

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

MATERIALS PROCEDURE

PROCEDURE FOR EVALUATING PRODUCTS FOR USE
IN HIGHWAY CONSTRUCTION

1. SCOPE

1.1 New products are frequently presented to the Division by various manufacturers, suppliers and/or producers (MS&Ps) with a request that they be considered for use in our highway program. To facilitate handling of such requests in a uniform and expeditious manner, this Materials Procedure outlines the steps necessary for such product submittal and evaluation. This Procedure covers the addition of approved submitted products to the Division's Approved Product List (APL).

1.1.2 This Materials Procedure outlines the review of materials for use outside of standard bid contract work. This applies to District Purchase Order Projects and outlines a path for the addition of materials to the Division's Qualified Purchase Order Materials (QPOMs).

2. REFERENCE DOCUMENTS

2.1 MP 106.00.03: Guidelines for Establishing and Maintaining Approved Product Lists of Materials, Systems and Sources.

2.2 MP 106.10.50: WVDOH Buy America Acceptance Guidelines.

3. DEFINITIONS

3.1 MCS&T Reviewing Entity: The applicable Section Supervisor at MCS&T who is responsible for the review and acceptance of a new product.

3.2 Non-MCS&T Reviewing Entity: A subject matter expert at a WVDOH division separate from MCS&T.

3.3 Project: For this Materials Procedure, this term means a traditional bid contract.

3.4 APL: Approved Product List.

3.5 MS&Ps: Material Supplier and/or Producer.

3.6 QPOM: Qualified Purchase Order Material.

3.7 QPOS: Qualified Purchase Order Submittal.

3.23.8 PO Project: Purchase Order Project.

4. SUBMISSION OF PRODUCT

4.1 Consideration for ~~new~~ product evaluation shall be requested through completion by the MS&Ps of ~~WVDOH~~ Form HL-468, "Preliminary Information for New Product

Evaluation". Once completed, DOH Form HL-468 shall be submitted to the MCS&T) via email to the New Products Evaluation email address: DOHNewProducts@wv.gov.

4.1.1 The HL-468 Form can be found on the MCS&T Division's Materials Procedures [Webpage](#)¹. A sample of this form is shown in Attachment 1. An online form may also be used to meet this requirement.

4.2 When submitting a product, the MS&P shall indicate whether the product is being submitted for either an APL or QPOM.

4.1.14.2.1 If a MS&P wishes the product to be submitted for both the APL and QPOM, they must complete two separate HL-468s. These may be sent together.

5. REVIEW OF SUBMITTED PRODUCT

5.1 Upon receipt of the completed Form HL-468, the MCS&T Division shall distribute to applicable MCS&T Reviewing Entity for preliminary evaluation.

5.1.1 Within 30 calendar days of receipt, the MCS&T Reviewing Entity shall review the submittal in accordance with the applicable material requirements and decide if the product is acceptable.

5.1.2 This MCS&T entity shall ultimately be responsible for ~~the approving the review~~ of the new product, though they may reach out to Non-MCS&T Reviewing Entities for additional approving criteria.

5.1.3 A Non-MCS&T Reviewing Entity shall be given 7 calendar days to review the submission before making a final decision. If the entity does not respond within that time, their affirmation for the approval will be assumed by the MCS&T Entity.

5.2 If the preliminary review indicates that additional information is needed, the MS&P shall be notified to submit additional information. This may include but not be limited to: samples, product specifications, certified test data, or product demonstrations. Product testing shall be coordinated by the MCS&T Division with the results of any further testing/evaluation being submitted to all appropriate evaluating parties. In the case where additional information has been requested or additional testing is required, the 30-day timeframe shall be reset to the date when the additional information is provided, or the testing has been completed.

5.3 If the MS&P fails to submit the request information within 30-days, the reviewing entity may reject the request. Discretion may be given if the information request requires testing or evaluation that would exceed this time frame.

6. APPROVED PRODUCT LIST

6.1 If the ~~preliminary~~ review indicates that the product meets the specifications, it may be accepted without further evaluation, the Product shall be considered accepted and added to the APL. The MS&P shall be notified via letter.

6.2 If the reviewing entity determines that the WVDOH does not currently have any specifications for the submitted product, the WVDOH shall notify the MS&P via

¹ <https://transportation.wv.gov/highways/mcst/Pages/MP-100s.aspx>

email that there is no specification; the MS&P may choose to submit the product for consideration as a QPOS (see Section 7.)

6.2.1 If the MS&P indicates that they do not wish to be considered a QPOS, a non-approval letter shall be sent.

6.2.2 If, after 14 calendar days, the MS&P does not respond to the email, a follow email shall be sent. If the MS&P does not respond after 7 days from the follow-up email, a non-approval letter will be issued.

6.2.3 If the MS&P indicates they wish the product to be evaluated as a QPOS, the original submission will be re-classified as a QPOS. The submission and review date will be reset to the email date from the MS&P.

6.2.3.1 For the purposes of performance tracking, the product will be considered a new submission. The previous submission shall be considered "completed" on the above mentioned email date and the final status be indicated as "reclassified".

~~6.26.3~~ If the evaluation indicates that the product is not acceptable, the ~~Manufacturer/Supplier~~MS&P shall be notified by MCS&T via letter. The MS&P shall not submit the same product for evaluation ~~during the same calendar year~~within a six-month period.

6.4 In the instance where a product has significant approved usage, the Director (or their Designee) of MCS&T may add a product to either a new or existing APL as per MP 106.00.03. If a product is a candidate for being added to the APL in this manner, the MCS&T Lab Coordinator shall contact the MS&P prior to the addition of the product to the APL to request completion of the required HL-468.

7. QUALIFIED PURCHASE ORDER MATERIALS

7.1 All products which appear on the Division's APL are approved for use on PO Projects. Under no circumstances shall an approved QPOM be accepted on a project without further testing and approval.

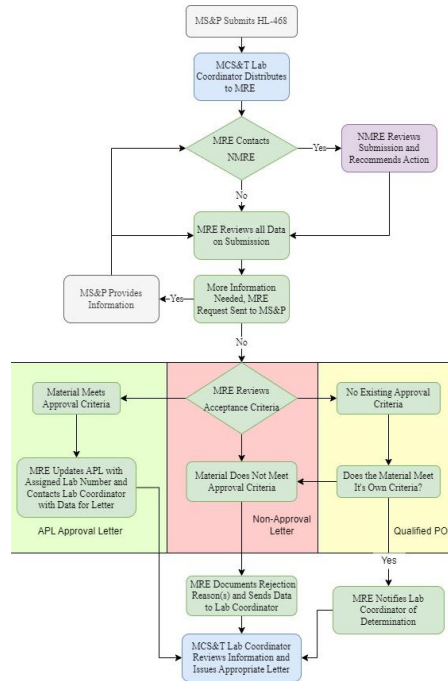
7.2 The reviewing entity shall determine if the QPOS performs as specified by the manufacturer. If this product meets those criteria, a QPOM acceptance letter shall be issued.

~~6.37.3~~ If the evaluation indicates that the product is not acceptable, the MS&P shall be notified by MCS&T via letter. The MS&P shall not submit the same product for evaluation within a six-month period.

8. PROCESS FLOW CHART

6.48.1 A flow chart for the process is provided in Figure 1

Figure 1: Flow Chart for Approved Products List Process.



Key:

MRE: MCS&T Reviewing Entity

NMRE: Non-MCS&T, WVDOH Reviewing Entity

MS&P: Manufacturers, Suppliers and/or Producers

9. NOTIFICATION LETTERS

6.59.1 Sample language for submission responses is shown in Attachment 2.

7.10. DOCUMENTATION OF REVIEWED PRODUCTS

7.10.1 MCS&T shall maintain a directory on the [Division's APL Webpage](#)² listing all the current approved products.

10.1.1 Additionally, MCS&T may evaluate the product listing after one year to determine if the performance or functionality of the product/process meets the desired results, goals, or intentions of the DOH. Any such evaluation may result in the product being removed from the Approved Product List APL.

² https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx

10.2 MCS&T shall maintain a directory on the Division's QPOM Webpage³ listing all products in this category.

10.2.1 Additionally, MCS&T may evaluate the QPOM listing after one year to determine if the performance or functionality of the product/process meets the desired results, goals, or intentions of the DOH. Any such evaluation may result in the product being removed from the list.

8.11. **REMOVAL OF PRODUCTS FROM APL OR QPOM**

8.11.1 If, at any time the reviewing entity determines that a previously approved product no longer meets the specifications, the product shall be removed from the ~~MCS&T approved product~~respective list.

8.211.2 In this instance, the reviewing entity shall notify the MS&P via letter.

9.12. **BUY AMERICA**

9.12.1 Each HL-468 submission must include whether the product meets the Federal and State Buy America requirements of Section 106.1 of the Specifications. If the MS&P indicates that their product meets Buy America requirements, the company shall produce a notarized Certificate of Compliance (CoC) signed by a company official with knowledge and authority to certify the product is compliant with applicable Buy America requirements.

9.1.12.1.1 In the event where the source of materials is changed and is no longer Buy America compliant, the MS&P must notify MCS&T in writing.

9.1.212.1.2 Under no circumstance shall the CoC described above be used for Buy America compliance on a project. Each project must submit a CoC as described in MP 106.10.50 "WVDOH Buy America Acceptance Guidelines."

9.212.2 A notarized CoC shall contain the following information:

9.2.112.2.1 Title: Certification of Buy America compliance for Source Approval.

9.2.212.2.2 The Name, Address and Contact Information for the Company.

9.2.312.2.3 The date of the application

9.2.412.2.4 A company statement that demonstrates compliance with Buy America.

9.2.512.2.5 The name of the material and/or material code reference in the CoC. This material name shall be a clear, common name of the material that is comparable to the AWP Material Name⁴. Part Numbers etc. may also be on the document if the company wishes.

9.2.612.2.6 Signature of the Company Official and date.

9.312.3 The document must be notarized.

9.412.4 A sample of this CoC document is provided in Attachment 3.

³ https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx

⁴ See "AWP Material Codes" at <https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx>

Michael Mance PE,
Director
Materials Control, Soils & Testing Division

MP 106.00.02 Steward – Lab Support Section

~~RL~~SMM:B

ATTACHMENTS

ATTACHMENT 1 - SAMPLE HL-468 FORM

FOR COMMITTEE SHOWN AFTER ATTACHMENT 2

Attachment 2: Sample APL Response Language

1. APL APPROVAL RESPONSE

West Virginia Division of Highways (WVDOH) Laboratory Approval Numbers 2XXXXXXX has been issued to your company <Name of Company>, for the above-mentioned product. The approval number, effective Date Month Day, 20XX, must appear on all shipping documentation for said product supplied to the Division of Highways projects.

2. NO APL RESPONSE:

The West Virginia Division of Highways (WVDOH) has evaluated your submittal of <Product Name>, <Product Material> as per Materials Procedure MP 106.00.02. This Division is not approving your material at this time for the Approved Product List; the WVDOH does not currently have a Specification or Materials Procedure which applies to your product.

This material may be evaluated for the Division's Quality Purchase Order Material List as specified in MP 106.00.02.

The inclusion of the material into a contract project's designs does not rest with this Division, though it may be specified at the discretion of WVDOH Designers or requested to be used by Contractors. If a contractor would propose to use it on a WVDOH project, or if the product is specified in Contract Documents, this product may be used, pending an individual evaluation on that project.

3. NON-APPROVAL RESPONSE (APL)

This material was submitted to the West Virginia Division of Highways for consideration in accordance with Materials Procedure 106.00.02.

This letter is to notify you that the Division has elected to not approve this product currently. As per Section <XXX> of the Standard Specifications Roads and Bridges, "<Description of Non-Approval Reason>."

4. OPOM ACCEPTANCE

The West Virginia Division of Highways (WVDOH) has evaluated your submittal of <Product Name>, <Product Material> as per Materials Procedure MP 106.00.02.

West Virginia Division of Highways (WVDOH) Laboratory Approval Numbers Q2XXXXXXX has been issued to your company <Name of Company>, for the above-mentioned product. This number, effective Date

Month Day, 20XX, must appear on all shipping documentation for said product.

This product has been evaluated and meets the provided criteria. This material has been added to the Qualified Purchase Order Material List, which is available on the Division's Webpage. This material has not been added to the Division's Approved Product List.

5. NON-APPROVAL RESPONSE (QPOM)

This material was submitted to the West Virginia Division of Highways for consideration in accordance with Materials Procedure 106.00.02.

This letter is to notify you that the Division has elected to not approve this product currently. As per the provided criteria, this material <description of failure>.”

ATTACHMENT 3: SAMPLE COMPLIANCE FORM
**Certification of Buy America, Build America Compliance
For Source Approval**

Acme Manufacturing Company
123 Main Street
Charleston, WV
25302

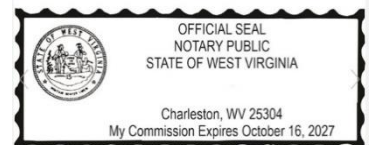
HL 468 Submission Date: 10/31/2022

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.

This Certification of Compliance is for the material listed below:

526.003.004 - Widget, Part Qi
596.003.004 - Widget, Part Hr

Jonathan Doe, Quality Assurance Manager



WVDOH Use Only

Reviewed by:

Reviewed Date:

Status:

HL-468-22

ATTACHMENT 1 - SAMPLE HL-468 FORM

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WEST VIRGINIA DIVISION OF HIGHWAYS

PRELIMINARY INFORMATION FOR TECHNOLOGY/PRODUCT EVALUATION

1 TRADE NAME _____

MANUFACTURER _____

ADDRESS _____ APPLIED FOR? _____
City State Zip

2 REPRESENTATIVE _____

ADDRESS _____ PHONE _____
City State Zip

3 PRODUCT CATEGORY _____

4 EXISTING MATERIAL CODE: _____

5 BUY AMERICA BUILD AMERICA COMPLIANT? _____ NO _____ YES

5A IF 5 IS YES, SIGNED AND NOTARIZED CERTIFICATE OF COMPLIANCE
PROVIDED IN ACCORDANCE WITH MP 106.00.02 _____ YES

6 RECOMMENDED USE - PRIMARY

7 RECOMMENDED USE - ALTERNATE

8 ANY KNOWN OR PROBABLE ADVERSE AFFECT ON PRESENTLY USED OR
INSTALLED MATERIALS, STRUCTURES OR EQUIPMENT

9 PLAN DRAWING, PICTURE, OR SKETCH FURNISHED BY MANUFACTURER?

_____ YES _____ NO

<-OTHER

NO

NO

AT SITE

NO

NO

NO

NO

CONDITIONS?

19 BACKGROUND DESCRIPTION OF COMPANY AND ITS PRODUCT

20 ADDITIONAL INFORMATION

PAGE 3 OF 3

21 THE FOREGOING INFORMATION IS FURNISHED BY

NAME/TITLE: _____

EMAIL ADDRESS: _____

EMAIL COMPLETED FORMS TO:

DOHNewProducts@wv.gov

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

MATERIALS PROCEDURE

WVDOH BUY AMERICA WAIVER
AND EXCEPTION GUIDELINES

1. PURPOSE

- 1.1 To set forth instructions for Waivers and Exceptions for Buy America Materials.

2. REFERENCED DOCUMENTS

- 2.1 MP 106.10.50 – WVDOH Buy America Acceptance Guidelines.
2.2 [West Virginia Code | §5A-3-56¹](#)

3. OVERVIEW OF BUY AMERICA WAIVERS

- 3.1 In certain circumstances, waivers may be applied to materials exempting them from both Federal and State Buy America requirements.
- 3.2 For each type of material as described in MP 106.10.50, a separate process is described.
- 3.3 If the contractor chooses to use foreign material for **steel and iron**, both Federal and State laws require Buy America waivers. 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.
- 3.4 If the contractor chooses to use foreign material for construction materials, Federal law requires Buy America waivers.

