Materials Procedures Committee Regular Meeting

Meeting Time/Date: September 20th, 10:00 AM

Meeting Location: MCS&T (Conference Rm.) - 190 Dry Branch Drive, Charleston, WV 25306

Online Meeting: Google Meet Video Conference

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

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

pw:\\DOT6KPWHQ.executive.stateofwv.gov:PW-Primary\Documents\WVDOH ORGS\MCS&T (0077) - FM\Materials Procedure Committee\MP Committee Meeting Files\2023\2023 09 20\

Files Available on Webpage:

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

Materials Procedures – Approved at Last Meeting

1. 212.02.20 - Procedure for Determining a Reduced Unit Price to Be Paid for Select Material for Backfilling Which Does Not Conform to Grading Requirements of Governing Specifications
2. 615.20.01 - Preparing, Recording and Transmitting Information on Approved List of Welded Stud Shear Connectors
3. 700.05.10 - Quality Assurance of Fertilizer at Source Fertilizer Acceptance Criteria
4. 711.00.21 - Procedure for Approving Paint Formulations and Production Batches
5. 715.27.20 - Test Methods for Wood Cellulose Fiber Mulches
6. 715.28.50 - Seed Acceptance Criteria
7. 709.46.50 - Quality Control of Steel Fence Post Studded Tee
8. 106.00.03 - Guidelines for Establishing and Maintaining Approved Product Lists of Materials, Systems and Sources

Materials Procedures - Old Business

Number	Champion	Title	Description
1 - 700.00.56*	Ross	Commercial And Potential Skid Resistant Aggregate Source Approval Procedures	Major Updates/Overhaul. Ross to discuss.
2 - 712.21.26*	Jobes	Procedure For Determining the Random Location of Compaction Tests	Significant content changes since last meeting.
3 - 601.03.52&	Thaxton	Procedural Guidelines for Maintaining Control Charts for Portland Cement Concrete	Deferred to next meeting, pending updates on control chart. Document not included. Pending document available on MCS&T Webpage from previous meeting.

4 - 106.00.02&	Brayack	Procedure for Evaluating Products for Use in Highway Construction	Deferred to next meeting, pending updates from management about stock language for approval/non-approval/no apl letters.
5 – Various QC Updates*	Brayack	Quality Control MPs: 307.00.50, 401.03.50, 601.03.50, 717.04.21	Added: "Testing includes both performing the test and submitting the results as per MP 109.00.21."
6 - 601.03.50*	Thaxton	Guide for Quality Control and Acceptance Requirements for Portland Cement Concrete	MP Ref Update, Changes to 5.2.6.1, Thaxton to explain.
7 - 715.09.20&	Mullins	Standard Method for Determining the Stability of Portable Sign Stands	New document for the testing of Temporary Traffic Signs. Still waiting to finalize testing procedure.
8 - 106.10.50&	Brayack	WVDOH Buy America Acceptance Guidelines	Deferred to next meeting, pending updates from FHWA on soon to be released guidance.
9 - 661.02.50*	Danberry	Criteria to Approve Manufacturers of Aluminum Sheeting for Traffic Signs	New document for approval of this material.
10 - 712.05.57*	Hanna	Criteria to Approve Fence Producer / Suppliers and their Materials.	Minor updates from previous version.
11 – 679.03.00*	Preston	Percent of Solids in the Latex Used in Latex Modified Compositions	Addressed comments from management, minor updates on units.

Materials Procedures - New Business with Significant or Process Updates

1 – 100.00.00&	Brayack	Preparing Materials Procedures	Adds definitions for common terms to be used in MPs. Champion is looking for additional terms to be added.
2 - 709.15.50&	Ratchford	Certification of Fabricators of Corrosion Resistant Coated Dowel Bars and Coated Dowel Bars in Basket Assemblies	Adds coated dowel bars; Updates acceptance criteria.
3 - 601.03.21&	Armes	Los Alamos Staining Method for Alkali Silica Reaction Gel	Defining method for identifying ASR in concrete.
4 - 601.03.22&	Armes	Damage Rating Index for Hardened Concrete	Describes quantification of damage done by ASR.

