type on that project. Overly broad waivers undermine market signals designed to boost domestic supply chains, particularly for key articles, materials and supplies in critical supply chains (i.e., critical supply chains identified in Executive Order 14017, *America's Supply Chains*). When necessary, agencies may consider issuing a waiver that has applicability beyond a single project; however, agencies should always issue, construe, and apply waivers to ensure the maximum utilization of goods, products, and materials produced in the United States, consistent with applicable law.

Federal agencies may consult with the MIAO when establishing or modifying criteria for granting waivers. They may also work within the Made in America Council,²⁴ a practice that will help to foster consistency across agencies to the greatest extent practical and appropriate. Federal agencies should use the following principles before issuing a waiver of any type —

- **Time-limited:** In certain limited circumstances, a Federal agency may determine that a waiver should be constrained principally by a length of time, or phased-out over time, rather than by the specific projects to which it applies. Waivers of this type may be appropriate, for example, when an item that is “non-available” from domestic sources is widely used in projects funded by a particular program’s awards. When issuing such a waiver, the agency should identify an appropriate, definite time frame (e.g., no more than one to two years) designed to ensure that, as domestic supply becomes available, domestic producers will have prompt access to the market created by the program.
- **Targeted:** Waivers that are not limited to particular projects should apply only to the item(s), product(s), or material(s) or category(ies) of item(s), product(s), or material(s) necessary. Waivers that are overly broad will tend to undermine domestic preference policies. Broader waivers will receive greater scrutiny from the MIAO.
- **Conditional:** Federal agencies are encouraged to issue waivers with specific conditions that support the policies of BABA and the Executive Order.

These principles and criteria should be viewed as minimum requirements for the use of

²³ IIJA § 70933(2).

²⁴ “Launching a New Made in America Council,” OMB, Briefing Room, Blogs (Jan. 19, 2022).

waivers by Federal agencies.²⁵ The MIAO expects all general applicability waivers to be appropriately targeted and time-limited. For example, agencies may consider phasing-out a waiver over time to provide a phased application of the Buy America preference requirements for a specific Federal program. Agencies also may consider limiting the scope of the waiver to only specific Buy America preference requirements (such as proposing to waive requirements for a limited set of construction materials). Project-level and award-level waivers should also be narrowly targeted, as appropriate.

Federal agencies should propose waivers to apply prospectively to future expenditures incurred after the effective date of the final waiver. While the BABA requirements apply when Federal funds are obligated²⁶ (when a Federal award is made), the MIAO recognizes that certain circumstances may justify a waiver of those domestic content requirements even after an award has been made. While waivers can be granted after a Federal agency makes an award, the waiver cannot apply to expenditures already incurred under the Federal award for items subject to a Buy America preference before the effective date of the waiver.

Non-availability Waivers

Before granting a non-availability waiver, agencies should consider whether the recipient has performed thorough market research, which may be accomplished with assistance from the agency, and adequately considered, where appropriate, qualifying alternate items, products, or materials. Waivers should describe the market research activities and methods to identify domestically manufactured items capable of satisfying the requirement, including the timing of the research and conclusions reached on the availability of sources. Agencies are encouraged to engage with the Made in America Council to develop resource lists for common items, goods, or materials.

Unreasonable Cost Waivers

An unreasonable cost waiver is available if the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent. Before granting an unreasonable cost waiver, to the extent permitted by law, agencies should ensure the recipient has provided adequate documentation that no domestic alternatives are available within this cost parameter. Agencies may assist recipients in gathering documentation.

For requests citing unreasonable cost as the statutory basis of the waiver, the waiver justification must include a comparison of the overall cost of the project with domestic products to the overall cost of the project with foreign-origin products, pursuant to the requirements of the applicable Made in America law.²⁷ Publicly available cost comparison data may be provided in lieu of proprietary pricing information.²⁸ Unreasonable cost waivers should be no broader than necessary.

²⁵ See Section IV. of this guidance for agencies that have existing regulations or guidance.

²⁶ IIJA § 70914(a).

²⁷ IIJA, § 70937(c)(2)(B).

²⁸ IIJA, § 70937(c)(2)(B).

Before granting an unreasonable cost waiver, to the extent permitted by law, agencies should also assess whether a significant portion of any cost advantage of a foreign-sourced product is the result of the use of dumped steel, iron, or manufactured products or the use of injuriously subsidized steel, iron, or manufactured products. More information on this topic is provided below in the discussion of public interest waivers.

Public Interest Waivers

A waiver in the public interest may be appropriate where an agency determines that other important policy goals cannot be achieved consistent with the Buy America requirements established by BABA and the proposed waiver would not meet the requirements for a non-availability or unreasonable cost waiver. Such waivers must be used judiciously and construed to ensure the maximum utilization of goods, products, and materials produced in the United States.²⁹ To the extent permitted by law, determination of public interest waivers must be made by the head of the agency with the authority over the Federal financial assistance award.³⁰

Public interest waivers may have a variety of bases. As with other waivers, they should be project-specific whenever possible, as what is in the public interest may vary depending upon the circumstances of the project, recipient, and specific items, products, or materials in question.

Federal agencies may wish to consider issuing a limited number of general applicability public interest waivers in the interest of efficiency and to ease burdens for recipients. The agency remains responsible for determining whether such a waiver is appropriate to apply to any given project; the MIAO will not review each application of such a waiver. The following are examples of types of public interest waivers an agency may consider proposing and issuing³¹ —

- ***De Minimis***: Ease of administration is important to reduce burden for recipients and agencies. Federal agencies may consider whether a general applicability public interest waiver should apply to infrastructure project purchases below a *de minimis* threshold. An agency may consider whether a public interest waiver should apply when necessary to ensure that recipients and Federal agencies make efficient use of limited resources, especially if the cost of processing the individualized waiver(s) would risk exceeding the value of the items waived. Agencies may consider adopting an agency-wide public interest waiver that sets a *de minimis* threshold, for example, of five (5) percent of applicable project costs up to a maximum of \$1,000,000, where applicable project costs are defined as material costs subject to the Buy America preference.
- **Small Grants**: Agencies may wish to consider whether it is in the public interest to waive application of a Buy America preference to awards at or below the Simplified Acquisition Threshold (SAT) that meet the following criteria: (1) the total Federal award does not exceed the SAT, currently set at \$250,000; and (2) the Federal award amount, inclusive of other funding sources for the infrastructure

²⁹ IIJA, § 70935(a).

³⁰ IIJA, § 70935(b).

³¹ The list is not exhaustive and no agency is required to issue the types of waivers noted as examples. As with other general applicability waivers, generally applicable public interest waivers must be reviewed at least every five years and more often as appropriate.

project, is not anticipated to exceed the SAT for the life of the Federal award. Federal agencies and the MIAO have found this type of waiver to be consistent with policy in some cases in the initial years after enactment of IIJA, but it may potentially be phased out over time as agencies develop more efficient award-level or project-level waiver review capabilities.

- **Minor Components:** Agencies may wish to consider whether it is in the public interest to allow minor deviations for miscellaneous minor components within iron and steel products. A general applicability, public interest, minor components waiver may allow non-domestically produced miscellaneous minor components comprising no more than five (5) percent of the total material cost of an otherwise domestically produced iron and steel product. This waiver type may not exempt an entire iron and steel product from the Buy America preference; the primary iron and steel components of the product must still be produced domestically. It would not be in the public interest to use a minor components waiver to exempt a whole product from the iron and steel requirements, or to allow the primary iron or steel components of the product to be produced other than domestically.
- **International Trade Obligations:** If a recipient is a State that has assumed procurement obligations pursuant to the Government Procurement Agreement or any other trade agreement, a waiver of a Made in America condition to ensure compliance with such obligations may be in the public interest.
- **Other Considerations:** A waiver may be in the public interest in one circumstance, but not in another, and considerations will depend upon the nature and amount of resources available to the recipient, the value of the items, goods, or materials in question, the potential domestic economic impacts, and other policy considerations, including sustainability, equity, accessibility, performance standards, and the domestic content (if any) of and conditions under which the non-qualifying good was produced.

All proposed waivers citing the public interest as the statutory basis must include a detailed written statement, which must address all appropriate factors, such as potential obligations under international agreements, justifying why the requested waiver is in the public interest.³²

Before granting a waiver in the public interest, to the extent permitted by law, agencies must assess whether a significant portion of any cost advantage of a foreign-sourced product is the result of the use of dumped steel, iron, or manufactured products or the use of injuriously subsidized steel, iron, or manufactured products. As explained above, Federal agencies should also conduct a similar analysis for unreasonable cost waivers, but it is not needed for non-availability waivers. Agencies may consult with the International Trade Administration (ITA) in making this assessment if the granting agency deems such consultation to be helpful. The agency must integrate any findings from the assessment into its waiver determination as appropriate.³³ MIAO will work with ITA and agencies to develop standard processes to expedite this required assessment, such as by ensuring agencies know how to easily access lists of dumped or injuriously subsidized products. Agencies can contact the MIAO for more information on possible resources.

³² IIJA, § 70937(c)(2)(C).

³³ Executive Order, § 5.

b. General Applicability Waivers

The term “general applicability waiver” refers to a waiver that applies generally across multiple agency projects or awards. A general applicability waiver can be “product-specific” (e.g., applies only to a product or category of products) or “non-product specific” (e.g., applies to all “manufactured products”).

General applicability waivers should be issued only when necessary to advance an agency’s missions and goals, consistent with IIJA, the Executive Order, and this guidance. For example, an agency might issue a general applicability waiver for a product for which there are well-established domestic sourcing challenges. General applicability waivers will require appropriate justification from the Federal agency.

Except as provided below, Federal agencies must review general applicability waivers within five years of the date on which the waiver was issued. Agencies are encouraged to review general applicability waivers more frequently, when appropriate. In reviewing of any general applicability waiver, the head of a Federal agency, or their delegated authority, must —

(A) Publish in the *Federal Register* a notice that—

- (i) describes the justification for the general applicability waiver; and
- (ii) requests public comments for a period of not less than 30 days on the continued need for the general applicability waiver; and

(B) Publish in the *Federal Register* a determination on whether to continue or discontinue the general applicability waiver, considering the comments received in response to the notice published under paragraph (A).³⁴

Through November 15, 2026, the requirement to review general applicability waivers under paragraphs (A) and (B) above does not apply to any product-specific general applicability waiver that was issued before May 19, 2021.³⁵

OMB has instructed Federal agencies with existing, non-product specific general applicability waivers that were issued more than five years before November 15, 2021 to promptly commence review of each such waiver by publishing a *Federal Register* notice as required in section 70914(d)(2)(A) of the IIJA. Should the review justify retaining the waiver, agencies should consider narrowing the waiver in a manner that would support supply chain resilience and boost incentives to manufacture key products domestically, as appropriate.

The MIAO will work with agencies to expedite consideration of general applicability waivers for products or categories of products for which domestic sourcing challenges have been well documented. Agencies should align such waivers with complementary policies, such as work to boost supply chain resiliency and domestic employment. General applicability waivers should include appropriate expiration dates designed to ensure that, once available, Buy America

³⁴ IIJA, § 70914(d)(1) & (2).

³⁵ IIJA, § 70914(d)(3).

qualifying products receive appropriate consideration.

Appendix I: Example of Award Term (Sample Language) —Required Use of American Iron, Steel, Manufactured Products, and Construction Materials

Where applicable, the Federal agency must include appropriate terms and conditions in all awards, in accordance with applicable legal requirements and its established procedures, in order to effectuate the requirements of BABA and this guidance. The following is sample language.

To achieve the greatest possible consistency across agencies and programs, agencies should send their proposed terms and conditions to the MIAO for review prior to incorporating them into applicable awards. Agencies should include appropriate language in the Notice of Funding Opportunity to provide applicants fair notice of the Buy America conditions that will apply to funds obligated on or after that date.

** ** **

Buy America Preference. Recipients of an award of Federal financial assistance from a program for infrastructure are hereby notified that none of the funds provided under this award may be used for an infrastructure project unless:

- (1) All iron and steel used in the project are produced in the United States—this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- (2) All manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product; and
- (3) All construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States. The construction material standards are listed below.

Incorporation into an infrastructure project. The Buy America Preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America Preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

Categorization of articles, materials, and supplies. An article, material, or supply should only be classified into one of the following categories: (i) Iron or steel products; (ii)

Manufactured products; (iii) Construction materials; or (iv) Section 70917(c) materials. An article, material, or supply should not be considered to fall into multiple categories. In some cases, an article, material, or supply may not fall under any of the categories listed in this paragraph. The classification of an article, material, or supply as falling into one of the categories listed in this paragraph must be made based on its status at the time it is brought to the work site for incorporation into an infrastructure project. In general, the work site is the location of the infrastructure project at which the iron, steel, manufactured products, and construction materials will be incorporated.

Application of the Buy America Preference by category. An article, material, or supply incorporated into an infrastructure project must meet the Buy America Preference for only the single category in which it is classified.

Determining the cost of components for manufactured products. In determining whether the cost of components for manufactured products is greater than 55 percent of the total cost of all components, use the following instructions:

(a) For components purchased by the manufacturer, the acquisition cost, including transportation costs to the place of incorporation into the manufactured product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(b) For components manufactured by the manufacturer, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (a), plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the manufactured product.

Construction material standards. The Buy America Preference applies to the following construction materials incorporated into infrastructure projects. Each construction material is followed by a standard for the material to be considered “produced in the United States.” Except as specifically provided, only a single standard should be applied to a single construction material.

(1) Non-ferrous metals. All manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.

(2) Plastic and polymer-based products. All manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.

(3) Glass. All manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.

(4) Fiber optic cable (including drop cable). All manufacturing processes, from the initial ribboning (if applicable), through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based products, or any others.

(5) Optical fiber. All manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.

(6) Lumber. All manufacturing processes, from initial debarking through treatment and planing, occurred in the United States.

(7) Drywall. All manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.

(8) Engineered wood. All manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

Waivers

When necessary, recipients may apply for, and the agency may grant, a waiver from these requirements. The agency should notify the recipient for information on the process for requesting a waiver from these requirements.

When the Federal agency has made a determination that one of the following exceptions applies, the awarding official may waive the application of the Buy America Preference in any case in which the agency determines that:

- (1) applying the Buy America Preference would be inconsistent with the public interest;
- (2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- (3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.

A request to waive the application of the Buy America Preference must be in writing. The agency will provide instructions on the format, contents, and supporting materials required for any waiver request. Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office.

There may be instances where an award qualifies, in whole or in part, for an existing waiver described at [\[link to awarding agency web site with information on currently applicable general applicability waivers\]](#).

*Definitions*³⁶

“Buy America Preference” means the “domestic content procurement preference” set forth in section 70914 of the Build America, Buy America Act, which requires the head of each Federal agency to ensure that none of the funds made available for a Federal award for an infrastructure project may be obligated unless all of the iron, steel, manufactured products, and construction materials incorporated into the project are produced in the United States.

“Construction materials” means articles, materials, or supplies that consist of only one of the items listed in paragraph (1) of this definition, except as provided in paragraph (2) of this definition. To the extent one of the items listed in paragraph (1) contains as inputs other items listed in paragraph (1), it is nonetheless a construction material.

(1) The listed items are:

- (i) Non-ferrous metals;
- (ii) Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- (iii) Glass (including optic glass);
- (iv) Fiber optic cable (including drop cable);
- (v) Optical fiber;
- (vi) Lumber;
- (vii) Engineered wood; and
- (viii) Drywall.

(2) Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.

“Infrastructure” means public infrastructure projects in the United States, which includes, at a minimum, the structures, facilities, and equipment for roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property; and structures, facilities, and equipment that generate, transport, and distribute energy including electric vehicle (EV) charging.

“Infrastructure project” means any activity related to the construction, alteration, maintenance, or repair of infrastructure in the United States regardless of whether infrastructure is the primary purpose of the project. See also paragraphs (c) and (d) of 2 CFR 184.4.

“Iron or steel products” means articles, materials, or supplies that consist wholly or predominantly of iron or steel or a combination of both.

³⁶ Federal agencies may choose to provide definitions on a public-facing website and reference that website in the terms and conditions, rather than including all definitions in the terms and conditions itself. If an agency chooses to do provide definitions on a public-facing website, it is not considered a deviation from the terms and conditions provided and does not need to be reviewed by OMB.

“Manufactured products” means:

(1) Articles, materials, or supplies that have been:

- (i) Processed into a specific form and shape; or
- (ii) Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.

(2) If an item is classified as an iron or steel product, a construction material, or a Section 70917(c) material under 2 CFR 184.4(e) and the definitions set forth in 2 CFR 184.3, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under 2 CFR 184.4(e) and paragraph (1) of this definition may include components that are construction materials, iron or steel products, or Section 70917(c) materials.

“Predominantly of iron or steel or a combination of both” means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron or steel components.

“Section 70917(c) materials” means cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives. See Section 70917(c) of the Build America, Buy America Act.

Appendix II: Guidance for Projects Identified at 2 CFR 184.2(b)-(c) as Remaining Subject to OMB Memorandum M-22-11

In 2 CFR part 184, OMB identifies a limited set of infrastructure projects that will remain subject to certain requirements established in Memorandum M-22-11. For projects identified at 2 CFR 184.2(b)-(c) as remaining subject to the requirements of Memorandum M-22-11, recipients and subrecipients may continue to rely on —

- a. The requirements established in Section VIII of the rescinded Memorandum M-22-11 on “Preliminary Guidance for Construction Materials,” which is included, in relevant part, in this appendix. This includes reliance on the shorter list of construction materials identified in Memorandum M-22-11 and the preliminary standard for “all manufacturing processes” applicable to construction materials on that list; and
- b. Their good faith efforts to categorize articles, materials, and supplies as (1) iron or steel products, (2) manufactured products, or (3) construction materials based on the guidance provided in Sections I, VI, and VIII of the rescinded OMB Memorandum M-22-11. In other words, recipients and subrecipients of Federal awards for these projects are not required to recategorize items based on the more specific guidance provided in 2 CFR part 184 and the associated preamble, but may rely on clarifying guidance in part 184 or the associated preamble if useful.

Below is relevant guidance for these projects restated from OMB Memorandum M-22-11 —

The IIJA finds that “construction materials” includes an article, material, or supply — other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives — that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- lumber; or
- drywall.

To provide clarity to item, product, and material manufacturers and processors, items that consist of two or more of the listed materials that have been combined together through a manufacturing process, and items that include at least one of the listed materials combined with a material that is not listed through a manufacturing process, should be treated as manufactured products, rather than as construction materials. For example, a plastic framed sliding window should be treated as a manufactured product while plate glass should be treated as a construction material.

Absent any existing applicable standard in law or regulation that meets or exceeds these preliminary standards, agencies should consider “all manufacturing processes” for construction materials to include at least the final manufacturing process and the immediately preceding manufacturing stage for the

construction material.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

PROCEDURAL GUIDELINES FOR MAINTAINING CONTROL CHARTS
FOR PORTLAND CEMENT CONCRETE

1. PURPOSE

- 1.1 To establish guidelines for developing and maintaining control charts to evaluate consistency, percent entrained air, strength characteristics, and the **Total Solids A** or optimized aggregate gradation of portland cement concrete.
-

2. SCOPE

- 2.1 These procedures shall be applicable in all instances in which they can be reasonably and logically applied. For consistency, air, and strength, the applicability will normally depend on the quantity of material used, the continuity of delivery, etc. Control charts for **Total Solids A** or optimized aggregate gradation shall be maintained for all concrete designs used on state work by a concrete producer.
-

3. REFERENCED DOCUMENTS

- 3.1 **MP 601.03.50 Guide for Quality Control and Acceptance Requirements for Portland Cement Concrete**
-

4. GENERAL PROCEDURE

- 4.1 ~~Control charts will be maintained at locations where the test samples are taken.~~

Control charts shall be maintained at the project office or at the testing site where applicable.

- 4.2 ~~Control charts will be prepared on a 10 x 10 cross section paper with a width of approximately 560 mm for the sheet presenting the charts for consistency, percent entrained air, and strength characteristics. A separate sheet of sufficient width shall be used to accommodate the control charts for the total solids A for concrete mix designs. A chart length of approximately 760 mm should be displayed at all times. When standard cross section sheets are used, the most recent sheet will be displayed and the previous sheets will be placed chronologically in a holder.~~

Charts for consistency, air, and strength shall have the item number and/or description of the material noted on the top of the chart and will be visible at all times. Charts will have the design number and class of concrete visible at all times.

- 4.3 ~~Charts for consistency, air, and strength shall have the item number and/or description of the material noted on the top of the chart and will be visible at all times. charts will have the design number and class of concrete visible at all times.~~

5. CHART PREPARATION

- 5.1 ~~At the beginning and end of each sheet (or the length of the displayed portion), vertical red lines will be drawn between the limits of the specification or tolerance; an arrow will be placed at the end of the vertical lines; the specification limits will be written above and below the arrows and the name of the property being graphed and the scale will be indicated between the limits on the left edge of the chart. See Attachment 1 and 2 for typical arrangements.~~

Control charts may be prepared by hand on paper, computer generated, or as deemed appropriate by the Division.

- 5.1.1 When standard cross section sheets are used, the most recent sheet will be displayed, and the previous sheets will be placed chronologically in a holder.

- 5.1.2 At the beginning and end of each sheet (or the length of the displayed portion), vertical red lines will be placed between the limits of the specification or tolerance; an arrow will be placed at the end of the vertical lines; the specification limits will be noted above and below the arrows and the name of the property being graphed and the scale will be indicated between the limits on the left edge of the chart. See **Attachments** for typical arrangements.

5.2 Scale Hand Drafted Charts

- 5.2.1 Consistency—One division of vertical scale will represent 5.0 mm of slump, or 5.0 mm of ball penetration (25 mm—50 mm).

Hand drafted charts will be prepared on a 10 x 10 grid with a width of approximately 22 in (560 mm) for the sheet presenting the charts for consistency, percent entrained air, and strength characteristics. A separate sheet of sufficient width shall be used to accommodate the control charts for the **Total Solids A** or optimized aggregate gradation for concrete mix designs. A chart length of approximately 30 in (760 mm) should be displayed at all times.

- 5.2.2 Air Content—One division of vertical scale will represent one-tenth of a percentage point of entrained air (25 mm—1%).

The general construction of the control charts shall be the same as described in section 4.4 and 4.5.

- 5.2.3 4.2.3 Strength—One division of vertical scale will represent 1 MPa (25 mm—10 MPa) compressive or 69 KPa (25 mm—1 MPa) flexural strength.

5.2.4 ~~4.2.4 Total solids A—One division of vertical scale will represent .01 (25 mm = 0.1) when the coarse aggregate size is 57, 7, 78, or 8 and .02 (25 mm = 0.2) when the coarse aggregate size is Number 3.~~

5.3 Plotting Test Data Computer Generated Charts

5.3.1 ~~Symbols and Color Code—Individual test values will be plotted in blue using the symbol "o", with the circle being approximately 2.5 mm in diameter. Average test values for consistency, percent air, and strength as well as the averages of consecutive five test values for total solids A shall be plotted in red using the symbol "o", with the square being approximately 2.5 mm on each side. Independent Assurance test values developed by the Division, including record samples, will be plotted in green using the symbol "r" with the sides of the triangle being approximately 2.5 mm.~~

Standard computer-generated charts allowing hand plotting, or computer plotting of individual data may be used.

5.3.2 ~~Arrangement of Data—All data developed on a production day will be plotted on one heavy, vertical line, however, when two or more individual test values developed on the same production day have the same magnitude, the symbols may be plotted side-by-side on the same horizontal division line. All test data for a characteristic developed on a production day, exclusive of any independent testing conducted by the Division, will be averaged, and the average value plotted on the same vertical line as the individual test values. When an average value and an individual test value have the same magnitude, the plotted symbols may be superimposed.~~

When charts are computer generated, they shall be printed in color with data plotted to scale; and displayed as described in 5.2 and 5.3 except it shall be printed on standard letter paper.

5.3.3 ~~When individual test values fall outside the specification limits, an arrow will be placed on the plotted symbol pointing in the direction of the specification limit.~~

5.3.4 ~~As test data are developed on following production days, it will be plotted on successive heavy vertical lines, 25 mm apart, progressing from left to right across the control chart. As successive averages for consistency, percent air, and strength characteristic are plotted, the symbol "o" will be connected with a heavy red solid line. For total solids A control chart the moving average is the average of five consecutive test values and is determined by starting with the fifth test value and averaging it with the four preceding test values. The moving average of five symbol "o" will be connected with a heavy red solid line. Individual test values will have the symbol "o" connected with a dashed blue line.~~

5.3.5 ~~At the bottom of the cross section paper and immediately to the left of the heavy vertical line on which the test data are plotted, the date of sampling and initials of the individual plotting the test data will be recorded.~~

5.4 Scale

5.4.1 Consistency - One division of vertical scale will represent $\frac{1}{4}$ in. of slump ($\frac{1}{10}$ in. - $\frac{1}{4}$ in.) (2.5 mm – $\frac{1}{4}$ in)

5.4.2 Air Content - One division of vertical scale will represent one-tenth of a percentage point of entrained air (1 in. - 1%) (25 mm – 1%).

5.4.3 Strength - One division of vertical scale will represent 100 PSI (690 MPa) (1 in. = 1000 PSI) (25 mm = 6,900 MPa) compressive or 10 PSI (70 MPa) (1 in. = 100 PSI) (25 mm = 690 MPa) flexural strength.

5.4.4 **Total Solids $\bar{A}$** or optimized aggregate gradation - One division of vertical scale will represent 0.01 (1 in. = 0.1) (25 mm = 0.1) when the coarse aggregate size is 57, 7, 78, or 8 and 0.02 (1 in. = 0.2) (25 mm = 0.2) when the coarse aggregate size is Number 3.

5.5 Plotting Test Data

5.5.1 Symbols and Color Code - Individual test values will be plotted in blue using the symbol “O”, with the circle being approximately 0.1 in. (2.5 mm) in diameter. Average test values for consistency, percent air, and strength as well as the averages of consecutive five test values for **Total Solids $\bar{A}$** shall be plotted in red using the symbol, “ $\square$ ” with the square being approximately 0.1 in. (2.5 mm) on each side. Independent Assurance test values developed by the Division, including record samples, will be plotted in green using the symbol “ $\triangle$ ” with the sides of the triangle being approximately 0.1 in. (25mm).

5.5.2 Arrangement of Data - All data developed on a production day will be plotted on one heavy, vertical line, however, when two or more individual test values developed on the same production day have the same magnitude, the symbols may be plotted side-by-side on the same horizontal division line. All test data for a characteristic developed on a production day, exclusive of any independent testing conducted by the Division, will be averaged, and the average value plotted on the same vertical line as the individual test values. When an average value and an individual test value have the same magnitude, the plotted symbols may be superimposed.

5.5.3 When individual test values fall outside the specification limits, an arrow will be placed on the plotted symbol pointing in the direction of the specification limit.

5.5.4 As test data are developed on following production days, it will be plotted on successive heavy vertical lines, 1 inch (25 mm) apart, progressing from left to right across the control chart. As successive averages for consistency, percent air, and strength characteristic are plotted, the symbol “ $\square$ ” will be connected with a heavy red solid line. For total solids $\bar{A}$ control chart the moving average is the average of five consecutive test values and is determined by starting with the fifth test value and averaging it with the four preceding test values. The moving average of five symbol “ $\square$ ” will be connected with a heavy red solid line. Individual test values will have the symbol “O” connected with a dashed blue line.

5.5.5 At the bottom of the cross section paper and immediately to the left of the heavy vertical line on which the test data are plotted, the date of sampling and initials of the individual plotting the test data will be recorded.