Commented [DB1]: Need to be consistent with steel and iron or Steel and Iron, Manufactured manufactured materials etc.

4. FEDERAL BUY AMERICA WAIVERS FOR STEEL AND IRON

- 4.1 Public Interest and Unavailability Waiver (PIUW)
- 4.1.1 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 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.
- 4.2 If a contractor wishes to apply for a PIUW, they will contact the Division with justification. This will be reviewed by the WVDOH and will be sent to FHWA for approval.

¹ http://www.legis.state.wv.us/Bill_Status/bills_text.cfm?billdoc=hb2207%20intr.htm&yr=2001&sesstype=RS&i=2207

5. STATE BUY AMERICA WAIVERS FOR STEEL AND IRON

5.1 As provided for in H. B. 2207, West Virginia Code | §5A-3-56, the Director of the West Virginia State Purchasing Division may authorize in writing the use of a minimal amount of foreign steel products if either of the following is true:

5.1.1 The director of the purchasing division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

Commented [DB2]: Break this section up if we do Waiver, then Exception?

6. BUY AMERICA WAIVERS FOR CONSTRUCTION MATERIALS AND MANUFACTURED PRODUCTS

6.1 There is a long-standing, general waiver for Manufactured Products.

6.2 There are currently no additional exceptions for Federal Buy America Requirements for Construction Materials or Manufactured Products.

7. OVERVIEW BUY AMERICA EXCEPTIONS

7.1 Federal Minimal Use Exception

7.1.1 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 State Minimal Use Exception

7.2.1 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 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 There are no Buy America exceptions for Construction Materials and Manufactured Products.

MP 106.10.51
Signature Date
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Michael A. Mance, P.E.
Interim Director
Materials Control, Soils & Testing Division

MP 106.10.51 Steward – Materials Control Section
MM:B

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

MATERIALS PROCEDURE

GUIDE FOR APPROVAL OF COMPONENT AND SHIP LOOSE MATERIALS PERTAINING
TO PRECAST AND PRESTRESSED CONCRETE ITEMS

1. PURPOSE

- 1.1. To set forth the procedures for the approval of component materials used in the fabrication of precast and prestressed concrete items and ship loose materials incidental to precast and prestressed concrete items.
- 1.2. Ship loose materials are defined as the loose materials that are used in conjunction with various precast or prestressed concrete items. These ship loose materials are normally paid for under the same bid item number as the primary precast or prestressed concrete item.
- 1.1.1 Materials such as (but not limited to) metal soil reinforcing devices, metal attachment devices, bearing pads, shims, and geotextile fabrics that are used for prestressed concrete beams, and retaining wall systems are classified as ship loose materials.

2. SCOPE

- 2.1. This procedure will apply to all precast concrete fabricators and prestressed concrete fabricators that supply material for use on West Virginia Division of Highways projects. It shall also apply to suppliers of any other precast concrete items (such as retaining wall system suppliers), which require the use of ship loose materials.

2. ~~REFERENCED DOCUMENTS~~ DEFINITIONS

- 2.1 ~~Current WVDOH Standard & Supplemental Specifications~~ APEAS: AASHTO Product Evaluation and Audit Solutions¹

3. SAMPLING

- 3.1. Approved Sources
 - 3.1.1. With the exception of coarse and fine aggregate, component materials obtained from a West Virginia Division of Highways approved source and component materials pre-tested at the source in a manner set forth in MP 700.00.01 (or other established procedures) may be used at the precast, or prestressed concrete fabricator without further sampling and testing.

¹ <https://transportation.org/product-evaluation-and-audit-solutions/>

- 3.1.1.1. Any ship loose materials that are obtained from an approved source will not require any further sampling or testing. However, the approved source laboratory number shall be listed on all shipping documents related to that material.
- 3.1.2. All component materials that are not obtained from a Division approved source or otherwise pre-approved shall be sampled at the precast or prestressed concrete fabricator and subsequently tested. Ship loose materials that are not obtained from a Division approved source may be sampled at a variety of locations (material fabricator, precast concrete fabricator, material distributor, or whichever location is most convenient), but they must be sampled, tested, and approved prior to shipment to the project. All materials must meet the requirements of the appropriate section of the Specifications.
 - 3.1.2.1. Certain ship loose materials may, at the discretion of MCS&T Division, be accepted based on certification rather than sampling and testing.
- 3.1.3. When AASHTO M 6 is the applicable specification for fine aggregate, natural sand shall meet the requirements of Class A with respect to material finer than the No. 200 (75 μ m) sieve. Natural sand shall meet the remainder of the Class B requirements. All other fine aggregate types shall meet all of the requirements of Class B.
- 3.1.4. Mixing water for precast concrete items shall be tested in accordance with the requirements of Section 715.7 of the Specifications.
- 3.2. Frequency of Sampling
 - 3.2.1. Aggregates (both coarse and fine) and other component and ship loose materials not obtained from a Division approved source will be sampled by the Division, at the fabricator (or other location as noted in Section 3.1.2), as shown in Table 1.

TABLE 1

<u>Material</u>	<u>Sampling Frequency</u>	<u>Sample Size</u>
Cement	Semi-Annually	10 lb.
Pozzolanic Additives	Semi-Annually	4 lb.
Fine Aggregate	Semi-Annually	25 lb.
Coarse Aggregate	Semi-Annually	110 lb.
Mixing Water	Semi-Annually	1 quart
Reinforcing Steel		
Epoxy	Annually	5 ft
Black Bar	N/A (Accepted on NTPEP <u>AASHTO PEAS</u> Compliance)	NA
Prestressing Steel	Only Sampled at the Source	N/A
Hot-Poured Elastic Type	Only Sampled at the Source	N/A
Concrete Joint Sealer		
Preformed Expansion	Only Sampled at the Source	N/A
Joint Filler		
Elastomeric Bearing Pads and Shims	Only Sampled at the Source	N/A
Welded Wire Fabric ft x 3 ft	Each Lot (if Not <u>AASHTO PEAS</u> NTPEP Compliant)	1 pc. 3
Bright Wire for Welded Wire Fabric	Reference MP 709.04.40 or in accordance with Q-Cast Certification Requirements	1 pc 5 ft
Concrete Sealant	Only Sampled at the Source	N/A
Steel Inserts & Miscellaneous Steel Hardware	Annually	2 Pieces
Asphalt Plastic Cement	Each Lot or at the Source	N/A
Metal Soil Reinforcing Strips	Each Lot (Either at the Source or At the Point of use Prior to Installation)	N/A (NDT of Random Pieces)
Geotextile Fabric N/A	N/A (Accepted on <u>AASHTO PEAS</u> NTPEP Compliance)	
Steel Diaphragms	N/A (Inspected at the Fabricator)	N/A

3.2.2. The fabricator may not use any component material in the fabrication process until the material has been shown to meet specifications. Until otherwise notified by the Division, the fabricator may continue to use materials that are sampled on a semi-annual basis (and that were approved during the prior sampling period) while these materials are being tested during the current sampling period.

3.2.2.1. An approved laboratory reference number shall be issued to each ship loose material that meets specifications. Approved laboratory reference numbers must be issued to

- all ship loose materials that are to be paid for under the same bid item number as a precast or prestressed concrete item before an approved laboratory reference number can be issued to that precast, or prestressed concrete item.
- 3.2.3. At the time of component material sampling, the fabricator shall provide the Division with a current copy of each concrete mix design (and a list of all items that are produced from each mix design) that may be used in production of precast or prestressed concrete items for the Division during the next six months.
- 3.3. Non-Specification Material
- 3.3.1. If a material is removed from the Division's approved list, use of that material shall be immediately discontinued, and the material shall be sampled and tested in the same manner as any other material that is not on the approved list (i.e. it shall be sampled and tested at the frequency shown in Table 1) until it regains status on the Division's approved list.
- 3.3.2. If tests conducted on a component material sample indicate that one or more properties of a material do not meet specification requirements, the Division shall immediately notify the fabricator. Upon receipt of this notification, the fabricator shall discontinue the use of the component material in question until further notice by the Division.
- 3.3.3. If an amount of material finer than the No. 200 (75 μ m) sieve, greater than what is allowed by Section 703.4 of the Specifications, is present in either the coarse or fine aggregate, then the total amount of material finer than the No. 200 (75 μ m) sieve for the entire mix shall be evaluated. The fabricator shall have previously provided a copy of all mix designs as outlined in section 3.2.3, and the total amount of material finer than the No. 200 (75 μ m) sieve for the entire mix will be evaluated as outlined in section 3.3.3.1.
- 3.3.3.1. As long as the total percentage of material finer than the No. 200 (75 μ m) sieve present in the entire mix does not exceed the total percent of material finer than the No. 200 (75 μ m) that would exist if both aggregate fractions in the mix contained their specified maximum percentage passing the No. 200 (75 μ m) sieve, then that combination of aggregates will be considered as meeting Section 703.4 of the Specifications.
- 3.3.4. If it is determined that a ship loose material does not meet Section 703.4 of the Specifications, use of that ship loose material shall not be permitted.
- 3.4. Re-Testing of Non-Specification Component Material
- 3.4.1. When tests of the first sample indicate that one or more properties of a material do not meet specification requirements, the Division shall re-sample the material as soon as possible after the fabricator has taken corrective action, and one of the following two scenarios will occur (section 3.4.1.1 or 3.4.1.2).
- 3.4.1.1. If the second sample meets Section 703 of the Specifications, the Division will immediately notify the fabricator. Upon notification, the fabricator may resume the use of this component material.

- 3.4.1.2. If the second sample does not meet Section 703 of the Specifications, the Division will immediately notify the fabricator, but the Division will not re-sample the material in question (from the particular source that did not meet specifications) until the next sampling period specified in Table 1 only after corrective action has been taken by the fabricator. Until a sample is obtained that meets specifications component material may not be used.
- 3.4.2. Once a component material in question has been shown to not meet specifications by more than one sample and test, the Division will only re-sample that component material once during the next sampling period (as set forth in Table 1), and one of the following two scenarios will occur (section 3.4.2.1 or 3.4.2.2).
 - 3.4.2.1. The material is sampled again during the next sampling period, and it meets specifications. The use of this component material may be resumed.
 - 3.4.2.2. The material in question is sampled again during the next sampling period, and again it does not meet specifications. The Division will not re-sample the material in question again until the next sampling period specified in Table 1 (see section 3.4.2). Until a sample is obtained that meets specifications the component material may not be used.
- 3.4.3. For an aggregate in which an excessive amount of material finer than the No. 200 (75 μ m) sieve is the only reason for not meeting specifications, there are two possible scenarios. When the first scenario, given in section 3.3.3.1, occurs, that particular combination of fine and coarse aggregate will be considered as meeting specifications. The second scenario is if the total percentage of material finer than the No. 200 (75 μ m) sieve present in the entire mix exceeds the total percent of material finer than the No. 200 (75 μ m) sieve that would exist if both aggregate fractions in the mix contained their specified maximum percentage passing the No. 200 (75 μ m) sieve. In this case, that particular combination of fine and coarse aggregate will be considered as not meeting Section 703.4 of the Specifications. When this second scenario occurs, the Division shall immediately notify the fabricator. Upon receipt of this notification, the fabricator shall discontinue the use of this combination of material until further notice by the Division. Situations in which the second scenario occurs will be handled as outlined in section 3.4.4.
- 3.4.4. During any re-sampling of a failing combination of aggregates, both the fine and coarse aggregate shall be re-sampled (so that a current evaluation of the total amount of material finer than the No. 200 (75 μ m) sieve present in the entire mix may be performed). The Division will re-sample both the fine and coarse aggregate as soon as possible, and one of the following two scenarios will occur (section 3.4.4.1 or 3.4.4.2).
 - 3.4.4.1. If the second sample meets Section 703.4 of the Specifications, the Division will immediately notify the fabricator and the fabricator may resume the use of this combination of fine and coarse aggregate.
 - 3.4.4.2. If the second sample does not meet specifications (as outlined in section 3.3.3.1), the Division will immediately notify the fabricator, but the Division will not re-sample that combination of fine and coarse aggregate until the next sampling period specified in Table 1 (see section 3.4.2). Until a sample is obtained that meets Section 703.4 of the

Specifications, this non-specification combination of fine and coarse aggregate may not be used.

4. ALTERNATE MATERIALS

- 4.1. The prestressed or precast concrete fabricator may use a different source of material if the current material has been shown to not meet specifications.
 - 4.1.1. This new material shall be sampled as set forth in section 3.0 or 3.2 (whichever is applicable).
 - 4.1.2. In the case of component materials, new concrete mix design (in the case of prestressed items) containing this material shall be approved by the Division prior to the use of this new material. In the case of precast items, a new mix design containing this material shall be provided to the Division at the time of sampling.
- 4.2. If either a new source of coarse or fine aggregate is used because of an inability of the former combination of material to meet specifications due to an excessive amount of material finer than the No. 200 (75 μ m) sieve, both the coarse aggregate and fine aggregate portions of this new combination shall be re-sampled and evaluated as set forth in section 3.4.3.

Michael Mance, PE, Director
Materials Control, Soils & Testing Division

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE PLAIN REINFORCING STEEL BARS USED IN CONCRETE

1. PURPOSE

- 1.1. To establish procedures for qualifying manufactures of plain steel reinforcing bars acceptable for use on ~~West Virginia Division of Highways (WVDOH)~~ projects.
 - 1.2. To establish a procedure for maintaining a record of such information.
 - 1.3. To establish a procedure for transmitting such information to the WVDOH Personnel and contractors on ~~WVDOH~~ projects.
-

2. SCOPE

- 2.1. This procedure shall apply to all manufacturers who produce plain uncoated reinforcing steel bars.
-

3. APPLICABLE DOCUMENTS AND DEFINITIONS

- 3.1. WVDOH Specifications ~~for Roads and Bridges~~, Section 709.1
 - ~~3.2. National Transportation Product Evaluation Program "NTPEP"~~
 - 3.2. American Association of State Highway and Transportation Officials ("AASHTO")
Section M31
 - 3.3. AASHTO Product Evaluation and Audit Solutions (APEAS)¹.
 - 3.4. MP 106.00.02 - Procedure for Evaluation of New Products for Use in Highway Construction²
 - ~~3.4. WVDOH Form HL-468~~
-

4. ACCEPTANCE PROCEDURE

- 4.1. With each shipment, of plain rebar material to a ~~WVDOH~~ project, the rebar manufacturer or distributor shall provide shipping documents which contain an Approved Source List (APL) source lab number reflecting materials meeting quality specified by the WVDOH.
-

5. ACCEPTANCE PROCEDURE (APPROVED SOURCE)

- 5.1. For a new manufacturer to be considered as an approved source of plain rebar, the manufacturer must comply with the following requirements.