5 – 106.03.50& and Handbook (Attachment)	Harper	General Information Guide for Technician and Inspector Certification Program (TICP)	Update due to org structure (State Highway Engineer to Deputy Secretary). Other minor changes.
6-604.02.40	Thaxton	Inspection and Acceptance Procedures for Precast Concrete Products	Ref docs updated, Update to requirement of final inspection and rejection, Section 7.3

Note 1: * Denotes this MP is up for Vote

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

Comments

Comments due September 13th, so the Champion may review and address them. Submit comments to Adam Nester (Adam.W.Nester@wv.gov)

Next Meeting

New or Updated MPs due to the MP Chair 3-weeks before the next meeting: October 5th

Meeting Time/Date: 10:00 AM, October 26th, 2023

Meeting Location: MCST

Online Meeting: Google Meet Video Conference (Link TBD)

Additional MP Committee Meeting Information

For details of previous meetings, please visit the MCST MP Committee Webpage

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

Tentative MP Committee Dates for 2023:

November 15, December 13

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

COMMERCIAL AND POTENTIAL SKID RESISTANT

AGGREGATE SOURCE APPROVAL PROCEDURES

1. PURPOSE

1.1 To provide a uniform procedure for the following:

1.1.1 Approval of producers/suppliers of aggregates for the West Virginia~~'s~~ Department of Transportation's Division of Highways (WVDOH) Approved Material Source/Product List.

1.1.2 Monitoring of producers/supplier's ongoing compliance with the ~~governing s~~Specifications for use of their products in ~~WVDOH~~ WVDOT projects.

2. SCOPE

2.1 This procedure shall apply to any aggregate producers/suppliers intending on supplying aggregates to any WVDO~~H~~T projects.

3. APPLICABLE DOCUMENTS

3.1 West Virginia Division of Highways Specifications~~, Roads and Bridges~~.

3.2 West Virginia Division of Highways Construction Manual.

3.3 West Virginia Division of Highways Materials Procedures.

3.4 MP 106.00.02 Procedure for Evaluating Products for Use In Highway Construction
~~Add ref to 106.00.02 as per Hao Chen~~

~~3.3~~3.5 MP 700.00.01 Sampling and Testing of Materials at the Source

4. CONSIDERATION FOR THE LIST OF COMMERCIAL AGGREGATE SOURCES

4.1 If a producer/supplier of aggregates wants to be placed on the commercial source list and has had no previous dealings with WVDOH, they shall submit a HL-468 New Products Evaluation form to the Materials Control, Soils and Testing Division (MCS&T). The producer/supplier shall describe what they intend to sell, what production processes are used, to what type of projects they intend on supplying, and when they intend to starting production. The submission, upon review by MCS&T, will

Commented [MMA1]: See comment below

Commented [BDA2]: DB, MM, where is the quarterly sampling requirement?

Commented [MMA3]: Is this just for the Commercial Source APL? Aren't A-1 Sources (Maintenance Contracts) covered by MP 700.00.52? We should clarify this.

Commented [JC4]: Is "already Producing" acceptable?

be forwarded to the nearest adjacent WVDOH District Materials Supervisor for notification purposes.

4.2 Test dData from a minimum of 20 samples shall be evaluated considered for addition of the new Producer/Supplier to the WVDOH List of Approved Aggregate Sources. Historical data concerning aggregate quality test results signifying compliance with WVDOH sSpecifications shall be available for review. Any data accepted by MCS&T concerning the quality of the material shall be obtained from an AASHTO re:source accredited laboratory. Quality testing consist of: of one or more of the fallowingfallowing tests: (Los Angeles aAbrasion, Sodium Sulfate Soundness, Liquid Limit, Plasticity index, and deleterious Material as) See applicable test in section 702 and 703 in the WV DOH Standard Specifications.