6. FAILING TESTS

6.1 When individual test values fall outside the specification limits, this information will immediately be made available to the supervisory personnel of both the Contractor and the Division.

6.2 Should the moving average of any five consecutive gradation tests of the Total Solids $\bar{A}$ fall outside the specified design mix A tolerance, action required by the Specification will be taken. When appropriate action has been taken to bring the Total Solids $\bar{A}$ back within tolerance, the first individual production sample that is within tolerance shall be used to start a new moving average.

5.2.1 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, action required by the Specification will be taken. When appropriate action has been taken to bring the working range back within tolerance, the first individual production sample that is within tolerance shall be used to start a new moving average.

Ronald L. Stanevich, P.E.

Director

Materials Control, Soils and Testing Division

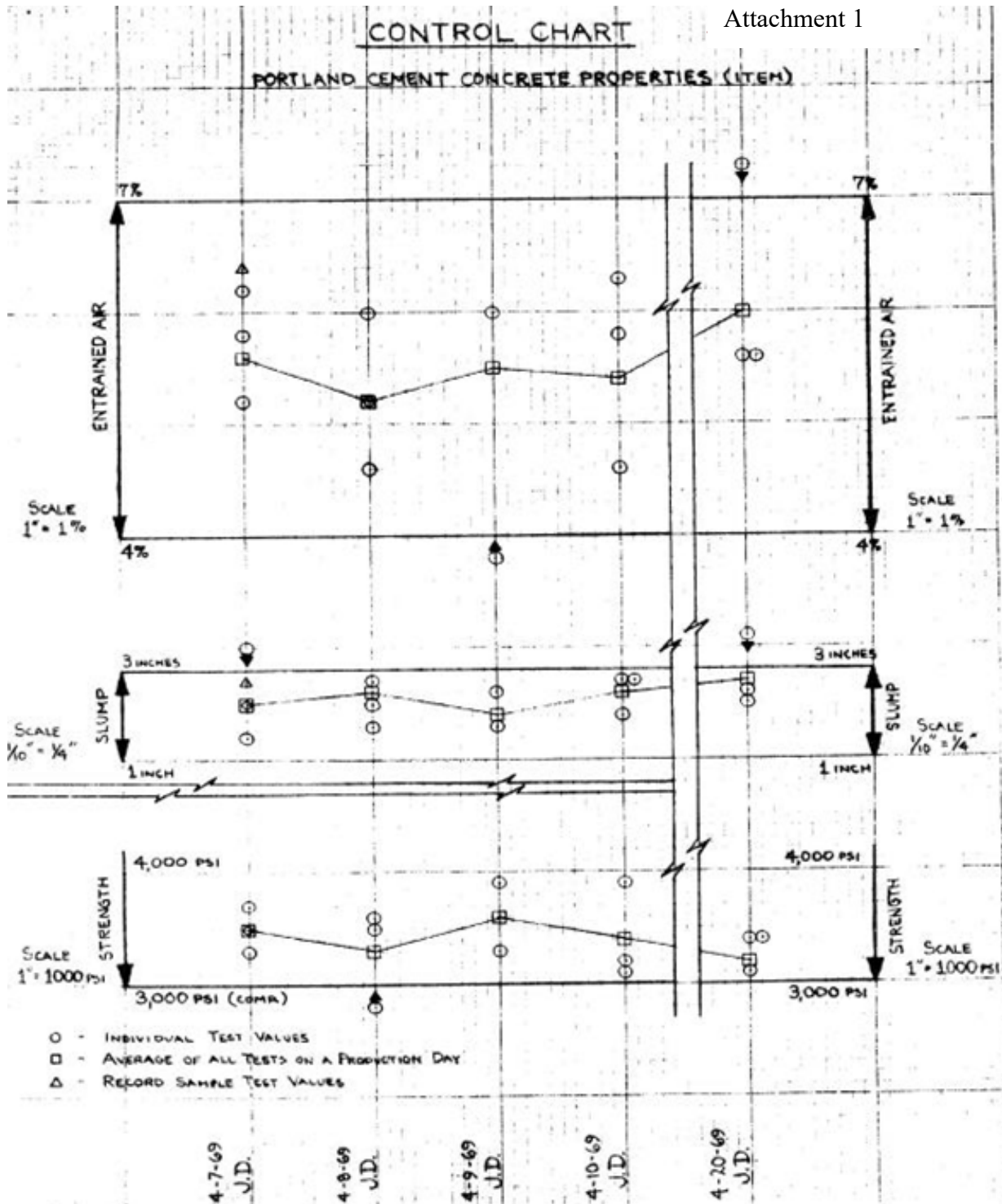
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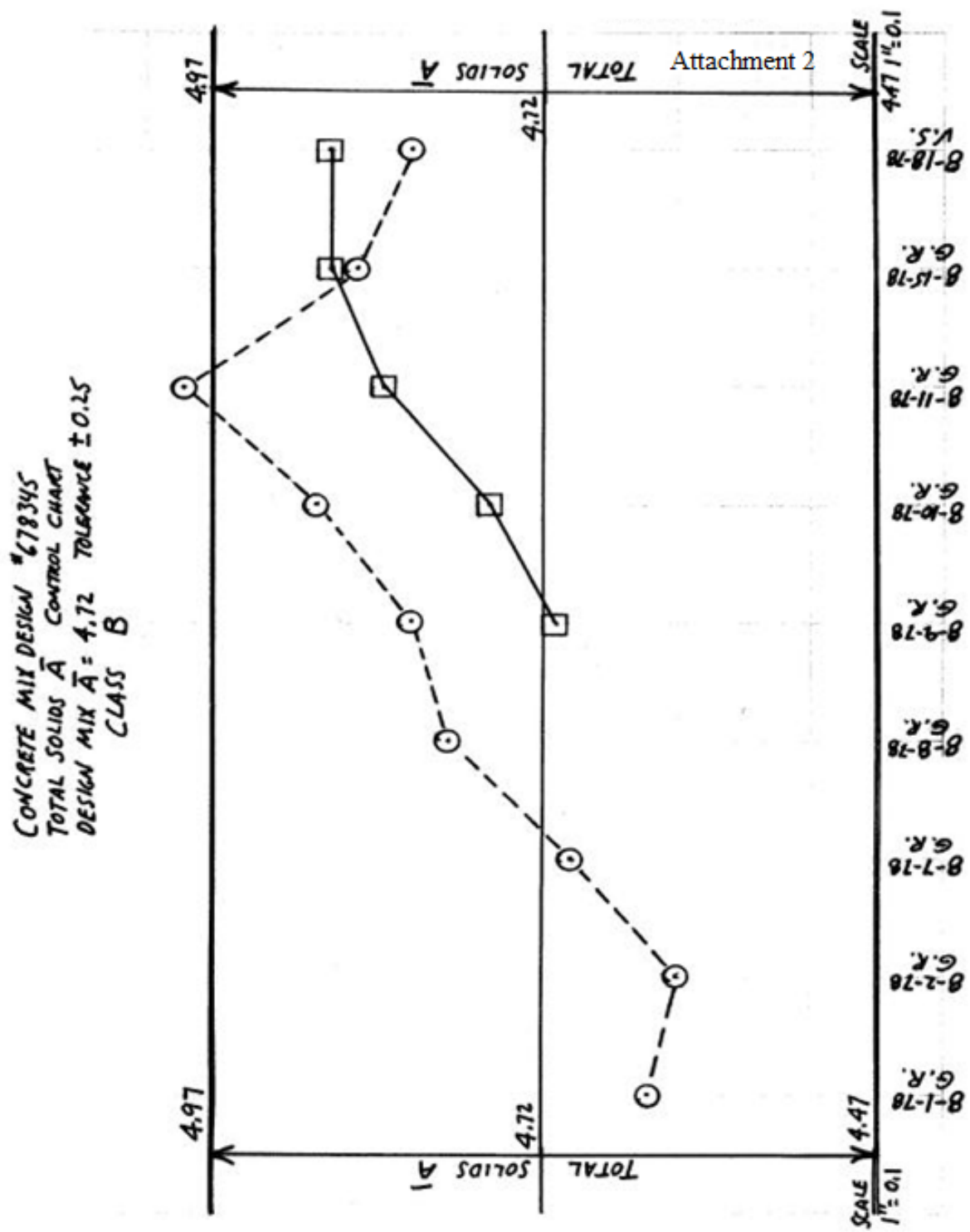
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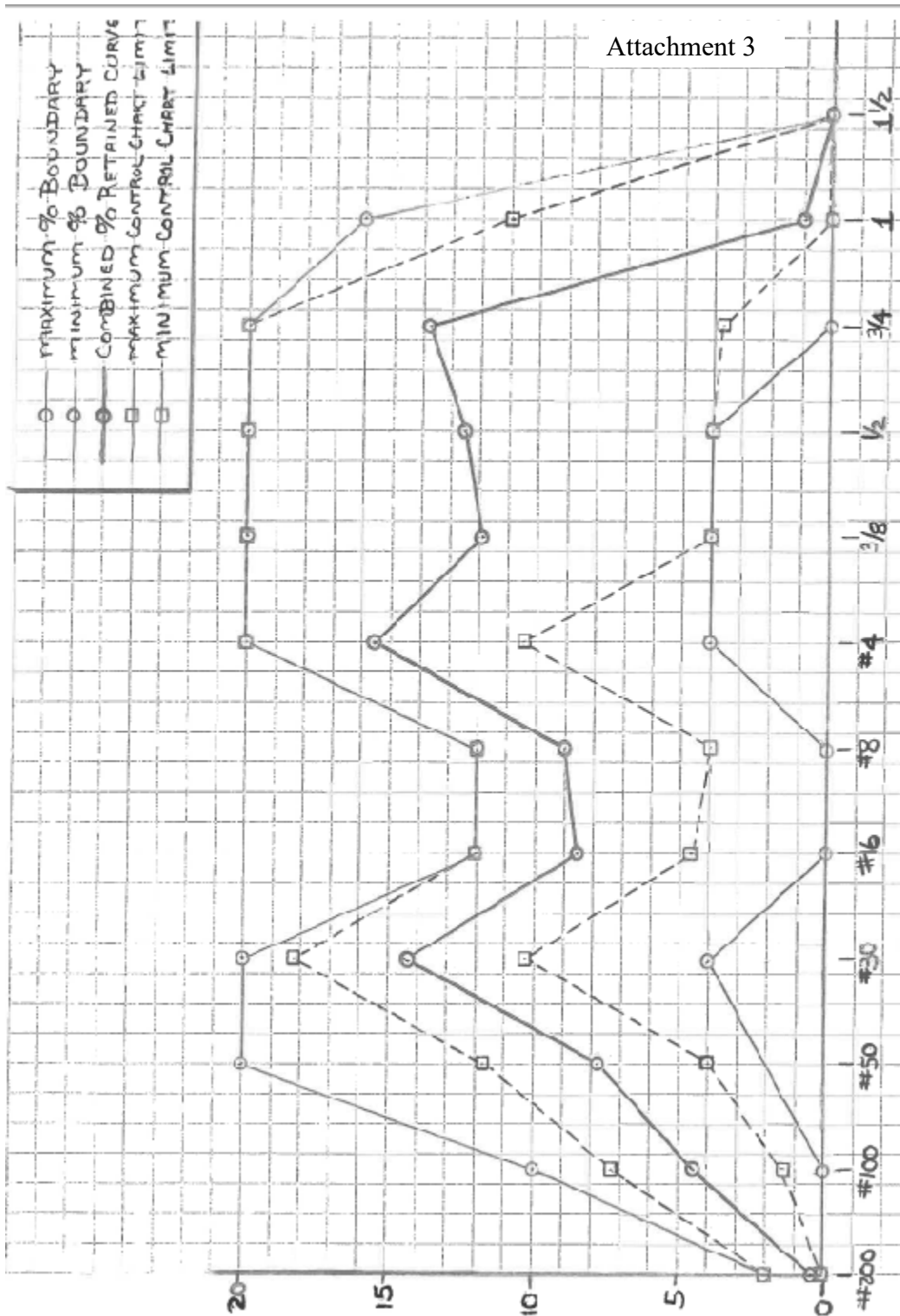
ATTACHMENT

Hand Drafted Charts

Attachment 1

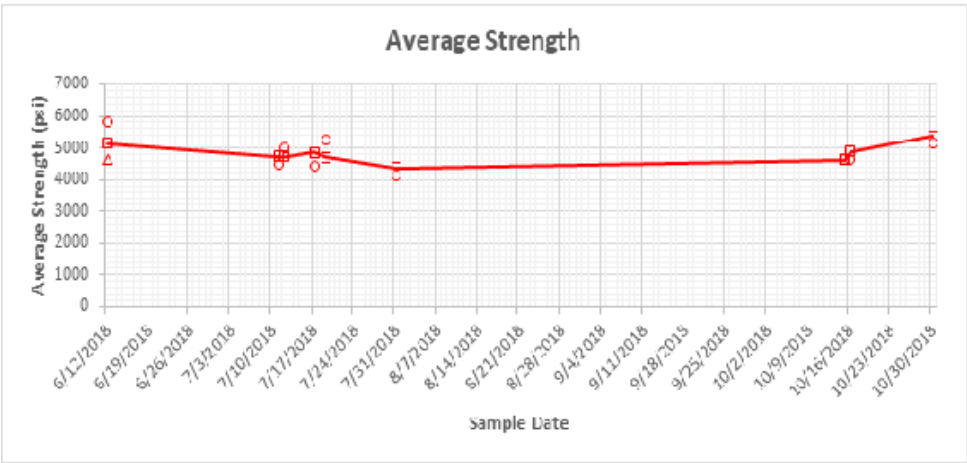
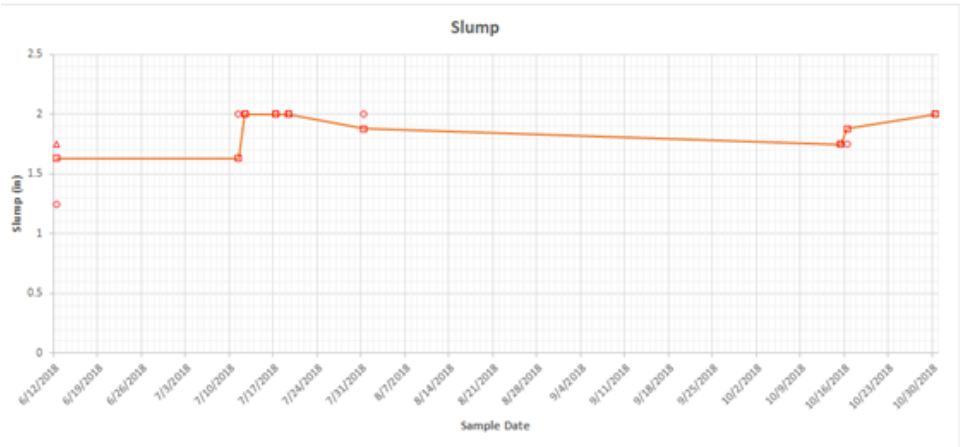
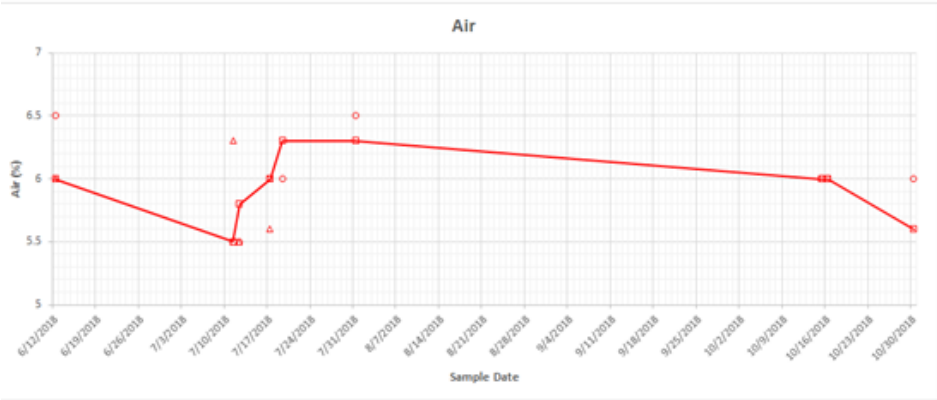


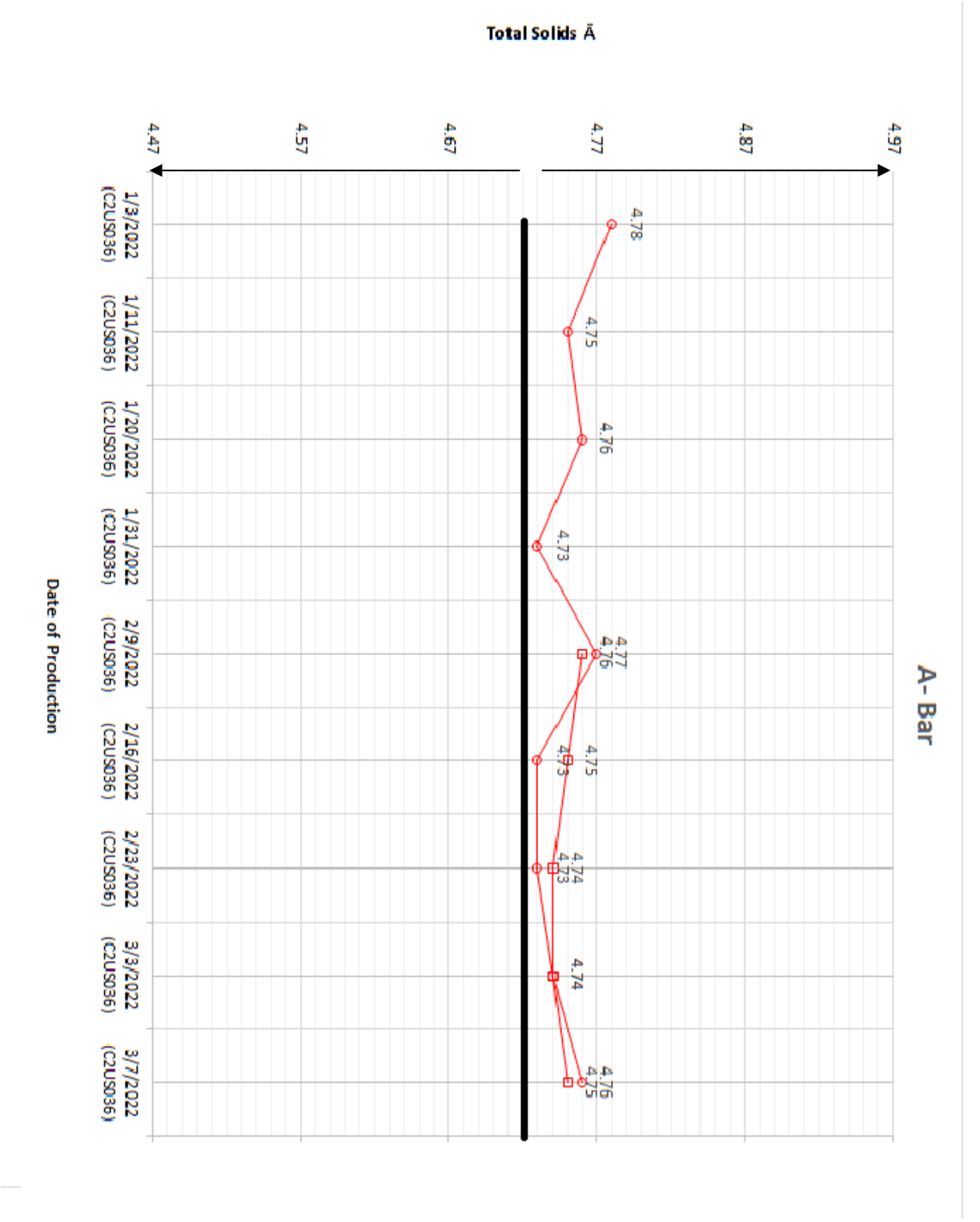


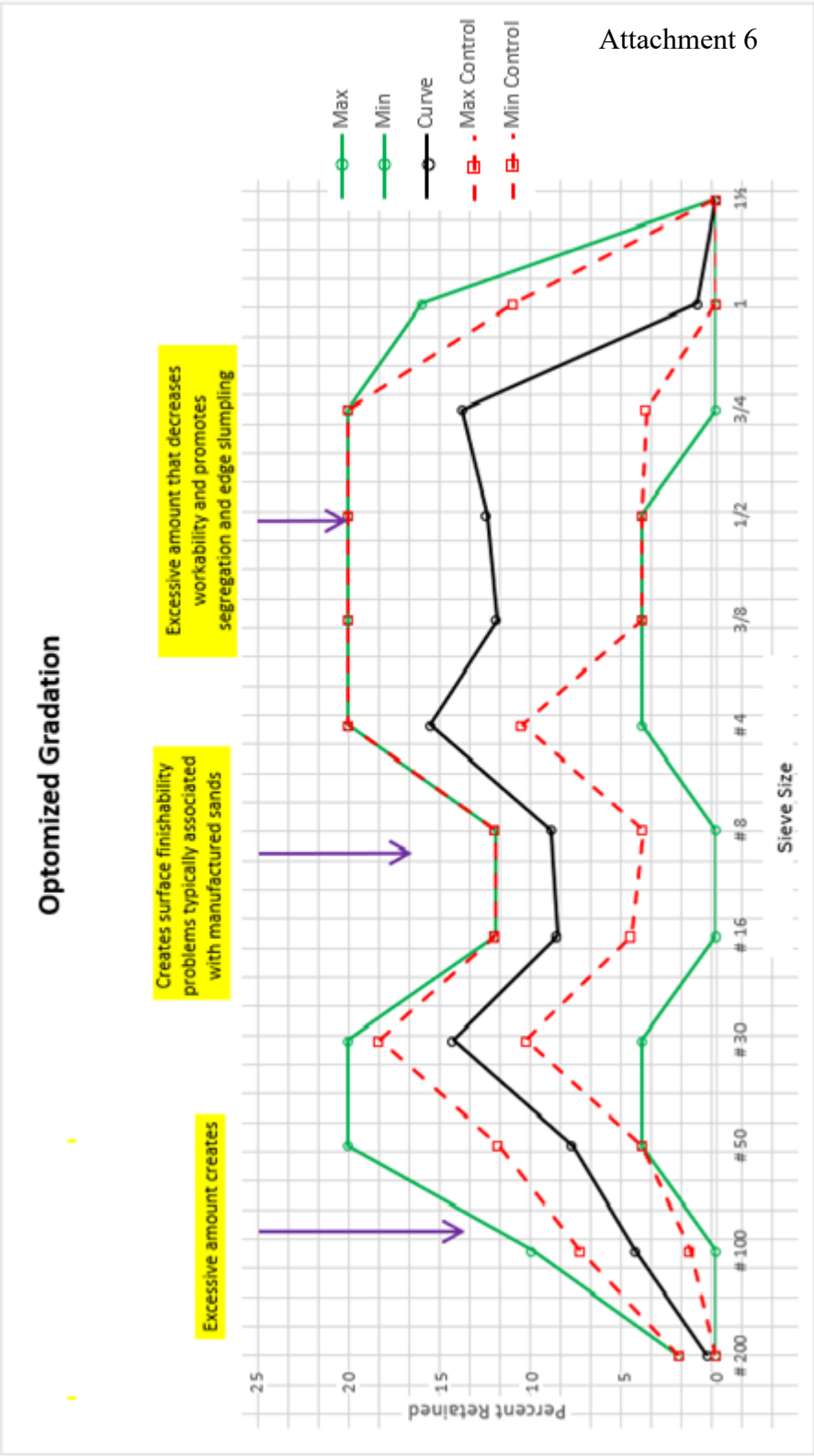


Computer Generated Charts

Attach Attachment 4







WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

GENERAL INFORMATION GUIDE FOR TECHNICIAN AND INSPECTOR CERTIFICATION
PROGRAM (TICP)

1. PURPOSE

- 1.1 The purpose of the West Virginia Division of Highways (WVDOH) Technician and Inspector Certification Program is to improve the quality assurance of embankments, subgrades, base course, asphalt and Portland cement concrete by the certification of industry and WVDOH. This procedure is to establish guidelines for this purpose.

2. GENERAL

- 2.1 It is the WVDOH's intent to conduct a cooperative program of training, study, and examination so that personnel of the producer, contractor, and the WVDOH will be able to better assure, by their increased technical knowledge, the level of quality required by the governing ~~specifications~~ Specifications.

3. SCOPE

- 3.1 This procedure is applicable to all requirements, guidelines, and other support documents of the WVDOH that reference conditions, methods, and levels of qualification specific to the WVDOH Training and Certification Program.

4. POLICIES AND ADMINISTRATION

- 4.1 Board of Certification - The Certification Program will be carried out in accordance with general policy guidelines established or approved by the Deputy Commissioner of Highways State Highway Engineer. The Deputy Commissioner of Highways State Highway Engineer will be advised by a Board composed of the following members:

1. Deputy Commissioner of Highways State Highway Engineer
2. Human Resources Director
3. Materials Control Soils and Testing (MCS&T) ~~Division~~'s Director
4. Quality Assurance Training Program Administrator
5. Applicable MCS&T Supervisors

- 4.1.1 The Certification Board will meet upon call of the MCS&T ~~Division~~'s Director.

- 4.2 Administration - The program will be administered by the Director of the MCS&T ~~Division~~ (hereafter referred to as "Director"). The Director will have the assistance of an

Implementation Committee appointed by the Deputy Commissioner of Highways State Highway Engineer as follows:

1. Quality Assurance Training Program Administrator
2. Applicable MCS&T ~~Division~~ Supervisors
3. A representative of the WVDOH Human Resources Division.

- 4.2.1 In addition the Certification Board may jointly select representatives of producers and contractors to work with the Implementation Committee at such times and on such matters as the Director and the representatives mutually agree. These representatives shall not be candidates for certification.
- 4.2.2 The Implementation Committee will meet upon call of the Director, or person authorized by the Director. The board shall have a minimum of three (3) members in order to form a quorum for a meeting.
- 4.2.3 The Program Administrator shall be appointed by the Director. The Program Administrator will be assigned to assist the Director in administering the program and to handle planning, administration, and coordinating functions as may be delegated within the scope of appropriate WVDOH directives.

5. REQUIREMENTS

- 5.1 Where applicable, quality control representatives of a contractor or producer will be certified in one (or more) of the certifications listed in Section 6.0, depending upon the individual's duties or responsibilities. Responsibilities and qualification requirements are listed in appropriate support documents such as Materials Procedures, Quality Control Plans and others.
- 5.2 For purposes of the WVDOH Quality Assurance Program, a non- WVDOH certified technician/Inspector represents the company of which he/she is a full-time employee on the WVDOH project, owner, or partner (as defined by the Federal Wage and Hour Legislation). If said company has subsidiary or affiliated organizations, each organization will be required to have its own certified Technicians/Inspectors where applicable unless the Deputy SecretaryState Highway Engineer makes an exception. Exceptions will be granted only when it can be proven that the certified Technician/Inspector actually performs the duties of the technician/inspector for all of the subsidiary or affiliated organizations.
- 5.3 Designated WVDOH personnel will be certified where applicable in one (or more) of the certifications listed in Section 6.0 depending upon the individual's duties and responsibilities.

6. CERTIFICATIONS

- 6.1 All certifications listed in the sections below require written examinations. Some of the listed certifications require a practical examination after successful completion of the

written examination. It is the responsibility of the applicant to determine which certification is applicable to his/her assignment. Following is a description of the certifications listing relevant information about each:

6.2 AGGREGATE CERTIFICATIONS

6.2.1 Aggregate Sampling Inspector - The web-based examination for an Aggregate Sampling Inspector consists of the following areas:

1. Specifications
2. Sampling Fundamentals
3. Sampling Methods and Equipment
4. Gradations
5. T11 Wash Test

The Aggregate Sampling Inspector requires the successful completion of an online examination. Certification as an Aggregate Sampling Inspector qualifies the employee, either Industry or Division, to perform sampling of aggregates relevant to the Quality Control Program or Acceptance Program respectively.