¹ <https://transportation.org/product-evaluation-and-audit-solutions/>

² <https://transportation.wv.gov/highways/mcst/Pages/MP-100s.aspx>

- 5.2. The manufacturer is to complete form HL-468 attainable from the ~~WVDOH website~~³ https://transportation.wv.gov/highways/mcst/Pages/newproduct_evaluationprocedure.aspx and submit it to the ~~WVDOH~~ Materials Control, Soils and Testing (MCS&T) Division new products email address, indicating intention to be included on the ~~WVDOH~~ APL as an approved source manufacturer of plain rebar.
- 5.3. A current certificate indicating membership and compliance with the National Transportation Product Evaluation Program “~~NTPEP~~~~APEAS~~” requirements.
- 5.4. After the ~~NTPEP~~~~APEAS~~ compliance documents have been evaluated, the Division will conduct quality assurance (QA) sampling at the source to verify compliance to AASHTO M31. This Division QA sampling and testing shall be performed prior to source approval and once a year thereafter. Division QA sampling shall consist of 3 bars with a minimum length of three feet, from 5 separate heats, all sampling shall be unbiased and sampled randomly from the most recent stocks or straight from production. Sampling may also be done from a ~~WVDOH~~ project location, should material be available at the project site.
- 5.5. If laboratory testing meets or exceeds the requirements of AASHTO M31, the manufacturer will be assigned a seven-digit approved source number and be placed on the APL for plain rebar. This approval will be active for one year.
- 5.6. If testing outlined in Section 5.4 is performed on material supplied by a manufacturer who is not on the APL, and the testing does not meet the requirements of AASHTO M31, or the manufacturer is not in compliance with ~~NTPEP~~~~APEAS~~ requirements, the manufacturer will not be added to the APL.
 - 5.6.1. If testing outlined in Section 5.4 is performed on material supplied by a manufacturer who is on the APL, and the testing does not meet the requirements of AASHTO M31, or the manufacturer is not in compliance with ~~NTPEP~~~~APEAS~~ requirements, the manufacturer will be removed from the APL. Also, any material from that manufacturer that is supplied to ~~WVDOH~~ projects, after the date on which it was determined that the AASHTO M31 or ~~NTPEP~~~~APEAS~~ requirements were not met, will be rejected from those ~~WVDOH~~ projects.
 - 5.6.2. If the manufacturer informs the ~~WVDOH~~ MCS&T Division in writing that issues causing noncompliance with ~~NTPEP~~~~APEAS~~ requirements and/or failure to meet the requirements of AASHTO M31 have been resolved, the manufacturer may request a reevaluation of their facility. That reevaluation shall be in accordance with sections 5.2 thru 5.5. If the results of that reevaluation confirm ~~WVDOH~~ requirements have been met, the manufacturer will be added to the APL.
- 5.7. If a manufacturer is currently listed on the APL for plain rebar, a yearly renewal evaluation of that manufacturer shall be conducted consisting of the above sections 5.3 thru 5.6.

³ <https://transportation.wv.gov/highways/mcst/Pages/MP-100s.aspx>

6. DOCUMENTATION REPORT

- 6.1. The APL for “plain” reinforcing steel bars “rebar” used on ~~WVDOH~~ projects may be updated at any time with the addition of a new manufacturer, or with the removal of a manufacturer.
- 6.2. A current APL of reinforcing steel bar manufacturers is available accessing the current West Virginia Department of Transportation approved source list website: https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

MM:HI

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

ACCEPTANCE CRITERIA FOR STEEL WIRE
REINFORCEMENT USED IN CONCRETE

1. PURPOSE

- 1.1. Establish a procedure to qualify approved and non-approved manufactures that produce drawn bright finish wire reinforcement for use on West Virginia Division of Highways (WVDOH) projects.
 - 1.2. To establish a procedure for maintaining a record of such information.
 - 1.3. To establish a procedure for transmitting such information to the districts and contractors of WVDOH projects.
-

2. SCOPE

- 2.1. This procedure shall apply to all producers who “manufacture” from a rough casted steel rod material to a drawn smooth bright finish wire product, or produce a welded wire reinforcement product “WWR” from smooth bright finish wire.
 - 2.2. This procedure shall apply to all steel wire reinforcement for concrete furnished to WVDOH projects and purchase orders. The WVDOH may elect to use other control procedures when special conditions dictate.
-

3. ~~APPLICABLE DOCUMENTS~~REFERECES AND DEFINITIONS

- 3.1. ASTM A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - 3.1.3.2. MP 106.00.02 - Procedure for Evaluation of New Products for Use In Highway Construction¹
 - 3.2.3.3. ~~NTPEP - AASHTO Product Evaluation and Audit Solutions (APEAS)²Certificate of conformance from manufacturer.~~
-

4. ACCEPTANCE PROCEDURE

- 4.1. With each shipment, the wire manufacturer shall provide shipping documents which contain either the steel wire approved source number, or the approval number that was assigned to the material as per Section 6.1 of this document.

¹ <https://transportation.wv.gov/highways/mcst/Pages/MP-100s.aspx>

² <https://transportation.org/product-evaluation-and-audit-solutions/>

5. ACCEPTANCE PROCEDURE (APPROVED SOURCE LIST)

- 5.1. For a producer to be considered an approved source manufacturer of steel reinforcement wire, either welded or non-welded, the manufacturer must comply with the following requirements:
- 5.2. The manufacturer must submit a completed HL-468 as per MP 106.00.02. This must include is to submit a statement to the WVDOH Materials Control, Soils and Testing (MCS&T) indicating intention to be included on the WVDOH approved source list (APL) as an approved source of steel wire reinforcement for concrete.
- 5.3. The prospective source shall produce a certificate indicating the prospective source is an active member in compliance with the APEAS program. National Transportation Product Evaluation Program "NTPEP."¹
- 5.4. The prospective source shall additionally submit a certified statement that all material shipped to the MCS&T will conform to Specification ASTM A1064 by a representative of the manufacturer that has the authority to bind the company shall sign the certified statement.
- 5.5. An evaluation and sampling of the material at the manufacturing facility shall be conducted by MCS&T personnel or by their designee for conformance to ASTM A1064. This shall be to reinforce confidence in the ability of the facility to produce a quality product within ~~WVDOH~~ Specifications.
- 5.5.1. Five samples each, five-foot in length, each of different sizes or lots are to be tested by MCS&T or their designee (as determined by the active date as discussed in Section 5.6) to confirm ~~WVDOH's~~ Specification compliance.
- 5.6. Once the above requirements are met, a laboratory approval number will be assigned to the manufacturer to indicate WVDOH requirement conformance, this approval number shall be active for one year. Acceptance of manufacturers facility can be verified by accessing the MCS&T online approved source list.
- 5.7. Revocation of approved source status may result from non-conformance to NTPEP-APEAS or tested material that does not comply with the specifications listed above.
- 5.8. "Approved Source" approval may be reinstated at the discretion of the MCS&T based on the findings of an investigation. The reinstatement process will commence upon the receipt of a letter of request from the manufacturer to the MCS&T. The letter of request should indicate reasons for reinstatement, and documentation to substantiate such reasons.

6. ACCEPTANCE PROCEDURES (NON-APPROVED SOURCE)

- 6.1. Steel wire used for concrete reinforcement will require testing and evaluation on a lot-by-lot basis by direct coverage, provided the material meets the following requirements:
- 6.2. The wire source shall produce a certificate indicating the manufacturing source of basic bright finish wire is an active member in compliance with the National Transportation Product Evaluation Program "NTPEP". APEAS.

- 6.3. A five-foot length of basic bright finish steel reinforcement representative of the sizes and heats used in the concrete structure shall be obtained by MCS&T personnel or its designee to be tested in MCS&T laboratories or their designee's laboratories.
- 6.4. The metallic components of the wire shall be tested to conform to the requirements of ASTM A1064 for yield, tensile, and reduction.
- 6.5. If the results of the testing reveal that the material is in compliance with Specifications, an approval number will be issued by the MCS&T that shall be affixed to the shipping documents of the basic bright finish steel reinforcement.

7. DOCUMENTATION REPORT

- 7.1. An updated list of steel wire reinforcement for concrete shall be conducted once a year, but no longer than two, and can be updated at any time with a new facility, or with a removal of a facility.
- 7.2. A current approved list of steel wire reinforcement is available to all contractors, fabricators, and suppliers by accessing the [MCS&T APL Website](https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx)²³

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

MM:HI

³ https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx

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

QUALITY ASSURANCE TESTING OF COATING PRODUCTS
LISTED ON WVDOH APPROVED PRODUCT LISTS (APLs)

1. PURPOSE

- 1.1 To establish a procedure to perform quality assurance (QA) testing on coatings products listed on MCS&T's approved product lists (APLs).
 - 1.2 To establish a procedure for maintaining a record of such information.
-

2. REFERENCED DOCUMENTS

- 2.1. WVDOH Specifications for Roads and Bridges, Section 711 Protective Coatings, Stains, and Traffic Paints.
 - 2.2. WVDOH Specifications for Roads and Bridges, Section 601.13.3 Concrete Protective Coating.
 - 2.3. WVDOH Specifications for Roads and Bridges, Section 707.16 Concrete Protective Coating Materials.
 - 2.4. MP 106.00.02 - Procedure for Evaluation of New Products for Use In Highway Construction
 - ~~2.4.2.5.~~ MP 711.00.20 Paint Testing Methods, most recent edition.
 - ~~2.5.2.6.~~ MCS&T Division Approved Product Lists¹ (APLs) for coating products.
 - ~~2.6.2.7.~~ AASHTO Product Evaluation and Audit Solutions (APEAS)~~National Transportation Product Evaluation Program (NTPEP).~~
 - ~~2.7.2.8.~~ Northeast Protective Coating Committee (NEPCOAT).
-

3. QUALITY ASSURANCE TESTING PROCEDURE

- 3.1. The quality assurance (QA) testing shall be performed on each approved coating listed on any of MCS&T's APLs.

¹ https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx

- 3.2. The QA testing shall be performed in MCS&T's Paint Laboratory and by MCS&T personnel.
- 3.3. The QA testing shall be performed every calendar year.
- 3.4. MCS&T shall obtain a sample of each approved product from the coating manufacturer.
- 3.5. The coating manufacturer shall supply a sufficient quantity of the product to perform all the required testing.
- 3.6. Each coating product shall be tested in accordance with the appropriate WVDOH Specification.
- 3.7. Each product shall be tested based on the testing requirements in the WVDOH Specifications.
- 3.8. The coating manufacturers will submit Safety Data Sheets (SDS) and Product Data Sheets (PDS) directly to MCS&T.
- 3.9. The coating manufacturers shall submit clearly marked samples, as well as, all required documentation for mixing and application directly to MCS&T.

4. QUALITY ASSURANCE HISTORICAL DATA

- 4.1. MCS&T shall maintain a spreadsheet for the purpose of collecting historical data for each coating product tested.
- 4.2. The historical data for each coating product will be analyzed yearly to determine if each product continues to meet the specification requirements necessary to remain on our APLs.
- 4.3. MCS&T will store the spreadsheet in a ProjectWise folder located under the Environmental & Coatings Group's folder.

5. ~~NTPEP-APEAS~~ TEST DATA

- 5.1. MCS&T shall obtain ~~NTPEP's-APEAS's~~ test data for each product by using the DataMine function located on the ~~NTPEP-APEAS~~ <https://transportation.org/product-evaluation-and-audit-solutions/> COAT uses test data from ~~NTPEP-APEAS~~ to generate their Qualified Product List. [The NEPCOAT Website](#)²
- 5.2. Any product that uses ~~NTPEP's-APEAS's~~ test data to obtain APL approval shall be compared to MCS&T's test data each year.

6. MCS&T'S QUALITY ASSURANCE TESTING

- 6.1. MCS&T will use the spreadsheet data, as described in Section 4, to perform QA testing analysis.

² <https://www.nepcoat.org>

- 6.2. The purpose of the QA testing is to determine if each of the coating products listed on our APLs are still satisfying our specification requirements.
- 6.3. Products that meet the specification requirements, based on MCS&T's test data, will remain on the APL.
- 6.4. Products that do not meet the specification requirements, based on MCS&T's test data, shall go through an internal investigation.

7. MCS&T INTERNAL INVESTIGATION

- 7.1. MCS&T shall perform an internal investigation on any coating product that does not meet the specification requirements necessary to remain listed on our APLs.
- 7.2. MCS&T shall run a second test on any sample that fails. If MCS&T's test data from the second test passes, then the product will remain listed on our APLs.
- 7.3. However, if MCS&T's test data from the second test does not pass, then ~~NTPEP~~ APEAS shall run a second test on the sample. If ~~NTPEP's~~ APEAS's test data from the second test passes, then the product will remain on our APLs.
- 7.4. If the second test data from both MCS&T and ~~NTPEP~~ APEAS fails, then the product will be removed from our APLs.
- 7.5. The findings from the internal investigation shall be kept with the historical data spreadsheet, described in Section 4.
- 7.6. MCS&T shall notify the company about the removal of their product from our APLs. The company must wait one-year from the date of the removal before they will be allowed to resubmit their product to MCS&T.
- 7.7. The company must resubmit their product through MP 106.00.02 Procedure for Evaluating Products for use in Highway Construction. MP 106.00.02 requires HL-468 Form to be submitted to MCS&T. This form is available at the WVDOH MCST [Webpage](https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx)³.

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

MP 711.00.22 Steward – Environmental and Coatings Section
RLS:P

³ <https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx>

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE FABRICATORS OF GUARDRAIL BEAMS,
STEEL GUARDRAIL POSTS AND HARDWARE

1. PURPOSE

- 1.1 To establish a procedure for approving fabricators of guardrail beams, steel guardrail posts and hardware acceptable for use on West Virginia Division of Highways (WVDOH) projects.
 - 1.2 To establish a procedure for maintaining a record of such information.
-

2. SCOPE

- 2.1 This procedure shall apply to the guardrail classes and types as defined in AASHTO M180, Section 3.
-

3. APPLICABLE DOCUMENTS

- 3.1 WVDOH Specifications: Roads and Bridges, Section 607
 - 3.2 AASHTO M180
 - 3.3 MP 106.00.02 - Procedure for Evaluation of New Products for Use in Highway Construction
 - 3.2.1 WVDOH Form HL-468
-

4. ACCEPTANCE PROCEDURE

- 4.1 For guardrail and hardware materials to be evaluated for acceptance, the fabricator must comply with the following requirements.
- 4.2 The fabricator shall complete form HL-468 (attainable from the MCS&T [Webpage](#)¹) and submit it to the WVDOH MCS&T Division New Products Email Address (DOHNewProducts@wv.gov), indicating intention to be included on the WVDOH APL (Approved Product List) as an approved fabricator of guardrail materials.
- 4.3 The fabricator shall submit a current certificate indicating membership and conformance with the AASHTO Product Evaluation and Audit Solutions National Transportation Product Evaluation Program (APEAS) "NTPEP" for guardrail. Additionally, audits are to be performed by NTPEP-APEAS at the fabricator's facility and encompass a detailed review of the quality management system, production process and testing capabilities.
- 4.4 After NTPEP-APEAS documents have been obtained, evaluated, and found to be in compliance, the fabricator will be assigned a seven-digit approved source laboratory approval number and placed on the APL for guardrail fabricators. This approval will remain active unless the fabricator fails to remain compliant with NTPEP-APEAS.

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

- 4.5 With each shipment of guardrail beams, posts, or hardware to a WVDOH project, the guardrail fabricator shall provide shipping documents which contain a laboratory approval number reflecting that the materials have been approved meeting quality specified by the WVDOH.

Michael Mance, P.E.

Director

Materials Control, Soils and Testing Division

MP 712.04.50 Steward - Metals Section

~~RLS~~SMM:H

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

MATERIALS PROCEDURE

GUIDE FOR QUALITY CONTROL OF COMPACTION

1. PURPOSE

- 1.1 This procedure sets forth minimum guidelines for the Contractor's Quality Control (QC) Plan for embankment, subgrade, pipe and random fill used as structure backfill material and aggregate base courses. It is intended that these requirements be used as a procedural guide in detailing the inspection, sampling, and testing necessary to maintain compliance with the specification requirements.
- 1.2 To establish procedural guidelines for approval and documentation of a Master QC Plan.

2. SCOPE

- 2.1 This procedure is applicable to all items requiring compaction control except asphalt pavements. This outlines the QC procedures for Compaction items and includes procedures for approving and using Master and/or Project Specific QC Plans. This procedure also aids in documentation and retention of QC Plans in ProjectWise.