4.2.1 At their discretion, MCS&T may sample stockpiles currently in production for full quality testing. If the material sampled meets the quality specificationsSpecifications, the stockpile can be approved for use in WVDOH WVDOT projects as long as no further material is added to the stockpile. This data will be included with the required 20 sets of data for source approval in the future, if necessary. Any material submitted for use in WVDOH WVDOT projects shall meet the criteria described in Sections 702, 703 and 704 of the WVDOH Sspecifications for that particular material.

4.2.2 Independent quality testing data shall be evaluatedverified by MCS&T to ensure compliance with the WVDOH governing sSpecifications. All data submitted will shall be reviewed in the verification process and may be included in the quality testing data compiled by MCS&T.

4.2.3 Records of Manufacturing, of both the geologic featuress of the source and historical quality testing data of the products compiled by the producer/supplier, if available, may shall be submitted to MCS&T for review.

Manufacturing and quality control processes and pertinent historical data shall be made available for review by MCS&T, if requested.

4.2.4 After the review of historical and geologic data concerning the material in question, a WVDOH sampling regimen shall be implemented to evaluate the quality of the material over the course of production. (every 7th day of operation)

4.2.44.3 The new Producer/Supplier shall demonstrate that they are capable of producingcan produce an E Ticket as defined in Section 109.20.1 of the Specifications. A sample ticket shall be provided to MCS&T and shall be included on the HL-468 New Products Evaluation form at the time of initial submittal.

4.3 Subsequent toAfter the review of historical and geologic data concerning the material in question, a sampling regimen shall be implemented to continually evaluate the quality of the material over the course of production.

4.4 Acceptance of any material submitted based on section 4.2 for approval from any potential producer/supplier is left to the discretion of the Director of the MCS&T or

Commented [MMA5]: Should this be the District Materials Supervisor in the District in which the source is located?

Commented [JC6]: Are these WVDOH testing or QC? Define,

Commented [JC7]: Is this a sample for each Coarse and fine

Commented [JC8]: What is the frequency of the testing sample per 7days

Commented [MMA9]: Commercial and Potential Skid Resistant ?

Commented [MMA10]: Possibly re-word as: "may be used in this evaluation if it is available"

Commented [JC11]: No one is Accredited

Commented [MMA12]: Do we need to define "quality testing"? (i.e. Soundness, LA Abrasion, Deleterious, etc.)

Commented [JC13]: If you are a new q or dorminate… you have to have some testing done to ensure you have q materials by an indepentant source to show the DOH that the material is of sound quality prior to any submittal

Commented [MMA14]: I think that we should discuss this. Is "all" data included or just data from an AASHTO re:source accredited lab?
Also, is this an "evaluation" process or an "approval" process?

Commented [JC15]: Combine into a single point

Commented [JC16]: This may need to be reorded to flow with the actual process taken.
4,2,3 &4.2.5 should be uptop.

their ~~representative~~designee. Approval shall consist of review of 20 acceptable samples in accordance with section 4.2, upon the approval the Producer/Supplier ~~p/S~~ will be added to the COMMERCIAL AND POTENTIAL SKID RESISTANT AGGREGATE SOURCES.

5. MAINTENANCE OF THE LIST OF COMMERCIAL AGGREGATE SOURCES

5.1 To remain on the WVDOH List of Commercial Aggregate Sources, the following criteria shall apply:

5.1.1 The Producer/Supplier shall maintain ~~consistent and satisfactory compliance of the~~ quality of the aggregates in according accordance wi~~tow~~ith Sections 702, 703, and 704 of the ~~WVDOH~~ Specifications and shall permit~~ting~~ to

Commented [BDA17]: DB, MM, where is the quarterly sampling requirement? How many samples tested per year to remain on the list?