6.2.2 Aggregate Technician - The written examination for an Aggregate Inspector consists of the following areas:

1. Aggregate Specifications and Procedures
2. Aggregate Fundamentals
3. Sampling, Control, and Inspection of Aggregates
4. Aggregate Testing

After successful completion of the written examination, the applicant will be required to pass a practical examination consisting of his/her demonstration of testing common to normal aggregate quality requirements. Certification as an Aggregate Inspector qualifies the employee, either Industry or Division, to perform sampling and/or testing of aggregates relevant to the Quality Control Program or Acceptance Program respectively.

6.3 COMPACTION CERTIFICATIONS

6.3.1 Soils and Aggregate Compaction Inspector - The written examination for a Soils and Aggregate Compaction Inspector consists of the following areas:

1. Specifications
2. Soil Compaction Test Procedures
3. Radiation Safety and Nuclear Gauge
4. Test Procedure Problems

After successful completion of the written examination, the applicant will be required to pass a practical examination demonstrating his/her proficiency in using the testing equipment. Certification of the Soils and Aggregate Compaction Inspector qualifies the employee, either Industry or Division, to conduct tests on all Soil and Aggregate construction materials that require compaction testing.

6.4 CONCRETE CERTIFICATIONS

6.4.1 Concrete Technician - The written examination for a Concrete Technician consists of the following areas:

1. Specifications
2. Fundamentals
3. Sampling and Testing
4. Control and Inspection
5. Mix Proportioning and Adjustment

The Concrete Technician requires only the successful completion of the written examination; no practical examination test is required. Certification of the Concrete Technician qualifies the employee, either Industry or Division, to make plant and mix adjustments, proportioning, and other duties.

6.4.2 Concrete Inspector - The written examination for a Concrete Inspector consists of the following areas:

1. Fundamentals
2. Sampling and Testing
3. Control and Inspection
4. Specifications

After successful completion of the written examination, the applicant will be required to pass a practical examination demonstrating his/her proficiency in conducting tests common to concrete quality control. Certification as a Concrete Inspector qualifies the employee, either Industry or Division, to perform sampling and/or testing of concrete relevant to the Quality Control Program or Acceptance Program respectively.

6.5 ASPHALT MIXTURE CERTIFICATIONS

6.5.1 Asphalt Plant Technician - The written examination for an Asphalt Plant Technician consists of the following areas:

1. Specifications
2. Fundamentals
3. Sampling and Testing

4. Control and Inspection
5. Mix Proportioning and Adjustment

After successful completion of the written examination, the applicant will be required to pass a practical examination demonstrating their proficiency in conducting tests common to Asphalt quality control. Certification of the Asphalt Technician qualifies the employee, either Industry or Division, to take asphalt mixture samples, perform quality control or quality assurance testing on plant produced asphalt mixtures, make plant and mix adjustments, aggregate proportioning, and other duties.

6.5.2 Asphalt Field Technician – The written examination for an Asphalt Field Technician consists of the following areas:

1. Specifications
2. Surface Preparation
3. Mix Delivery and Placement
4. Joint Construction
5. PWL
6. Asphalt Compaction

The successful completion of the written examination and a practical examination test is required. Certification as an Asphalt Field Technician qualifies the employee, either Industry or Division, to oversee or inspect asphalt pavement construction. In addition, the class hand-out material is a valuable reference tool for each stage of the construction process. The required radiation safety training is included in this class and will certify attendees with a passing score to perform nuclear density testing on asphalt pavements.

6.5.2.1 Asphalt Field Technicians must also be evaluated by qualified District personnel on the first ~~WVDOH~~ WVDOH paving project in which they perform this testing. The District personnel will make the decision as to whether or not the technician is correctly conducting the nuclear density tests in accordance with the WVDOH's Specifications. The District will also complete an evaluation form and send it to the MCS&T ~~Division~~ for processing. A technician that does not demonstrate proper nuclear density testing techniques shall not be allowed to continue testing on the WVDOH project. They must be replaced by another qualified technician. Anyone who does not meet the evaluation standards must provide proof of additional WVDOH approved radiation safety training before another evaluation will be conducted.

6.5.3 Inertial Profiler Operator- The written examination for the inertial profiler operator covers of the following areas:

1. West Virginia Specifications
2. AASHTO and ASTM Specifications

3. Knowledge of operation and analysis of collected data

This certification covers an employee of either a contractor, consultant, or DOH staff to operate a lightweight/low-speed and high-speed inertial profiler.

6.5.4 Radiation Safety

6.5.4.1 This certification is required by the Nuclear Regulatory Commission (NRC) before operating a portable nuclear gauge. The training consists of 3 - 4 hours class room instruction and has a 25-50 question closed book exam. A minimum score of 70% is required for passing the course. The course and exam will cover the following areas:

1. Proper storage and security of portable nuclear gauges
2. Transportation of portable nuclear gauges
3. Personal safety while operating a portable nuclear gauge

7. TRAINING

- 7.1 Training - The Division of Highways, contractors, and producers may sponsor courses of instruction consisting of schools and seminars to help prepare personnel for certification under one or more of these certification programs. To the extent possible, these courses of instruction will be joint efforts of the industry and WVDOH. Nothing in this document shall be interpreted to prohibit any party from conducting courses of instruction for their personnel to assist in preparation for these exams.
- 7.2 The purpose of the schools is to provide helpful information and instruction for persons preparing to take the WVDOH Technician/Inspector examinations. These courses are designed to provide instruction for persons with a basic foundation in the subject matter.

8. EXAMINATIONS

- 8.1 Examinations, both written and practical, will be coordinated by the MCS&T ~~Division of the WVDOH~~. The locations and dates of the examinations will be announced on the Division's MCS&T's website¹. The examinations may be held on a regional basis when feasible. Most written examinations will be an 'open-book' type, with a time limit. Practical examinations require performance of the tests required by the specifications Specifications for the material type involved.
- 8.2 To pass the written examinations, the applicant must obtain a score of at least 70 percent. The Inertial Profiler Operator exam requires a minimum of 75% to pass. The applicant will be allowed two attempts within a 12-month period to obtain a passing score per each certification class attended.

¹ <http://transportation.wv.gov/highways/mcst/Pages/techcert.aspx>

- 8.3 After the applicant passes the written examination, he/she will have two attempts within a 12-month period to pass the practical exam. (Where applicable)
- 8.4 Certificate Non-Transferable - The status of the certification for a Technician or an Inspector is not transferable and is valid only for the quality control procedures designated by the bearer's certificate.
- 8.5 Revocation of Certificate - If at any time a WVDOH, contractor's, producer's, or supplier's Technician or Inspector is found to have altered or falsified test reports or is found to have improperly performed tests or reported their results, the individual's certification may be rendered invalid by the Deputy Secretary State Highway Engineer upon recommendation of the Implementation Committee and/or the Board.
- 8.6 Renewal and Certification – Certifications shall be renewed as required in the Technician Inspector Certification Program (TICP) handbook. General guidance and information for renewal will be recommended by the Board as required by the Deputy Secretary State Highway Engineer. All certifications shall terminate on December 31st of the year of expiration. There may be written, and practical examination required for recertification where applicable. More recertification information can be found in the Technician Inspector Certification Program (TICP) handbook available on the MCS&T-Division's Webpage².
- 8.6.1 The responsibility for obtaining re-certification shall lie with the certified individual.
- 8.6.2 The Implementation Committee or other designated party shall establish internal criteria for renewal. The Technician Certification Handbook with the current rules and requirements shall be posted on the MCS&T-Division's Webpage.
- 8.6.3 Upon obtaining renewal of certification, a renewal card may be printed from the MCS&T Division's website Webpage.
- 8.7 For further information on classes, recertification, schedules, class calendars and other helpful information please visit the Division's MCS&T's website Webpage.

9. FUNCTIONS AND RESPONSIBILITIES

- 9.1 Contractor or Producer - The producer and contractor will be responsible for product control of all materials during the handling, blending, and mixing operations. The contractor and producer also will be responsible for the formulation of a design mix that will be submitted to the Division ~~of Highways~~ for approval.

² <http://transportation.wv.gov/highways/mest/Pages/techeert.aspx>

- 9.1.1 Technician/Inspector - A Quality Control representative of a contractor or producer should be a certified Technician/Inspector as outlined in Section 5. and whose responsibilities may include such duties as proportioning and adjusting the mix, sampling and testing the product, and preparing control charts.
- 9.2 The WVDOH - The WVDOH is responsible for all acceptance decisions.
- 9.2.1 District Materials Supervisor - District Materials activities are the responsibility of the District Materials Supervisor.
- 9.2.2 Division Technicians and Inspectors – The WVDOH Technicians and Inspectors will be assigned as necessary to carry out the required acceptance decision activities. The WVDOH representatives will not issue instructions to the contractor or producer regarding process control activities. However, the WVDOH representatives have the responsibility to question, and where necessary to reject, any operation or sequence of operations, which are not performed in accordance with the contract documents.

Ronald L. Stanevich, P.E., Director
Materials Control, Soils and Testing Division

RLS:~~BBE~~h
ATTACHMENT

WEST VIRGINIA TECHNICIAN INSPECTOR CERTIFICATION PROGRAM HANDBOOK

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1. INTRODUCTION

The purpose of the West Virginia Division of Highways (WVDOH) Technician and Inspector Certification Program (TCIP) is to improve the quality assurance of embankments, subgrades, base course, asphalt and Portland cement concrete by the certification of industry and Division of Highways personnel. This document is to establish guidelines for this purpose.

The Division's intent is to conduct a cooperative program of training, study, and examination so that personnel of the producer, contractor, and the Division of Highways will be able to better assure, by their increased technical knowledge, the level of quality required by the governing ~~specifications~~ Specifications.

This document, along with MP 106.03.50, is applicable to all requirements, guidelines, and other support documents of the Division of Highways that reference conditions, methods, and levels of qualification specific to the Division of Highways' training and certification program.

There are often changes and additions to the TICP, so please, thoroughly review this document as well as the ~~Materials Division MCS&T Website Webpage~~ to find out about any applicable changes. ~~changes that may pertain to you~~

2. CERTIFICATION BOARD

As per MP 106.03.50 the certification board members are:

1. ~~State Highway Engineer~~ Deputy Secretary
2. Human Resources Director
3. Materials Control Soils & Testing Director
4. Quality Assurance Training Program Administrator
5. Applicable Materials Control Soils and Testing Group Supervisors

3. APPLICATION AND CLASS SIGN-UP INSTRUCTIONS

For course registration, instructions, please visit the [WVDOH MCST Webpage](https://transportation.wv.gov/highways/mcst/Pages/techcert.aspx)¹ for Instructions:

4. CERTIFICATIONS

The TICP offers certification classes in the following disciplines:

1. Aggregate Technician
2. Aggregate Sampling Inspector
3. Soils & Aggregate Compaction Technician
4. Portland Cement Concrete Technician
5. Portland Cement Concrete Inspector
6. Asphalt Plant Technician

¹ <https://transportation.wv.gov/highways/mcst/Pages/techcert.aspx>

7. Asphalt Field & Compaction Technician
8. Radiation safety

****EXCEPT AS NOTED HEREIN ALL CERTIFICATIONS ARE VALID FOR A THREE-YEAR PERIOD****

5. CLASS SUPPLY LIST

We recommend that participants bring the following items with them to the certification classes:

1. Laptop Computer or Tablet (Mandatory)
2. Photo ID
3. Current WV ~~specification~~ Specification book and the latest supplemental to the ~~specification~~ Specification book. You will need this during the test. These are also available in printable PDF format on the [WVDOH Webpage](#).²
4. Hand held calculator (No electronic devices other than a Hand held calculators are allowed to be used during testing.)
5. Hi-lighters
6. Sticky Notes
7. Ruler / Straight edge

6. SPECIAL NEEDS AND REQUESTS

Applicants with special needs should notify the Quality Assurance Training Program Administrator prior to the class to ensure that the training location is prepared to accommodate their needs.

7. RECIPROCAL CERTIFICATIONS

The West Virginia Division of Highways may recognize reciprocity certifications from other states. ~~Please s~~See MP 106.03.51 for detailed instructions.

American Concrete Institute (ACI) Field Testing Grade I certification will be accepted as a portion of the West Virginia PCC Inspector training. However, the applicant must pass the online West Virginia PCC Inspector written certification test before a certification will be issued.

Acceptance of WVDOH Certifications by other state agencies is at the sole discretion of the other agency.

8. TRAINING

The Division of Highways, contractors, and producers may sponsor courses of instruction consisting of schools and seminars to help prepare personnel for certification under one or more of these certification programs. To the extent possible, these courses of instruction will be joint efforts of the industry and

² <https://transportation.wv.gov/highways/contractadmin/specifications/Pages/default.aspx>

WVDOH. Nothing in this document shall be interpreted to prohibit any party from conducting courses of instruction for their personnel to assist in preparation for these exams.

The purpose of the schools is to provide helpful information and instruction for persons preparing to take the technician/inspector examinations. These courses are designed to provide instruction for persons with a basic foundation in the subject matter.

9. CERTIFICATIONS

All certifications listed in the sections below require written examinations. Some of the listed certifications require a practical examination after successful completion of the written examination. Applicants are responsible to determine which certification is applicable to their assignment. The following is a description of the certifications listing relevant information about each:

10. AGGREGATE CERTIFICATIONS

10.1 Aggregate Sampling Inspector

The written examination for an Aggregate Sampling Inspector consists of the following areas:

1. Specifications
2. Sampling Fundamentals
3. Sampling Methods and Equipment
4. Gradations
5. T11 Wash Test

There is no in-person class for the Aggregate Sampling Inspector Certification; the class is online-only and on-demand. The Aggregate Sampling Inspector Certification requires the successful completion of the examination. Certification as an Aggregate Sampling Inspector qualifies the employee, either industry or Division, to perform sampling of aggregates relevant to the quality control program or acceptance program respectively.

The test will be available online throughout the year but may only be attempted twice per year. A score of 70 is required for passing Aggregate Sampling Inspector.

10.2 Aggregate Technician

The written examination for an Aggregate Technician consists of the following areas:

1. Specifications
2. Aggregate Specifications and Procedures

3. Aggregate Fundamentals
4. Sampling, Control, and Inspection of Aggregates
5. Aggregate Testing

After successful completion of the written examination, applicants will be required to pass a practical examination consisting of their demonstration of procedures common to normal aggregate quality requirements. Certification as an Aggregate Technician qualifies the employee, either industry or Division, to perform sampling and/or testing of aggregates relevant to the quality control program or acceptance program respectively.

11. COMPACTION CERTIFICATIONS

- 11.1 Soils & Aggregate Compaction Technician (SACT) - The written examination for the Soils & Aggregate Compaction Technician consists of the following areas:

1. Specifications
2. Compaction Test Procedures
3. Radiation Safety and Nuclear Gauge
4. Test Procedure Problems

After successful completion of the written examination, the applicant will be required to pass a practical examination demonstrating his/her proficiency in using the testing equipment. Certification of the Compaction Technician qualifies the employee, either industry or Division, to conduct tests on all soil construction materials that require compaction testing.

12. CONCRETE CERTIFICATIONS

- 12.1 Portland Cement Concrete Technician

The written examination for a Portland Cement Concrete Technician consists of the following areas:

1. Specifications
2. Fundamentals
3. Sampling and Testing
4. Control and Inspection
5. Mix Proportioning and Adjustment

The Portland Cement Concrete Technician certification requires only the successful completion of the written examination; no practical examination is required. Certification of the Portland Cement Concrete Technician qualifies the employee, either industry or Division, to make plant and mix adjustments, proportioning, and other duties.

12.2 Portland Cement Concrete Inspector

The written examination for a Portland Cement Concrete Inspector consists of the following areas:

1. Specifications
2. Fundamentals
3. Sampling and Testing
4. Control and Inspection
5. Specifications

After successful completion of the written examination, applicants will be required to pass a practical examination demonstrating their proficiency in conducting tests common to concrete quality control. Certification as a Portland Cement Concrete Inspector qualifies the employee, either industry or Division, to perform sampling and/or testing of concrete relevant to the quality control program or acceptance program respectively.

13. ASPHALT CERTIFICATIONS

13.1 Asphalt Plant Technician

The written examination for the Asphalt Plant Technician consists of the following areas:

1. Specifications
2. Fundamentals
3. Sampling and Testing
4. Control and Inspection
5. Mix Proportioning and Adjustment

After successful completion of the written examination, applicants will be required to pass a practical examination demonstrating their proficiency in conducting tests common to Asphalt quality control. Certification of the Asphalt Technician qualifies the employee, either industry or Division, to take asphalt mixture samples, perform quality control or quality assurance testing on plant produced asphalt mixtures, make plant and mix adjustments, aggregate proportioning, and other duties.

13.2 Asphalt Field and Compaction Technician (AFCT) –

The written examination for the Asphalt Field and Compaction Technician consists of the following areas:

1. Specifications
2. Compaction Test Procedures
3. Radiation Safety and Nuclear Gauge
4. Test Procedure Problems
5. Testing Forms

After successful completion of the written examination, applicants will be

required to pass a practical examination demonstrating their proficiency in using the testing equipment. Certification of the Asphalt Field & Compaction Technician qualifies the employee, either industry or Division, to conduct tests on all asphalt materials that require compaction testing.

14. RADIATION SAFETY

This certification is required by the Nuclear Regulatory Commission (NRC) before operating a portable nuclear gauge. The training consists of 3 - 4 hours classroom instruction and has a 25-50 question closed book exam. A minimum score of 70% is required for passing the course. The course and exam will cover the following areas:

1. Proper storage and security of portable nuclear gauges
2. Transportation of portable nuclear gauges
3. Personal safety while operating a portable nuclear gage

15. EXAMINATIONS

All participants are required to furnish their own laptop or tablet to take the final course exams. Examinations, both written and practical, will be coordinated by the ~~Materials Control, Soils & Testing Division (MCS&T) of the Division of Highways.~~ The locations and dates of the examinations will be announced at least two weeks prior to being given. All written examinations will be a one-part, 'open-book' type, with a time limit.

If an applicant fails to receive a minimum score of 70% on the first exam, they will be given another attempt to score a 70%. This second attempt shall be a subsequent, scheduled make-up exam. Failure to attend any examination counts as a failed exam.

If the re-test examination is not passed, the applicant must attend the certification school. Practical examinations require performance of the tests required by the ~~specifications-~~ Specifications for the material type involved.

After the applicant passes the written examination, they will be granted two attempts within a 12-month period to pass the practical exam. All practical examinations are pass / fail. If an applicant fails the practical twice, the applicant may not take another practical test in the same 12-month period without first attending the certification school. The scheduling of the practical examination and re-examination is established by the MCS&T section running the certification class.

16. CERTIFICATION AND RE-CERTIFICATION

16.1 Certification

An individual must pass the examination in each level for which they are requesting certification. Unless otherwise noted, to pass the written examinations, the applicant must obtain minimum score of 70 percent.

If an applicant fails to receive a minimum score of 70% on the first exam, they will be given another attempt at a later date to score a 70%. This second attempt shall be a subsequent, scheduled make-up exam. Failure to attend any examination counts as a failed exam.

Upon successfully completing the requirements for certification, applicants may print their certification card from the divisions ~~w~~Web-site page.
<http://dotftp.wv.gov/materialsdir/>

This certification is not transferable. A certification is valid for up to Three years and expires December 31, of the 3rd year of certification.

16.2 Re-Certification

The renewal of all certifications shall require a written exam and a hands-on practical exam, where applicable.

Applicants will be given two scheduled attempts to pass the recertification exam and one attempt to pass the practical exam (each, respectively). Any applicant that fails to acquire a minimum score of 70% on a recertification exam or who fails the subsequent practical exam will not have their certification renewed. The applicant will be required to take the respective certification classes at the next available time given by ~~the WVDOH~~MCS&T.

Any failed recertification examination taken prior to the expiration date of the current certification, either practical or written will not result in termination of any current certification prior to the expiration date of that certification.

The certification holder is responsible updating their personal information on the online learning website. <http://www.onlinelearning.wv.gov/student/home.html>

Certification holders are responsible to ensure that their certifications stay current. The West Virginia Division of Highways will no longer mail reminder letters to certification holders.

If an applicant seeking recertification disagrees with a recertification decision, they may file a written appeal with the board. (See Appealing a Decision).

17. TESTING PROTOCOL

The TICP has a testing protocol that must be followed. The protocol includes testing environment, time limits, proctoring exams, etc. The entire protocol will be covered with attendees prior to testing.

18. REVOCATION OF CERTIFICATION

The Certification Board grants certification upon satisfactory completion and maintenance of certain conditions and may be revoked upon any breach of

these conditions.

Generally, certifications may be revoked if in the opinion of the certifying authority, an individual has knowingly committed acts detrimental to the integrity of the Certification Program or transportation industry. Examples of situations that warrant revocation include, but are not limited to:

- Deliberate falsification of field or quality control test results or records.
- Deliberate falsification of calculations, test results or materials
- Cheating on certification/re-certification exams.
- Submittal of false information on certification applications.
- Submitting trial mix mixture and/or calculations completed by someone other than the signatory, or knowingly supplying trial mix mixture and/or calculations for another individual's certification.

The Quality Assurance Training Program Administrator will take the lead in gathering facts and investigating any allegations which may require revocation of a certification. The review board will notify the individual in writing of intent to revoke certification(s).

19. APPEALING A DECISION

Any individual who disagrees with a decision by the Certification Board has 10 business days from the date of receipt of the notification to respond in writing to the board and present documentation to support their continued certification and/or request an opportunity for a meeting to present their case.

If the individual fails to respond within 10 days of receipt of the original notification of revocation letter, the revocation becomes final.

Not later than 20 business days after receiving a request for a meeting from the individual, the Certification Board will schedule a meeting in which the appellant can present their case. If the Certification Board was not persuaded by the documentation provided by the appellant and believe that revocation of the certification is warranted, the appellant may file a written appeal to the ~~State Highway Engineer~~Deputy Secretary for review. All information including any letter(s) of explanation from the appellant will accompany the documents submitted to the ~~Deputy Secretary~~State Highway Engineer. The board will mail the decision of the ~~Deputy Secretary~~State Highway Engineer to the appellant. The decision by the ~~Deputy Secretary~~State Highway Engineer is final.

20. THE LENGTH OF REVOCATION:

20.1 First Offense

This may include revocation of all certifications for up to one year. After the revocation period the individual may obtain recertification by passing respective certification exam and a practical (if applicable). If either exam is failed, the individual will be required to take the certification class before being permitted to test again. The individual will be required to retake and pass the written exam regardless of whether it was previously passed.

20.2 Second Offense

This may include revocation of all certifications for up to for five years. There is also the possibility of demotion and reduced pay for WVDOH employees. After the revocation period the individual may obtain recertification by passing respective certification exam and a practical (if applicable) at the discretion of the board. If either exam is failed, the individual will be required to take the certification class before being permitted to test again. The individual will be required to retake and pass the written exam regardless of whether it was previously passed.

20.3 Third Offense

This may include revocation of all certifications for life. There is also the possibility of termination, demotion and reduced pay for WVDOH employees.

21. CONTACT INFORMATION

If an applicant/technician/appellant has any questions about the DOH program or needs more information. Please contact: Qaschoolscoordinator@wv.gov

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

INSPECTION AND ACCEPTANCE PROCEDURES
FOR PRECAST CONCRETE PRODUCTS

1. PURPOSE

- 1.1 To set forth procedures for the inspection and acceptance of precast concrete products, including inlets, manholes, box culverts, 3-sided bridge units, retaining wall panels, headwalls, wingwalls, lagging, junction boxes, and any other precast products, and the approval of the plants at which they are fabricated.

2. SCOPE

- 2.1 This procedure will apply to all precast concrete products supplied for use on ~~West Virginia Division of Highways projects~~ WVDOH projects and to all precast concrete product fabricators that supply material for use on ~~West Virginia Division of Highways projects~~ WVDOH projects.

For prestressed concrete members refer to MP 603.10.40 "Inspection and Acceptance Procedure for Prestressed Concrete Bridge Beams."

3. REFERENCED DOCUMENTS

- a. ACI R5.3 – Proportioning on Basis of Field Experience or Trail Mixtures, or Both
- b. AASHTO T 22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens
- c. AASHTO M 6 - Standard Specification for Fine Aggregate for Hydraulic Cement Concrete
- d. AASHTO - R 100 - Standard Practice for Making and Curing Concrete Test Specimens in the Field
- e. AASHTO - T 280 - Standard Method of Test for Concrete Pipe, Manhole Sections, or Tile
- f. AASHTO T 303 - Standard Method of Test for Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction
- g. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- h. ASTM C497-20e1- Standard Test Methods for Concrete Pipe, Concrete Box Sections, Manhole Sections, or Tile
- i. ASTM C1577-20 - Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD

Commented [DB1]: Add Reference to the DMIR MP here and in the location it is discussed.

- j. [ASTM C1610/C1610M-10 - Standard Test Method For Static Segregation Of Self-Consolidating Concrete Using Column Technique](#)
- k. [ASTM A1064/A1064M-10e1 - Standard Specification for Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete](#)
- l. [ASTM C1611 – Standard Test Method for Slump Flow of Self-Consolidating Concrete](#)
- m. [ASTM C1621 – Standard Test Method for Passing Ability of Self-Consolidating Concrete by J-Ring](#)
- n. [ASTM C642-21 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete](#)
- o. [MP 106.00.02 - Procedure for Evaluation of New Products for Use in Highway Construction](#)
- p. [MP 603.02.10 - Guide for Approval of Component and Ship Loose Materials Pertaining To Precast And Prestressed Concrete Items](#)
- q. [MP 642.03.50 - Contractors Quality Control for Surface Water and Sampling Procedures for Quality Determination](#)
- r. [MP 700.00.01 - Sampling and Testing of Materials at the Source \(Coverage\)](#)
- s. [MP 703.00.22 - Soundness of Aggregates Using Sodium Sulfate](#)
- t. [MP 703.00.25 - Method of Determination of Percent of Thin or Elongated Pieces in Coarse Aggregate](#)
- u. [MP 700.00.30 - Certification of Batch Scales and Calibration of Standard 50 Pound Test Weights](#)
- v. [MP 703.00.25 - Method of Determination of Percent of Thin or Elongated Pieces in Coarse Aggregate](#)
- w. [MP 703.01.20 - Standard Method of Test for Friable Particles in Aggregates](#)
- x. [MP 709.04.40 - Acceptance Criteria for Steel Wire Reinforcement Used in Concrete](#)
- y. [MP 711.03.23 - Mix Design for Portland Cement Concrete](#)
- z. [MP 714.03.30 - Quality Assurance of Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe](#)
- aa. [West Virginia Department of Transportation, Division of Highways, Standard Specifications Roads & Bridges](#)

4. FABRICATOR APPROVAL

- 4.1 All precast concrete product fabricators (hereafter referred to as the Fabricator) shall be approved by ~~Materials Control Soils and Testing~~ MCS&T ~~Division~~ prior to the start of any work for the WVDOH. If not listed on the WVDOH Approved List of Precast Concrete Fabricators, a Fabricator shall contact MCS&T ~~Division~~ a minimum of six weeks prior to the planned date on which fabrication is to begin to initiate the approval process.
- 4.2 In order for a Fabricator to be approved and listed on the WVDOH Approved List of Precast Concrete Fabricators, they must be NPCA (National Precast Concrete

Association) certified, QCAST (American Concrete Pipe Association) Certified, or have an equivalent type of certification.