3. REFERENCED DOCUMENTS

- a) MP 207.07.20 - Nuclear Field Density - Moisture Test for Random Material Having Less Than 40% of +3/4 Inch Material
- b) MP 700.00.24 - Nuclear Density Test By The Roller Pass Methods Revised December 2008
- c) MP 700.00.50 - Procedure for Monitoring the Contractor's Compaction Testing of Bituminous Concrete, Base Course, Embankment, Sub-Grade and Pipe and Structural Backfill
- d) MP 712.21.26 - Procedure for Determining Random Location of Compaction Tests
- e) WV Division of Highways Construction Manual, Current Edition
- f) WV Division of Highways Standard Specifications, Current Edition & Supplementary

4. GENERAL REQUIREMENTS

- 4.1 The Contractor shall provide and maintain a QC system that will provide assurance that all materials submitted to the Division for acceptance will conform to the contract

requirements whether natural, manufactured or processed by the Contractor, or procured from suppliers. The QC Plan should clearly describe the methods by which the QC Program will be conducted. For example, the items to be controlled, tests to be performed, testing frequencies, sampling locations and techniques all should be included etc. Each item should be listed separately.

- 4.1.1 A detailed plan of action regarding disposition of non-specification material shall be included. Such a plan shall provide for immediate notification of the Division in the event of a non-conforming situation or instance.
- 4.2 Inspection and testing records shall be maintained, kept current, and made available for review by the Engineer throughout the life of the contract. All other documentation, such as date of inspections, tests performed, temperature measurements, and any accuracy, calibration, or re-calibration checks performed on production or testing equipment shall be recorded and kept.
- 4.3 The Contractor shall maintain standard calibrated equipment and qualified personnel in accordance with the contract and Specification requirements for the applicable material.

5. QUALITY CONTROL PLAN

- 5.1 The Contractor shall prepare a QC Plan detailing the type and frequency of inspection, sampling, and testing necessary to measure and control the compaction properties of materials and construction governed by the Specifications. As a minimum, the sampling and testing plan should detail sampling location, sampling techniques, and test frequency. QC sampling and testing performed by the Contractor may be utilized by the Division for acceptance.
 - 5.1.1 A QC Plan shall be developed by the Contractor and submitted to the Engineer prior to the start of construction on every project. Acceptance of the QC Plan by the Engineer will be contingent upon its concurrence with these guidelines as listed in section 5.2 through 5.4.5.2.
 - 5.1.2 As work progresses, an addendum(s) may be required to a QC Plan to keep the QC program current. Personnel may be required to show proof of certification for testing.
- 5.2 QC PLAN MINIMUM REQUIREMENTS
 - 5.2.1 The QC Plan should be on Company Letterhead, be addressed to the District which it pertains, and include the items to be controlled. An example/template is provided in Attachment 1.
 - 5.2.2 Provide the name of the Person who is responsible for the Company's QC program and will be liaison with the Division's personnel.
 - 5.2.3 List all inspectors' names performing compaction tests on the project and their date becoming a Certified Soil & Aggregate Compaction Inspector as per WVDOH Specification Section 106, Control of Materials.

5.2.4 Compaction field tests will be performed according to MP 207.07.20, MP 700.00.24, and Standard Specification 716.32.3

5.2.5 Soft shale tests ~~shall be~~ be conducted according to~~done as per~~ Section 716 of the Standard Specifications.

5.2.6 Specify in the plan the methods by which each item will be tested. Table A and Table B summarizes the different materials, minimum frequencies, and the appropriate test procedure or method for controlling each material.

Table A- COMPACTION CONTROL OF AGGREGATE BASE COURSES

TEST PROCEDURE	LOT SIZE	NUMBER OF TEST	MATERIAL TYPE			
			PORTLAND CEMENT TREATED AGGREGATE BASE COURSE	CRUSHED AGGREGATE BASES AND SUBBASE COURSES	HOT-MIX HOT- LAID BITUMINOUS TREATED BASE COURSE	SOIL CEMENT BASE COURSE
MP 700.00.24	2000 FEET	1 PER SUBLOT				
		5 PER LOT	X	X	X	
MP 207.07.20	2000 FEET	1 PER SUBLOT				
		5 PER LOT				X

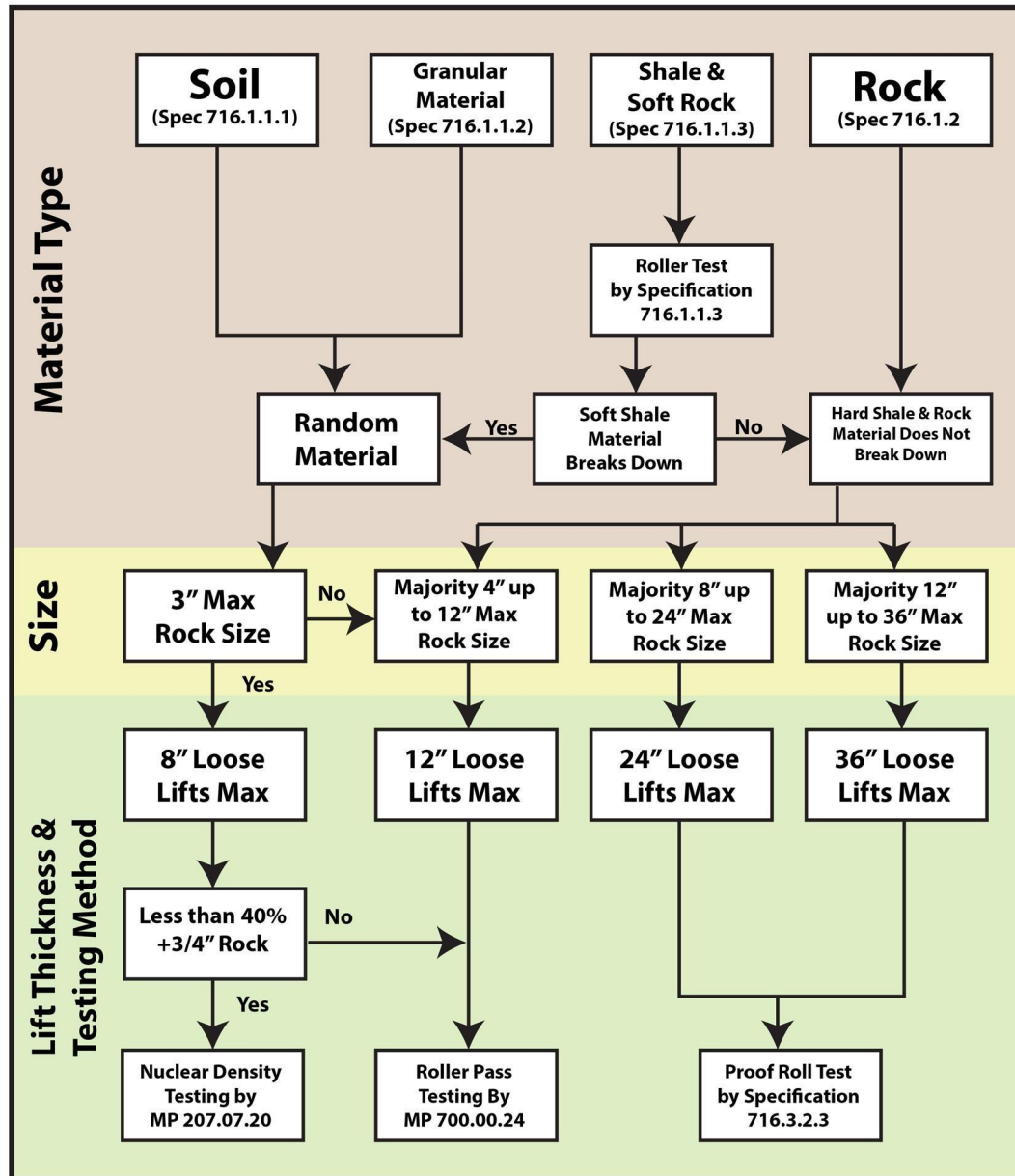
Table B - COMPACTION CONTROL OF EMBANKMENT BACKFILL AND SUBGRADE

TEST	LOT SIZE	NUMBER OF TESTS	MATERIAL WITH LESS THAN 40% RETAINED ON 3/4" (19.0 mm) SIEVE	MATERIAL WITH 40% OR MORE RETAINED ON 3/4" (19.0 mm) SIEVE AND CAN BE PLACED IN A 12" (300 mm) LOOSE LIFT OR LESS		MATERIAL THAT CAN BE PLACED IN A LOOSE LIFT GREATER THAN 12" ^{min}		GRANULAR SUBGRADE	SELECT MATERIAL FOR BACKFILLING AND CLASS I AGGREGATE
				UNIFORM	NON-UNIFORM	ROCK	HARD SHALE		
MP 207.07.20	SEE STD. SPECS.	1 PER SUBLOT 5 PER LOT	X						
MP 700.00.24	SEE STD. SPECS.	1 PER SUBLOT, 5 PER LOT		X [1]	X [1], [2]			X	X
PROOF Rolling		1 REPORT PER LIFT				X	X		

1. If a hole for a direct transmission density reading cannot be readily made due to the coarse material, proof roll the lift.
2. If density readings are varying above 105 percent or below 95 percent and the material appears to be non-uniform, proof roll the lift.

5.2.7 A flow chart for embankment material, Table C, shall serve as a guide for identifying material types, maximum rock size, lift thickness and compaction test method. This table shall be included in the QC Plan for making field decisions to ensure that each type of material is properly placed and compacted.

Table C – Guide for Quality Control of Embankment Material



5.2.8 The plan shall include a statement that all necessary testing equipment will be provided to perform the procedures outlined in MP 700.00.24, MP 207.07.20, and Specification 716.3.2. ~~and lists the required testing equipment for compaction tests.~~ The plan shall list the make and model of equipment for proof rolling and its weight per Specification 716.3.2. The plan shall list the make, ~~and~~ model and operating weight of the roller(s) to be used for the soft shale tests outlined in ~~and per~~ Specification 716.1.1.3.

5.2.9 List the type of gauge to be used (...i.e., Troxler 3430, etc). The calibration frequency must be acceptable to the Division. Gauges must be calibrated according to ~~as per~~ the manufacturer's requirements. This information shall be given to the Division upon their request.

- 5.2.10 If applicable, outline the procedure for performing a stability check on gauges that are not within the tolerance range for standard counts during the interval between calibrations. Standard counts derived during the stability check for stable gauges may be used in lieu of the manufacturer's standards. Gauges found to be unstable cannot be used until repaired and calibrated.
- 5.2.11 Include in the plan the lot and subplot sizes to be used for testing each type of installation. During construction, some flexibility in lot sizes may be made if the situation warrants in order to maintain a workable system. For example, two or more areas containing small quantities of embankment material might be combined into one lot at the Contractor's option and subject to the Division's approval.
- 5.2.12 Specify the maximum time period for completion of a lot of embankment material. As a guide, if the desired lot size cannot be obtained within seven calendar days, then the material placed up to that time would constitute the lot and the specified number of tests for a lot would still be performed.
- 5.2.13 Specify in the plan when quality control tests for base and subgrade will be performed. QC tests are to be performed after the material has been shaped and final rolling has been completed.
- 5.2.14 The Contractor is responsible for the accuracy of individual testing and calculations.
- 5.2.15 List the forms and method of distribution for tests and measurements.
- 5.2.16 Compaction test results are reported on forms specified in MP 207.07.20 and MP 700.00.24. The forms are supplied by the Division and available on the [MCS&T Webpage](#)¹. ~~Each form consists of an original and one copy. The original of a completed form shall be~~ submitted to the Division's project supervisor, District Materials Lab, and ~~the other copy should be retained~~is for the Contractor's records.
- 5.2.17 Indicate the length of time after tests and measurements are completed that documentation will be provided.
- 5.2.17.1 Test results and measurements ~~shall be~~ made available to project personnel for review on a daily basis. Formal submission of measurements should be made within 24 hours after the measurements are taken and test results within 24 hours after testing of a lot is completed.
- 5.2.17.2 Tests performed in a lot before final rolling is completed should be submitted to the Project Supervisor and retained in the project files. This includes test documents for failing lots and moisture checks.
- 5.2.18 List the compaction equipment giving the quantity, make, model, and weight or applied force at which each roller will be operated. If ballast will be added to a roller, indicate the type and quantity of ballast and the method for verifying the gross weight. Attach the manufacturer's specifications for compaction capabilities

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

for each

roller to the plan or state the procedure for verifying the compaction capabilities of each roller in cases where the manufacturer's specifications are not available. This equipment shall meet the requirements ~~of Section~~~~as per~~ 207.7.5 of the Standards Specifications.

- 5.2.19 Indicate in the plan that a minimum of a 10-ton (9.07 Mg) roller will be used for testing ~~in accordance with~~~~as per~~ MP 700.00.24 for soil and granular material only.
- 5.2.20 Rollers used to breakdown soft shale shall be in accordance with ~~Section~~ 716.1.1.3 of the Standard Specifications and shall have a minimum of 1.5 tons per linear foot of roller ~~or~~ drum width.
- 5.2.21 Specify the method by which proof rolling will be conducted on embankment materials. The materials to be proof rolled are summarized in Table B in Section 5.2.6.
- 5.2.22 List the number of passes to be made and corrective measures if soft areas are detected. Documentation should include the type of material, number of passes, and corrective action if soft areas are detected.
- 5.2.23 For equipment used for proof rolling explain how the gross weight will be determined for any ballast added to the operating weight. For alternate proof rollers, attach to the QC Plan the calculations used to determine that the roller meets specifications. Also, attach the manufacturer's specifications for all proof rollers to the Plan. The following calculation is used to determine if an alternate proof roller meets specifications:

ENGLISH Metric

$$c = \frac{\pi(ab\pi)}{2} \quad c = \frac{\pi}{50.8} (ab\pi)$$

Where:

a = weight (force) on a single tire = pounds (kg x .009807 =

kN) b = operating tire pressure = psi (kPa)

c = weight (force) per inch (mm) width of tire = pounds per inch (Nm)

The weight (force) per inch (mm) width of tire must be equal to or greater than 1315 pounds (9.067 kN/mm).

- 5.2.24 Outline the procedure for notifying the Division when the test section in MP 700.00.24 will be performed. The Division ~~shall~~~~ould~~ be notified a minimum of 24 hours in advance unless other arrangements acceptable to the Division can be made.
- 5.2.25 Laboratory testing for random material is not required unless the material has unusual characteristics or differs from the soil and rock data used to develop the design. Testing to develop density curves, specific gravities, organic content, etc. may be required.
- 5.2.26 A list of test procedures is contained in Section 716 of the WVDOT Standard Specifications as a guideline for required testing should the need arise for random material.

- 5.2.27 Design a plan of action for the disposition of non-specification material, such as material with excessive moisture, excessive organic content, etc. These materials shall be stockpiled away from the embankment or fill placement areas. The Project Supervisor should be immediately notified in the event a nonconformance situation is detected.
- 5.2.28 List the method(s) and frequencies per Table DE-(attached) by which lift thickness measurements will be taken. If surveying of compacted lifts is not utilized, then the maximum loose lifts per Table C shall be measured.

TABLE D - LIFT THICKNESS MEASUREMENTS

<u>MATERIAL TYPE</u>	<u>NUMBER OF MEASUREMENTS</u>
<u>EMBANKMENT</u>	<u>MINIMUM OF 3 PER LIFT</u>
<u>SUBGRADE</u>	<u>MINIMUM OF ONE PER 1200 FEET PER WORKING WIDTH</u>
<u>PIPE BACKFILL</u>	<u>MINIMUM OF ONE PER SIDE PER LIFT</u>
<u>STRUCTURE BACKFILL</u>	<u>MINIMUM OF ONE PER LIFT</u>

5.3 TYPES OF QC PLAN

- 5.3.1 QC Plans which are intended for use on more than one project shall be defined as Master QC Plans. Section 5.4 outlines the procedures for Master QC Plan submittal and approval.
- 5.3.2 QC Plans which are intended for use on a single project shall be defined as Project Specific QC Plans. Project Specific QC Plans shall contain a cover letter which includes the following: project name/description, CID#, Federal and/or State Project Number.
- 5.3.3 A contractor may submit a Master QC Plan for field operations instead of a Project Specific QC Plan.
- 5.3.4 Once any QC Plan is approved for a project, the key date shall be entered in AASHTOWare software by the appropriate District Materials personnel. The first date entered shall be the date the Project QC Plan letter is received. The second date shall be when the District approves the QC Plan for use on the project.