Commented [BDA18]: Add e-ticketing here.

random, intermittent quality sampling and testing of of the aggregate source by MCS&T or a representative of MCS&T. This testing will determines if the approved products continually exhibit the same characteristics and quality as the originally approved materialmeets quality specification (see MP MP 106.00.03700.00.55; Guidelines for Establishing And and Maintaining Approved Lists Of of Materials And Sources, section Section 6)

5.2 If the a Pproducer/Ssupplier has not provided any materialproducts to any WVDOH WVDOT projects over a period of 5 consecutive years from the same source, that source will be removed from the WVDOH List of Commercial and Potential Skid Resistant Aggregate Sources. In the event of If an inactive Producer/Supplier source re-establishcsing production and desires tothe producer/supplier wishes to regain Division approvalacceptance, they shall refer to sSection 4 of this MP shall applyfor reconsideration.

6. REMOVAL FROM LIST OF COMMERCIAL AND POTENTIAL SKID RESISTANT AGGREGATE SOURCES

6.1 In the event the Pproducer/Ssupplier does not provide materials in compliance with the governing sSpecifications, the following actions shall be taken by the Pproducer/Ssupplier, and subsequently by MCS&T, up to and including removal from the List of Commercial and Potential Skid Resistant Aggregate Sources:

6.1.1 Upon testingsampling of an aggregate sample source by MCS&T, if the quality test results from that sample do not meet the minimum specifications requirements, then a second test portion a "split" test portion shall be be splittakensplit from the originalsame field sample, and it shall be retested for the failing properties of the first sampley(ies). The test results and methods of testing shall then be reviewed for accuracy and precision.

6.1.2 When If the "split" sample in Section 6.1.1a material, upon reexamination, fails to meet quality requirementsWVDOH Specifications, MCS&T shall notify the Pproducer/Ssupplier shall be notified of the failing results and a. A second field sample shall be obtained by MCS&T within ten calendar days and tested for quality as in Section 6.1.12. At this time, MCS&T shall notify the Producer/Supplier in accordance with Section 6.2 of the failing results from the previousinitial field sample and "split" sample. The results from this sample will determine if further action is needed.

6.1.3 Given the failure of the initial field sample and it's "split",For the second Field sample, fFfTheollow the same proceduretocol infor Section 6.1.1 for thea second field samples shall be obtained in Section 6.1.2 and shall will be tested for quality requirementss as in section 6.1.1. If the second field sample, and subsequent "split" samples does does not meet quality requirements, MCS&T will review the Producer/Suppliers quality test performed by MCS&T over the previous 5 years.

6.1.3.1 If the Producer/Supplier has had zero failing quality test results over the last 5 years (not including the most recent two tests described in the Sections above), a third sample

Commented [MMA19]: Is this where we want to specify a frequency (i.e. quarterly, annually, etc.)?

Commented [MMA20]: Should this be MP 106.00.03 instead?

Commented [MMA21]: Need to define "quality" tests. See Section 4.2.2.

will be obtained from the Producer/Supplier by ~~MSC~~MS~~C~~CS&T and tested for quality requirements. If the third sample does not meet quality requirements, the following course of action shall be taken: MCS&T shall notify the Producer/Supplier of the failing results of the third sample and inform the Producer/Supplier of their removal from the approved source list, as stated in section 6.1.5.

~~6.1.3~~6.1.4 In the event the Producer/Supplier source does have failing results during the previous 5 years as described in Section 6.1.3, ~~in the past 5 years~~ the source will be contacted with the results and informed they are being removed from the approved Producer/Supplier list. ~~specifications, at the discretion of MCS&T personnel, a third sample may be obtained from the Pproducer/Ssupplier by MSC&T and tested for quality.~~

~~6.1.4~~6.1.5 ~~For the third Field sample, f~~Follow t~~The~~he same protocol ~~in~~for Section 6.1.1 for the third sample obtained in Section 6.1.3.1~~4~~3. will be tested for quality. ~~If the third sample does not meet quality requirements, specifications the following course of action shall be taken: .MCS&T shall notify the Producer/Supplier of the failing results of the third sample and inform the Producer/Supplier of their removal from the approved source list. In the event the Producer/Supplier field sample results remain within WVDOH~~ Specification the Producer/Supplier will remain on the approved list and will return to the standard sampling regimen.