- 4.3 The process for approving a Fabricator shall include, but not be limited to, an on-site visit to the fabrication plant by a WVDOH representative from MCS&T ~~Division~~. During this visit, the WVDOH Quality Assurance (QA) personnel shall inspect the fabrication facility, the Quality Control (QC) lab, and meet with QC and other key personnel from the Fabricator. Component materials which will be used in the fabrication of precast items shall be sampled for testing. Batch scales shall be calibrated in accordance with MP 700.00.03 at a minimum once per year.
- 4.3.1 Sampling and testing of component materials shall be done in accordance with MP 603.02.10. Copies of recent component delivery tickets should be presented on the day of sampling. All component materials must be approved prior to the start of fabrication.
- 4.3.1.1 Any Fabricator which does not produce for the WVDOH for a period of 2 years shall be removed from the Approved Fabricator list. After removal from the approved list, before a Fabricator can again produce for the WVDOH, they must repeat the approval process. Sampling of component materials will not continue when the plant is not listed on the Approved Fabricator list.
- 4.3.2 Personnel from the Fabricator required to be present during the initial on-site visit and meeting between WVDOH and Fabricator shall include representatives from Production and Quality Control. Any questions and concerns regarding WVDOH requirements, including applicable Specifications, Materials Procedure (MP's), Standard Details, and QC/QA Inspections shall be addressed at this meeting.
- 4.3.3 The Fabricator must submit the Quality Control Manual/Plan for review at this meeting.
- 4.4 All Concrete Mix Designs which will be used on products fabricated for the WVDOH must be submitted for review & approval, prior to the start of fabrication. Any design mix with an aggregate(s) that has a reactivity classes R1, R2, or R3, as shown as in Approved Aggregates Source List, shall be developed in accordance with WVDOH specifications, subsection 601.3.1.1. If an aggregate Source is not listed on the Approved Aggregates Source List, the Division will test the fine and coarse aggregate from the Source, in accordance with AASHTO T 303, to determine the reactivity class of the aggregate prior to its use on any WVDOH project. The Division will inform the Fabricator of the reactivity class of aggregates that they are proposing to use. If a cement Source and/or a SCM Source are not listed on the Approved Source List, the Division will test cement and/or SCM from that Source prior to its use on any WVDOH project.
- 4.5 The Fabrication Plant QC Personnel, as a minimum, shall be a certified ACI Grade I Concrete Field Testing Technician and/or a WVDOH PCC Inspector. In addition, if

Self-Consolidating Concrete (SCC) is used, Fabrication Plant QC Personnel shall be a certified ACI SCC Testing Technician.

- 4.6 All Precast Concrete items shall be accepted by Direct or Master Coverage except when a Fabricator is certified as an Approved Source of concrete lagging as defined in Section 78.

5. FABRICATION & INSPECTION OF PRODUCTS FOR DIRECT & MASTER COVERAGE

- 5.1 Prior to beginning fabrication of any precast concrete products, the Fabricator shall provide written or email notification to MCS&T Division at least one calendar week in advance of the date on which fabrication is to begin.
- 5.1.1 Depending upon the precast items being fabricated, MCS&T Division may choose to monitor fabrication. Fabrication of structurally significant products such as box culverts and 3-sided bridge units shall be monitored. Other items may be monitored at the discretion of MCS&T.
- 5.1.2 After fabrication has begun, the Fabricator shall keep MCS&T Division and the Inspector (whether a WVDOH employee or a contract employee representing the WVDOH) informed in advance of the days on which fabrication will take place.
- 5.2 Shop Drawings must be approved by the West Virginia Division of Highways prior to the start of any work by the Fabricator. The Inspector must have a copy of these approved shop drawings prior to start of any work by the Fabricator.
- 5.3 Concrete cylinders shall be made for compressive strength testing with 6-inch by 12-inch (150 mm by 300 mm) or 4-inch by 8-inch (100 mm by 200 mm) molds. The cylinders are to be cured in the same area as the products for which they represent (Field Cured as outlined in AASHTO R100) until tested to create a curing environment similar to the product that they represent. A compressive strength test shall consist of the average result of a set of cylinders, which is at least two cylinders. Form removal for wet cast concrete is not permitted until concrete has reached 50% of the design strength, unless otherwise specified. If forms are stripped from box culverts at 50% of the design strength, another curing method from section 601.12, or ASTM C1577 must be used until 70% of the design strength is obtained. Form removal limitations do not apply to elements fabricated with dry cast concrete. Dry cast concrete is defined as concrete with a slump less than 1-inch (25 mm).
- 5.3.1 For both conventional wet cast concrete and SCC mixes, a minimum of one set of compressive strength cylinders shall be fabricated from every 7 yards (6.5 m) of concrete, or fraction thereof, with a minimum of one set per day per mix design. Both the form removal strength and the 28-day strength must be confirmed by a set of cylinders. Cylinders shall be the same size as those used in the initial approved mix design. For conventional concrete, slump, temperature, and air content tests shall be conducted on the first batch of concrete each day and every time that cylinders are fabricated. For SCC mixes, spread, temperature, and air content tests shall be conducted on every batch. For all types of concrete, unit weight and yield tests shall

be conducted on the first batch of concrete each day and thereafter as deemed necessary by Quality Control and Quality Assurance Personnel.

- 5.3.2 For dry cast mixes, the 28-day strength shall be confirmed by a set of compressive strength cylinders. Compressive strength testing for form removal is not required for dry cast mixes. A minimum of one set of compressive strength cylinders shall be fabricated for each item fabricated. The cylinders are to be fabricated in the molds on the vibration table in accordance with ASTM C497. For dry cast mixes, slump testing is not required, and concrete temperature testing shall be performed on the first batch of concrete each day and every time that cylinders are fabricated.
- 5.4 For precast manholes fabricated with wet cast and SCC mixes, absorption tests are to be conducted in accordance with ASTM C642. Tests should be conducted on a weekly basis for each mix design used, at a minimum, unless otherwise specified.
- 5.5 For precast products fabricated with dry cast mixes, absorption tests are to be conducted in accordance with ASTM C642, and tests should be conducted on a weekly basis for each mix design used. The maximum allowable absorption shall be 9%.
- 5.6 Unless otherwise specified, for conventional wet cast and SCC mixes, plastic concrete shall have an air content measured at $7.0 \pm 2.0\%$. For dry cast concrete, the air content test requirement is waived.
- 5.6.1 Prior to the use of Self-Consolidating Concrete in precast items all mix designs must be submitted to MCS&T for approval and meet the requirements of the following table. Test results from trial batches produced by the laboratory which designed it shall be included in the submittal. The compressive strength of the design mix shall be at least 15% above the specified design strength.

Table 45.6.1 - SCC Mix Design Acceptance

Fresh Property	Mix Design Batch Acceptance Criteria
Air Content	$7.0 \pm 1.5\%$
Spread (ASTM C1611)	Target ± 1.5 inches (40 mm) $2 \text{ seconds} \leq T_{50} \leq 7 \text{ seconds}$ Visual Stability Index ≤ 1.0
Passing Ability (ASTM C1621)	J-Ring Value ≤ 1 inch (25 mm)
Segregation Resistance (ASTM C1610)	Segregation $\leq 12\%$
Unit Weight and Yield	$\pm 2\%$ of Theoretical

- 5.6.2 The following table lists the criteria for SCC production.

Table 45.6.2 - SCC Production Acceptance

Fresh Property	Production Acceptance Criteria
Air Content	7.0± 2.0%
Spread (ASTM C1611)	Target ± 2 inches (50 mm) 2 seconds ≤ T ≤ 7 seconds Visual Stability Index ≤1.0
Concrete Temperature	<90°F
Unit Weight and Yield	±2% of Theoretical

- 5.6.3 SCC should only be given minimal vibration; and shall not be dropped from a distance greater than 4 feet (1.2 m) relative to the top of the form.
- 5.6.4 Precast products fabricated with dry cast concrete shall be limited to a maximum wall thickness of 12 inches (305 mm) when single sided vibration is used and 18 inches (460 mm) when double sided vibration is used.

6. FINAL INSPECTION

- 6.1 After fabrication is completed and prior to shipment, the precast items will be stored on dunnage. The Fabricator shall provide MCS&T Division with a written or email request for final inspection a minimum of one calendar week prior to the desired date of inspection. Effective communication from the Fabricator to MCS&T Division and Consultant Inspection Agency is the key to avoiding any scheduling conflicts regarding final inspection.
- 6.2 At the final inspection, the fabricator shall provide the inspector with documentation of required data pertinent to the product(s) being produced. Attached to this document is a sample inspection sheet to be used as a guide for presenting this information. This documentation is also available on the [MCS&T Division Website](#)¹.
- 6.2.1 For the final inspection, the Inspector may witness compressive strength tests if required, inspect repairs as needed, and conduct a thorough visual examination of each member. A copy of the Inspector's daily reports, a copy of the final inspection report, and all other pertinent information provided to the Inspector by the Fabricator shall be kept on file by MCS&T Division.
- 6.2.2 For box culverts, trial fitting of adjacent pieces, prior to shipping, will be required as part of the final inspection process. Each adjacent box culvert will be trial fitted in pairs horizontally or vertically; the gaps between each pair will be measured. Dunnage will be placed on a smooth level surface below the bottom of the culvert to prevent damage.

¹ <https://transportation.wv.gov/highways/mcst/Pages/WVDOH-Materials-Procedures.aspx>

The maximum gap between the adjacent pieces shall not exceed ½ inch (13 mm), unless otherwise stated in the construction plans.

7. ACCEPTANCE & REJECTION

- 7.1 Upon completion of final inspection, if a precast product meets all specification requirements and does not contain any defects, the Inspector will stamp the precast product as accepted by MCS&T ~~Division~~ and provide a 7-digit Laboratory Reference Number for shipment.
- 7.2 If, however, the precast product does not meet all specification requirements due to damage, defect, or dimensional tolerance, the product must be further evaluated before potential acceptance by the MCS&T ~~Division~~ as described in the following subsections.
- 7.2.1 Minor defects may be repaired in accordance with the pre-approved repair procedures which should be incorporated within the Fabricator QC Plan. Cracks 4 mils (0.1 mm) or less shall be sealed by silane; and cracks between 4 mils (0.1 mm) and 16 mils (0.4 mm) shall be repaired by epoxy injection in accordance with Section 603.10.2. Any crack exceeding 16 mils (0.4 mm) shall be considered a major defect and the item shall be rejected by MCS&T. If repairs have been approved, and appear satisfactory and all other specifications are met, the Inspector shall stamp the product as approved for shipment and issue a 7-digit Laboratory Reference Number for acceptance.
- 7.2.2 Major defects shall include: dimensions that exceed tolerances, failure to reach required compressive strength, cracks greater than 16 mils (0.4 mm), and any defect that could be considered structural. Lagging dimensions shall be within $\pm \frac{1}{4}$ " (6 mm) from the specified dimension, and all other items must meet relevant tolerances in AASHTO and ASTM Standards. Items with major defects shall be rejected by MCS&T ~~Division~~, and a 7-digit Laboratory Reference Number will be assigned documenting MCS&T ~~Division~~'s rejection. When items are load bearing, they shall be evaluated by the Designer for structural adequacy and then may be accepted by DMIR, pending concurrence by the District, and or the Engineer of Record. If a product is approved for repair, and if repairs appear satisfactory, the Inspector shall proceed with a final shipping inspection of the piece.

Any items found to be not acceptable by the Engineer of Record, Designer, or the District/Division; shall be rejected by the Division.

- 7.2.3 When an item does not achieve the specified 28-day compressive strength prior to shipment, and if it is accepted by a DMIR, the following formula for the price adjustment shall be used in the DMIR, plus any administrative fee.

f_c 28 Day Compressive Strength (psi)
 $\bar{X}$ Average 28 day Compressive Strength (psi)
IC - The invoiced cost of the precast item only.

Formula 1 (Constructed by Contractor)

$$\text{Price Reduction} = \left[\frac{f_c - \bar{X}}{.5 f_c} \right] \times 40\% \text{ Unit Bid Price}$$

Formula 2 (Constructed by Division)

$$\text{Price Reduction} = \left[\frac{f_c - \bar{X}}{.5 f_c} \right] \times \text{IC}$$

- 7.3 If a fabricator fails to request a final inspection to MCS&T and final inspection is not completed prior to delivery; MCS&T will reject the precast items. Contractors may seek acceptance of the precast items by the District through a DMIR. If the District chooses to accept the precast items through a DMIR, the District may apply a price adjustment of \$700 per shipment of the precast items.

8. PROCEDURE FOR APPROVED SOURCE OF PRECAST CONCRETE LAGGING

- 8.1 Precast concrete Fabricators may be classified as an Approved Source of precast concrete lagging if they have met the requirements of Section 3-4 and are producing lagging which is made in accordance with the relevant WVDOT Standard Details. Once classified as an Approved Source of precast concrete lagging, an Approved Source Lab Number will be assigned to the Fabricator for material tracking.
- 8.2 MCS&T ~~Division~~ may perform regular quality assurance inspections prior to shipment and/or, monitor fabrication of lagging from a Fabricator that is an Approved Source. The Approved Source Lab Number shall be noted on all shipping documents from the fabricator, and material coverage will be requested under the assigned Approved Source Lab Number. All relevant concrete test data, component material information, QC inspection data, and shipping information shall be kept on file at the Fabricator for the last three years of fabrication and shall be available upon request by the Division. Failure to produce requested documentation may result in revocation of the Fabricator's Approved Source certification status.
- 8.3 Approved Sources will be evaluated by the Division by random audits. Audits will be conducted on the material that is available to the Inspector at the time of the audit. All

documentation and records for the pieces must be made available to the Inspector on the day of the audit and must be complete, current, and accurate. Failure to produce records shall be a cause for decertification.

- 8.3.1 All shipping documentation, concrete test data, and component material certifications shall be made available to the Inspector for review. These documents shall include all documents from material that has been shipped to ~~state projects~~ WVDOH projects since the last audit. If data indicates that any material did not conform to this MP, the applicable Specifications, or Standard Detail; and was used in a ~~state~~ WVDOH project, then the Fabricator will be de-certified as an Approved Source of precast concrete lagging.
- 8.3.2 In addition to documentation, the audit will consist of fabrication monitoring, test observance, and a visual inspection of material that is stocked for shipping on the day of the audit.
- 8.3.2.1 Each material test monitored during the audit must be performed in accordance with the applicable Standards, and Specifications. Visual inspection of stocked material will include quality checks of surface finish for cracks, spalls, and other surface blemishes after all repairs have been performed and dimensional checks. The material shall be properly stored to avoid handling damage and be accessible to the Inspector. Audits shall be graded on a point system deducted from 100 and weighted based on the Non-Conformance Points found per Table 7.3. A minimum score of 75 shall be considered passing.

TABLE 7.3

Audit Category	Non-Conformance Points
Material Test Data Review	10 (per error)
Component Material Certification Review	10 (per error)
Shipping Documentation	10 (per error)
Stocked Material Visual Inspection	15 (per defect)
Dimension Check	20 (per error)
Test Performance Check	15 (per Test)

- 8.4 When a Fabricator, which is an Approved Source, fails an audit, the Fabricator must submit a written corrective action plan to bring their QC program back into compliance with this MP and corresponding Specifications during a probationary period of one month during which time the fabricator must prove they have fulfilled the corrective actions they submitted before supplying the material again. If the Fabricator fails to bring their material back into compliance within the probationary period, the Approved Source status will be revoked for a minimum of one year from the date of the end of the probationary period, or until the Fabricator has corrected the nonconformances listed during the failed audit. Two failing audits in a year shall result in revocation of the Fabricator's Approved Source status for one year from the date of the last failed audit. Any evidence of document falsification shall result in immediate loss of Approved Source status, and removal from the Approved List of Concrete Fabricators

MP 604.02.40

Signature Date

PAGE 10 OF 9

for a minimum 2 years. Depending on the severity and the legality of the falsified documents the removal may be permanent.

- 8.5 Non-Conforming material received by WVDOT projects and reported to MCS&T shall result in an immediate failing audit and will require the Fabricator to submit corrective actions. If the Fabricator fails the subsequent audit, it will result in the loss of their Approved Source status.

Ronald L. Stanevich, P.E.

Director

Materials Control, Soils and Testing Division

MP 604.02.40 Steward – Cement and Concrete Section

RLS:MT

ATTACHMENT

**PRECAST CONCRETE PRODUCTS
WV DOT DIVISION OF HIGHWAYS MCS&T DIVISION**

SAMPLE FABRICATION CHECKLIST

Preliminary Verifications

NPCA (National Precast Concrete Association) Certification _____

CONCRETE COMPONENTS

Mix Design Lab # (if applicable): _____

Cement Source: _____

Fly Ash Source: _____

Coarse Aggregate Source 1: _____

Coarse Aggregate Source 2: _____

Cement Type: _____

Approved/Tested: _____

Fly Ash Type: _____

Approved/Tested: _____

Coarse Aggregate 1: _____

Approved/Tested: _____

Coarse Aggregate 2: _____

Approved/Tested: _____

Fine Aggregate 1: _____

Approved/Tested: _____

Fine Aggregate 2: _____

Approved/Tested: _____

Batch Water Source: _____

Approved/Tested: _____

Admixtures: _____

STEEL COMPONENTS

Reinforcement: Supplier(s): _____

Description: _____ Lab Number: _____

Description: _____ Lab Number: _____

Description: _____ Lab Number: _____

Inserts: Supplier(s): _____

Description: _____ Lab Number: _____

SHIPLOOSE MATERIAL

Grates: Fabricator: _____

Mill Certs.: _____ Galvanize Cert.: _____ Lab Number: _____

Mastic: Fabricator: _____

Inspected at: _____ Lab Number: _____

SHOP DRAWING REVIEW

Approval Date: _____ Approved By: _____

Preliminary Verifications

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Sample Form Inspection (Pre-Placement of Concrete)

Product Type (s)				
Criteria	Design Dimension	Tolerance (±)	Actual Measurement	Within Tolerance
Fill in Form Information (if applicable)				
Height of Product (ft-inch)				
Depth of form (ft-inch)				
Inside Width of form (inch)				
Outside Width of form (inch)				
Inside Length of form (inch)				
Outside Length of form (inch)				
Wall Thickness (inch)				
Forms Square and Level (✓)				
Skew dimensions [if applicable (ft-inch)]				
Locations of inserts, sleeves, block outs, etc. (✓)				

Product Type(s)		Form Properly sealed at joints & edges (✓)	
Framework Constructed of metal on concrete foundation (✓)		Form Clean & Free of debris (✓)	
Form dimensionally correct (✓)		Release Agent applied (✓)	
Other Information:			

Reinforcing Steel	
Reinforcing Steel (Condition)	
Fill in steel information (if applicable)	
Size & Grade	
Location & Lapping Length (✓)	
Spacing and Clearances (✓)	
Chairs, Spacers properly used	

Sample Concrete Placement & Curing

Quality Control Concrete Testing			
Concrete Truck Arrival Time		Concrete Truck Departure Time	
Concrete Temp		Ambient Temp, Weather Conditions	
Slump/Spread (inch)		Air Content (%)	
QC Tests performed per Specifications & Passing		Number & diameter (inch) of Cylinders	
Comments:			

Placement of Concrete			
Lift	Start Time	Completion Time	Vibrated (External/Internal/Both)
1 st			
2 nd			
3 rd			
4 th			
Placement of Concrete Completion Time			
Comments:			

Curing/Finishing of Concrete	
Top Surface Finished Per Specification	
Lifting loops/inserts accessible	
Product Curing Location (Inside/Outside)	
Product Covered & Heat Applied (Time Start & Time Finished)	
Heat Sensors Installed (✓)	
Compressive Strength Cylinders Stored with Product under Curing/Normal Environment (✓)	
Compressive Strength Test Conducted when curing was discontinued (✓)	
Comments:	

Sample Concrete Post Pour Product Inspection

Product	
Visual Inspection for Damage (✓)	
Notes (Size & Location of cracks, spalls, honeycomb, etc.)	
Products in Need of Repair (✓)	
Repair Method Approved (✓)	
Comments:	

Product Type (s)				
Criteria	Design Dimension	Tolerance (±)	Actual Measurement	Within Tolerance
Fill in Form Information (if applicable)				
Height of Product (ft-inch)				
Inside Width of product (inch)				
Outside Width of product (inch)				
Inside Length of product (inch)				
Outside Length of product (inch)				
Wall Thickness (inch)				
Product Square and Level (✓)				
Skew dimensions [if applicable (ft-inch)]				
Locations of inserts, sleeves, block outs, etc. (✓)				

Product	
Dimensional Tolerances Met? (yes or no)	
Heights (yes or no)	
Widths (yes or no)	
Depths (yes or no)	
Wall Thickness(es) (yes or no)	
Inserts, sleeves, lifting points, etc. (yes or no)	
All Concrete Finishes per specification (yes or no)	
Product properly transported (yes or no)	

Product stored on proper dunnage (yes or no)	
Design Shipping Strength met (yes or no)	
Repairs Satisfactory (yes or no)	
Product Stamped for Final Inspection (yes or no)	
Comments:	

Sample Inspection Sheet

Inspection Date _____ QC Personnel _____ QC Signature _____

Fabricator _____ Location _____

Project Name _____ WV State Project # _____ Federal Project # _____

Authorization # _____ Inspection done by _____
Steel Reinforcement

Reinforcement Supplier _____

Description _____ Approved Lab # _____

Description _____ Approved Lab # _____

Description**Approved Lab #**

Product Description	Quantity	Date Cast	Slump/ Spread (inch)	Air Content (%)	Design Strength (psi)	Cylinder Breaks (psi)	Date Of Break	Absorption (%)
Type "D" inlet								
Type "G" inlet								
36-inch Manhole (base, riser, top)								
48-inch Manhole (base, riser, top)								
10'0"x 12'0" Box Culvert								NA
Lagging 8"x24"x54"								NA
Type A Reinforced Panel								NA
6'0" Coping								NA
24-inch Wing wall								

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

ACCEPTANCE PROCEDURE FOR EVALUATING INDEPENDENT ASSURANCE
SAMPLES WITH SAMPLES USED FOR ACCEPTANCE

1. PURPOSE

- 1.1 To provide a procedure for the immediate evaluation of Independent Assurance (IA) Samples with samples used for acceptance.

2. SCOPE

- 2.1 This procedure is intended to apply to the following materials:
- 2.1.1 Aggregate
 - 2.1.2 Asphalt Concrete
 - 2.1.3 Portland Cement Concrete

3. REFERENCED DOCUMENTS

- 3.1 Office of Pavement Technology Publication No. [FHWA-HIF-12-001](#)¹, October 2011. Included as Attachment 32.
- 3.43.2 [MP 700.00.56 – Sampling and Testing Procedures for Independent Assurance Sampling.](#)

4. DEFINITIONS

- 4.1 Quality Assurance Samples and Tests - All of the samples and tests performed by the Division of Highways (DOH) or its designated agent used to validate the quality and acceptability of the materials and workmanship which have been used or are being incorporated in the project.
- 4.2 Quality Control Samples and Tests - All the samples and tests performed by the contractor that are performed or conducted to fulfill the contract requirements.
- 4.3 Independent Assurance Samples and Tests - Independent and unbiased samples or other activities performed by the DOH or its designated agent who do not normally have direct responsibility for quality control or quality assurance sampling and testing. IA samples and tests are taken to evaluate the sampling and testing procedures used in the acceptance program.
- 4.4 Split Sample - One of two selected samples that have been halved, quartered, etc. from a single sample taken in the field. The field sample must be of adequate size to render each "split sample" sufficient material for test.

¹ <https://www.fhwa.dot.gov/pavement/materials/hif12001.pdf>

- 4.5 Adjacent Sample - One of two field samples taken in close proximity to each other in both time and space. Adjacent samples must represent the same material, production process, and other activity through the point of sampling.
- 4.6 Proficiency Sample - A single (homogeneous) sample that is distributed by an agency or designated agent to be tested at multiple laboratories. The distributing agency will provide a “score”, statistically comparing results amongst the laboratories.
- 4.7 Active Tester – A person who has performed a material test for acceptance in a calendar year.
- 4.8 Active Test Equipment – A piece of equipment which has been used to perform acceptance testing in a calendar year.
- 4.9 Satisfactory Evaluation – If the results of a test fall within the guidelines established in Section 11 of this document, the test will be considered satisfactory.
- 4.10 Non-Satisfactory Evaluation – If the results of a test do not fall within the guidelines established in Section 11 of this document, the test will be considered non-satisfactory.

5. SYSTEM APPROACH FOR IA SAMPLING AND TESTING

- 5.1 Personnel and equipment will be verified on a system basis as per [FHWA-HIF-12-001](#). The system approach evaluates each Active Tester and each Active Testing Equipment once per calendar year.
- 5.2 If possible, all IA samples shall be the result of a split/adjacent sample. If this is not achieved, a proficiency sample may be used to satisfy the yearly IA requirement.

6. POPULATION OF QUALITY ASSURANCE TESTERS

- 6.1 Once per year, before any work is performed by District Technicians, a signed letter stating the names of each of their quality assurance testers shall be submitted by the District Construction Engineer to the Director of MCS&T. In lieu of this letter, Districts may utilize a MCS&T provided online form.
- 6.2 If, during the calendar year, additional testers are added to the District’s roster, the Construction Engineer shall submit an amended list to the Director of MCS&T. This shall be done before any quality assurance work is performed by the technician.
- 6.3 In the event where a project incorporates non-DOH acceptance testers, the District Construction Engineer shall submit to the Director of MCS&T a signed letter stating the names of each of the quality assurance testers.

7. PORTLAND CEMENT CONCRETE

7.1 The means and methods of meeting the yearly IA requirement for PCC are outlined in [MP 700.00.56](#)~~Attachment 1: IA Work Plan~~.

7.2 The IA frequency goal for each tester and each piece of testing equipment is as follows:

PCC IA Samples Frequency	
Air – AASHTO T 152	1/Year
Compressive Strength Testing - AASHTO T 22	1 Set/Year
Slump – AASHTO T119	1/Year

7.3 The evaluation of these tests shall be described in Section 11 of this document.

8. SUPERPAVE ASPHALT CONCRETE

8.1 The means and methods of meeting the yearly IA requirement for Superpave HMA is outlined in ~~Attachment 1: IA Work Plan~~[MP 700.00.56](#).

8.2 The IA frequency goal for each tester and each piece of testing equipment is as follows:

SuperPave IA Samples	
Air Voids - AASHTO T 269	1/year
Asphalt Content by Ignition - AASHTO T308	1/year
Bulk Specific Gravity, Vacuum - AASHTO T331	1/year
Bulk Specific Gravity, SSD - AASHTO T166	1/year
Maximum Specific Gravity - AASHTO T209	1/year
Percent Passing the #200 Sieve - AASHTO T30	1/year

8.3 The evaluation of these tests shall be described in Section 11 of this document.

9. MARSHALL ASPHALT CONCRETE

9.1 The means and methods of meeting the yearly IA requirement for Marshall HMA is outlined in [MP 700.00.56](#)~~Attachment 1: IA Work Plan~~.