5.4 MASTER QUALITY CONTROL PLAN

- 5.4.1 The intent of Master QC Plans is to facilitate the approval process in a more uniform manner. A Master QC Plan can be submitted to the Division/District by the Contractor when their work in a given District is routinely repetitive for the year. The

Master Quality Control Plan is applicable for only the calendar year for which it has been approved.

- 5.4.2 The Contractor shall submit the Master Compaction QC Plan yearly to each District in which they have work in. If the Contractor does not have work in a given District for the year then no Master QC Plan shall be submitted to that District.
- 5.4.3 The District will review the submitted Master QC Plan and assign a laboratory reference number upon approval for future referencing. The District will acknowledge approval of Master QC Plan to the Contractor by letter (see Attachment #2 for an example), which will include the laboratory reference number and a copy of the approved Master QC Plan attached. This will then be scanned and placed in ProjectWise under the appropriate District's Org for that Contractor.
- 5.4.4 Once a project has been awarded, if a contractor elects to use the approved Master Compaction QC Plan on that project, the Contractor shall submit a letter requesting to use the Master QC Plan for that project. This letter must be on the Contractor's letterhead, be addressed to the District Engineer/Manager or their designee, and contain the following information: project number, CID#, project name/ description, type of Quality Control Plan and the laboratory reference number for the Master QC Plan (See Attachment #3 for an example).
- 5.4.5 The District shall review the referenced Master QC Plan to ensure that it covers all items in the project. If the referenced Master QC Plan is found to be insufficient for some items on the project, the District shall request the Contractor to submit additional information for QC of those items as an addendum on a project specific basis. When the District is satisfied with the QC Plan for this project, a letter shall be sent to the Contractor acknowledging approval (see Attachment #4 for an example), with the following attached: the Contractor's project QC Plan request letter and the Master QCP approval letter. This shall then be placed in the project's incoming-mail mailbox in ProjectWise.
 - 5.4.5.1 A Master QC Plan that has been approved for project use shall be acceptable for the duration of that project, even if that project continues into subsequent calendar years, unless otherwise directed by the District.
- 5.4.5. For the use of Division Personnel, the District approval letter for this project must state the ProjectWise link to the referenced Master QC Plan for that Contractor. (i.e., WVDOT ORGS > District Organization #> Materials > Year>Master QC Plans...)

6. CERTIFICATION & ACCEPTANCE SAMPLING AND TESTING

- 6.1 The Contractor shall certify that compaction testing and sampling is in conformance with the approved QC plan, referenced MP's and referenced Standard Specifications in a letter format on the company's letterhead. The certification shall summarize what materials ~~wherewere~~ encountered and the compaction method/lift thickness utilized. The letter shall state whether any deviations from the requirements of the QC plan, MP's, and Standard Specifications exist, and why.

- 6.2 Acceptance sampling and testing is the responsibility of the Division. QC tests by the Contractor may be used for acceptance.
- 6.3 The Division shall sample and test for applicable items completely independent of the contractor at a frequency equal to but not limited to approximately ten (10) percent of the frequency for testing given in the approved Quality Control Plan. Witnessing the contractor's sampling and testing activities may also be a part of the acceptance procedure, but only to the extent that such tests are considered "in addition to" the ten (10) percent independent tests.
- 6.4 MP 700.00.50, MP 207.07.20, and Standard Specifications Section 716.3.2.3 outlines the procedures to be followed for acceptance of compaction testing.

7. ABSENT TESTING OF MATERIAL

- 7.1 If the Contractor fails to perform testing of the material in accordance with the Contractor's Division Approved Quality Control Plan, payment for the portion of the item represented by the absent test shall be withheld, pending the Engineer's decision whether or not to allow the material to remain in place.
- 7.1.1 If the Engineer allows the material to remain in place, the Division shall not pay for the material represented by the absent test. However, the Division shall pay for the cost of the placement of the material, including labor and equipment. The invoice or material supplier cost (if applicable), determined at the time of shipment, shall be used to calculate the cost of material when evaluating the total cost of labor and equipment.
- 7.1.1.1 If there is no material cost, the deduction shall be assessed on the tonnage of material represented by the missing test~~that was failed to be tested~~ via a District Materials Inspection Report (DMIR).

8. MATERIAL TEST DATA

- 8.1 The Contractor's Quality Control Plan shall clearly state the name(s) of the individual(s) entering test data as outlined in MP 109.00.21.

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

MP 717.04.21 Steward – Pavement Analysis & Evaluation Section

MAM : J

Attachments

For Committee – No changes to attachments

ATTACHMENT 1 - EXAMPLE GUIDE FOR COMPACTION QUALITY CONTROL PLAN

The Acme Company
20 First St.
Somewhere, WV XXXXXXXX

Mr./Ms/Mrs. _____
WV Division of Highways
District ____ Engineer/Manager
_____, WV

RE: (YEAR) Master Compaction QC Plan
DISTRICT: _____

Dear Mr./Ms/Mrs. _____

We are submitting our Compaction Quality Control Plan for field control, developed in accordance with sections 716 and 717 of the (year) WVDOH Standards and Specifications, (year) WVDOH Supplemental specifications, MP 700.0024, MP 207.07.20, MP 712.21.26 and MP 700.00.50.

The Quality Control Program is under the direction of _____. He/She can be contacted by telephone number _____, email _____ and/or in person.

- 1.) All testing will be performed by qualified personnel as per WVDOH Specification Section 106 Control of Materials. Proof of personnel certification shall be provided to WVDOH inspectors upon request.
- 2.) Specify the methods by which each item will be tested (IE.. 207,307...etc). Table A and Table B (attached) summarizes the different materials, minimum frequencies, and the appropriate test procedure or method for controlling each material. A flow chart for embankment material, Table C (attached), is intended to serve as a guide for making field decisions to insure that each type of material is properly placed.
- 3.) Testing Equipment used will be as required in MP 700.00.24 and MP 207.07.20.
- 4.) Type of gauge to be used (IE.... Troxler 3430, etc). State that calibration information is available upon request by the Division/District.

- 5.) Outline the procedure for performing a stability check on nuclear gauges which are not within the tolerance range for standard counts during the interval between calibrations. Gauges found to be unstable cannot be used until repaired and calibrated.
- 6.) Include in the plan the lot and subplot sizes to be used for testing each type of installation.
- 7.) Specify the maximum time period for completion of a lot of embankment material.
- 8.) Specify in the plan when quality control tests for base and subgrade will be performed.
- 9.) List the forms and method of distribution for tests and measurements. (The forms are specified in MP 207.02.20 and MP 700.00.24.) State that test results will be made available to WVDOH personnel on a daily basis.
- 10.) List the compaction equipment giving the quantity, make, model, and weight or applied force at which each roller will be operated. If ballast will be added to a roller, indicate the type and quantity of ballast and the method for verifying the gross weight. Attach the manufacturer's specifications for compaction capabilities for each roller to the plan or state the procedure for verifying the compaction capabilities of each roller in cases where the manufacturer's specifications are not available.
- 11.) Indicate in the plan that a minimum of a 10 ton (9.07 Mg) roller will be used for testing as per 700.00.24.
- 12.) Indicate in the plan that when shale materials are encountered, the shale hardness test will be performed to determine if material is a soft shale as per 716.1.1.3 of the WVDOH Standards and Specifications.
- 13.) Specify the method by which proof rolling will be conducted on embankment materials. The materials to be proof rolled are summarized in Table B (attached).
- 14.) Laboratory testing for random material is not required unless the material has unusual characteristics or differs from the soil and rock data used to develop the design. Testing to develop density curves, specific gravities, organic content, etc. may be required. The Yearly Quality Control Plan should state that these additional tests must be performed by qualified Aggregate testing personnel as per as per WVDOH Specification Section 106 Control of Materials.

- 15.) Design a plan of action for the disposition of non-specification material.
- 16.) List the method(s) and frequencies by which the lift thickness measurements will be taken.

Very Truly Yours,

Title

ATTACHMENT 2 **** WVDOH

LETTERHEAD ****

THE ACME COMPANY INC.
20 First St.
Somewhere, WV XXXXX

RE: Compaction Master QCP
Description: 20XX Year

Dear Mr./Ms/Mrs. _____,

Your Master Quality Control Plan(M# - #####) for Compaction has been reviewed and found to be acceptable for the following items:

- 207001-001 Unclassified Excavation	- 207002-001 Subgrade
- 211-001 - 307001 Items	- 604 items
- 212 Items - 605 items	-etc....

As work progresses throughout the season an addendum(s) may be required to this QCP to keep the QC program current. **Please use M# - ##### when corresponding about this QC plan.** Please make sure that all appropriate personnel have a copy of this plan in their possession.

Very Truly Yours,

Title

ATTACHMENT 3

The ACME COMPANY
20 First St.
Somewhere, WV XXXXX

EXAMPLE

Mr./Ms/Mrs _____
WV Division of Highways
District ____ Engineer/Manager
_____, WV

RE: Compaction Quality Control plan
for Field ---- Project

Fed. Project No _____ State
Project No. _____
Contract ID No. _____ Description

Dear Mr./Ms/Mrs. _____,

We would like to use our approved Yearly Master Quality Control Plan, reference number _____ for the project referenced above. All Compaction items on the referenced project are covered by the Master Quality Control Plan.

The QC Plan is under the direction of _____,
_____(title), and will be the company's contact representative to the Department of Highways District Materials and Construction Departments. He/She can be contacted in person at the project, by telephone _____ or at email account _____.

Very Truly Yours,

Title

ATTACHMENT 4 ***** WVDOH

LETTERHEAD *****

THE ACME COMPANY INC.
20 First St.
Somewhere, WV XXXXX

RE: Compaction QC Plan
Project CID#: #####
Fed/State Project #: NHPP- ## - ####.##
Description: Falling Slide
County : XXXXXXX

Dear Mr./Ms/Mrs. _____,

Your request to use Master Quality Control Plan (M# - #####) for compaction on the project referenced above, has been reviewed and found to be acceptable for the following items on the referenced project:

- 207001-001 Unclassified Excavation - 207002-001 Subgrade - 307001 Items
- 604 items - 212 Items -etc....

As work progresses throughout this project an addendum(s) may be required to this QCP to keep the QC program current. **Please use M##### when corresponding about this QC plan.** Please make sure that all appropriate personnel have a copy of this plan in their possession.

For Division/District

The Master Quality Control Plan can be reviewed in ProjectWise folder shown below:

WVDOTORG> D0# > year > MASTERQCPLANS > Contractors >Contractor Name > Name of Quality Control Plan

Very Truly Yours,

Title

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 this document.

2. REFERENCED DOCUMENTS

- 2.1 PUBLIC LAW 117–58—NOV. 15, 2021, Infrastructure Investment and Jobs Act.
- 2.2 Build America, Buy America Act (BABA).
- 2.3 23 U.S.C. 313 and 23 CFR 635.410 “Buy America Requirements”.
- 2.4 2 CFR part 184 Buy America Preferences for Infrastructure Projects.
- 2.5 M-22-11 Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.
- 2.6 M-24-02 Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.
- 2.7 Chapter 5, Article 19 and Chapter 5A, Article 3, Section 56 of the West Virginia Code, entitled “West Virginia American Steel Act of 2001.”
- 2.8 West Virginia Notary Handbook, Current Edition.
- 2.9 MP 106.10.51 – WVDOH Buy America Waiver Guidelines.

3. ACCEPTANCE OF MATERIALS

- 3.1 This procedure applies to the following:
1. Steel and Iron
 2. Manufactured Products
 3. Construction Materials
 4. Section 70917(c) Materials
- 3.2 An article, material, or supply shall only be classified into a single category listed in Section 3.1. In some cases, an article, material, or supply may not fall under any of these categories. Classification of the category must be made based on the status of article, materials, or supply at the time it is brought to the work site for incorporation into the project. The work site is generally the location of the project at which the materials will be incorporated. An article, material, or supply permanently incorporated into a project must meet the Buy America Preference for only the single category in which it is classified.
- 3.3 A Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to a 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 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 project but are not an integral part of the structure or permanently affixed to the project.¹

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

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.
- 4.2 Definition
- 4.2.1 “Iron or steel products” means articles, materials, or supplies that consist wholly or predominantly of iron or steel or a combination of both.
- 4.2.1.1 “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.
- 4.3 Standard
- 4.3.1 This includes all processes from the initial melting stage through application of coatings occurs in the United States.

5. MANUFACTURED PRODUCTS

- 5.1 Pursuant to Buy America Requirements, all Manufactured Materials are required to be produced in the United States. All manufacturing processes shall occur in the United States.
- ~~5.1 The Federal Highway Administration (FHWA) has a longstanding waiver in effect exempting Manufactured Products from Buy America Requirements.~~
- 5.2 Definition
- 5.2.1 Manufactured products means:
1. Articles, materials, or supplies that have been:
 - A. Processed into a specific form and shape;
 - B. or Combined with other articles, materials,
 - C. 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, 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

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

this definition may include components that are construction materials, iron or steel products, or Section 70917(c) materials.

5.3 Standard

5.3.1 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.²

5.3.1.1 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:

1. 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).
2. For components manufactured by the manufacturer, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1), plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the manufactured product.

6. CONSTRUCTION MATERIALS.

6.1 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.

6.2 Definition

6.2.1 Construction materials means articles, materials, or supplies that consist of only one of the items listed in Section 6.2.1.1, except as provided in Section 6.2.1.2. To the extent one of the items listed in Section 6.2.1.1 contains as inputs other items listed in this section, it is nonetheless a construction material.

6.2.1.1 The listed items are:

1. Non-ferrous metals;
2. Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
3. Glass (including optic glass);
4. Fiber optic cable (including drop cable);
5. Optical fiber;
6. Lumber;
7. Engineered wood; and

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.

8. Drywall.
- 6.2.1.2 Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.
- 6.3 Standard
- 6.3.1 The Buy America Preference applies to the following construction materials incorporated into projects. Each construction material is followed by a standard for the material to be considered “produced in the United States.”
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.
- 6.3.2 Except as specifically provided, only a single standard under this section should be applied to a single construction material.

7. SECTION 70917(C) MATERIALS

- 7.1 The standards developed under BABA 70915(b) (1) shall not include cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives as inputs of the construction material. These are referred to as 70917(C) materials.
- 7.2 Definition

7.2.1 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.

7.3 These materials are exempt from Buy American Requirements.

8. BUY AMERICA COMPLIANCE.

8.1 On a given project, the Division shall not accept, approve, authorize, or make any payments to any Contractor not fully compliant with Buy America.

8.1.1 When Buy America Requirements apply, the Contractor shall furnish a notarized Certificate of Compliance signed by 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.

8.1.2 The notarized Certificate of Compliance shall contain the following information:

8.1.2.1 Title: Buy America Certification of Compliance.

8.1.2.2 The Name, Address and Contact Information for the Contractor.

8.1.2.3 A contractor statement that demonstrates compliance with Buy America Requirements.

8.1.2.4 The Contract ID for the Material (if applicable).

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

8.1.2.6 The name of the material referenced in the Certificate of Compliance. This material name shall be a clear, common name for the material as stated in the proposal. Part Numbers, etc., may also be on the document if the contractor wishes.