6.2 Communication of sample information shall be implemented as follows:

6.2.1 The P~~p~~roducer/S~~s~~upplier shall be notified of what aspect(s) of the samples did not meet Specification requirements~~the deficiency~~, either in writing or via electronic communication (i.e. email).

6.2.2 In the event a Producer/Supplier is removed from the ~~APL~~COMMERCIAL AND POTENTIAL SKID RESISTANT AGGREGATE SOURCES, t~~T~~he Producer/Supplier is no longer permitted to ship material to the WVDOH. At this time the ~~1~~10 District Material Supervisors, the Regional Construction Engineers, the Director of Contract Administration, and the Director of MCS&T shall be notified of what aspect(s) of the samples ~~did~~which did not meet Specification requirements ~~the deficiency~~ via electronic communication (~~i.e.~~i.e., email).

6.3 The P~~p~~roducer/S~~s~~upplier of the material in question~~substandard product~~ is then responsible for mitigating the deficiency~~inquency~~ and improving the production quality to comply with the ~~corresponding governing s~~Specifications to be reinstated to the ~~APL~~COMMERCIAL AND POTENTIAL SKID RESISTANT AGGREGATE SOURCES. Mitigation of substandard materials is not the responsibility of MCS&T; only the verification of the quality of material provided by the P~~p~~roducer/S~~s~~upplier shall be the responsibility of MCS&T.

7. REINSTATEMENT TO THE LIST OF COMMERCIAL AND POTENTIAL SKID RESISTANT AGGREGATE SOURCES

7.1 The following procedure shall be used by a Producer/Supplier desiring to ~~A supplemental sampling program shall be implemented to confirm the mitigation of the deficiency and shall be coordinated as follows~~return to the Commercial and Potential Skid Resistant source list:

7.1.1 The Producer/Supplier shall supply three (3) passing quality test results from an AASHTO re:ssource accredited laboratory ~~for quality testing~~. Once the passing tests have been reviewed by MCS&T personnel, a sampling ~~plan~~regimen will be implemented by MCS&T to resample the Producer/Supplier.

7.1.2 The sampling plan will consist of ~~six~~six (66) samples to be obtained every seven days of production, either by MCS&T or by their~~a representative~~representative ~~of MCS&T~~ and tested for full quality. ~~The first three (3) samples shall be obtained every six (6) days of production. The second three (3) samples will be obtained randomly over the four (4) weeks after the first three (3) samples have been obtained and tested.~~

7.1.3 If the samples in Section 7.1~~and 6.4.2~~ all meet the Specification requirements, the Producer/Supplier shall be notified of compliance, and they shall ~~be reinstated on the be included on the next~~ List of Commercial and Potential Skid Resistant Aggregate. An addendum letter from MCS&T shall be sent out to stating the Producer/Supplier's reinstatement.

~~6.3.1~~7.1.4 If any one of the six (6) samples in section ~~6.4~~7.1.2 fails to meet quality requirements sampling will be terminated and the producer/Supplier will restart ~~at~~process of section ~~6.4~~7.1~~.1 again~~.

~~7.~~8. DOCUMENTATION

~~7.1~~8.1 All samples obtained by MCS&T shall be assigned a corresponding laboratory reference number for record keeping, ensuring proper access by MCS&T personnel to pertinent information regarding the materials provided by the ~~p~~Producers/~~s~~Suppliers.

~~7.2~~8.2 In the event of recurring failure to meet ~~repeat non-conformance of~~ WVDOH ~~s~~Specifications, the following procedure shall be implemented:

8.2.1 ~~7.2.1~~ A record of communication between ~~the Division~~MCS&T and the P~~p~~roducer/S~~s~~upplier's contact shall be retained for future reference, for no more than one year.