9.2 The IA frequency goal for each tester and each piece of testing equipment is as follows:

Marshall IA Samples	
Asphalt Content by Ignition - AASHTO T308	1/year
Bulk Specific Gravity, SSD - AASHTO T166	1/year
Marshall Stability/Flow - AASHTO T245	1/year
Maximum Specific Gravity - AASHTO T209	1/year
Percent Passing the #200 Sieve - AASHTO T30	1/year

9.3 The evaluation of these tests shall be described in Section 11 of this document.

10. AGGREGATE GRADATION

10.1 The means and methods of meeting the yearly IA requirement for Aggregate Gradation is outlined in [MP 700.00.56](#)~~Attachment 1: IA Work Plan.~~

10.2 The IA frequency goal for each tester and each piece of testing equipment is as follows:

Aggregate Gradation Samples	
Class 1,3, or 10	1/year

10.3 The following sieves will be evaluated:

1. 1.5" Sieve
2. ¾" Sieve
3. #4 Sieve
4. #40 Sieve
5. #200 Sieve

10.4 The evaluation of these tests shall be described in Section 11 of this document.

11. EVALUATION PROCEDURE

11.1 Samples will be evaluated statistically when the population of results is 5 or greater. If the sample is not provided by AASHTO re:source, they will be evaluated by the WVDOH IA sampler. A sample that falls within 2 standard deviations of the population will be considered satisfactory.

11.2 If the samples are provided by AASHTO re:source a rating of 3, 4, 5 as assigned by the testing agency shall be considered satisfactory.

11.3 In the event where the population is less than 5, samples will be evaluated by averaging the tests results and using the respective AASHTO Precision and Bias Table as the acceptable range of values.

11.3.1 For example, if the average is 5.0 and the table provides a precision and biased of 1.2, the test values must fall between 3.8 and 6.2 to be considered satisfactory.

11.3.2 For Portland Cement Concrete, the acceptable range for the average of all results is as follows:

1. Slump: +/- 1.5 in ([40 mm](#))
2. Air: +/- 1.5 in ([40 mm](#))
3. Cylinders: +/- 10%

- 11.4 If the results of an evaluation are satisfactory, the evaluation will be considered successful. A successful evaluation will verify both the Active Tester and the Active Testing Equipment used during the material test.
- 11.5 If the results of an evaluation are deemed non-satisfactory, the material test will be reviewed by the respective District or Managing Office Representative. Within 30 days of notification, the District Construction Engineer or Managing Office Representative shall submit a corrective action report to the Director of Materials Control Soils and Testing Division. This Corrective Action Report will be included in the yearly IA report. A sample of this Corrective Action Report is provided in Attachment [21](#). The live version of the file is in the [WVDOH MCS&T Toolbox](#)².
- 11.5.1 If a Concrete Slump and Air IA test is determined to be unsatisfactory, the IA sampler shall perform another 1-1 test with the testing technician to determine the root cause. The IA sampler may have the technician use either the IA testing equipment or another previously satisfactory test equipment to isolate the issue.
- 11.5.2 If the Technician is determined to be satisfactory using another piece of equipment, the IA sampler shall perform additional testing with the errant devices to determine if the testing equipment is the root cause of the unsatisfactory result.
- 11.5.3 In the above-described instance, all pertinent information shall be provided in a corrective action report.

Ronald L. Stanevich, PE
Director
Materials Control, Soils & Testing Division

MP 700.00.53 Steward – Materials Control Section
RLS:B
ATTACHMENTS

² <https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx>

Attachment 21: Sample Corrective Action Report

Commented [DB1]: Attachment 1 moved to a new
MP

WVDOH Independent Assurance Corrective Action Report			
Form 2023-IA-CAR			
Date of Occurrence:			
Date Submitted:			
Name of Tester:			
Testing Equipment:			
Material Tested:			
Describe the issue reported:			
What was the root cause of the issue?			
What actions have been done to correct this issue?			
Signature of Testing Technician	Date		
Signature of District Materials Supervisor	Date		
Signature of District Construction Engineer	Date	Review: MCST	

MP 700.00.53 – ATTACHMENT 32
SIGNATURE DATE
PAGE 1 OF 1

Attachment 32: Office of Pavement Technology Publication No. [FHWA-HIF-12-001](#)³,
October 2011

³ <https://www.fhwa.dot.gov/pavement/materials/hif12001.pdf>

TechBrief

The Construction and Materials Quality Assurance Program is an integrated, national effort to improve the effectiveness of the State acceptance of materials both in the inspection, sampling and testing. The program is designed to provide tools and guidance in implementing Quality Assurance programs. The program is designed to provide tools and guidance in implementing Quality Assurance programs.



U.S. Department of Transportation
Federal Highway Administration

Office of Pavement Technology

Publication No.
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INDEPENDENT ASSURANCE PROGRAMS

This Technical Brief provides information regarding independent assurance as it relates to activities for the evaluation of the sampling and testing procedures used in a materials and quality acceptance program.

Introduction

23 CFR 637 defines an Independent Assurance Program as: Activities that are an unbiased and independent evaluation of all the sampling and testing procedures used in the acceptance program.

An Independent Assurance Program ensures the sampling and testing is performed correctly and the testing equipment used in the program is operating correctly and remains calibrated. It involves a separate and distinct schedule of sampling, testing and observation.

Qualified sampling and testing personnel, other than those performing the verification and quality control (QC) sampling and testing, should perform the Independent Assurance (IA) tests. Likewise, equipment other than that used for verification and QC should be used for IA sampling and testing. By regulation IA sampling and testing is conducted by agency personnel or an accredited laboratory designated by the agency.

The regulation requires IA specifically be designed to include testing performed on project produced materials. Since the testing of project produced materials are tested in multiple locations and by multiple personnel it is necessary to have some assurance the testing is being performed accurately.

Manufactured products are typically tested in the State's central laboratory or by a designated consultant laboratory. Testing in the central laboratory is considered to be covered by the laboratories accreditation and participation in proficiency testing.

Background

In the early sixties Congressional investigation uncovered improper testing and fraud in some of the federally funded highway projects. To address the issue of improper testing a separate sampling and testing program was developed. The program was operated by personnel different than project personnel on different equipment. The samples were split with project personnel and the test results were compared. In addition, testing procedures were also observed. This was done to ensure sampling procedures were performed correctly and equipment stayed in calibration. In later rewrites of the regulation this program became the Independent Assurance program.

Scope

The regulation, 23 CFR 637, only covers projects that are on the National Highway System (NHS). The regulation requires testing personnel that perform any verification testing or QC testing used in the acceptance decision be covered by an IA program regardless of the agency, including a local agency or a toll authority administering a project.

Some States have IA testing personnel perform other duties such as: (1) instructing other testers, (2) obtaining samples for the verification of manufactured products,(3) obtaining samples of aggregate, cement, binder samples at production facilities for purposes other than IA, (4) inspecting precast or other facilities. Even though these functions are a necessary part of an overall Quality Assurance (QA) program they will not be discussed in this Tech Brief since the purpose of this Tech Brief is to discuss the IA functions as defined in the regulation.

Regulation 23 CFR 637

The text of the entire regulation can be found at this website:

http://www.access.gpo.gov/nara/cfr/waisidx_03/23cfr637_03.html

The following is a summary of the elements of the IA program:

1. Establish IA sampling and testing frequencies;
2. Evaluate testing equipment by using one or more of the following: calibration checks, split samples, or proficiency samples.
3. Evaluate testing personnel by observations and results from testing split samples or proficiency samples.
4. Prompt comparison and documentation of test results obtained by the tester being evaluated and the IA tester.
5. Develop guidelines including tolerance limits for the comparison of test results.

6. Provide an annual report to the FHWA when the system approach is used.

The rest of the Tech Brief will discuss best practices for each of the above requirements.

System versus Project Approach

The Independent Assurance Program can be set up on a project basis, which is the traditional approach, or on a system basis. The difference in the two approaches is the basis of the frequency of testing (cover all projects versus cover all personnel).

Some States have moved away from having testing personnel on all projects and are moving toward centralizing testing away from the project level. As this occurs testers may perform testing on several projects and it becomes more efficient to have a frequency based on the testers instead of projects quantities. In addition, the project approach does not always include all the testing personnel.

As States have moved toward the system approach they have also incorporated the IA program results as part of the technician qualification program.

Frequency of Independent Assurance Testing

Project Approach - The State establishes the frequency for the IA testing based on the testing frequency performed on the project or on a time frequency on a project. Typically, the States use a frequency of 10 percent of the verification/acceptance testing. For example if the verification testing is performed at the rate of 1 per 500 tons the IA frequency would be 1 per 5000 tons.

System Approach - An alternative method to basing frequency on project testing frequencies is to base the IA frequency on a time basis for all testers and equipment. In this case, the personnel and equipment would be verified on a "system" basis. The purpose is to cover all the testers and equipment over a period of a year. While States strive to reach all testers, it is not always possible. States typically set a goal of reaching 90% of the active testers. Active testers are defined as those testers that are performing testing in a given year, in most States this is a subset that is smaller than all "qualified" testers since some qualified personnel may have retired, move to other jobs or resigned. The system approach can be a more effective means of performing IA since it ensures that most testers are reviewed and that the same testers are not continually reviewed.

One challenge is to determine the active testers. For States that have an electronic materials management system it is very easy to determine the active testers since these systems indicate who is performing a given test. The IA testers will run reports periodically (monthly) to

determine the testers that need to be reviewed. For those States that do not have an electronic materials management system it becomes more challenging to determine the active testers. A good practice under these circumstances is to require the project personnel to identify the personnel that are going to perform testing, state, consultant, and contractor, at the beginning of the project along with any changes to the IA personnel. The IA testers will then know the active testers along with the testers that they have already been reviewed and will thus know the testers that need to be reviewed in the future.

Mixed Approach - It is permissible to separate the verification of equipment and personnel, i.e., one method to check equipment is to require a calibration and inspection frequency. Personnel can be checked by sending out proficiency samples. It is permissible to use a mixed approach, i.e. where some test procedures and or some testers are covered by a project approach where the remaining procedures are covered by a system approach.

Equipment and Personnel

Testing equipment may be evaluated by using one or more of the following: calibration checks, split samples, or proficiency samples.

Testing personnel may be evaluated by observations and split samples or proficiency samples.

The typical approach for performing IA is to check equipment and personnel at the same time. This is performed by IA personnel visiting a job site to observe the sampling and testing on site and to also test a split of the sample on site with equipment the IA personnel brought or to take the split to another laboratory for testing. When the test results are compared it checks both the equipment and tester. If a set of samples do not compare further analysis is required to determine if the source of the error is in procedure or equipment.

Some States send out proficiency samples to district, other subsidiary laboratories as well as consultants and contractors. Some of these States develop their own samples, while others require the laboratories to subscribe to the AASHTO Materials Reference proficiency samples. Proficiency samples are a way to address equipment and test procedures. Some States are preparing enough proficiency samples for all the active testers. In cases where all the testers are covered by the proficiency samples additional IA work would only need to review those that did not compare. If the proficiency program did not cover all the testers additional IA work would also be required.

Another method that covers just the equipment is performed by frequent standardization and or calibration. The frequency for standardization and/or calibration differs by equipment due to the unique nature of each testing device. AASHTO R-18 and some of the test procedures contain a frequency for standardization/calibration of the testing equipment. However, if standardization/calibration is the only check on the equipment (no split samples or proficiency samples) the standardization/calibration should probably be run frequently.

As some States move toward the system approach the States are checking testers in a central location. This allows the IA inspectors to cover numerous testers at one time. This has worked especially effectively in States where the projects and or laboratories are spread across a large geographic area. The States that use this approach are also including this data for requalification of testing personnel. When this approach is used the equipment needs to also be covered by standardization/calibration, split sample or proficiency sample testing.

Some States will suspend and/or revoke a technician's qualification/certification for repeated poor performance on IA evaluations. These are in addition to suspensions and/or revocation due to fraudulent activities. Some States will also perform testing on 3 way split-samples. In this approach one split is tested by project personnel, one split is tested by the contractor personnel and the third split is tested by the IA personnel. This is typically performed at the beginning of production to ensure that all testing personnel and equipment are performing correctly.

Prompt Comparison and Documentation

It is essential the IA Program compare results and detect deficiencies in State or contractor testing procedures in a timely manner. This improves the reliability of sampling and testing. The timely comparison of data may be restricted by the resources of an agency including personnel, facilities, and geographical constraints. These resource needs must be considered in an agency program.

Deviations from the established tolerances will require an engineering audit of the respective sampling and testing procedures, and the equipment used. When comparison of QC and verification data reveals significant differences in test values, the variables involved should be evaluated by the IA personnel to determine whether further testing and investigation is needed to establish the source of the discrepancy.

Corrective actions should be incorporated as appropriate under the direction of IA personnel.

Tolerances for Comparison of Test Results

A common place to start in establishing comparison tolerances are the D2S limits in the published test procedures. However, as States reduce the options in published test procedures and as testers become more proficient, the tolerances should be reduced. When split samples are used, the materials and sampling variability are eliminated from the analysis and only the variability due to the testing procedures and the equipment are included.

The comparison of split sample test results should be based on established deviation values or tolerances that are representative of the testing procedures and materials used. AASHTO and ASTM have published precision statements for some test methods. However, many of these procedures have multiple methods and or options inside the procedure. In order to reduce

testing variability most States have specified the particular options within the test procedures. Therefore the agency should develop Independent Assurance tolerances based on their specific options that the State is requiring. Care must be taken when historical data are used in establishing these limits to ascertain that the data are not biased; i.e., they were obtained in a random manner and that all test results have been reported. Otherwise, the variability may be underestimated and the limits too restrictive.

Many States distribute proficiency samples to their district laboratories. This data can be analyzed to determine IA tolerances. The formula for D2S is
$$D2S = \frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2$$
 where

Established tolerances should be periodically evaluated and modified to ensure that the goals of IA are being met; that is, it assures the reliability of contractor and agency test results. Some States are evaluating their tolerance every year. As a minimum the tolerances should be evaluated every 5 years.

In situations where multiple split tests are performed on a project a paired t-test can also be used to analyze data.

Annual Reports

The regulation requires those States that use a system approach to prepare and submit an annual report to the FHWA Division Office.

The annual report should include the following information: the number of certified technicians, the number of active technicians, the number of technicians covered by the IA program, the number of IA reports that had deviations, and a summary of how the deviations were addressed along with the potential systematic solutions to reoccurring deficiencies.

Alternate Approach

One State is statistically analyzing State and Contractor data in an innovative manner to accomplish both verification and IA.

An example of this approach is shown in Figure 1. In this approach the contractor performs sampling and testing at the rate of 4 samples per lot. The State takes verification samples, at the beginning of production; a minimum of 4 samples are taken the first week of production and at least 1 per lot. The State's verification samples are taken at the plant by contractor personnel under the direction of the State personnel. The verification samples are split and one split is given to the contractor. Analysis is performed in two ways. First, for IA, the split results are compared using IA comparison tolerances. In the figure below; IA1 is compared to the contractor split of that sample, sample 4 of lot 1. For validation, the State verification

samples are made independent by removing the corresponding contractor splits. In the figure below samples 1, 2, 3 from lot 1; samples 1, 2, 4 from lot 2; samples 1, 2, 3 from lot 3; and samples 1, 3, 4 from lot 4 are compared to the State's IA1, IA2, IA3, and IA4 with the F& t tests.

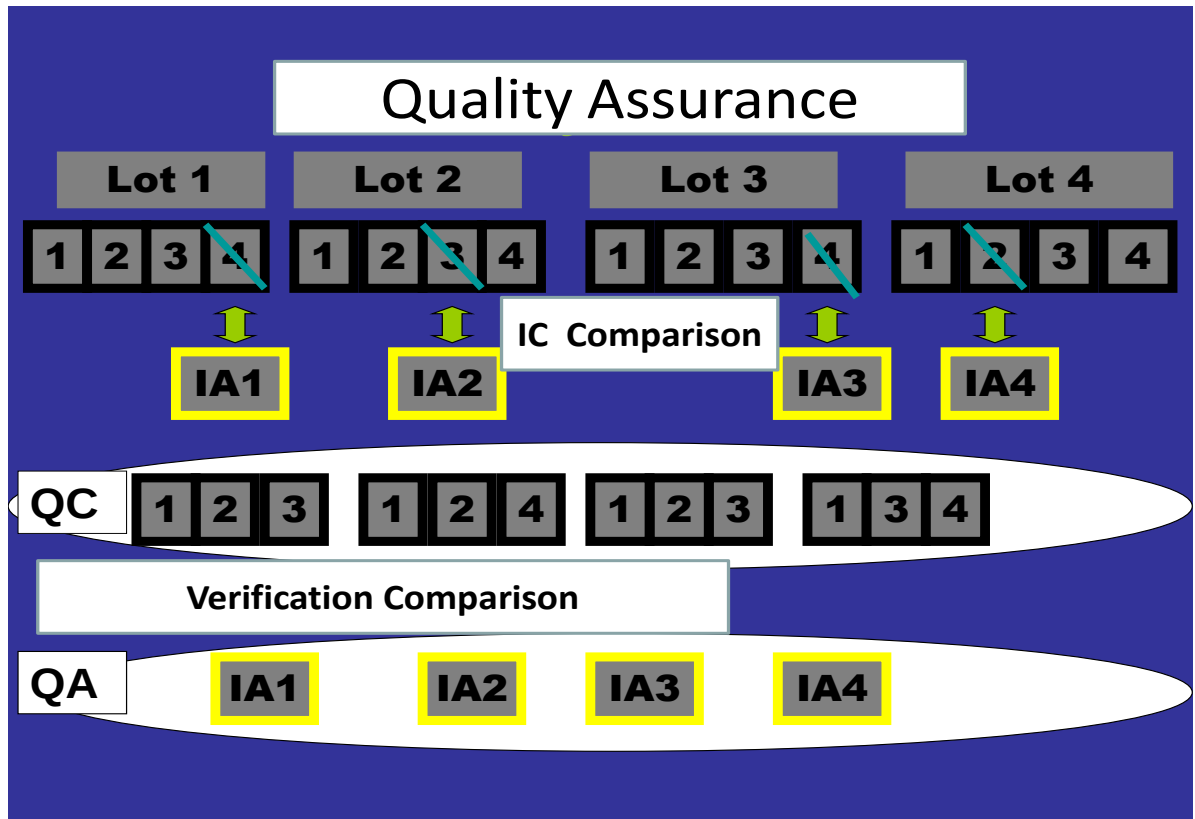


Figure 1. Example of Alternate Approach.

Conclusion - Commonly Noted Areas of Concern

- Test results from the IA program should only be compared to split test results or results from others testing the same set of proficiency samples.
- IA results are not to be used in the acceptance decision.
- IA should be based on split samples or proficiency samples not independent samples so that data can be compared without material variability.
- All tests that are performed in the field to determine the final acceptability of the materials should be covered by the IA program.

- All technicians that are performing testing that is used in the acceptance decision need to be covered by the IA program.
- Observation of sampling and testing procedures should be included as part of an IA system to evaluate sampling and testing personnel and ensure that testing and sampling procedures are performed correctly.

Further Information:

- "23 CFR Part 637," Subpart B - Quality Assurance Procedures for Construction, Federal Highway Administration, *Federal Register*, Washington, DC published on June 29, 1995, and amended on December 10, 2002, and September 24, 2007, http://www.access.gpo.gov/nara/cfr/waisidx_03/23cfr637_03.html
- Non-regulatory supplement for 23 CFR Part 637, Subpart B - Quality Assurance Procedures for Construction, Federal Highway Administration. The non-regulatory supplement was updated on July 19, 2006. <http://www.fhwa.dot.gov/legregs/directives/fapg/0637bsup.htm>
- Frequently asked questions (FAQ) on the Quality Assurance Regulation. The FAQs were updated on November 26, 2006. <http://www.fhwa.dot.gov/pavement/materials/matnote11.cfm - gaa>
- AASHTO Standard Practice R 44, "Independent Assurance Programs" has been published in the 2007 AASHTO Standards. This guide will assist the States in developing Independent Assurance Programs
- NHI Course 134042, "Materials Control and Acceptance –Quality Assurance." The course is four days long and covers the basic essentials of QA. A two-day version of the course is also available. http://www.nhi.fhwa.dot.gov/training/brows_catalog.aspx
- NHI Course 134064 – "Transportation Construction Quality Assurance"

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

SAMPLING AND TESTING PROCEDURES
FOR INDEPENDENT ASSURANCE SAMPLING.

1. PUPROSE

- 1.1 This procedure will provide the guidelines for the Sampling and Testing of Independent Assurance Samples. The acceptance of these samples are described in MP 700.00.53.
-

2. REFERENCED DOCUMENTS

- 2.1 MP 700.00.53: Procedure for Evaluating Independent Assurance Samples With Acceptance Samples
-

3. SCOPE

- 3.1 The following materials are to be sampled by the District and tested by both the District and MCS&T for IA sampling compliancy requirements.
- a) Asphalt – Superpave and Marshall
 - b) Aggregate – Class Material
 - c) Concrete – Cylinders, Slump and Air.
-

4. TESTERS

- 4.1 The District is required to identify testing quality assurance testing technicians who perform the tests and provide this information to MCS&T at the start of the season. This needs to be updated on a regular basis, specifically when testing technicians are added. This includes the following personnel:
- a) QAM / Consultant Testing Technicians
 - b) District Testing Technicians
-

5. TESTS

- 5.1 The following tests will be evaluated for the IA Program:
- a) Superpave Mixture Testing
 - b) Marshall Mixture Testing
 - c) Class Aggregate Gradation
 - i) Only Class 1,3,10
 - d) PCC Cylinder Testing
 - i) Only 4x8 cylinders (100 x 200 mm)

- ii) Only 28-day breaks
- e) PCC Field Testing (Slump and Air)

6. SAMPLING

- 6.1 The samples are to be prepared by the District as a split sample from project acceptance testing.
 - 6.1.1 The District will collect one IA sample per test, per testing technician, per year. Example: In the occurrences where a District has two Aggregate Testers, they will need two samples per year.
 - 6.1.2 The samples will be labeled, and all documentation shall be provided with the sample, including the District Lab Number, Project Information, etc.
 - 6.1.3 The District will test the sample as per normal guidelines and provide the IA sampler with the Sample ID for the test results.
 - 6.1.4 The District will enter a note on the sample record in AWP that an IA sample was taken with this sample.

7. PLASTIC CONCRETE TESTING

- 7.1 In the occurrences of tests done on plastic concrete, there will be no change in the current procedure. IA sampler will visit each District and perform testing with each. Each testing technician shall bring their testing equipment for this evaluation.

8. SAMPLE PICKUP

- 8.1 The District will notify the IA sampler that a sample has been created and is available for pickup. The IA sampler will be responsible for the transportation of the sample to MCS&T.
- 8.2 No sample will be dropped off at MCS&T unless specifically instructed by the IA sampler.
- 8.3 In the occurrences of a PCC cylinder, the District will notify the IA sampler of the creation date of the sample within 3 days of the sample creation. The District will also notify the IA sampler of the intended break date.

9. TESTING AT MCS&T

- 9.1 The IA sampler will be responsible for coordinating testing of the IA sample with the respective MCS&T Section Supervisor.
- 9.2 The IA sampler will be responsible for entering the test results into AWP.

10. PROFICIENCY SAMPLES

- 10.1 Proficiency samples shall be considered a second layer of assurance for the WVDOH IA program. Though these are still required, the results of these should only be used in extenuating circumstances where a split/adjacent sample could not be obtained.

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

PROCEDURE FOR EVALUATING QUALITY CONTROL SAMPLE TEST
RESULTS WITH VERIFICATION SAMPLE TEST RESULTS

1. PURPOSE

- 1.1 To provide a procedure for the comparison of quality control sample test results with verification sample test results ~~(similarity)~~.
-

2. SCOPE

- 2.1 This procedure is used to review and evaluate contract quality control samples.
- 2.2 Materials and Tests
- 2.2.1 Aggregate Gradations
- 2.2.2 Asphalt (Marshall)
- 1. Asphalt Content
 - 2. Air Voids
 - 3. Stability
 - 4. Flow
 - 5. Gradation
- 2.2.3 Asphalt (SuperPave)
- 1. Asphalt Content
 - 2. Air Voids
 - 3. Gradation
- 2.2.4 Portland Cement Concrete
- 1. Air Content
 - 2. Consistency
-

3. PROCEDURE

- 3.1 The following procedure will be implemented by the District Materials Supervisor.
- 3.2 After completion of the ~~similarity~~verification sample test, the data will be entered into the Division approved materials tracking program. This data will be compared by the software to the applicable quality control sample test results for the same item. Note that all samples being compared must be taken from the same sampling location, e.g., stockpile, roadway, etc., and sampled and tested in the same manner.
- 3.2.1 If there are more than ten quality control samples, a verification sample shall be done for the first ten samples. Additional ~~similarity~~verification samples shall be done at the

frequency of one in ten. For example, if 16 QC samples are taken, there shall be a similarity verification for samples 1-10 and then another for 11-16.

3.2.1.1 If there are only five to nine quality control samples available, determine the average of all the available consecutive quality control test results. When comparing the grading characteristics of an aggregate, the average ($\bar{X}$) for each sieve will be determined.

3.2.2 In the unlikely event that there are less than five quality control samples available when the similarity verification sample is complete, the District Materials Supervisor will make an informal review of the data. If the data is such that a dissimilarity appears obvious (even without a formal comparison) then Section 4.1 of this procedure would apply. If, however, the verification sample results appear to be similar to the quality control sample results then the verification sample would be judged similar at this point by the District Materials Supervisor ~~to be similar~~, and the applicable portions of Section 5.1 of this procedure would apply with the following statement: "This verification sample (verification sample number recorded here) has been judged to be similar in accordance with Section 3.2.2 of MP 700.00.54." This statement shall be on the sample record.

3.2.3 Determine the range (R) of the quality control samples used in Section 3.2.1 by subtracting the smallest test value from the largest test value.

3.2.2.13.2.3.1 When comparing the grading characteristics of aggregate, the range (R) for each sieve will be determined.

3.2.33.2.4 Compute the interval (I) by substituting the values calculated in Sections 3.2.1 and Section 3.2.3 into the proper equation below. When comparing the grading characteristics of aggregate, the interval(I) for each sieve will be determined.

No. of Samples Used in Calculating the Average in Section 3.2.1	Equation for Computing the Interval (I)
10	$I = \bar{X}_{10} \pm 0.91 \times R$
9	$I = \bar{X}_9 \pm 0.97 \times R$
8	$I = \bar{X}_8 \pm 1.05 \times R$
7	$I = \bar{X}_7 \pm 1.17 \times R$
6	$I = \bar{X}_6 \pm 1.33 \times R$
5	$I = \bar{X}_5 \pm 1.61 \times R$

3.2.43.2.5 The interval (I) is determined by first adding the average ($\bar{X}_n$) to the product of the range (R) times the given constant. This determines the upper limit of the interval. Note that for gradings, if the result obtained is greater than 100, it will be recorded as 100. And second, subtract the product of the range (R) times the given constant from the average ($\bar{X}_n$). This determines the lower limit of the interval. Note here that if the result is less than zero, it will be recorded as zero.

3.2.6 Compare the verification sample test result with the calculated interval.

3.2.53.2.6.1 When comparing the grading characteristics of aggregates, a comparison for each sieve will be determined.

3.3 If the verification sample is an aggregate and all sieve results coincide with or lie between the upper and lower limits of the interval, the quality control sample test results will be ~~considered~~ similar to the verification ~~sample test result~~ sample. If

3.3.13.3 ~~If the similarity sample is an aggregate and~~ any one of the compared values (on any sieve) does not coincide with or lie between the upper and lower limits of the interval, the ~~quality control~~ samples test results will be ~~considered~~ dissimilar ~~to the verification sample~~.

3.4 If the ~~similarity~~ verification sample is an asphalt mix, and the asphalt content and air voids coincide with or lie between the upper and lower limits of their interval, the quality control samples will be ~~considered to be~~ similar to the verification sample. If any one of the compared values does not coincide with or lie between the upper and lower limits of the interval, the samples test results will be dissimilar.