8.1.2.7 The Line Item for the Material (if applicable).

8.1.2.8 The Bid and/or Placed Quantity of the Material.

8.1.2.9 Signature of the Contractor and date.

8.1.2.10 A list of materials on the project that “Buy America” applies but are not Buy America compliant.

8.1.2.11 The document must be notarized as per the “West Virginia Notary Handbook.”

8.2 Attachment 1 shows a sample Certificate of Compliance.

- 8.2.1 Multiple items may be listed on the Certificate of Compliance, though all the information for each line must be on the document.
- 8.2.2 A list of these materials may be referenced on an attached page as long as that page is also signed and notarized.

9. BUY AMERICA WAIVERS

- 9.1 Buy America Waivers are outlined in MP 106.10.51 as per “§ 184.7 Federal awarding agency's issuance of a Buy America Preference waiver” and “23 CFR 635.410(c)”.

10. BUY AMERICA MATERIALS

- 10.1 Attachment 2 includes a list of materials and products used in WVDOH construction projects and the applicability of Buy America Requirements. This attachment also shows each category of each based on Section 3.1 of this document. Finally, if the material is not applicable to Buy America Requirements, justification is given. Example exemptions are as follows:
1. Historic Waiver: Manufactured Product is waived by FHWA as per Section 5 of this Document.
 2. Temporary Material: Material is not permanently incorporated into the project.
- 10.1.1 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 be in accordance with guidance from and through an affirmation process with FHWA.
- 10.1.2 Glass added to a permanent paint product requires a Certificate of Compliance.
- 10.1.3 Attachment 3 includes [OMB Memorandum M-24-02](https://www.whitehouse.gov/wp-content/uploads/2023/10/M-24-02-Buy-America-Implementation-Guidance-Update.pdf)³, dated October 25, 2023, for additional guidance and as the source material for WVDOH's compliance.

³ <https://www.whitehouse.gov/wp-content/uploads/2023/10/M-24-02-Buy-America-Implementation-Guidance-Update.pdf>

11. DOCUMENTATION OF BUY AMERICA CERTIFICATION OF COMPLIANCE

- 11.1 The Certificate of Compliance shall be placed in the QC Plan Folder in ProjectWise (or the current WVDOH approved document retention software) under the contract.

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

MP 106.10.50 Steward – Materials Control Section
ATTACHMENTS

Buy America Certification of Compliance

Acme Construction Company
123 Main Street
Charleston, WV 25302

Ship Date: 10/31/2023

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.

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

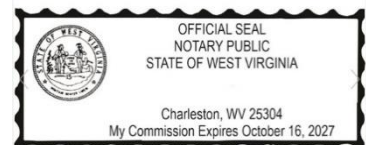
CID: 22000005R1

Federal Number: B-0010(000)X

State Number: U002-00-1.00

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

Non-Compliant Buy America Materials		
Line: 0055	Widget, Part I ^z	300 Cubits



Janie Doe, Contractor President

Attachment 2: Full document is available at the [WVDOH MCST Toolbox](#)⁴.

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

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

MATERIALS PROCEDURE

ACCEPTANCE OF MATERIALS
VIA APPROVED PRODUCTS LIST

1. PURPOSE

- 1.1 To set forth instructions for the acceptance of materials on projects via the WVDOH Approved Product List (APL).
 - 1.1.1 This document is a general guideline for the acceptance of any material on a project via the APL. Specific materials may have additional acceptance criteria not listed in this document. If specific material acceptance criteria conflict with this document, those criteria override this document.
-

2. REFERENCED DOCUMENTS

- 2.1 MP 106.00.02 - Procedure for Evaluation of New Products for Use in Highway Construction.
 - 2.2 MP 106.00.03 - Guidelines for Establishing and Maintaining Approved Product Lists of Materials, Systems and Sources
-

3. ACCEPTANCE OF MATERIALS ON APPROVED SOURCE

- 3.1 When accepting material on the project, the contractor must provide proof of the source of origin. The contractor shall provide an invoice which clearly includes the following information:
 - 1. The name of the producer/supplier
 - 2. The common name of the material
 - 3. The current WVDOH approval number
 - 3.2 The invoice must be legible and clearly show all the required information.
 - 3.3 The project shall review the submission and confirm that the company and approval number appear on the APL.
 - 3.3.1 Any producer/supplier wishing to submit their material for consideration for the APL shall follow the guidelines of MP 106.00.02 and MP 106.00.03.
-

4. DOCUMENTATION OF ACCEPTANCE

- 4.1 The acceptance shall be documented in AWP on the Daily Work Report (DWR).
- 4.2 The producer/supplier, as well as the approval number shall be included on the DWR.
- 4.3 A scan or original version of the invoice shall be placed in the ProjectWise project folder.

5. E-TICKETING

- 5.1 For materials requiring an E-Ticket, this ticket shall be provided in addition to the paper ticket.
- 5.2 The E-Ticket shall include all the required information.
- 5.3 A PDF of the E-Ticket shall also be placed in ProjectWise.

Michael A Mance, P.E.
Interim Director
Materials Control, Soils & Testing Division

MP 106.00.05 Steward – Materials Control Section
MM:B

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

MATERIALS PROCEDURE

GUIDE FOR QUALITY CONTROL AND ACCEPTANCE REQUIREMENTS FOR
PORTLAND CEMENT CONCRETE

1. PURPOSE

- 1.1 To establish minimum requirements for Contractor's Quality Control (QC) system and the Division's Acceptance Plan. It is intended that these minimum requirements be followed in detailing the inspection, sampling, and testing deemed necessary to maintain compliance with all Specification requirements.

2. SCOPE

- 2.1 This Materials Procedure (MP) is applicable to all Portland Cement Concrete (PCC) items, and it outlines the quality control procedures for both plant and field operations and includes procedures for approving and using Master and/or Project Specific QC Plans. This procedure also aids in documentation and retention of QC Plans in ProjectWise.

3. REFERENCED DOCUMENTS

- 3.1 AASHTO M 201 - Standard Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes.
- 3.2 AASHTO T 22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens.
- 3.3 AASHTO T 231 - Standard Method of Test for Capping Cylindrical Concrete Specimens.
- 3.4 ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
- 3.5 ASTM C1231 - Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Cylindrical Concrete Specimens.
- 3.6 ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- 3.7 ASTM C511 - Standard Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes.

-
- 3.8 ASTM C617 - Standard Practice for Capping Cylindrical Concrete Specimens.
 - 3.9 MP 109.00.21 - Basis for Charges for Non-Submittal of Sampling & Testing Documentation by the Established Deadline.
 - 3.10 MP 300.00.51 - Procedural Guidelines for Maintaining Control Charts for Aggregate Gradation.
 - 3.11 MP 601.03.52 – Procedural Guidelines for Maintaining Control Charts for Portland Cement Concrete.
 - 3.12 MP 601.04.20 - Curing Concrete Test Specimens in The Field.
 - 3.13 MP 601.05.50 - Quality Assurance Procedures for Portland Cement Concrete.
 - 3.14 MP 700.00.54 - Procedure for Evaluating Quality Control Sample Test Results with Verification Sample Test Results.

4. GENERAL REQUIREMENTS

- 4.1 The Contractor shall provide and maintain a quality control system that will provide reasonable assurance that all materials and products submitted to the Division for acceptance will conform to the contract requirements whether manufactured or processed by the Contractor or procured from suppliers, subcontractors, or vendors. The Contractor shall perform or have performed the inspections and tests required to substantiate product conformance to contract document requirements and shall also perform or have performed all inspections and tests otherwise required by the contract. The Contractor's quality control inspections and tests shall be documented and shall be available for review by the Engineer throughout the life of the contract. The Contractor shall maintain standard equipment and qualified personnel as required by the Specifications to assure conformance to contract requirements. Procedures will be subject to the review of the Division before the work is started.

5. QUALITY CONTROL PLAN

- 5.1 The Contractor shall prepare a QC Plan detailing the type and frequency of inspection, sampling, and testing deemed necessary to measure and control the various properties of materials and construction governed by the Specifications. As a minimum, the sampling and testing plan should detail sampling location, sampling techniques, and test frequency to be utilized. Quality control sampling and testing performed by the Contractor may be utilized by the Division for acceptance.
 - 5.1.1 A QC Plan must be developed by the Contractor and submitted to the Engineer prior to the start of construction on every project. Acceptance of the QC Plan by the Engineer will be contingent upon its concurrence with these guidelines.
 - 5.1.2 As work progresses, an addendum(s) may be required to a QC Plan to keep the QC program current. Personnel may be required to show proof of certification for testing.

5.2 Quality Control Plan Guidelines

- 5.2.1 The Plan shall identify the personnel responsible for the Contractor's quality control. This should include the company official who will act as the liaison with Division personnel, as well as the Certified Portland Cement Concrete Technician who will direct the inspection program at the plant or in the field depending if it is a plant or field QC Plan. Their phone number and email address must also be included as a means for contact by the Division personnel.
- 5.2.2 All classes of concrete and corresponding mix design numbers, which may be used, shall be listed on the Plant QC Plan. All classes of concrete, which may be used, shall be listed on the Field QC Plan.
- 5.2.3 Process control sampling, testing, and inspection should be an integral part of the contractor's quality control system. In addition to the above requirements, the Contractor's QC Plan should document the process control requirements shown in Table 1 of Attachment 1. The process control activities shown in Table 1 are considered to be normal activities necessary to control the production and placement of a given product or material at an acceptable quality level. To facilitate the Division's activities, the Contractor, as per ML-25, shall retain all completed gradation samples until further disposition is designated by the Division.

5.2.4 All concrete producers shall provide an e-ticket that meets the requirements of Section 109.20.1 of the Specifications.

5.2.4.5.2.5 All sampling and testing shall be in accordance with the methods and procedures required by the Specifications. Measuring and testing equipment shall be standard and properly calibrated as per the specified test procedures. If alternative sampling methods, procedures, and inspection equipment are to be used, they shall be detailed in the QC Plan. Any QC testing that is not performed in accordance with the methods and procedures required by the Specifications shall be considered an invalid test, and the applicable penalty for the cost associated with that test, in accordance with MP 109.00.20, will be assessed to the contractor, along with the applicable price adjustment in Section 105.3. The test specimen(s) represented by an invalid test shall be considered as not meeting Specifications and documented accordingly. The Division may, however, use the results of an invalid test to determine if material may be accepted and allowed to remain in place and if payment may be made for the material represented by the invalid test.

5.2.4.15.2.5.1 Any individual who samples or tests plastic concrete for quality control purposes shall be certified as a WVDOH PCC Inspector.

5.2.4.25.2.5.2 Any Laboratory which tests the hardened concrete cylinders for the Contractor, for quality control purposes, shall be listed in the Contractor's QC Plan for field operations.

This Laboratory shall provide evidence that it meets the applicable requirements in ASTM C1077, pertaining to testing hardened concrete cylinders, for a concrete testing laboratory, including curing facilities, testing equipment, technician proficiency, participation in the Cement and Concrete Reference Laboratory (CCRL) Concrete Proficiency Sample Program (PSP), Quality Management System documentation, and recordkeeping. The only test required for these laboratories, in the CCRL Concrete PSP, is ASTM C39 (AASHTO T22), but it is recommended that the laboratory perform all the field test portions of these Proficiency Samples and maintain the results of these tests, in order to evaluate any root cause issues pertaining to compressive strength. Each Laboratory shall be inspected and evaluated initially, and at least once every regular inspection tour cycle (approximately 30 months) by the CCRL. The ASTM standards pertaining to testing concrete cylinders, with which the subject laboratory must comply, include ASTM C39 (AASHTO T22), ASTM C617 (AASHTO T231) or ASTM C1231, and ASTM C511 (AASHTO M201). The Personnel Qualification requirements in Section 6 of ASTM C1077 regarding PE direction, Laboratory Supervisors, and concrete laboratory personnel testing certifications also apply, except that a Laboratory Supervisor with at least five years' experience in construction materials testing shall be a permissible substitution for the licensed professional engineer. Subsequent documentation shall be provided to the Division showing that the subject Laboratory and personnel meet the applicable requirements of ASTM C1077, pertaining to testing concrete cylinders, for a concrete laboratory. In addition any laboratory conducting concrete surface resistivity testing must be evaluated by CCRL for AASHTO T358. Any Laboratory which desires to test Contractor hardened concrete QC specimens on WVDOH projects shall submit the evidence/documentation, required in Section 4.2.4.2, confirming compliance with ASTM C1077, with regards to testing concrete cylinders, to MCS&T Division at the following e-mail address: DOHMCSnTconcretelab@wv.gov. MCS&T Division will review this submittal. In this submittal, the subject Laboratory shall also explain how all deficiencies noted in the CCRL Laboratory Inspection Report have been addressed. All deficiencies noted in the CCRL Laboratory Inspection Report shall be resolved to the satisfaction of the Division within 90 days from the date of the CCRL Laboratory Inspection Report. Once MCS&T Division determines that the subject Laboratory is in compliance with the applicable requirements of ASTM C1077, and all deficiencies have been adequately resolved, that Laboratory will be placed on the Division's Approved List of Concrete Cylinder Testing Labs. All laboratories which test contractor hardened concrete QC specimens on WVDOH projects must be listed on the Division's Approved List of Concrete Cylinder Testing Labs. Laboratories that are certified to run AASHTO T358 will be indicated by a asterisk associated to the applicable footnote on the APL. A listing of these laboratories is available on the WVDOH MCS&T [Webpage](#)¹. All Division Approved Laboratories shall provide the Division with the CCRL Lab Number for their laboratory and agree to allow DOH, CCRL, and AASHTO re:source to freely share information about assessment reports, proficiency samples, corrective actions

¹ https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx

, quality management system, and personnel competency and certification records.

5.2.55.2.6 When calculating the compressive strength of concrete cylinders in accordance with AASHTO T22, the following procedure shall be used:

$$CS = \frac{ML}{0.25 \times \pi \times D^2}$$

Where:

- CS = Compressive Strength of the specimen
- ML = Maximum load carried by the specimen during the test
- π = Mathematical constant PI
- D = Diameter of the cylinder being tested (in accordance with AASHTO T 22)

Note: The calculation for CS shall be performed in one continuous step (without any rounding), either by the testing machine, or by calculating device, and only the final value (CS) is permitted to be rounded (to the accuracy specified in AASHTO T 22). The value for π shall be the manufacturer's pre-programmed value in a calculating device or the testing machine.

5.2.65.2.7 Miscellaneous Concrete:

The contractor is not required to perform the process control testing required by Part C of Table 1 of the Attachment on miscellaneous concrete (as defined in section 4.2.6.1), provided that the concrete in question is being supplied by an A1 or A2 plant (as defined in MP 601.05.50, formerly numbered as IM-18), and provided that the requirements of section 4.2.6.2 are met for each project on which the reduced testing of miscellaneous concrete is applied.

5.2.6.15.2.7.1 Miscellaneous concrete shall be defined as relatively small quantities, not exceeding 25 yd³ per day, incorporated into items that will not adversely affect the traffic carrying capacity of a completed facility. Such items would not include any concrete intended for major structures, permanent mainline or ramp pavements, or any other structurally critical items part of, or adjacent to the roadway.

The following items are suggested as a guideline in establishing items that may be categorized as miscellaneous concrete:

Note: Concrete testing for certain items below is waived, in some cases, by the referenced section of the specifications.

- 1 Sidewalks
2. Curb and Gutter
3. Slope walls for under drain outlet pipes

4. Temporary pavements and pipe crossings
5. Building floors
6. Slope paving and headers
7. Paved ditch or gutter
8. Small (less than 36" diameter) culvert headwalls
9. Catch basins, manhole bases, inlets, and junction boxes (and adjustments of such items) not located in the roadway
10. Foundations for breakaway supports
11. Utility trench fills
12. Cast-in-place survey markers

~~5.2.6.2~~5.2.7.2 One sample per two days of production (for the same project) shall be tested (beginning on the first day of production) for compressive strength, air content, and consistency. On a minimum of ten percent of the samples outlined above, the Division will observe the batching operation at the plant (that is producing the concrete to be sampled) and check the operational control.