~~7.2.1~~8.2.2 The sample (or samples) failing to meet ~~quality s~~Specification~~s~~ requirements shall be packaged and stored for later access by MCS&T personnel for future reference. Such samples will be stored for no longer than one year from the date the ~~testing~~material was sampled ~~was performed~~. The sample containers shall display the lab reference number, the date on which the ~~tests~~ material w~~as~~ere ~~conducted~~sampled, the type of material

Commented [JC22]: This seems like a 3+ year reinstatement. Am I reading this correctly?

Commented [JC23]: Not AASHTO re:source testing…. Just a accredited lab

Commented [MMA24]: At what point did we remove them from the list? Did we want to remove them in Section 6.2 or 6.3 until they have shown us that they have mitigated the problem, or do we want to say "shall remain on the …"?

Commented [MMA25]: Does this only apply when a Producer/Supplier is removed (Sections 6.4.4 and 6.5) or any time that mitigation is required (Section 6.3)?

tested, and data revealing whichat ~~s~~Specifications requirement(s) were not met~~out of compliance~~.

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

MP 700.00.56 Steward – Aggregate Section
RLS:R

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION
OF HIGHWAYS
MATERIALS DIVISION

MATERIALS PROCEDURE

PROCEDURE FOR DETERMINING THE RANDOM LOCATION OF COMPACTION TESTS

1. PURPOSE

1.1 This procedure provides methods for determining the random locations for soil and aggregate compaction tests on WVDOHT projects.

2. SCOPE

2.1 This procedure is applicable for locating all compaction tests.

3. EQUIPMENT

3.1 Measuring tape, approximately 50 feet.

4. DEFINITIONS

4.1 Test Section- A test section is an isolated quantity of material used to determine the maximum density and optimum moisture content of the material using the roller pass method.

~~3.1~~4.2 Lot- A lot is an isolated quantity of specified material from a single source or a measured amount of specified construction assumed to be produced by the same process.

~~4.~~5. PROCEDURE

~~4.1~~5.1 Compaction test site locations ~~are to~~ shall be randomly located along the roadway centerline (length) and offset (width) randomly from this reference line. Some test site locations, such as pipe backfill, require random selection of lifts for the tests and a random determination of the side of the pipe backfill to test.

~~4.2~~5.2 Selection of random numbers

~~4.2.1~~5.2.1 Determine the number of test sites which will be required for the lot or test section.

~~4.2.2~~5.2.2 The table of random numbers (Table ~~1~~I attached) or a calculator, which will generate random numbers, can be used.

~~4.2.3~~5.2.3 The table of random numbers contains 5 sections with 2 columns of numbers in each section.

~~4.2.3.1~~5.2.3.1 The first column of numbers in each section is for determining the test site along the centerline. The second column of numbers is for determining the distance from the centerline (offset). Either column of numbers can be used for selecting lifts to be tested.

~~4.2.3.2~~5.2.3.2 To use the table, select a random point on the table by tossing a pencil upon the page or blindly pointing out a location with the finger. The selection of random numbers will consist of a pair of random numbers. Once the point is located, select the number in the first column for the length and the corresponding number in the right column for the width. When more than one pair of random numbers is needed, continue selecting the pairs of numbers down the page. If the bottom of the page is reached, go to the top of the next section to the right or to the top of the first section on the left side of the page if the bottom of the right most section of the page is reached. When selecting lifts to be tested, only single random numbers are needed and can be obtained from any of the columns of numbers.

5.2.3.3 To use a calculator, which will generate random numbers, select all numbers needed for a test site before selecting numbers for additional test sites.

~~4.2.3.3~~5.2.3.4 Round to the nearest whole number when calculating the test site location.

~~4.3~~5.3 Location of test sites

~~4.3.1~~5.3.1 There are many variations in the required number of tests and the physical dimensions of the area to be tested.