3.4

3.4.1 ~~If the similarity sample is an asphalt mix, and any one of the compared values is not similar to the quality control data, the quality control samples will be considered to be dissimilar.~~

3.5 If the ~~similarity~~ verification sample is Portland Cement Concrete, and both the air content and consistency coincide with or lie between the upper and lower limits of their interval, the quality control samples (~~tests~~) will be ~~considered~~ similar. If any one of the compared values does not coincide with or lie between the upper and lower limits of the interval, the samples test results will be dissimilar.

3.5

4. EVALUATION

4.1 If the quality control sample data is dissimilar to the verification sample the following action will be taken where appropriate.

4.1.1 Review the quality control sampling procedure.

4.1.2 Review the quality control testing procedures.

4.1.3 Check testing equipment.

4.1.4 Review computations.

4.1.5 Review documentation.

4.1.6 Perform any additional investigations that may clarify the dissimilarity.

5. REPORTING AND SAMPLE SUBMISSION

- 5.1 If the quality control samples are found to be similar to the verification sample, the sample shall be marked as “Similar Passed” and submitted to the respective Materials Regional Coordinator for final evaluation using the currently materials tracking software.
- 5.2 If the quality control samples are dissimilar to the verification sample, the sample shall be marked as “Non-Similar” and submitted to the respective Materials Regional Coordinator for final evaluation using the currently materials tracking software.
- 5.2.1 If the Sample is not similar, a note will be made on the sample record including a brief statement of the action taken to correct the deficiency. In the event other documentation is needed, such as a District Materials Inspection Report, to explain and/or support the final resolution of the dissimilarity, the dissimilar verification sample number should be referenced therein.
- 5.3 The results of the investigation as reported will be noted by District Materials in their email submission.
- 5.4 The test agency view shall contain the information: "Issued by District (Number) per MP 700.00.54, (Date)."
- 5.5 When the sample is completed, it shall be authorized by the respective Materials Regional Coordinator.
- 5.6 The testing technician shall be listed on each sample.

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION

MATERIALS PROCEDURE

SEED ACCEPTANCE CRITERIA

1. PURPOSE

- 1.1 To provide an interpretation of existing Specifications governing seed used on Division projects.
- 1.2 The interpretation set forth herein shall apply to all seeding operations.
- 1.3 To provide instructions for use by Division field personnel as to acceptance and documentation of material.

2. REFERENCED DOCUMENTS

- ~~2.1~~ ~~Section 715.28 of the Specifications.~~
- 2.22.1 West Virginia Seed Law, West Virginia Department of Agriculture, Agricultural Materials. Agricultural Materials : West Virginia Department of Agriculture (wv.gov) West Virginia Code Chapter 19, Article 16 - West Virginia Seed Law. West Virginia Code | §19-16 (wvlegislature.gov).

3. CRITERIA FOR ACCEPTANCE

- 3.1 ~~Specifications~~ Governing seed varieties as set forth in ~~the Section 715.28 of the West Virginia Division of Highways Standard Specifications Roads and Bridges~~ shall be interpreted to mean that all seeds utilized on Division projects shall be a commercial variety meeting the definitions and requirements of the West Virginia Seed Law as well as any applicable Federal laws and regulations.
- 3.2 Each container of any variety of seed used on Division projects will bear a "vendors tab" of analysis. Said tag will contain such information as LOT number, germination, purity, weed seed, etc.
- 3.3 Seed bearing a vendor tag with a test analysis date in excess of twelve (12) months (excluding the month of test) is not to be used and shall be removed from the project.
- 3.4 All stored material shall be inspected. Those containers exhibiting improper storage shall not be used and are to be removed from the project.
- 3.5 If the claimed analysis, listed on the vendors tag, is below that set forth in Specification requirements, then adjustments to the application rate shall be made. Such adjustments shall be in accordance with Section 4.

4. ADJUSTING FOR APPLICATION RATE

4.1 Subsequent to receipt of seed at job site, the project engineer or supervisor will compare the test results shown on the vendor tags with those of the governing Specification requirements.

4.1.1 If the percent germination and/or percent purity of each seed is below that of the project Specification requirements, the seed weight per acre shall be computed for adjustments as follows. (The equation yielding the maximum pound of seed per acre shall govern).

$$(GS) (WS) / Gt = Wn$$

GS = Percent germination specified.

Gt = Percent germination on vendor tag.

WS = Pounds of seed per acre as specified on plans, or special provisions.

Wn = The required pounds of seed per acre.

$$(PS) (WS) / Pt = Wn$$

PS = Percent purity specified.

Pt = Percent purity on vendor tag.

WS = Pounds of seed per acre as specified on plans or special provisions.

Wn = The required pound of seed per acre.

4.1.2 If the percent germination and percent purity indicated on the vendor tags exceed the governing Specification requirements, the above formula does not apply.

4.1.3 If a maximum ~~percent~~percent of weed seed content is specified, and the percent weed seed stamped on the vendor tag exceeds the specified limit, the seed is not to be used, and shall be removed from the project.

~~4.1.3~~ **DOCUMENTATION OF SEED**

5. CRITERIA FOR ACCEPTANCE

5.1 ~~Coverage for seed shall be obtained by entering the~~The following information from the vendors tag on ~~shall be documented on the inspector's DWR. Form HL-440.~~

5.1.1 Name of vendor.

5.1.2 Lot number.

5.1.3 Type of Seed.

~~5.1.4~~ Quantity.

~~5.1.4~~5.2 For difficult calculations, Form JH-715 is available for calculating placement (Sample Attached).
The live version of this worksheet is available on the WVDOH MCS&T Toolbox Webpage¹.

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ATTACHMENT

¹ <https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx>

Batch Ticket for Seed, Mulch, and Fertilizer

Project	_____	Date	_____
Batch Number	_____	Type of Mix	D
Station(s)	_____	Acres Batched	10.00

Type of Seed Mix Choices

B	C-1	C-2
D	L	Wetland
Temp		

	Hay Mulch
X	Paper Mulch

Type of Seed	LB/AC	LB	CT Numbers		Fertilizer (LB)	Urea (LB)
Kentucky 31 Fescue	20	200	Lot #			
			Purity			
			Germin.			
			Test Date			
Red Fescue	20	200	Lot #			
			Purity			
			Germin.			
			Test Date			
Crownvetch	20	200	Lot #			
			Purity			
			Germin.			
			Test Date			
Annual Ryegrass	7	70	Lot #			
			Purity			
			Germin.			
			Test Date			
	0	0	Lot #			
			Purity			
			Germin.			
			Test Date			
	0	0	Lot #			
			Purity			
			Germin.			
			Test Date			

Material	Application Rate Per Acre	Payment
Seed Added (if low germination)	LB/AC	LB
Fertilizer Added (if nutrient low)	0.15 TN/AC	1.50 TN
Ounces of Inoculant Used	OZ/AC	OZ
Agricultural Limestone	0.50 TN/AC	5.00 TN
Fertilizer	0.40 TN/AC	4.00 TN
Seed Mix Type D	67.00 LB/AC	670.00 LB
Wood Cellulose Mulch	0.75 TN/AC	7.50 TN
Straw or Hay Mulch	2.00 TN/AC	TN

Foreman for Contractor

Batch Ticket for Seed, Mulch, and Fertilizer

Type of Seed Mix Choices

B	C-1	C-2
D	L	Wetland

Temp

This sheet is used for 2nd and 3rd step seeding with >50% growth and slight to moderate erosion. Apply one half original seed and mulch. If erosion problem, then apply half wood mulch.

Hay Mulch
Paper Mulch

Fertilizer:

Material	Application Rate Per Acre	Payment
Seed Added (if low germination)	LB/AC	LB
Fertilizer Added (if nutrient low)	0.15 TN/AC	0.22 TN
Ounces of Inoculant Used	OZ/AC	OZ
Agricultural Limestone	0.50 TN/AC	0.74 TN
Fertilizer	0.50 TN/AC	0.74 TN
Seed Mix Type D	67.00 LB/AC	99.16 LB
Wood Cellulose Mulch	0.75 TN/AC	1.11 TN
Straw or Hay Mulch	2.00 TN/AC	TN

Remarks:

Foreman for Contractor

West Virginia Division of Highways
Batch Ticket for Seed, Mulch, and Fertilizer

Project NFA-0035(149) Date 8 Month 29 Year 2008
Batch Number 1 Type of Mix Stream Acres Batched 2.00
Station(s) US 35 Sta. 6552+00 to Sta. 6634+00 L & R

(See applicable Specifications for amount of components required.)

A. Check to insure germination conforms to Specifications.

B. Check to insure analysis of fertilizer conforms to Specifications.

If A or B does not conform, show calculations here and amount required
to add to each acre. See MP. 715.28.50 and MP. 700.05.10

☐ Permanent(652)
☒ Temp. Permanent(642)

☐ Hay Mulch
☒ Paper Mulch

Seed :

Fertilizer:

Type of Seed	LB/AC	LB	CT Numbers	Fertilizer (LB)	Urea (LB)
Redtop	6	12	Lot #		
			Purity		
			Germin.		
			Test Date		
Fowl Bluegrass	6	12	Lot #		
			Purity		
			Germin.		
			Test Date		
Virginia Wild Rye	6	12	Lot #		
			Purity		
			Germin.		
			Test Date		
Alkali Grass	6	12	Lot #		
			Purity		
			Germin.		
			Test Date		
Fox Sedge	4.8	9.6	Lot #		
			Purity		
			Germin.		
			Test Date		
Autumn Bentgrass	0.6	1.2	Lot #		
			Purity		
			Germin.		
			Test Date		
Ticklegrass	0.6	1.2	Lot #		
			Purity		
			Germin.		
			Test Date		
Annual Rye	10	20	Lot #		
			Purity		
			Germin.		
			Test Date		

Material	Application Rate Per Acre	Payment
Seed Added (if low germination)		LB
Fertilizer Added (if nutrient low)		TN
Ounces of Innoculant Used		OZ
Agricultural Limestone	0.50 TN/AC	1.00 TN
Fertilizer	0.40 TN/AC	0.80 TN
Seed Mix Type Stream	40.00 LB/AC	80.00 LB
Wood Cellulose Mulch	0.75 TN/AC	1.50 TN
Straw or Hay Mulch	2.00 TN/AC	TN

45 LB (Average weight of 5 hay/straw bales)

Remarks
:

Hydro - SEEDED bare areas throughout project per punchlist

Inspector

Foreman for Contractor

West Virginia Division of Highways

Batch Ticket for Seed, Mulch, and Fertilizer

Project _____ Date _____ Month _____ Day _____ Year _____
 Batch Number _____ Type of Mix _____ Acres Batched _____
 Station(s) _____

(See applicable Specifications for amount of components required.)

A. Check to insure germination conforms to Specifications.

B. Check to insure analysis of fertilizer conforms to Specifications.

If A or B does not conform, show calculations here and amount required to add to each acre. See MP. 715.28.50 and MP. 700.05.10

☐ Permanent(652)
☐ Temp. Permanent(642)
☐ Hay Mulch
☐ Paper Mulch

Seed :

Fertilizer:

Type of Seed	LB/AC	LB	CT Numbers		Fertilizer (LB)	Urea (LB)
			Lot #			
			Purity			
			Germin.			
			Test Date			
			Lot #			
			Purity			
			Germin.			
			Test Date			
			Lot #			
			Purity			
			Germin.			
			Test Date			
			Lot #			
			Purity			
			Germin.			
			Test Date			
			Lot #			
			Purity			
			Germin.			
			Test Date			
			Lot #			
			Purity			
			Germin.			
			Test Date			

Material	Application Rate Per Acre	Payment
Seed Added (if low germination)		LB
Fertilizer Added (if nutrient low)		TN
Ounces of Inoculant Used		OZ
Agricultural Limestone	TN/AC	TN
Fertilizer	TN/AC	TN
Seed Mix Type	LB/AC	LB
Wood Cellulose Mulch	TN/AC	TN
Straw or Hay Mulch	TN/AC	TN

_____ LB (Average weight of 5 hay/straw bales)

Remarks:

Inspector

Foreman for Contractor

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

INSPECTION AND ACCEPTANCE
OF SIGNING MATERIAL

1. PURPOSE

- 1.1 To establish procedures for approving finished aluminum roadway signs or project markers acceptable for use on West Virginia Division of Highways (WVDOH) projects. And to establish a procedure for maintaining a record of such information
-

2. SCOPE

- 2.1 This procedure shall apply to all fabricators who assemble and produce aluminum roadway signs “henceforth referred to as Fabricator” either flat sheet or extruded and related hardware used in installation.
-

3. APPLICABLE DOCUMENTS

WVDOH Specifications for roads and bridge / Supplemental Specifications Section 661

- 3.1 WVDOH Sign Fabrication Manual¹.

- 3.2 WVDOH Design Guide for Signing².

- 3.23.3 MP 106.00.02 - Procedure for Evaluation of New Products for Use In Highway Construction

- 3.3 ~~WVDOH Approved products list “APL” for Aluminum Sheeting for traffic signs.~~

- 3.4 ~~WVDOH Approved products list “APL” for retroreflective sign sheeting~~
-

4. ACCEPTANCE PROCEDURE

- 4.1 For sign materials to be evaluated for acceptance, the Fabricator must comply with the following requirements.
- 4.2 With each shipment, of aluminum signs or sign hardware to a ~~WVDOH~~ WVDOH project, the sign fabricator supplier shall provide shipping documents which contain a laboratory approval number reflecting materials have been inspected meeting quality specified by the WVDOH.
- 4.3 An on-site investigation and evaluation will be conducted by a WVDOH Inspector at the Fabricator’s distribution location prior to materials being shipped.
- 4.4 All bare aluminum blank sign material shall be obtained from the WVDOH APL for aluminum sheeting for traffic signs.
- 4.5 All retroreflective materials shall be obtained from the WVDOH APL for retroreflective sign sheeting.
- 4.6 The Inspector shall verify the finished sign to be free of any visible defects to the reflective sheeting in the form of bubbling or misaligned borders or any defect in

¹ <https://transportation.wv.gov/highways/engineering/Pages/Sign-Fabrication-Manual.aspx>

² <https://transportation.wv.gov/highways/engineering/Pages/Archive.aspx>

relation to the WVDOH Sign Fabrication Manual or the Design Guide for Signing issued by the WVDOH Traffic Engineering Division.

- 4.7 The Inspector is to verify that the finished sign matches the approved shop drawings from Traffic Engineering Division of the WVDOH
- 4.8 The Inspector will examine the workorder or invoice to verify items and quantities are correctly listed, and the Inspector will verify the document has listed the contract ID number to which the materials will be delivered.
- 4.9 The Inspector will examine the work order or invoice to verify APL numbers used for aluminum sheeting and retroreflective sheeting are listed, plus for tracking purposes the workorder or invoice must have a unique date or invoice number from the Fabricator.
- 4.10 If the evaluation of sign materials meets the above requirements, the Inspector shall approve the work order or invoice and issue a seven-digit Laboratory approval number indicating all sign materials and or hardware have been inspected.
- 4.11 If the evaluation of sign materials does not meet the above requirements, the Inspector shall issue a failing Laboratory number, plus report the reasons for not meeting ~~specifications~~Specifications. Also, the Inspector shall inform the Fabricator not to ship items until the failing issues have been resolved.

Ronald L. Stanevich, P.E.
Director
Materials Control, Soils and Testing Division

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

SAMPLING COMPACTED ASPHALTIC MIXTURES FROM THE ROADWAY

1. PURPOSE

- 1.1 This procedure has been written to provide a means for sampling compacted roadway asphalt mixtures.

2. SCOPE

- 2.1 This method covers the procedure for sampling of asphaltic paving mixtures taken from the finished pavement for determination of the characteristics of the compacted mixture.
- 2.2 Samples obtained using this method will be collected for several reasons including but not limited to the following:
- 2.2.1 Visual examination.
- 2.2.2 Measurement for layer thickness.
- 2.2.3 Determination of bulk specific gravity, air voids, and other volumetric properties.
- 2.2.4 Determination of bond strength between constructed layers.

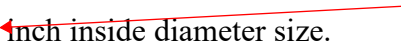
3. REFERENCED DOCUMENTS

- 3.1 WVDOH Standard Specifications – Current Edition
- a) Section 410: Asphalt and Wearing Courses, Percent Within Limits (PWL)
- 3.2 Materials Procedures
- a) MP 401.02.31, Quality Control and Acceptance of Asphalt Mixtures
- b) MP 401.07.20, Sampling Loose Asphaltic Mixtures
- c) MP 401.07.22, Measurement for Thickness of Asphalt Pavement Using Drilled Cores
- d) MP 401.07.23, Interface Bond Shear Strength of Multi-layered Asphalt Pavement Specimens
- e) MP 401.13.50, Determination of Percent Within Limits

3.3 AASHTO Procedures

- a) AASHTO T331, Bulk Specific Gravity and Density of Compacted Asphalt Mixtures Using Automatic Vacuum Sealing Method
-

4. EQUIPMENT AND TOOLS

- 4.1 Powered core drill, water cooled, equipped to core cylindrical samples.
- 4.2 Diamond drill bit of six (6)  inch inside diameter size. 150 mm
- 4.3 Incidental materials and equipment.
- 4.4 Hand-held core sample extraction tool capable of grasping and removing a drilled cylindrical pavement core sample from the pavement without damage to the core sample.

Note: Worn drill bits of the same size as those used for coring have been successfully used by cutting slots vertically along the side of the casing to allow for expansion.

- 4.5 An ice cooler large enough to hold the sample without distortion after it is removed from the pavement.

Note: Large ice coolers (approximately 150 quart)  140 Liters have been used successfully to store and transport multiple pavement cores.

- 4.6 Small plastic bags for core specimens
- 4.7 Masking tape
- 4.8 A marking pencil, paint pen, lumber crayon, or other means suitable for labeling cores.
- 4.9 Markers for labeling the plastic bags.
-

5. MAT DENSITY, BOND STRENGTH, AND THICKNESS CORE SAMPLES

- 5.1 Density acceptance of the asphalt mixture from the roadway shall be determined on the basis of test results from core samples for each Lot. One sample shall be taken from each Sublot. Samples are to be selected by means of a random sampling plan.
- 5.1.1 Random numbers used shall be generated from a calculator, software capable of generating random numbers, or from the Random Number Table attached to this MP. All random numbers shall be recorded and maintained in order to verify the means of sample locations.
- 5.2 At the Pre-Paving Meeting, WVDOH and Contractor personnel shall confer and agree on the sequence and widths of the paving operation in order for a sampling

plan to be developed by the Division. The plan shall begin at the intended starting point and progress continuously until the end of the paving operation. Lots for mainline travel lanes should not be extended onto outside shoulders. As paving progresses onto the outside shoulders, new lots shall be established along the shoulders. Ramps, turning lanes, and truck lanes are traveled lanes and shall be considered as mainline pavements.

- 5.3 All lots shall be calculated and laid out based on converting 2500 tons to square yardage using the project plan lift thickness and a project theoretical yield. The theoretical yield shall be based on 94% of the design maximum theoretical density from the approved JMF (Form T400) for asphaltic mixture designs. The lots shall be laid out using the full width of placement for each pull. However, no samples shall be taken from the inside shoulder adjacent to the median (generally four feet in width), or the outside 12 inches (one foot) of the unsupported or supported edge of a paving mat. The remaining dimension of width shall be considered testable and used to determine the random location of each sample. Partial lots shall be laid out and either considered separate lots or combined with the previous lots as per Table 410.7.1 of the WVDOT Standard Specifications.

- 5.3.1 Sample locations determined using random numbers shall be rounded to the nearest 1ft for both length and offset. If it is determined that the offset is zero or the maximum dimension in the testable width, the samples should be taken within either the first or last one foot respectively of material at each side of the testable width. Additionally, samples determined to fall at the same location as a sample removed from an underlying paving lift should be recalculated using a new random number for either width or length.

NOTE: It is likely that some lots will be laid out in the field beginning with a mat that is a different dimension than that where the lot ends. Such would be the case for a lot that starts within a mat being pulled along the median where the fast lane and inside shoulder are being pulled simultaneously (approximately 16'), but ends along the outside or slow lane (approximately 12') on the other side of the median. In such a case, it will be necessary to calculate the area on the side of the median where the lot is started, then use the remaining area for the lot to determine the length of the remaining portion of the lot on the other side of the median.

- 5.4 Refer to the Illustrative Example included in this MP for examples of how to select samples using a random sampling plan for pavement courses. Density acceptance samples and bond strength samples should be cross-referenced to a corresponding mixture acceptance sample as per MP 401.07.20.

- 5.4.1 For purposes of identification, the sampling ID shall be consistent for projects. Along with the pertinent project identification data (as indicated in Section 410 of the Standard Specifications) that is needed for processing test results, it will be necessary to discern all samples on the project by lot, subplot, and type of sample. For mat density and bond strength samples obtained from the mat, and for joint density samples obtained from the longitudinal joint, they should follow the

convention shown below. Please note that mat density and bond strength samples shall also be measured for thickness.

Layer/Lot Designation	Lot #	Sub Lot #	Type of Sample	Example Sample ID
B – Base I – Intermediate S – Surface/Wearing J – Joint Density Core	2	5	M – Mat B – Bond Core D – Density Core	B2-5M J2-5

- 5.5 Samples for mat density shall be used to determine the percent compaction of the finished mat by first determining the bulk specific gravity of each specimen as per AASHTO T331, and then by dividing by the corresponding daily theoretical maximum density of the paving mixture.

6. LONGITUDINAL JOINT DENSITY CORE SAMPLES

- 6.1 Samples shall be taken on the basis of a random sampling plan established for each lot. Lots shall be established as specified in Standard Specifications 410.7 - Acceptance Testing and will consist of 10,000' of constructed longitudinal joint. Each lot will be further divided into sublots consisting of 2,000'. Partial lots shall be addressed as described within Section 410.7 of the Standard Specifications. Lots along constructed joints between travel lanes shall not extend onto the constructed joint adjacent to the outside shoulders. New lots shall begin with the constructed joint adjacent to the outside shoulders.
- 6.2 One sample shall be taken from each subplot. Refer to Figure 3 for an example of how to select samples using a random sampling plan.
- 6.3 A core sample taken from a longitudinal vertical joint shall be centered on the line where the joint between the two adjacent lifts abut at the surface as illustrated in Figure 1 below. The center of all vertical joint cores shall be within one (1) inch of this joint line.
- 6.4 When the two lanes forming the longitudinal joint have daily theoretical maximum specific gravity values differing by more than 0.050, particular attention should be paid to these core locations. Examine each longitudinal joint core sample to ensure that approximately one-half of the longitudinal joint core sample is from each lane. If the materials in the longitudinal joint core are unbalanced, take a replacement sample at a location within twelve (12) inches longitudinally of the original sample location and adjust the location of the core drill relative to the joint line to ensure approximately equal material on each side of the joint will be obtained in the core sample.

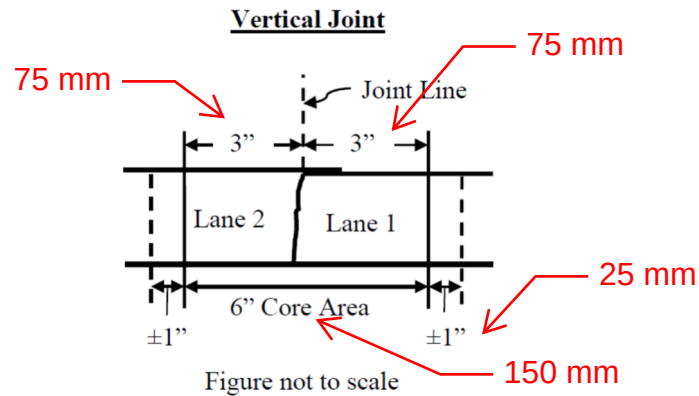


Figure 1 – Cross-sectional View, Position of Core Along Longitudinal Joint

- 6.5 Samples for joint density shall be used to determine the percent compaction of the finished mat by first determining the bulk specific gravity of each specimen as per AASHTO T331, and then by dividing by the corresponding daily theoretical maximum densities of the paving mixture.

7. GENERAL CORING AND SAMPLING PROCEDURE

- 7.1 In the presence of the Engineer's representative, the contractor shall core and identify the density acceptance samples as specified in Section 410.7 of the Standard Specifications.
- 7.2 Efforts should be taken to cool the pavement with ice or other suitable means prior to coring. Using the powered core drill, drill core samples to the specified diameter (6.0 ± 0.125 inches) and to a depth sufficiently below the depth of the pavement course to be sampled. Ensure sufficient water is dispersed through the core bit during drilling to keep the drill bit and core sample cool enough in order to allow cutting through the pavement without damaging the sample and the core bit. Carefully and slowly lower the drill bit to the surface of the pavement course at the start of drilling to prevent the drill bit from moving and to obtain a smooth clean initial drill cut at the surface of the core sample. After drilling to a sufficient depth, carefully raise the core drill bit to prevent any damage to the core sample.
- 7.2.1 Additional care should be taken when laying out and drilling samples for bond strength testing. Prior to drilling the sample, mark the pavement within the area to be cored using a lumber crayon or other suitable means to indicate the direction of traffic. Efforts shall be taken to ensure the core location has cooled sufficiently, and the drill bit is plumb so the sample is not skewed after removal. Skewed samples will likely not be suitable for testing in the shear testing apparatus. Drilling depth shall be such that the core is cut completely through the material immediately underlying the surface lift to prevent the core from pulling apart at the bonded surface during the removal process.

- 7.3 Carefully dislodge or break the core sample away from the underlying pavement layer. Do not distort, bend, crack, damage or physically change the physical condition of the core sample during this operation.
- 7.4 Using a hand-held core sample extraction tool, carefully grasp and remove the core sample from the pavement. Do not distort, bend, crack, damage or physically change the physical condition of the core sample during removal from the pavement.
- 7.5 Immediately after removing the core sample from the pavement, wash off the core sample with water to remove the fine material generated from the drilling operation. Air dry or towel dry the core sample sufficiently to allow identification of the Lot and subplot number on each core sample by using a paint pen, or other suitable means.
- 7.6 If a core sample includes materials other than the material or pavement course to be tested, clearly show and mark with a paint pen the section(s) of each core sample to be discarded. Core samples suspected of including more than one material and not clearly showing the section to test, and the section(s) to discard, will be considered non-conforming samples and will not be tested until the section to test is identified.
- 7.7 Once the core sample has been obtained and identified, the Division will take immediate possession of the core sample and store it in a proper environment. Overheating or impact can damage core samples and prevent accurate test results.
- 7.8 Samples should be placed in separate small plastic bags and stored out of direct sunlight and/or placed in a cooler with enough ice to prevent them from warming up. The sample bags can be marked ahead of time to further help identify individual samples once transported to the lab. Core samples should then be laid in the cooler with the top surface (flat) down on the bottom of the cooler to prevent movement.
- 7.9 During the same work shift for placement of the sampled asphalt concrete mix, each core hole location shall be backfilled with compacted mixture of the same material being used for paving, or other preapproved method. Efforts shall be taken to clean the hole of loose debris and any standing water shall be removed. If asphalt mixture is used for backfilling, the material shall be placed in lifts, as necessary, and substantial compactive effort shall be applied to each lift using a device comprised of a suitable handle with an attached tamping foot of a size slightly smaller than the core hole. Fuel or solvent based release agents are strictly prohibited during this process. Each core location shall be sealed with an approved crack/joint sealant prior to contract completion.
- 7.10 After the Lot is completed or has been terminated, or at the end of each day of placement, the Division personnel will transport the core samples from each day of production to the District Materials Laboratory or Materials Control, Soils & Testing Division for additional processing and evaluation.