~~5.2.6.3~~5.2.7.3 When placing miscellaneous concrete and no testing is required, an Approved Source Sample will be generated in SiteManager. The C##### representing the test from the previous day of production shall be entered in the intended use field. Miscellaneous Concrete will be entered in remarks. Miscellaneous Concrete will be written on all batch tickets for which testing is not required, per the miscellaneous concrete provisions of this MP, prior to scanning and placing in ProjectWise.

~~5.2.75~~5.2.8 Documentation:

The Contractor shall maintain adequate records of all inspections and tests. The records shall indicate the nature and number of observations made, the number and type of deficiencies found, the quantities approved and rejected, and the nature of corrective action taken as appropriate. The Contractor's documentation procedures will be subject to the review and approval of the Division prior to the start of the work and to compliance checks during the progress of the work.

~~5.2.85~~5.2.9 Charts and Forms:

All conforming and non-conforming inspections and test results shall be kept complete and shall be available at all times to the Division during the performance work. Forms shall be on a computer-acceptable medium where required. Batch ticket data shall be documented in accordance with the applicable section of MP 601.03.50, with a copy to be submitted to the District Materials Section within 72 hours of the concrete placement. Gradation data shall be documented on WVDOH form T300 using the material codes listed in the online computer systems user guide. The original gradation data shall be submitted to the District Materials Section within 72 hours of obtaining the gradation sample. Test data for (PCC) shall be charted in accordance with the applicable requirements of MP 601.03.52. Gradation test data shall be plotted in

accordance with the applicable requirements of MP 300.00.51. The Contractor may use other types of control charts as deemed appropriate by the Division. It is normally expected that testing and charting will be completed within 48 hours after sampling. The Contractor shall also ensure that all Material Suppliers prepare and submit the HL-441 form (weekly supplier report) in a timely manner

~~5.2.8.1~~5.2.9.1 All charts and records documenting the Contractor's quality control inspections and tests shall become property of the Division upon completion of the work.

~~5.2.9.5~~5.2.10 Batch Tickets

Each batch of Structural Concrete, including miscellaneous concrete (as defined in section 4.2.6.1), delivered at the project shall be accompanied by one batch ticket with all of the items of information listed in Section 4.2.9.1 pre-populated on the ticket. In the case of (PCC) Pavement, each batch of concrete delivered at the project on which a test in accordance with Table 1 of Attachment 1 is to be performed shall be accompanied by a batch ticket. This batch ticket shall have all of the items listed in section 4.2.9.1 pre-populated on the ticket unless non-agitator trucks or truck agitators are used. In this case, the batch ticket shall have all of the items listed in section 4.2.9.2 pre-populated on the ticket.

~~5.2.9.1~~5.2.10.1 All batch tickets for Structural Concrete and (PCC) Pavement Concrete transported by truck mixers shall have all the following items pre-populated on the ticket:

1. Producer/Supplier Code
2. Producer/Supplier Name
3. Producer/Supplier Location
4. Mix Design Laboratory Reference Number
5. Date
6. Sequence Number
7. Volume (yd³/m³)
8. Time Batched
9. Contract Identification Number (CID #)
10. Federal Project Number (If applicable)
11. State Project Number
12. Material Code/Name
13. Water Allowed (gal/L)
14. Water at Plant (gal/L)
15. Weight of Ice at Plant (lb/kg)
16. Weight of Cement (lb/kg)
17. Supplementary Cementitious Material(s) (SCM) (lb/kg)
18. Weight of Fine Aggregate (lb/kg)
19. Weight of Coarse Aggregate (lb/kg)
20. *Admixture Name(s) and Dose (oz/L)

21. Cylinder I.D.
22. Initial Counter
23. Target Consistency (in/mm)
24. Target Air (%)
25. License Number of Haul Unit.

* If admixtures are added at the jobsite, these shall be entered by the project.

The following information shall be documented on the ticket by the project:

1. Contract Item Number
2. Contract Line Number
3. Time Unloaded
4. Water at Job (gal/L)
5. Concrete Temperature (°F/°C)
6. Final Counter
7. Actual Consistency (in/mm)
8. Actual Air (%)

~~5.2.9.2~~5.2.10.2 All batch tickets for concrete delivered by means of non-agitator trucks or truck agitators shall have all of the following items pre-populated on the ticket:

1. Producer/Supplier Name
2. Mix Design Laboratory Reference Number
3. Date
4. Sequence Number
5. Volume (yd³)
6. Time Batched
7. Contract Identification Number (CID #)
8. Federal Project Number (If applicable)
9. State Project Number
10. Material Code/Name
11. Water Allowed (gal/L)
12. Water at Plant (gal/L)
13. Weight of Ice at Plant (lb/kg)
14. Weight of Cement (lb/kg)
15. Weight of SCM (lb/kg)
16. Weight of Fine Aggregate (lb/kg)
17. Weight of Coarse Aggregate (lb/kg)
18. *Admixture Name(s) and Weight(s) (oz/L)
19. Target Consistency (in/mm)
20. Target Air (%)
21. License Number of Haul Unit.

* If admixtures are added at the jobsite, these shall be entered by the project

The following information shall be documented on the ticket by the project:

1. Item Number
2. Line Number
3. Time Unloaded
4. Temperature (°F/°C)
5. Actual Consistency (in/mm)
6. Actual Air (%)

~~5.2.9.3~~5.2.10.3 The batch ticket in the case of either type of concrete shall be a batch ticket prepared by the plant. This ticket must be computer generated with blank fields provided in which all of the required data shall be recorded. The data items listed above that are completed in the field (such as Time Unloaded, Actual Consistency, etc.) must have a field on the batch ticket for completion. Volume is to be reported to the nearest 0.01 yd³. Consistencies are to be reported to the nearest 0.25 inch. Target and Actual Air are to be reported to the nearest 0.1% (to the nearest 0.25% if the volumetric method is used).

~~5.2.9.4~~5.2.10.4 As per the requirements of Section 109.20.1 of the Specifications, an e-ticket shall be provided to meet these requirements.

~~5.2.10~~5.2.11 Corrective Action:

The Contractor shall take prompt action to correct conditions, which have resulted, or could result, in the submission to the Division of materials and products, which do not conform to the requirements of the Contract documents.

~~5.2.11~~5.2.12 Non-Conforming Materials:

4.2.11.1 The Contractor shall establish and maintain an effective and positive system for controlling non-conforming material, including procedures for its identification, isolation and disposition. Reclaiming or reworking of non-conforming materials shall be in accordance with procedures acceptable to the Division. All non-conforming materials and products shall be positively identified to prevent use, shipment, and intermingling with conforming materials and products. Holding areas, mutually agreeable to the Division and the Contractor shall be provided by the Contractor.

~~5.2.12~~5.2.13 Types of QC Plans:

~~5.2.12.1~~5.2.13.1 QC Plans which are intended for use on more than one project shall be defined as Master QC Plans. Section 4.3 outlines the procedures for Master QC Plan submittal and approval.

~~5.2.12.25.2.13.2~~ 5.2.13.2 QC Plans which are intended for use on a single project shall be defined as Project Specific QC Plans. Project Specific QC Plans shall contain a cover letter which includes the following: project description, CID#, Federal and/or State Project Number.

~~5.2.12.35.2.13.3~~ 5.2.13.3 A Contractor may submit a Master QC Plan for Plant and/or Field operations instead of a Project Specific QC Plan.

~~5.2.12.45.2.13.4~~ 5.2.13.4 Once any QC Plan is approved for a project, the key date shall be entered in SiteManager by the appropriate District Materials personnel. The first date entered shall be the date the Project QC Plan letter is received. The second date shall be when the District approves the QC Plan for use on the project.

5.3 Master QC Plan

5.3.1 The intent of Master QC Plans is to facilitate the approval process in a more uniform manner. Master QC Plans can be submitted to the Division by the Contractor when their workload in a given District is routinely repetitive for the year.

5.3.2 The Contractor shall submit a Master Field QC Plan yearly to each District in which they have work (see Attachment 2). If the Contractor does not have work in a given District for the year, then a Master Field QC Plan does not need to be submitted to that District.

5.3.3 The Producer/Supplier shall submit a Master Plant QC Plan at the beginning of each year to the District in which their plant is located (see Attachment 3).

5.3.4 The District will review the submitted Master QC Plans to see if they meet the applicable requirements of Sections 4.2 thru 4.2.11.1 and assign a Laboratory Reference Number to each QC Plan upon approval, for future referencing. The District will acknowledge approval of each Master QC Plan to the Contractor and/or Producer/Supplier by letter (see Attachment 4), which will include the Laboratory Reference Number and a copy of the approved Master QC Plan. This will then be scanned and placed in ProjectWise under the appropriate District's Org for that Contractor and/or Producer/Supplier.

5.3.5 Once a project has been awarded, if a contractor elects to use the approved Master Plant and Master Field QC Plans on that project, the Contractor shall submit a letter requesting to use the Master QC Plans for that project. This letter must be on the Contractor's letterhead, be addressed to the District Engineer/Manager or their designee, and contain the following information: project number, CID#, project description, type of Quality Control Plan and the laboratory reference number for the Master QC Plan. See Attachment 5 for an example of a plant letter and Attachment 6 for an example of a field letter.

- 5.3.5.1 The District shall review the referenced Master QC Plans to ensure they cover all items in that project. If the referenced Master QC Plan is found to be insufficient for some items on that project, the District shall request the Contractor to submit additional information for quality control of those items as an addendum on a project specific basis. When the District is satisfied with the QC Plan for that project, a letter shall be sent to the Contractor acknowledging approval (see Attachment 7), with the following attached: the contractor's project QC Plan request letter and the Master QC Plan approval letter. This shall then be placed in the project's incoming-mail mailbox in ProjectWise.
- 5.3.5.2 A Master QC Plan that has been approved for project use shall be good for the duration of that project.
- 5.3.5.3 For the use of Division Personnel, the District approval letter for this project must state the ProjectWise link to the referenced Master QC Plan for that Contractor (for example: WVDOT ORGS > District Organization #> Materials > Year > Master QC Plans).
- 5.3.6 The Master Field and Plant QC Plans shall be valid for the duration of one calendar year beginning on January 1st and ending on December 31st. The Master Plant QC Plan will also cover maintenance purchase order concrete for the year.

6. ACCEPTANCE SAMPLING AND TESTING

- 6.1 Acceptance sampling and testing is the responsibility of the Division. Quality control tests by the Contractor may be used for acceptance.
- 6.2 The Division shall sample and test for applicable items completely independent of the contractor at a frequency equal to approximately ten (10) percent of the frequency for testing given in the approved QC Plan. Witnessing the contractor's sampling and testing activities may also be a part of the acceptance procedure, but only to the extent that such tests are considered "in addition to" the ten (10) percent independent tests.
- 6.3 Results from independent tests conducted by the Division for gradation, entrained air, consistency, and strength will be plotted on the Contractor's quality control charts with a red circle but are not to be included in the moving average. When the Contractor's tests are witnessed, the results are circled on the control chart in red and are to be included in the moving average calculations.
- 6.4 Results from both independent tests and witnessed tests will be evaluated in accordance with MP 700.00.54. If a dissimilarity is detected, an investigation shall be immediately initiated to determine the cause of the dissimilarity.

7. ABSENT TESTING OF MATERIAL

- 7.1 If the Contractor fails to perform testing of the material in accordance with the Contractor's Division Approved Quality Control Plan, payment for the portion of the item represented by the absent test shall be withheld, pending the Engineer's decision whether or not to allow the material to remain in place. Testing includes both performing the test and submitting the results as per MP 109.00.21.
- 7.1.1 If the Engineer allows the material to remain in place, the Division shall not pay for the material represented by the absent test. However, the Division shall pay for the cost of the placement of the material, including labor and equipment. The invoice or material supplier cost (if applicable), determined at the time of shipment, shall be used to calculate the cost of material when evaluating the total cost of labor and equipment.

8. TEST DATA ENTRY

- 8.1 The Contractor's Quality Control Plan shall clearly state the name(s) of the individual(s) entering test data as outlined in MP 109.00.21.

Michael Mance, 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

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 and to all precast concrete product fabricators that supply material for use on West Virginia Division of Highways projects.
- 2.2 For prestressed concrete members refer to MP 603.10.40 "Inspection and Acceptance Procedure for Prestressed Concrete Bridge Beams."

3. FABRICATOR APPROVAL

- 3.1 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.
- 3.2 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.
- 3.2.1 **All fabricators must set up their invoicing as a E-tickets that meet the requirements of Section 109.20.1 of the Standard Specification prior to approval.**
- 3.3 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.

- 3.3.1 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.
- 3.3.1.1 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.
- 3.3.2 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.
- 3.3.3 The Fabricator must submit the Quality Control Manual/Plan for review at this meeting.
- 3.4 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.
- 3.5 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.
- 3.6 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 7.

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

- 4.1 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.
- 4.1.1 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.
- 4.1.2 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.
- 4.2 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.
- 4.3 Concrete cylinders shall be made for compressive strength testing with 6-inch by 12-inch or 4-inch by 8-inch 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.
- 4.3.1 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 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.

- 4.3.2 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.
- 4.4 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.
- 4.5 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%.
- 4.6 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.
- 4.6.1 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 4.6.1 - 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 $2 \text{ seconds} \leq T_{50} \leq 7 \text{ seconds}$ Visual Stability Index ≤ 1.0
Passing Ability (ASTM C1621)	J-Ring Value ≤ 1 inch
Segregation Resistance (ASTM C1610)	Segregation $\leq 12\%$
Unit Weight and Yield	$\pm 2\%$ of Theoretical

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

Table 4.6.2 - SCC Production Acceptance

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

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

5. FINAL INSPECTION

- 5.1 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.
- 5.2 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](https://transportation.wv.gov/highways/mcst/Pages/WVDOH-Materials-Procedures.aspx)¹.
- 5.2.1 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.
- 5.2.2 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.

6. ACCEPTANCE & REJECTION

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.
- 6.1.1 Shipping invoices shall document the assigned Laboratory Reference Number, type of material, number of pieces, size, and cast dates. All Division invoicing must be submitted as an e-ticket to the project that meets the requirements of Section 109.20.1 of the Specifications.
- 6.2 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.
- 6.2.1 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 or less shall be sealed by silane; and cracks between 4 mils and 16 mils shall be repaired by epoxy injection in accordance with Section 603.10.2. Any crack exceeding 16 mils 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.
- 6.2.2 Major defects shall include: dimensions that exceed tolerances, failure to reach required compressive strength, cracks greater than 16 mils, and any defect that could be considered structural. Lagging dimensions shall be within $\pm \frac{1}{4}$ " 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.

- 6.2.3 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. **PROCEDURE FOR APPROVED SOURCE OF PRECAST CONCRETE LAGGING**

- 7.1 Precast concrete Fabricators may be classified as an Approved Source of precast concrete lagging if they have met the requirements of Section 3 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.
- 7.2 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.
- 7.3 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.
- 7.3.1 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 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 project, then the Fabricator will be de-certified as an Approved Source of precast concrete lagging.

- 7.3.2 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.
- 7.3.2.1 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)

- 7.4 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

- for a minimum 2 years. Depending on the severity and the legality of the falsified documents the removal may be permanent.
- 7.5 Non-Conforming material received by WVDOH 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.