~~4.3.2~~5.3.2 Random location of tests on a single lift that rectangular in shape (Example 1 of Attachment).

~~4.3.2.1~~5.3.2.1 Generally, the Materials Procedure used for testing a material and/or Specifications requires a lot, portion of a lot, or a test section to determine the maximum compacted density of a material to be divided into equal sublots or subsections when more than one test is required.

~~4.3.2.2~~5.3.2.2 Divide the length of the area along the centerline by the number of tests to determine the length of each sublot or subsection.

~~4.3.2.3~~5.3.2.3 From the beginning station number, add the length of the subsection or sublot to the station number to determine the station number for the beginning of the next sublot or subsection. Next add the length of the subsection or sublot to this station number to determine the station number at the beginning of the next subsection or sublot. Continue this procedure until the beginning station numbers for all subsections or sublots have been calculated.

~~4.3.2.4~~5.3.2.4 Select the random numbers according to ~~4.2 through 4.2.3.3~~sSection 45.2.

Commented [DB1]: Check all references

~~4.3.2.5~~5.3.2.5 Multiply the length of the subsections or sublots by the random numbers selected for the length. Add the values to the corresponding station numbers for the beginning of each subsection or sublot. The station numbers locate the test sites along centerline.

~~4.3.2.6~~5.3.2.6 Next multiply the width of the test section or lot by the random numbers selected for the offset. The offset can be calculated from the left or right side of the test area and test location designated in relation to centerline. If the test site falls on the edge of the lot or sublot, move 2 feet into the lot and perform the test at that location. Alternatively, a new set of random numbers can be used to avoid this occurrence.~~.Determine the offset distance of the lot or test section from the centerline when the centerline is not within the area to be tested. This will usually be a constant value. Always calculate the offset by working from the side nearest the centerline. Add each of the values calculated in 4..2.7 to the constant value. The values establish the offset distance of each test site from the centerline. Designate rather the offset is left or right of centerline.~~

~~4.3.2.7~~5.3.2.7 When the centerline is not contained within the area to be tested, the offset distance of the lot or test section from the centerline shall be determined. This will usually be a constant value. Always calculate the offset by working from the side nearest the centerline. Add each of the values calculated in 5.3.2.7 to the constant value. The values establish the offset distance of each test site from the centerline. Designate if the offset is left or right of centerline.~~the offset can be calculated from the left or right side of the test area and test location designated in relation to centerline.~~

~~4.3.3~~5.3.3 Random location of test sites on a single lift that is irregular in shape (Example 2 attached).

~~4.3.3.1~~5.3.3.1 Determine the dimensions of the area to be tested.

~~4.3.3.2~~5.3.3.2 Determine the minimum dimensions of a rectangle that will contain the area to be tested and has two sides parallel to centerline.

~~4.3.3.3~~5.3.3.3 Divide the rectangle into the desired number of subsections or sublots and randomly locate the test sites locations as in sections 54.3.2. ~~4.3.2.8 above.~~ If a test site location falls outside the area to be tested, obtain a new set of random numbers for the test site and recalculate the test site location. Continue this procedure until the test site falls within the area to be tested.

5.3.4 Random selection of lifts to be tested (Example 3 attached).

5.3.4.1 When testing certain materials, especially backfill material, where an area to be backfilled will constitute a lot of material to be tested, a random selection of lifts shall be tested.

5.3.4.2 Determine the projected number of lifts to be contained within the lot. Divide the number of lifts by the number of tests in the lot. If the value is not an even number, assign an additional lift to the first sublot and continue to assign a lift to each consecutive sublot until all remaining lifts have been assigned to a sublot.

5.3.4.3 By starting with the bottom lift, number the lifts in the lot, select a single random number for each test site.

5.3.4.4 Multiply each random number by the number of lifts in each sublot and round the values to whole numbers. Each value designates which lift in each sublot that will be tested.

5.3.4.5 Once the lifts to be tested have been selected, the random location of the test site on the lift can be determined.