Illustrative Example – Project and Lot Layout ← **Example in English Units only**

An exactly four-mile-long project is to commence paving within the next couple of weeks along an interstate roadway. The division has contacted the contractor to determine the paving sequence and widths and has confirmed that the approved JMF maximum theoretical density is 2501 kg/m³. For theoretical yield on the project, 94% of 2501 kg/m³ is 2351 kg/m³. Dividing by 1000 and then multiplying by 62.4 PCF, the corresponding density in English units is 146.7 PCF. Using this value, and selecting the proper conversion factor from Table 1 below, the corresponding application rate per square yard at 1.5 inches thick is determined as follows:

Table 1 - Conversion of Design Bulk Density to In-Situ Application Rate

Project Design Thickness (inches)	Conversion for Application Rate (psy)
1.00	0.750
1.25	0.938
1.50	1.125
1.75	1.313
2.00	1.500
2.25	1.688
2.50	1.875
2.75	2.063
3.00	2.250

(Use English units) 146.7 pcf x 1.125 cf/SY = 165 psy (nearest pound)

The corresponding lot area for placement of the material in square yards is then calculated as follows:

$(2500 \text{ tons} \times 2000 \text{ pounds per ton}) / 165 \text{ psy} = 30,303 \text{ sy (nearest sy)}$

Work will begin on the inside fast lane next to the median. The first pull will be 16' wide. The length of the lot, length per subplot, and total area per subplot is calculated as follows:

$30,303 \text{ SY} \times 9 = 272,727 \text{ sf}$

$272,727 \text{ sf} / 16 = 17,045' \text{ Total lot length (nearest linear foot)}$

$17,045 / 5 = 3409' \text{ length per subplot}$

$30,303 / 5 = 6,061 \text{ sy per subplot (nearest sy)}$

These values will be used to lay out the station for the beginning of each subplot, and to keep track of the breakdown of a subplot that begins on one side of median and then continues on the other side in an opposite direction. The area for each subplot is used when the situation above occurs and there is a change within the subplot to a pull of a different width.

The beginning and ending stations for each lot and subplot shall then be calculated and plotted in continuous fashion. Figure 2 shows a clean project layout using the widths for each pull, beginning and ending stations and how each lot/sublot progress for a complete project. Daily stops can also be approximated and then actual stops shown on a diagram to help keep track of

the entire project. Partial mat and joint lots were addressed along the main travel lanes and new lots were started along the shoulder.

Project Layout By Area - With Estimated Daily Paving Stops

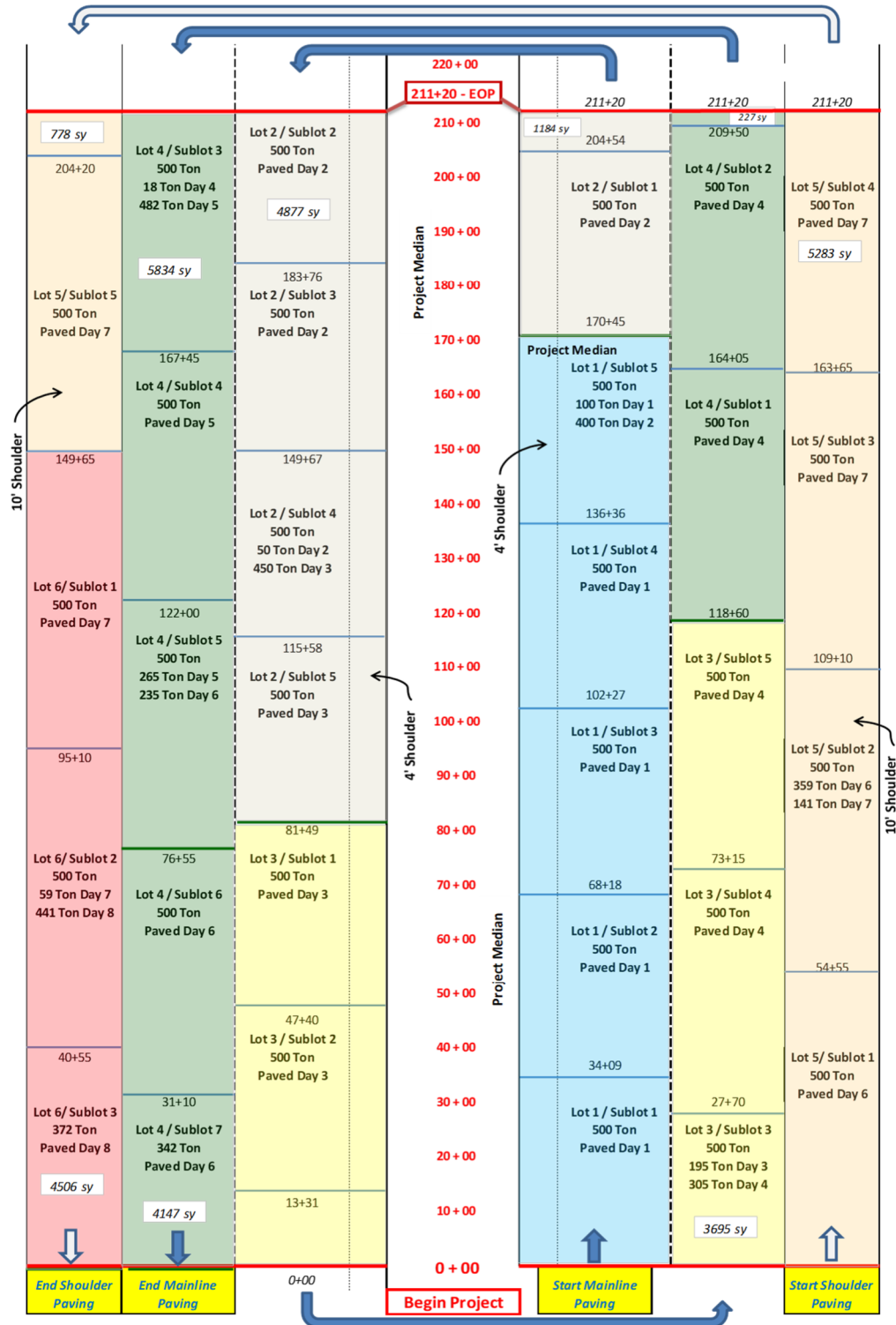


Figure 2

Using Lot 1 from Figure 2, the random sample locations are determined as shown below:

Lot #1-Density Cores

Sublot	Random Numbers		Length	Width
	X (length)	Y (width)		
1	0.632	0.287	0.632 (3409') = 2,155'	0.287 (11') = 3'
2	0.534	0.264	0.534 (3409') = 1,820'	0.264 (11') = 3'
3	0.871	0.159	0.871 (3409') = 2,969'	0.159 (11') = 2'
4	0.753	0.177	0.753 (3409') = 2,567'	0.177 (11') = 2'
5	0.277	0.530	0.277 (3409') = 944'	0.530 (11') = 6'

Lot #1- Bond Strength Cores

Sublot	Random Numbers		Length	Width
	X (length)	Y (width)		
1	0.149	0.155	0.149 (3409') = 508'	0.155 (11') = 2'
2	0.239	0.992	0.239 (3409') = 815'	0.992 (11') = 11'*
3	0.295	0.480	0.295 (3409') = 1,006'	0.480 (11') = 5'
4	0.517	0.473	0.517 (3409') = 1,762'	0.473 (11') = 5'
5	0.805	0.741	0.805 (3409') = 2,744'	0.741 (11') = 8'

* Sample should be taken between 10'-11' offset

Using the offsets and lengths within each subplot, the stations and offsets for Mat Density and Bond Strength Core samples are determined as shown below.

Lot #1 - Corresponding Sample Stations for Mat Density –

Sublot	Beginning Station	Length	Sample Station
1	0+00	2,155	21+55, 3' offset
2	34+09	1,820'	52+29', 3' offset
3	68+18	2,969'	97+87, 2' offset
4	102+27	2,567'	127+94, 2' offset
5	136+36	944'	145+80, 6' offset

Lot #1 - Corresponding Sample Stations for Bond Strength

Sublot	Beginning Station	Length	Sample Station
1	0+00	508'	5+08, 2' offset
2	34+09	815'	42+24, 10' offset
3	68+18	1,006'	78+24, 5' offset
4	102+27	1,762'	119+89, 5' offset
5	136+36	2,744'	163+80, 8' offset

For purposes of illustration, all locations for loose samples, mat density cores, and bond strength cores are shown in Figure 3 below. Refer to MP 401.07.20 for more information on obtaining loose samples of asphaltic mixture for determination of asphalt content and gradation.

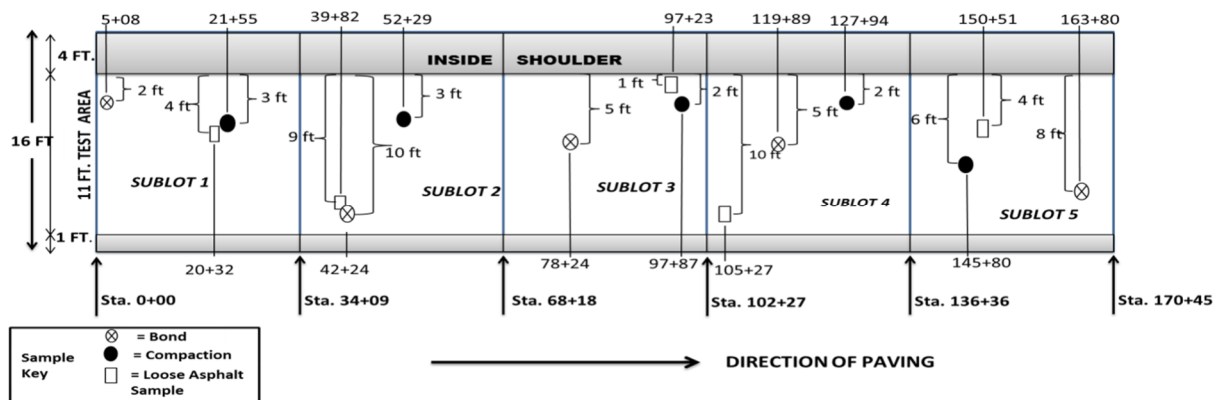


Figure 3

Using the same methodology and following the continuous lots in correspondence to paving sequence, the entire project layout for sampling can be completed as shown in Figure 4. Longitudinal joint lots begin at Station 0+00 between the fast and slow lanes and Joint Lot 1 ends at 10+00. Joint Lot 3 begins at Sta. 20+00 and continues to the other side of the median and extends the amount of the lot remaining.

After Figure 4, a summary is shown to help quantify the daily and total sampling efforts for the project.

Project Layout with Sampling Plan - Density and Bond Cores, Loose Mix Samples

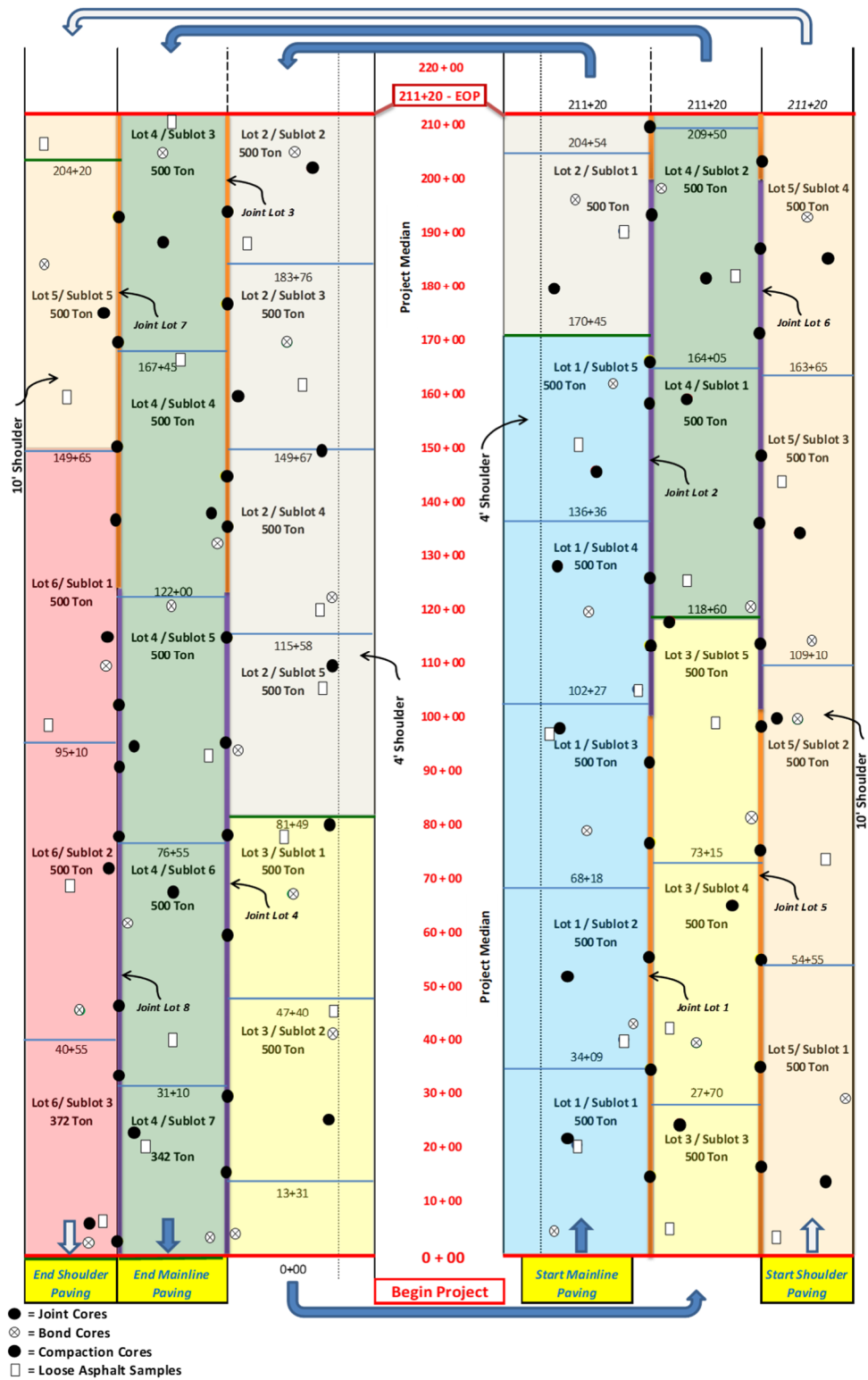


Figure 4

Table 2 – Testing Summaries from Daily and Total Production

	Loose Sample	Density Core *	Bond Core *	Joint Cores
Day 1	4	4	4	0
2100 Ton	4 --> Lot 1	4 --> Lot 1	4 --> Lot 1	
Day 2	4	5	4	0
1950 Ton	1 --> Lot 1	1 --> Lot 1	1 --> Lot 1	
	3 --> Lot 2	4 --> Lot 2	3 --> Lot 2	
Day 3	4	3	5	0
2145 Ton	2 --> Lot 2	1 --> Lot 2	2 --> Lot 2	
	2 --> Lot 3	2 --> Lot 3	3 --> Lot 3	
Day 4	5	5	4	11
2323 Ton	3 --> Lot 3	3 --> Lot 3	2 --> Lot 3	5 --> Lot 1
	2 --> Lot 4	2 --> Lot 4	2 --> Lot 4	5 --> Lot 2
				1 --> Lot 3
Day 5	2	2	3	5
1265 Ton	2 --> Lot 4	2 --> Lot 4	3 --> Lot 4	4 --> Lot 3
				1 --> Lot 4
Day 6	5	4	3	9
1918 Ton	3 --> Lot 4	3 --> Lot 4	2 --> Lot 4	5 --> Lot 4
	2 --> Lot 5	1 --> Lot 5	1 --> Lot 5	4 --> Lot 5
Day 7	3	5	4	13
2200 Ton	1 --> Lot 5	2 --> Lot 5	2 --> Lot 5	1 --> Lot 5
	2 --> Lot 6	3 --> Lot 6	2 --> Lot 6	5 --> Lot 6
				5 --> Lot 7
				2 --> Lot 8
Day 8	3	2	3	4
812 Ton	3 --> Lot 6	2 --> Lot 6	3 --> Lot 6	4 --> Lot 8
<i>* Measured for Thickness</i>				
Totals :	30	30	30	42
	6 Lots	6 Lots	6 Lots	8 Lots
60 Cores Measured for Thickness				

Table 3 - Random Numbers

.858	.082	.886	.125	.263	.176	.551	.711	.355	.698
.576	.417	.242	.316	.960	.819	.444	.323	.331	.179
.687	.288	.835	.636	.596	.174	.866	.685	.066	.170
.068	.391	.739	.002	.159	.423	.629	.631	.979	.399
.140	.324	.215	.358	.663	.193	.215	.667	.627	.595
.574	.601	.623	.855	.339	.486	.065	.627	.458	.137
.966	.529	.757	.308	.025	.836	.200	.055	.510	.656
.608	.910	.944	.281	.539	.371	.217	.882	.324	.284
.215	.355	.645	.460	.719	.057	.237	.146	.135	.903
.761	.883	.771	.388	.928	.654	.815	.570	.539	.600
.869	.222	.115	.447	.658	.989	.921	.924	.560	.447
.562	.036	.302	.673	.911	.512	.972	.576	.838	.014
.481	.791	.454	.731	.770	.500	.980	.183	.385	.012
.599	.966	.356	.183	.797	.503	.180	.657	.077	.165
.464	.747	.299	.530	.675	.646	.385	.109	.780	.699
.675	.654	.221	.777	.172	.738	.324	.669	.079	.587
.279	.707	.372	.486	.340	.680	.928	.397	.337	.564
.338	.917	.942	.985	.838	.805	.278	.898	.906	.939
.316	.935	.403	.629	.130	.575	.195	.887	.142	.488
.011	.283	.762	.988	.102	.068	.902	.850	.569	.977
.683	.441	.572	.486	.732	.721	.275	.023	.088	.402
.493	.155	.530	.125	.841	.171	.794	.850	.797	.367
.059	.502	.963	.055	.128	.655	.043	.293	.792	.739
.996	.729	.370	.139	.306	.858	.183	.464	.457	.863
.240	.972	.495	.696	.350	.642	.188	.135	.470	.765

08/23/2023

Ronald L. Stanevich, P.E.

Director

Materials Control, Soils and Testing Division

MP 401.07.21 Steward – Asphalt Section

RLS: J

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION

MATERIALS PROCEDURE

DETERMINING APPLICATION RATE OF GROUND
AGRICULTURE LIMESTONE BASED ON PH TESTS

1. PURPOSE

- 1.1 To provide guidance and instruction in determining the application rate of agricultural limestone to specific areas, based on pH, prior to seeding.
 - 1.2 This procedure is applicable to all projects and is intended to be used in the field.
-

2. DEFINITIONS

- 2.1 Section - An entire cut, fill, or median area, or any portion thereof, to receive either permanent or temporary seeding.
 - 2.2 pH - The acidity or alkalinity of a substance expressed as a numerical value.
 - 2.3 Average pH - The average of individual pH determinations from each section.
-

3. PROCEDURE

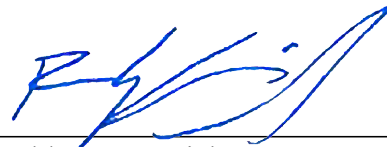
- 3.1 All pH determinations shall be made in accordance with instructions that accompany soil reaction kits furnished by Materials Control, Soils and Testing Division (MCS&T) to District Materials.
 - 3.2 For through cuts or through fill slope sections, the average pH will be determined from a total of six individual readings. If both sides of the roadway are seeded concurrently, three of the individual readings shall be made on each side.
 - 3.3 For side hill cut and side hill fill sections, the average pH will be determined from six individual readings from each side of the roadway.
 - 3.4 For medians, the average pH will be determined from six tests for each section.
 - 3.5 For all other miscellaneous sections not listed above, the average pH will be determined from two tests.
-

**4. DETERMINING APPLICATION RATES OF AGRICULTURAL
LIMESTONE**

- 4.1 Using the average pH, as set forth in Section 3, each section will be limited at the rates specified in Table 1 for the type of soil and seed mixture.

5. DOCUMENTATION

- 5.1 Results of pH determinations and locations will be documented on the attached worksheet(s), with one copy being forwarded to the Materials Control, Soils and Testing Division by District Materials.



10/17/2023

Ronald L. Stanevich, P.E.
Director
Materials Control, Soils and Testing Division

MP 700.04.10 Steward – Environmental and Coatings Section
RLS:Pp

ATTACHMENT

TABLE 1
 RATES FOR APPLYING AGRICULTURAL LIMESTONE

(Pounds per Acre)  Kg/hectare

Soil pH	Degree of Acidity	Crown Vetch and Lawn (Type C ₁ C ₂ D)		Sericea Lespedeza and K ₃₁ Fescue (Type A and B)	
7+	Neutral to Alkaline	Sandy Soil	All Others	Sandy Soil	All Others
6.0 to 6.9	Slightly Acidic	1,000	2,000	0	0
5.5 to 5.9	Medium	2,000	4,000	1,000	1,000
4.5 to 5.4	Strong	3,000	5,000	1,500	2,000
3.5 to 4.4	Very Strong	Not Suitable for Crown Vetch		3,000	4,000
<= 3.4	Toxic to most Plants	Not Suitable for Crown Vetch		5,000	8,000

1000 = 1100
 1500 = 1700
 2000 = 2200
 3000 = 3400
 4000 = 4500
 5000 = 5600
 8000 = 8970

TABLE 2
 FIELD DETERMINATION OF pH

Project:				County:		
Date				Signature:		
Section Sta. to Sta.	Right and/or Left	Cut or Fill	pH Values	Average pH	Sandy or Other	Appl. Rate
			1= 2= 3= 4= 5= 6= Σ=			
			1= 2= 3= 4= 5= 6= Σ=			
			1= 2= 3= 4= 5= 6= Σ=			
			1= 2= 3= 4= 5= 6= Σ=			

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION

MATERIALS PROCEDURE

PAINT TESTING METHODS

1. PURPOSE

- 1.1 To set forth the standard test methods to be used in analyzing paint.

2. REFERENCED DOCUMENTS

- 2.1 American Society for Testing and Materials (ASTM) Section 6, Paints, Related Coatings, and Aromatics.
- 2.2 Federal Test Methods Standard Number 141D, Paint, Varnish, Lacquer and Related Materials: Methods of Inspection, Sampling and Testing.

3. TESTING METHODS

- 3.1 Table I, in this MP, is a list of the paint testing methods. It contains the following information:
- 3.1.1 Test - This is the name of each test.
- 3.1.2 Reference Document - This is the referenced document where you can find each test.
- 3.1.3 Test Method Number - This is the number assigned to each federal test method.

4. GENERAL INFORMATION

- 4.1 Adhesion - (Film thickness greater than 5 mils (125 μ m)) ASTM D3359 (Method A)
Adhesion - (Film thickness 5 mils (125 μ m) or less) ASTM D3359 (Method B)
- 4.2 Test Panel Preparation
- 4.2.1 Panels for testing shall meet the requirements of Federal Test Method 2011.
- 4.2.2 Panels that receive hot-dip galvanizing should be blast clean to near white finish (SSPC-SP10) and galvanized in accordance with the AASHTO M111. Average galvanized coating thickness should be 1.8 Mils.

- 4.2.3 Coating applied over galvanizing will be done in accordance with the manufacturer's product data sheets. If the data sheet does not show how to apply the coating over galvanizing, then the manufacturer shall furnish this information in writing. Failure to provide this information could result in incorrect preparation of the galvanized surface, thus resulting in failure of the paint system.
- 4.2.4 All coatings shall be applied at the normal field application thickness. Primers will be applied over panels that have been cleaned to a near white (SSPC-SP10) condition. All coatings, which are part of a coating system, shall be applied over the previous coating in the system.
- 4.3 Curing Conditions
- 4.3.1 All coatings except zinc primers shall be cured seven days prior to testing. The curing will be done in the laboratory under normal laboratory conditions of temperature and humidity.
- 4.3.2 Zinc primers shall be cured, as in 4.3.1, except the cure period will be 10 days.
- 4.3.3 All coatings which require chemical resistance testing, will be cured an extra 24 hours at 221°F - 230°F.  105 C - 110 C
- 4.4 Chemical analyses of pigments shall be conducted by ASTM test methods. In cases where no ASTM test method is available, Federal test methods or a mutually agreed procedure shall be used.
- 4.5 Any test method not included in Table I shall be conducted according to ASTM, Federal Test or mutually agreed to procedures.
- 4.6 Initial approval of a paint requires that all specified tests be conducted. Subsequent batches, at the Division's option, may have randomly selected tests conducted.


10/17/2023

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Director
Materials Control, Soils and Testing Division

TABLE I

	Test	Referenced Document	Test Methods
1.	Accelerated Weathering	2.1	G53
2.	Adhesion (Film thickness 5 mils (125 µm) or less)	2.1	D3358 (Method B)
3.	Adhesion (Film thickness greater than 5 mils (125 µm))	2.1	D3358 (Method A)
4.	Chemical Analysis of Pigments	4.4	MP 711.00.20
5.	Chemical Resistant (Spot Test)	2.1	D1308
6.	Coarse Particles	2.1	D185
7.	Color	2.1	D2244
8.	Compatibility	2.2	4203
9.	Condition of Container	2.2	3011
10.	Consistency (Viscosity)	2.1	D562
11.	Density (Weight/Gallon)	2.1	D1475
12.	Drying (Traffic Paint - No Pickup)	2.1	D711
13.	Drying Time	2.1	D1640
14.	Fineness of Grind	2.1	D1210
15.	Flexibility	2.2	6221
16.	Infrared Scan	2.1	D2621
17.	Leafing	2.1	D480
18.	Nonvolatile Vehicle	2.2	4051
19.	Pigment - Vehicle	2.2	4021
20.	Salt Spray	2.1	B117
21.	Sampling	2.1	D3925
22.	Skinning	2.2	3021
23.	Specular Gloss (60°)	2.1	D523
24.	Storage Stability	2.1	D1849
25.	Total Solids	2.1	D2369
26.	Water	2.2	4081
27.	Working Properties	2.2	4541, 4321, 4331

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS & TESTING DIVISION

MATERIALS PROCEDURE

INORGANIC ZINC PRIMER QUALITY ASSURANCE PROCEDURE

1. PURPOSE

- 1.1 To establish a procedure for certifying inorganic zinc paint suppliers and to set forth sampling, testing, and shipping procedures for certified and noncertified suppliers.
- 1.2 This procedure shall apply to all suppliers of inorganic zinc paint. Both certified and non-certified sources shall follow the sampling, testing, documentation, and shipping instructions of this materials procedure.

2. REFERENCED DOCUMENTS

- 2.1 MP 711.00.20 - Paint Testing Methods.
- 2.2 ASTM D3925 - Sampling Liquid Paints and Related Pigment Coatings.
- 2.3 AASHTO M300 - Standard Specification for Inorganic Zinc Primer.

3. PROCEDURE

- 3.1 Initial Requirements for Certification
 - 3.1.1 The supplier shall submit a written request for certification stating that all material shipped to the Division will conform to specifications. This request is to be signed by an authorized representative of the company.
 - 3.1.2 A Quality Control Program adequate to ensure that the material complies with specifications.
 - 3.1.3 Test equipment and qualified personnel necessary to test the material for compliance with specifications. The laboratory may be at a location other than the place of manufacture. The laboratory shall be approved by the Division.
 - 3.1.4 A satisfactory record of compliance with the specifications.
 - 3.1.5 Once the requirements for certification have been met, the Division will notify the supplier. Shipments may then be made using the procedure given in Section 6.