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

MP 604.02.40 Steward – Cement and Concrete Section
RLS:T
ATTACHMENT

**PRECAST CONCRETE PRODUCTS
WVDOT 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: _____

PRECAST CONCRETE PRODUCTS

WVDOT DIVISION OF HIGHWAYS MCS&T DIVISION

SAMPLE FABRICATION CHECKLIST

Preliminary Verifications

POST POUR WORK

Repairs:

Approved Repair Procedures: _____

Approved by: _____ **Approval Date:** _____

Repair Witnessed: _____

Comments:This image shows a single sheet of white paper with horizontal blue or grey 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)	

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

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 x 8-inch (100 mm x 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 manufacturer 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.). All precast shall provide an Division invoicing must be submitted as an e-ticket to the project that meets the requirements of Section 109.20.1 of the Specifications.
- ~~7.27.1~~ ~~All precast shall provide an e-ticket that meets the requirements of Section 109.20.1 of the Specifications.~~
- ~~7.37.2~~ 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

Michael Mance, 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

INSPECTION AND ACCEPTANCE PROCEDURES
FOR PRESTRESSED CONCRETE BRIDGE MEMBERS

1. PURPOSE

- 1.1 To set forth procedures for the inspection and acceptance of prestressed concrete bridge members, including beams, pier caps, deck panels, and any other prestressed members, and the approval of the plants at which they are fabricated.

2. SCOPE

- 2.1 This procedure will apply to all prestressed concrete bridge members supplied for use on West Virginia Division of Highways projects and to all prestressed concrete bridge member fabricators that supply material for use on West Virginia Division of Highways projects.

3. INSPECTION

- 3.1 All prestressed concrete bridge member 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.
- 3.1.1 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 and Quality Control (QC) lab, meet with QC and other key personnel from the Fabricator, and sample component materials which will be used in fabrication of precast items.
- 3.1.1.1 Sampling and testing of component materials shall be done in accordance with MP 603.02.10. All component materials shall be approved prior to the start of fabrication. Batch scales shall be calibrated in accordance with MP 700.00.03 at a minimum once per year.

~~3.1.1.2~~

3.1.1.2 Shipping invoices shall document the assigned Laboratory Reference Number, type of material, number of pieces, size, and cast dates. All Division invoicing must be submitted as an e-ticket to the project that meets the requirements of Section 109.20.1 of the Specifications.

- 3.1.1.3 Any fabricator which does not produce for the WVDOH for a period of 2 years shall be removed from the approved fabricator list and the fabricator will need to be approved again before they can do work. Sampling of component materials will not continue when the plant is removed from the approved fabricator list.
- 3.1.1.4 Personnel from the Fabricator required to be present during the initial on-site visit and meeting between WVDOH and Fabricator personnel shall include representatives from Production and Quality Control. Any questions and concerns regarding WVDOH requirements, including applicable Specifications, Materials Procedures, Standard Details, and QC/QA Inspections shall be addressed at this meeting.
- 3.1.1.5 Prior to beginning fabrication of any prestressed concrete bridge members, the Fabricator shall provide written notification to MCS&T Division at least one calendar week in advance of the date on which fabrication is to begin. 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.
- 3.1.2 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.
- 3.1.3 The Inspector, as a minimum, shall be registered with the Precast/Prestressed Concrete Institute (PCI) as a Level II Quality Control Technician.
- 3.2 The Inspector shall be present at any or all times during fabrication including casting bed layout, steel placement, stressing operations, concrete testing, placing, and finishing, detensioning operations, camber measurements, testing hardened concrete cylinders, post-pour inspections, and repairs.
- 3.2.1 Fabricators must provide adequate lighting to illuminate the casting bed to allow for visual inspection of the entire rebar assembly and setup. Fabricators must make forms safely accessible for visual inspection of the setup down in the form for the entire length of the bed.
- 3.3 After fabrication is completed and prior to shipment, the Fabricator shall provide MCS&T Division with a written request for Final Inspection a minimum of one calendar

week prior to the desired date of inspection. This written request may be in the form of an e-mail. Upon receipt of the written request for Final Inspection from the Fabricator, MCS&T Division will notify the Fabricator of the earliest possible date of this inspection. Effective communication from the Fabricator to MCS&T Division and Consultant Inspection Agency is key to avoiding any scheduling conflicts regarding Final Inspection.

- 3.4 At Final Inspection, the Inspector shall witness any compressive strength tests which may be required, inspect repairs as needed, and conduct a thorough visual examination of each member. After the Final Inspection is completed, the Inspector shall provide the Fabricator with a copy of the inspection report. This report shall include the findings of the Final Inspection and any other observations or notes taken by the Inspector during fabrication, including a completed copy of the Inspector's checklist. 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.
- 3.5 The Inspector shall use the checklist and inspection forms which are included as Attachments to this MP. The Fabricator shall also document all required information on the applicable Attachments.

4. ACCEPTANCE

- 4.1 Upon completion of the inspection of a member, the subject member shall be classified in one of two ways. The first way is that the member does not contain any defects. The second way is that the member contains some type of defect.
 - 4.1.1 If a member meets all specification requirements and does not contain any defects, the Inspector will stamp the subject member as accepted by MCS&T Division.
- 4.2 If a member contains some type of defect, it will be classified into one of the following three categories. These categories are: Category I (Cosmetic Defects), Category II (Dimensional Tolerances), and Category III (Structural Defects).
 - 4.2.1 Category I defects include cosmetic defects such as minor spalls with no exposed reinforcing steel or prestressing strand, bug holes, and minor surface irregularities, etc. Category I defects also include cracks up to and including 16 mils in width for which repair procedures are addressed by the standard specifications. Prior to the start of fabrication, the Fabricator shall submit to MCS&T Division, for approval, the proposed repair procedures for Category I defects which may be encountered.

4.2.1.1 Any Category I defect(s) will first be noted by the Inspector and may be subsequently repaired by the Fabricator as per the Fabricator's pre-approved repair procedure. The Inspector shall inspect the repair(s), and if the repair(s) is satisfactory, and if all other aspects of the member meet specifications, the Inspector will stamp the subject member as accepted by MCS&T Division.

4.2.2 Category II addresses any aspect of a member which exceeds the dimensional tolerances set forth in the Specifications. The Inspector will document the variance(s) and notify the Fabricator. At this point, the Fabricator may seek acceptance of the subject member by sending a written notification to the Contractor including a copy of the Inspector's report and any other pertinent data.

If the Contractor agrees to accept the subject member with the defect at the original contract price, then the Contractor shall provide a written statement to District Construction personnel and MCS&T Division stating such.

4.2.2.1 The Contractor, or his designated representative (i.e. the Fabricator), shall then contact MCS&T Division and provide them with a report containing all relevant information and a detailed summary of the dimensional variation(s) in the subject member for which the Fabricator is seeking acceptance. MCS&T Division shall then contact the Designer (either Engineering Division, or the appropriate District, or Engineer of Record) and District Construction personnel and forward this information to them. If the member was designed by a Consultant, Engineering Division may forward the information to the appropriate Consultant. The Designer will then analyze the dimensional variation(s) and provide a written statement to the Contractor, the Fabricator, MCS&T Division, and District Construction personnel as to whether it will affect the structural performance of the subject member. After receipt of that statement from the Designer, District Construction personnel shall then provide a written statement to the Contractor, the Fabricator, and MCS&T Division as to whether the dimensional variation will create construction difficulties.

4.2.2.2 If the Designer states that this dimensional variation(s) will adversely affect the structural performance of the member, or if District Construction states that it will create construction difficulties, or if the Contractor does not agree to accept the subject member with the defect at the original contract price, MCS&T Division will not accept the subject member. MCS&T Division will assign a laboratory number to this subject member, which notes that the member does not meet specifications, and will include a thorough explanation as to why the member does not meet specification requirements. If rejected by MCS&T, the subject member may be accepted by the District by means of a District Materials Inspection Report (DMIR).

4.2.2.3 If the Designer does not feel qualified to perform the analysis outlined in Section 4.2.2 and make the decision as to whether the dimensional variation will affect the structural

performance of the subject member, the Designer shall inform MCS&T Division of this fact, and MCS&T Division will relay this to the Fabricator. The Fabricator may then elect to have the defect(s) evaluated by a Division approved, qualified, independent Engineer in the same manner that the Designer would analyze the defect(s). The Division would then review and take into consideration this Engineer's analysis as part of the acceptance decision.

- 4.2.3 Category III defects include structural defects (spalls that expose prestressing strand or reinforcing steel, honeycombed areas, etc.) and cracks for which the specifications require evaluation by the Designer. If a member contains any structural defect(s), the defect(s) will be noted in the Inspector's report. The Fabricator shall then provide the Contractor with detailed information regarding the type, size, and location of the defect(s). It is then the Contractor's, or his designated representative's, responsibility to contact MCS&T Division and provide them with a report containing all relevant information and a detailed summary of the structural defect(s) in the subject member for which the Fabricator is seeking acceptance. MCS&T Division shall then contact the Designer (either Engineering Division, or the appropriate District) and forward this information to them. MCS&T Division shall also contact District Construction to inform them of the situation. In situations when the member(s) was designed by a Consultant, Engineering Division may forward the information to the appropriate Consultant. The Designer will then analyze the subject defect(s) and provide a written statement to the Contractor, the Fabricator, District Construction, and to MCS&T Division as to the effect of the defect(s), if the member will be structurally adequate, if a repair may be made, and if, in the Designer's opinion, the service life of the member will be reduced because of the defect. It shall also be documented in the Inspector's report whether, in the opinion of the Inspector, the service life of the member will be reduced because of the defect.
- 4.2.3.1 If the Designer does not feel qualified to make the decision concerning the effect of the defect(s), they shall inform MCS&T Division of this fact, and MCS&T Division will relay this to the Fabricator. The Fabricator may then elect to have the defect(s) evaluated by a Division approved, qualified, independent Engineer in the same manner that the Designer would analyze the defect(s). The Division would then review and take into consideration this Engineer's analysis as part of the acceptance decision.
- 4.2.3.2 Category III defect Scenario 1 – Category III defect which will adversely affect the structural performance of the member:
- If the Designer states that the defect(s) will adversely affect the structural performance of the subject member, the Division will not accept the subject member.
- 4.2.3.3 Category III defect Scenario 2 – Category III defect which will not adversely affect the structural performance of the member and will not reduce the service life of the member:

If the Designer states that the defect(s) will not adversely affect the structural performance of the subject member, and that a repair should be made, and if MCS&T Division and the Designer agree that the service life of the member will not be reduced, the Fabricator shall submit a repair procedure to MCS&T Division for approval. If the repair procedure is approved, the Fabricator may proceed with the approved repairs in the presence of the Inspector. If the repair(s) is satisfactory, the Inspector will stamp the subject member as accepted by MCS&T Division.

4.2.3.4 Category III defect Scenario 3 – Category III defect which will not adversely affect the structural performance of the member, but which will reduce the service life of the member:

If the Designer states that the defect(s) will not adversely affect the structural performance of the subject member, and that a repair should be made, but if either MCS&T Division or the Designer feels that the service life of the member will be reduced, the Fabricator may submit a repair procedure to MCS&T Division for approval. If the repair procedure is approved, the Fabricator may proceed with the approved repairs in the presence of the Inspector. After the inspection of the repair(s), the Inspector will document whether the repair(s) is satisfactory. Since the service life of the member will be reduced, MCS&T Division will not accept the subject member. MCS&T Division will assign a laboratory number to this member, which notes that the member does not meet specifications, and will include a thorough explanation as to why the member does not meet specification requirements. MCS&T Division will then contact District Construction, forward all information relevant to the subject member to the District, and based on the quality of the repairs and the degree to which the service life of the member will be reduced, it is the District's option whether or not to accept the subject member. If the District decides to accept the member it will be paid for at a reduced price based on 40% of the Contract Unit Bid Price. . This cost does not include the cost of items such as bearing pads, guardrail items, delivery charges, etc., which are incidental to the cost of the member. If the District accepts the subject member with this type of defect and reduced service life, it shall be accepted by means of a DMIR.

Michael Mance, P.E.
Director
Materials Control, Soils and Testing Division

**ATTACHMENT: PRESTRESSED CONCRETE BRIDGE BEAMS
WVDOT DIVISION OF HIGHWAYS MCS&T DIVISION
INSPECTION CHECKLIST**

PROJECT NAME: _____ AUTHORIZATION: _____
PROJECT NUMBER: (State) _____ (Fed.) _____
BRIDGE NUMBER: _____ COUNTY: _____ DISTRICT: _____
MANUFACTURER: _____ JOB NUMBER: _____
PROPOSED PRODUCTION DATE(S): _____
INSPECTION AGENCY: _____ INSPECTOR(S): _____

Preliminary Verifications

SHOP DRAWING REVIEW

Approval Date: _____ Approved By: _____
Concrete Strength Requirements: _____ at release _____ at 28 days
Beam Type: _____ Total Number of Beams: _____
Finish Requirements: Top: _____ Bottom/Sides: _____ Ends: _____
Notes: _____

CONCRETE COMPONENTS

Cement Source: _____ Mix Design Lab Number: _____
Cement Type: _____ Lab Number: _____
Coarse Aggregate: _____ Lab Number: _____
Fine Aggregate: _____ Lab Number: _____
Batch Water Source: _____ Lab Number (if applicable): _____
Admixtures: _____

STEEL COMPONENTS

Bearing Plate: Fabricator: _____
Mill Certs: _____ Galvanize Cert.: _____ Lab Number: _____
Reinforcement: Supplier(s): _____
Description: _____ Lab Number: _____

Prestressing Strand: Manufacturer: _____ Description: _____
Coil Numbers: _____
Lab Numbers: _____

[illegible]

Form Inspection (<i>Pre-Placement</i>)

BEAM NUMBER					
Formwork constructed of metal w/ concrete foundation					
Form clean & free of debris					
Form dimensionally correct					
Length (bulkhead to bulkhead)					
Depth of form					
Width at top flange					
Width at bottom flange					
Width of web					
End square					
Skew dimensions					
Location of inserts, sleeves, blockouts, etc.					
Reinforcing steel (condition)					
Size and grade					
Location & lapping lengths					
Spacing & Clearances					
Chairs, spacers properly used					
Hold Down locations (draped strand)					
Form properly sealed at joints & edges					
Release agent applied					
Strand Placement					
Number of strand					
Strand location (vertical & horizontal)					
Strand free of damage or contaminants					
Strand Tensioning					
Jack & gauge calibration					
Initial load					
Final Load					
Elongation					
Theoretical vs. Actual (within 5%)					
Strand symmetrically loaded					
Check for strand slippage					
Bearing plate location					

Concrete Placement

Ambient temperature, weather conditions					
Concrete Temperature					
Concrete quality (appearance)					
Placement (start/completion times)					
1 st Lift					
2 nd Lift					
3 rd Lift					
QC Tests performed per specification					
Slump					
Air content					
Compressive strength cylinders					
Concrete placed within specified time restrictions					
Concrete properly vibrated					
External vibration applied					
Internal vibration per specification					
Top surface per specification					
Lifting loops per specification					
Curing per specification					
Heat sensors properly installed					
Beams adequately covered					
Compressive strength cylinders stored with beams					
Stress Transfer					
Cylinders loaded to failure per specification					
Release strength met – record average of 2 tests (psi)					
Strands properly cut					
Strands detensioned in specified sequence					

Product Inspection (*Post-Placement*)

Visual inspection for damage					
Note size & location of cracks, spalls, honeycomb, etc.					
Discuss damaged areas with QC Manager					
Beams in need of repair					
Repair method approved?					
Dimensional Tolerances met?					
Length					
Width(s)					
Depth					
Inserts, sleeves, etc.					
Stirrups (horizontal. & vertical within tolerance)					
Finish per specification					
Top scored per specification					
Fascia finish as specified					
Camber					
Lifting loops OK					
Beams properly transported					
Beams stored on proper dunnage at bearing points					
Sweep					
Design shipping strength (28 day) met? (avg of 2 tests)					
Repairs satisfactory					
Beam stamped for shipment					
Concrete Sealer (Silane) applied as specified					
Interior Sides blast cleaned (within 5 days of shipment)					