4. SAMPLING AND TESTING

- 4.1 The sampling and testing are divided into two phases as follows:
 - 4.1.1 Phase One consists of the suppliers' Quality Control testing and the Division's optional monitor sample tests.

- 4.2 Phase One Sampling and Testing: Sampling shall be conducted in accordance with ASTM D3925. Testing shall be conducted by the test methods required by AASHTO M300. When the test method is not mentioned in AASHTO M300, the test shall be conducted by the methods in MP 711.00.20.
- 4.2.1 The supplier shall test material which is produced to meet the AASHTO M300 specification. All tests required by the M300 specification shall be conducted and the test data shall be sent to the Division. Work sheets and panels shall be maintained for 1 year and be available to the Division's representative upon request.
- 4.2.2 The supplier shall submit to the Division on a semi-annual basis test results on a batch of previously qualified product (approved code number).
- 4.2.3 At the Division's option, monitor samples will be tested at periodic intervals for specification compliance. Actual sampling frequency will vary in accordance with such factors as the past history of the material.
- 4.3 Phase Two Sampling and Testing: Shall consist of field samples and independent assurance samples. The samples shall be tested by the Division for all requirements of the governing specifications.

5. PROCEDURES FOR SHIPPING

- 5.1 Certified Source
 - 5.1.1 The supplier shall include the following information on the shipping invoice: Name and location of company, type of material, quantity, date shipped, supplier's certification number, batch code number, date of manufacture, and a statement that the material meets AASHTO M300 Specifications.
- 5.2 Non-Certified Source
 - 5.2.1 Each batch or LOT shall be sampled and tested. The quantity represented by the sample shall be the quantity in the vat at the time of sampling, or if the material is stored in drums or pails, the quantity of the particular batch on hand at time of sampling.
 - 5.2.2 Tests shall be conducted by a Division approved laboratory. The Division may elect to use the supplier's test results in combination with their own test results.
 - 5.2.3 If the sample meets specifications, shipments may be made until the entire batch or LOT has been shipped. Notification of shipment is to be made to the Division prior to shipment.
 - 5.2.4 Material which has been tested and does not meet specifications may not be shipped until it has been reworked, retested, and meets specifications.
- 5.3 Documentation Required of Non-Certified Suppliers
 - 5.3.1 Shipments will be made in accordance with 5.1.1 of this procedure except that the following additional information will be required on the shipping documents: Batch

number and date sampled. If the material has been tested and meets specifications, the invoice shall list the Division's laboratory number assigned to that sample.

6. CERTIFICATION OF COMPLIANCE

- 6.1 Samples taken in accordance with Section 4.3, which fail to meet specifications, shall be reviewed by this Division to determine the cause of failure. This investigation shall include a review of the supplier's test records.
- 6.2 Two consecutive failing samples shall be cause to remove the supplier from the certified list. The supplier shall show proof by actual test data that the cause of failure has been found prior to recertification.
- 6.3 During the decertification period, the supplier may have their material sampled and tested on a batch-by-batch basis in accordance with Section 5.2.
- 6.4 When the quantity of material is 50 Gallons or less, the Division may elect to accept the material based on certified test data from the supplier or passing test results from a Division approved laboratory.



10/17/2023

Ron L. Stanevich, P.E.
Director
Materials Control, Soils and Testing Division

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

QUALITY ASSURANCE OF REINFORCED CONCRETE CULVERT,
STORM DRAIN, AND SEWER PIPE

1. PURPOSE

- 1.1 To set forth the procedures which govern the Quality Assurance of Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- 1.2 To set forth manufacturers Quality Control requirements.
- 1.3 To set forth acceptance inspection procedures.
- 1.4 To set forth documentation and shipping procedures.

2. SCOPE

- 2.1 This procedure will apply to all manufacturers of Reinforced Concrete Culvert, storm pipe, and sewer pipe for use in West Virginia projects.
- 2.2 This procedure will establish the basis for acceptance of reinforced concrete pipe.

3. APPLICABLE SPECIFICATIONS

- 3.1 All standard types of reinforced concrete pipe are to be manufactured and tested in accordance with Section 714.2 of the WVDOT Specifications for Roads and Bridges.
- 3.2 Each LOT of reinforced concrete pipe having a wall thickness of 4.5 inches (110 mm) or less, which is manufactured in accordance with the applicable specifications is treated in the following manner to determine acceptability.
 - 3.2.1 The three-edge bearing test (AASHTO T 280) shall be used to determine the force required to produce the 0.01-inch (0.25 mm) crack and the minimum specified ultimate load.
 - 3.2.1.1 50% of the LOTs of Class III and Class IV concrete pipe 24 inches (610 mm) in diameter and less, and conforming to WVDOT Specifications, will be accepted based on the Fabricator's certification, provided they are QCast Certified by the American Concrete Pipe Association (ACPA). Testing of Class III and Class IV concrete pipe greater than 24 inches (610 mm) in diameter shall be witnessed by the Division.
 - 3.2.1.2 50% of the LOTs of Class V Concrete Pipe with a diameter less than 24 inches (610 mm), and conforming to WVDOT Specifications, will be accepted based on the Fabricator's certification, provided they are QCast Certified by the ACPA. Testing of Class V Concrete Pipe, with a diameter greater than or equal to 24 inches (610 mm), shall be witnessed by the Division.

- 3.2.2 The absorption test (AASHTO T 280) shall be conducted on samples selected from the wall of the pipe.
- 3.2.3 A plant inspection of the finished product is conducted to determine dimensional conformance and freedom from defects.
 - 3.2.3.1 For LOTs of concrete pipe accepted on the Fabricator's certification, the inspection, including the three-edge-bearing test, will be performed and recorded by the Fabricator's Quality Control person. These LOTs shall be as defined in Table 1, but the sizes shall be based on the criteria in the QCast Certification program.
- 3.3 Each LOT of reinforced concrete pipe fabricated with dry cast concrete having a wall thickness greater than 4.5 inches (110 mm), which is manufactured in accordance with the applicable specifications, is treated in the following manner to determine acceptability.
 - 3.3.1 The compressive strength of the concrete will be determined by testing cores taken from the wall of the pipe. The manufacturer may choose to test this pipe as specified in Section 3.2.1, in which event the requirements for the 0.01-inch (0.25 mm) crack and the minimum specified ultimate load shall be met. This choice shall not be applied to a LOT (refer to Table 1) of pipe, which has been previously cored and found unacceptable.
 - 3.3.2 The absorption test (AASHTO T 280) shall be conducted on samples selected from the wall of the pipe.
 - 3.3.3 A plant inspection of the finished product will be conducted by the Division to determine dimensional conformance, and freedom from defects.
- 3.4 Each LOT of reinforced concrete pipe fabricated with wet cast concrete can be accepted on the basis of compressive strength from cylinder breaks (cylinders made per AASHTO R 100 and tested per AASHTO T 22) reaching the required 28-day compressive strength or by the three-edge bearing test (AASHTO T 280) as detailed in Section 3.2.1.
 - 3.4.1 The absorption test (AASHTO T 280) for wet cast pipe shall be conducted on samples cored from the wall of the pipe or by making cylinders (4-inch (100 mm) x 8-inch (200 mm) minimum in accordance with AASHTO R 100).
- 3.5 Flared end sections will be accepted by either the inspection method or Fabricator certification method, with the same size criteria as outlined in Section 3.2.
 - 3.5.1 Acceptance by the inspection method of precast concrete flared end sections is to be based on verification of compressive strength of concrete as determined from cylinders or cores. Flared end sections must also meet the dimensional requirements listed on the standard detail and on appearance. The testing frequency for compressive strength cores and steel verification coring is 1 out of every 40 pieces, but cylinders shall be fabricated and tested for each piece, if cylinders are used for strength acceptance instead of cores.
 - 3.5.2 In order to accept flared end sections by the Fabricator certification method, the Fabricator must be QCast Certified by the ACPA. The fabricator will take photos/videos showing correct steel placement and cover for one piece in each LOT. All flared end sections must be fabricated within the dimensions listed on the standard detail and have an acceptable finish free of bug holes, spalls, cracks and other surface defects.

TABLE 1

SAMPLING AND TESTING FREQUENCY FOR REINFORCED CONCRETE PIPE

A production "LOT" is defined as follows:

It is a pipe of the same size and class that is manufactured using the same process and similar materials during consecutive days of production, excluding weekends and holidays. The production LOT shall not exceed the specified value of 1% of the LOT and the minimum number tested per LOT is as follows:

Number of Pipe Sections in the LOT	Number of Pipe Sections to be Tested
0 to 300	1
301 to 800	2
801 to 1500	3
over 1500	3 plus 1 section per each 600 pieces or fraction thereof over 1500 pc.

When the tests indicate that a production LOT is acceptable for WVDOH use, the LOT should be inspected by the Division's representative.

4. QUALITY CONTROL REQUIREMENTS

- 4.1 Quality Control is the responsibility of the manufacturer and shall include the following:
 - 4.1.1 Ensure all component materials used in the fabrication of the pipe have been sampled, tested, and approved (MP 603.02.10).
 - 4.1.2 Ensure quality workmanship as well as a quality product throughout the production.
 - 4.1.3 To scribe into each piece of pipe the following:
 - (a) Cast Date
 - (b) Class and Wall Type
 - (c) Manufacturer's Trademark
 - 4.1.4 Notify the Division's representative upon the completion of casting of a LOT (Refer to Table 1) of pipe so the Division may select a representative sample and witness the testing.
 - 4.1.5 To conduct the three-edge bearing test or to secure cores to ensure strength requirements are met (Section 3.2 and 3.3).
 - 4.1.6 To conduct the absorption test (AASHTO T 280) on samples selected from the wall of the pipe.

- 4.1.7 Any LOT of pipe or portion of a LOT of pipe failing to meet the specification requirements will be stored separately from acceptable pipe.
- 4.1.8 Accurate inventory records containing the information required in Section 6.1.2 will be kept and maintained by the manufacturer.

5. ACCEPTANCE CRITERIA

The Division will:

- 5.1 Sample and test the component materials to be used in the manufacture of the reinforced concrete pipe in accordance with MP 603.02.10.
- 5.2 Select representative samples of the LOT to be tested and:
 - (a) Witness the three-edge bearing test and/or the coring procedure
 - (b) Verify dimensional conformance
 - (c) Verify actual steel placement
 - (d) Determine the steel area
- 5.3 Ensure each piece comprising the LOT is scribed as stated in 4.1.3.
- 5.4 Make a visual inspection of the LOT and designate unacceptable units to be removed or set apart from the approved pipe in the LOT.

6. SHIPPING REQUIREMENTS

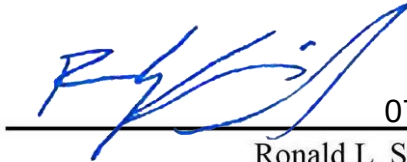
- 6.1 The approved LOT of pipe or portion of the LOT can be shipped by the manufacturer providing the following provisions have been met:
 - 6.1.1 The manufacturer will notify the Division's representative prior to each shipment so that the Division may maintain a current inventory with the manufacturing plant.
 - 6.1.2 The manufacturer will supply one copy of the shipping invoice to Materials Control, Soils and Testing Division and one copy to the Division's representative at the project site. The invoice shall contain the following information:
 - (a) Cast date of the approved LOT
 - (b) Master laboratory reference number
 - (c) Size, class, and wall type
 - (d) Project number
 - (e) Number of pieces

7. ACCEPTANCE PRACTICE

- 7.1 Ensure the information on the shipping invoice, as required in Section 6.1.2, agrees with the shipment it accompanies. (Number of pieces, class, size, and type, etc.).
- 7.2 Check each piece of pipe for the proper identification markings (Section 5.3) and make a visual inspection of each piece to ensure there is no evidence of damage during shipment.

8. COVERAGE REQUEST FROM PROJECT SITE

- 8.1 Request for coverage shall include the information as referenced on the shipping invoice, Section 6.1.2


07/20/2023
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MP 714.03.30 Steward – Cement and Concrete Section
RLS:Tt

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

PREPARING MATERIALS PROCEDURES

1. PURPOSE

- 1.1 To set forth instructions for drafting Materials Procedures (MP) concerning sampling, testing, reporting, and inspection.
 - 1.1.1 To establish a numbering system for MPs.
 - 1.1.2 To establish a styles guideline for MPs.
 - 1.2 To establish a workflow for the creation, acceptance, and approval for MPs.
 - 1.2.1 To set up a reconfirmation schedule for existing MPs.
 - 1.3 To provide further guidance and clarification from that set forth in DD-105.
-

2. REFERENCED DOCUMENTS

- 2.1 [AASHTO Publications Style Manual and Process Guide](#)¹, current edition.
 - 2.2 [Using SI Units in ASTM Standards: A Guide to Form and Style for ASTM Standards, Part H](#)²
 - 2.3 [WVDOH Design Directives DD-105](#)³
 - 2.4 [ASTM E29-22 - Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.](#)
-

3. NUMBERING GUIDELINES

- 3.1 A MP consists of a sequence of numbers such as 120.20.01.
 - 3.1.1 The first set (three digits) of an MP are taken from the WVDOH Specifications Roads and Bridges to denote the general area to which the procedure applies.
 - 3.1.2 The second set (two digits) of an MP are taken from the WVDOH Specifications Roads and Bridges denotes the particular area to which the procedure applies.

¹ <https://materials.transportation.org/>

² <https://sn.astm.org/rules-and-regs/using-si-units-astm-standards-nd12.html>

³ <https://transportation.wv.gov/highways/engineering/Pages/Design-Directives.aspx>

3.1.3 The third set (two digits) is defined by this Division thus:

- .00 - .09 Field Sampling
- .10 - .19 Pre-sampling (Source or Intermediate Points)
- .20 - .29 Testing
- .30 - .39 (For future designation)
- .40 - .49 Inspection
- .50 - .59 Quality Assurance System
- .60 - .69 Reporting (laboratory)
- .70 - .79 Reporting (issuance under master control)
- .80 - .89 (For future designation)
- .90 - .99 Miscellaneous

4. COMMON DEFINITIONS

4.1 Often, different entities use different terminology to describe certain entities. To stay consistent, this section will define some commonly used terms and specify the term that is to be used in Materials Procedures.

4.2 Authors may choose to spell out these terms in titles, sections, or headers.

4.3 Specific Terms:

4.3.1 DWR: When referring to a Daily Work Report that is performed on a WVDOT project, the term to be used is “DWR”.

4.3.2 Coverage: When referring to coverage for a material, traditionally referred to as “Direct Coverage” or “Master Coverage”, the term to be used is “coverage”.

4.3.3 Specifications: When referring to the WVDOT Standard Specifications, Roads and Bridges, current edition including supplementals, the term to be used is “Specification(s)” with a capital “S”. There is no need to list the Specifications in the referenced document, this link is assumed. Specific references to aid in navigation are encouraged.

4.3.4 WVDOT project: When referring to any construction project in the state that is governed by the Specifications, the term to be used is “WVDOT project(s).”

4.3.5 MS&P: When referring to Manufacture and/or a Supplier and/or a Producer, the term to be used is: “MS&P”. This author may choose to define this in the first instance of use in the document as this is not a common, industry wide term.

4.3.6 Deputy Commissioner of Highways: When referring to the final approving entity, the term “Deputy Commissioner of Highways” shall be used. This position was previously the State Highway Engineer.

4.3.6 4.3.7 Division: When referring to the Department of Transportation, Division of Highways as an entire entity, the term: “Division” shall be used with a capital “D”. There is no need to spell out the name in any materials procedure.

4.3.7 4.3.8 MCS&T Division: When referring to the Materials Control, Soils and Testing Division, the term: “MCS&T Division” shall be used. There is no need to spell out the name in any materials procedure, though the author may choose to do so.

~~4.3.84.3.9~~ TED Division: When referring to the Traffic Engineering Division, the term: “TED Division” shall be used. There is no need to spell out the name in any materials procedure.

~~4.3.94.3.10~~ All other Divisions shall be spelled out once and then given an appropriate abbreviation. For example, Engineering Division “Engr Division”

~~4.3.104.3.11~~ APL: When referring to MCS&T Approved Product List, the term to be used is “APL”, with all letters capitalized.

~~4.3.10.14.3.11.1~~ When referring to an APL submission, the following text shall be used: Prospective Producers/Suppliers shall complete form HL-468, as per MP 106.00.02 indicating their intention to be included on the WVDOT APL.

5. UNITS

5.1 Each champion has the option of using rationalized SI units, or both rationalized SI units and rationalized inch-pound units (combined units) as the standard units of measure.

5.2 When writing a procedure, the following two statements govern:

5.2.1 For solely SI standards, the values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

5.2.2 For combined units, the values stated in either SI units or inch-pound units are to be regarded separately as standard. The value stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the procedure.

5.2.3 When providing a sample calculation or an example of a filled form, the author may choose to use any single unit system; providing the exact calculation using another unit is a duplication of work.

5.2.4 When converting units, rounding shall be performed as specified in ASTM E29-22 - Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.

5.3 An example of the unit syntax is as follows:

5.3.1 The distance between the earth and moon is 238,900 mi (384,400 km)

6. FORMAT GUIDELINES

6.1 The style guides for MPs shall follow the general guidelines established in “Section 6.4.3” of [AASHTO Publications Style Manual and Process Guide Typography in Design](#). These guidelines are further refined in this document.

- 6.1.1 The font shall be Times New Roman, size 12, fully justified for all text except for the section title. The section title shall be all capital letters, fully justified, Times New Roman, size 12 and bold. There shall also be a horizontal line above this text.
- 6.1.2 The line numbering shall be as follows: “x.” For a section title and “x.x” for a section paragraph. From here, follow the format of “x.x.x...” for additional layers of sub paragraphs. This document provides an example of the formatting.
- 6.1.3 Links shall be [blue and clickable](#)⁴. The link path shall also be included as a footnote. An example of this is demonstrated by the “blue and clickable” text and link above and the footer at the bottom of this page.
- 6.1.3.1 Any instances of an email address shall also be clickable and adhere the guidelines for a link.
- 6.1.4 Figure labels shall follow the guidelines of “Section 2.1.4” of AASHTO Publications Style Manual and Process Guide Typography in Design. This section states: “The title should be succinct noun or noun phrase that describes the figure, but does not provide unnecessary background information, nor repeat information found in the text.” Do not abbreviate “Figure” and capitalize key words such; an example of this is as follows: “Conditions Determined to Be Pre-Existing.”
- 6.1.4.1 Formatting for labels shall be the same as normal body text, except that “Figure X.” shall be bold. All figure text shall be centered and located below the figure.

7. HEADER GUIDELINES

- 7.1 A standard numbering and indexing system shall appear in the upper right-hand corner shall of pages of all MPs. All header text shall be in “All Caps” format.
- 7.1.1 The letters MP shall appear first, denoting Materials Procedure. The number of the MP shall follow that text and be in the header of every page. The numbering of the MP shall follow the format as described in this document.
- 7.1.2 All MPs shall contain headers in the manner described in this section. There are two instances of a header. If an MP has been reconfirmed, the header will follow the example in Figure 1. This includes the date the latest date the MP was approved, and the date of confirmation.

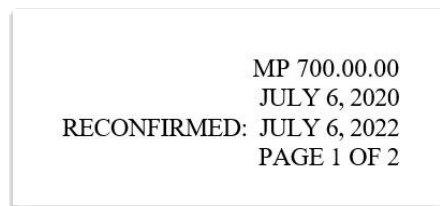
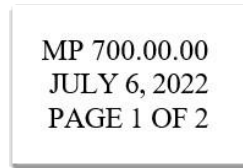


Figure 1 – MP Header with Approval Date and Reconfirmation Date

⁴ <https://transportation.wv.gov/highways/mcst/Pages/default.aspx>

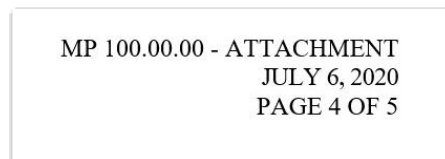
- 7.1.3 In the instance of either a new MP or an approved update to a MP, only the Director signature date (located at the end of the body section of the document) is in the header. A sample is provided in Figure 2.



MP 700.00.00
JULY 6, 2022
PAGE 1 OF 2

Figure 2 – MP Header With Approval Date

- 7.1.4 In the instance of an attachment, the first line of the MP header shall be in the format: MP XXX.XX.XX – ATTACHMENT. All other lines shall follow the guidelines previously described. This is demonstrated in Figure 3.



MP 100.00.00 - ATTACHMENT
JULY 6, 2020
PAGE 4 OF 5

Figure 3 – MP Attachment Header

- 7.1.4.1 In all instances, on all pages (do not use different first page), the text “PAGE X1 to X2” shall be last, with X1 being the current page and X2 being the total pages in the section. The main body and each attachment shall be considered a separate section; numbering shall be restarted on any new attachment instance.

8. MP APPROVAL PROCESS

- 8.1 In the instance of any MP Committee work, the champion is a person defined as the person who is the primary author, editor and/or liaison for the document. The champion is responsible for introducing and presenting the document. The champion is also responsible for addressing comments on the document.
- 8.2 Attachment 1 provides an overview of the approval process of an MP. First the document is brought to the MP committee chair (chair) by the champion. The document is distributed by the chair and discussed at the next MP committee meeting. After the document has been at a minimum of two consecutive MP meetings, the document may be approved by vote. The document is then reviewed, and if approved, signed by the Director of Materials Control, Soils and Testing Division (Director, MCS&T). The signed document is sent through DOH management for review and approval. Once the review is complete, the document is reviewed and affirmed by Federal Highways (FHWA). Once the document is affirmed by FHWA, the document is posted and distributed. If at any step an approving authority makes comments, the document is cycled back to the MP Committee meeting for review and another approval vote.

- 8.2.1 In the instance where a document has no content changes (editorial changes only), the MP committee may choose to vote to approve the document after one meeting. In this case, any voting member of the MP committee or the FHWA representative may veto this decision.
- 8.2.2 The details of the MP committee, including the submission process, distribution practices, and current voting members is available for review in Design Directive 105 and available at the [WVDOH Technical Support Webpage](#)⁵

9. RECONFIRMATION PROCESS

- 9.1 Each MP shall be periodically reviewed for both relevancy and accuracy. At a minimum frequency, each MP shall be reviewed every 4 years by the applicable MCS&T Section Supervisor (Reconfirmation Champion). In the instances where there is no obvious Section Supervisor, the delegation of the review shall be the responsibility of the chair in liaison with the Director of MCS&T.
- 9.2 After reviewing the document, if the Reconfirmation Champion determines that no changes are required, they will submit the document to chair for reconfirmation. The reconfirmation shall be done by the voting members.
- 9.3 If approved by the Committee, the MCS&T Director shall review the document and if accepted, sign the document. Because no changes were made to this document, once the document is signed, it shall be posted and distributed.

10. POSTING AND DISTRIBUTION OF MPS

- 10.1 Active MPs are available on the [WVDOH MCST MP Webpage](#)⁶. The webpage shows the MP number, the title of the MP and the latest approval or reconfirmation date.
- 10.1.1 For each document (if applicable), an archived link is available to provide a documented history of updates. Figure 4 provides an example.

106.00.02	Procedure for Evaluation of New Products for Use In Highway Construction	November 2016
Archive		

Figure 4 – MP Committee Webpage Example

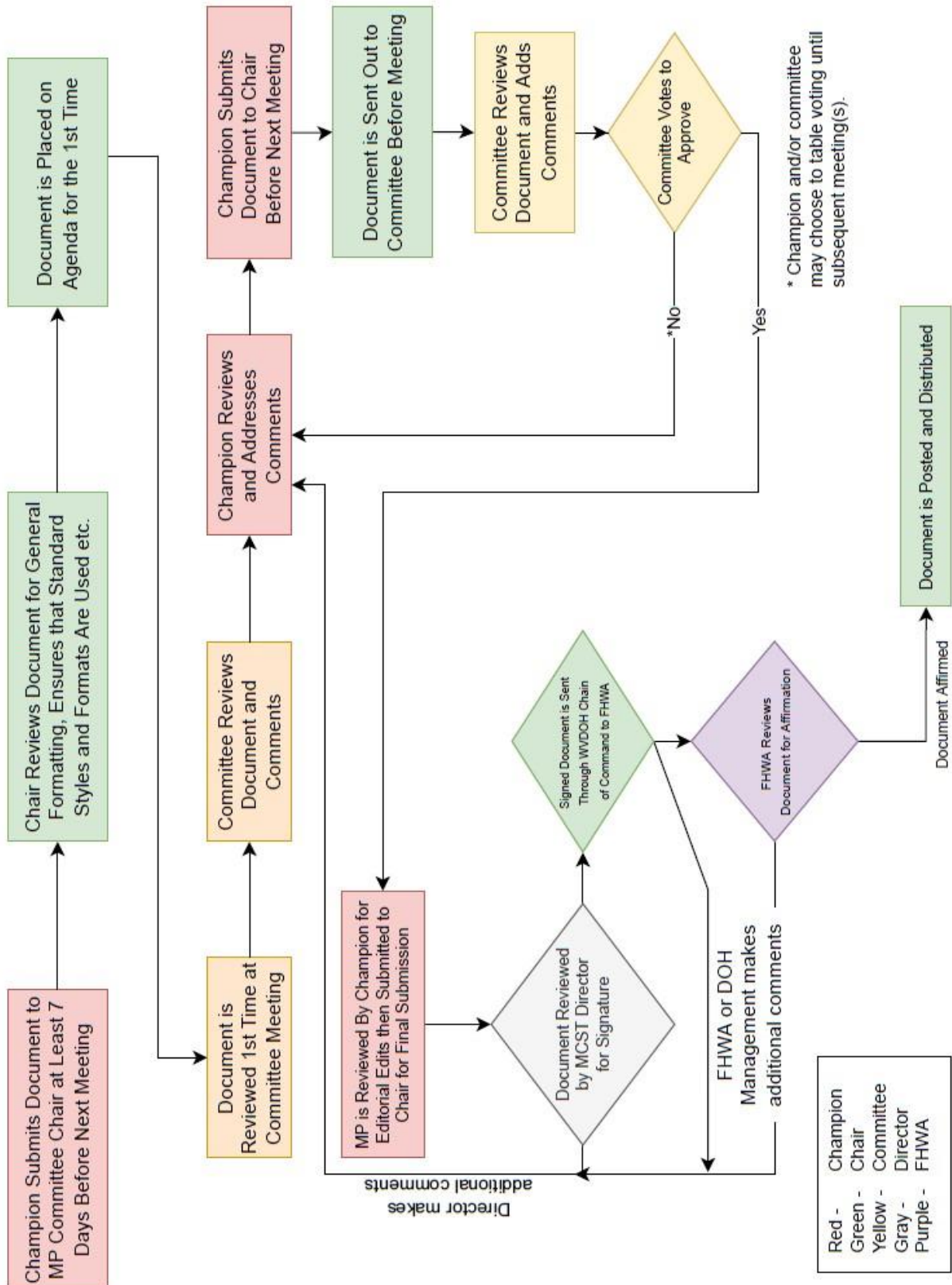
- 10.2 When a document is affirmed by FHWA, the documents will be distributed to applicable Division Directors, District Engineer/Managers and District Material Supervisors.

⁵ <https://transportation.wv.gov/highways/TechnicalSupport/Pages/Design-Directives.aspx>

⁶ <https://transportation.wv.gov/highways/mcst/Pages/WVDOH-Materials-Procedures.aspx>

Ronald L. Stanevich, PE
Director
Materials Control, Soils & Testing Division

MP 100.00.00 Steward – Materials Control Section
RLS:B
ATTACHMENT



ATTACHMENT 1 – MP Committee Meeting Flowchart