5.3.4.6 The test site location can be found by multiplying the length of the lot by the first column of random numbers in the section. The offset of the test site location can be calculated by multiplying the second column of random numbers in the section by the width of the lot, if applicable.

5.3.5 Random selection of the side of backfill for pipe culverts.

5.3.5.1 When a lot of pipe backfill is being tested, tests shall be performed on both sides of the pipe. The side to be tested shall be randomly selected by using the random numbers selected for the location of the tests along the pipe. If the random number is less than 0.500, the test is on the left side and greater than or equal to 0.500 on the right side of the pipe.

5.3.5.2 The test site location's length is calculated by multiplying the denoted random number by the length of the lot of the pipe backfill.

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

TABLE 1 RANDOM NUMBERS

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

EXAMPLE 1~~I ENGLISH~~

Length of test section = 100 ft Width of section = 10 ft
Number of tests required = 5
4 equal subsections 100/5 = 20 ft
Test section starts at station 5+46

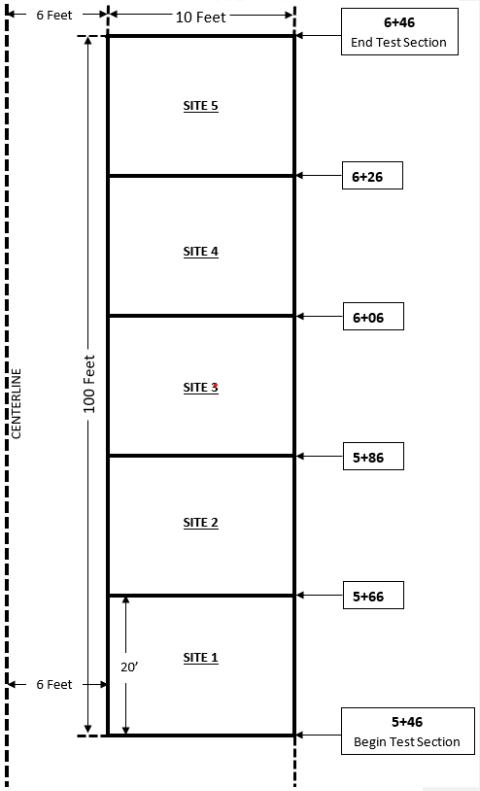
Station number at the beginning of each subsection
A. 5+46
B. 5+46 + 20 = 5+66
C. 5+66 + 20 = 5+86
D. 5+86 + 20 = 6+06
E. 6+06 + 20 = 6 +26

Random Numbers

	Length	Width
A.	.869	.222
B.	.562	.036
C.	.481	.791
D.	.599	.966
E.	.464	.747

Multiply the length of each subsection by the random numbers for the length.
A. 20 x .869 = 17
B. 20 x .562 = 11
C. 20 x .481 = 10
D. 20 x .599 = 12
E. 20 x .464 = 9

Add the values to the beginning station numbers of each subsection to determine the station number for each test.
A. 5+46 + 17 = 5+63
B. 5+66 + 11 = 5+77
C. 5+86 + 10 = 5+96
D. 6+06 + 12 = 6+18
E. 6+26 + 9 = 6 +35



Multiply the width of each subsection by the random numbers for the width.
A. 10 x .222 = 2
B. 10 x .036 = 0
C. 10 x .791 = 8
D. 10 x .966 = 10
E. 10 x .747 = 7

Add the values to the constant distance the test section is from the centerline and label the values as right of centerline .
A. 6 + 2 = 8 ft right of centerline
B. 6 + 0 = 0 ft right of centerline (Test shall still be taken fully in the sublot)
C. 6 + 8 = 14 ft right of centerline
D. 6 + 10= 16 ft right of centerline
E. 6 + 7 = 13 ft right of centerline

Metric example deleted

EXAMPLE 2

The shaded area designates the lift to be tested. For this example, 2 sublots are required with 1 test in each sublot.

Since the area to be tested is not rectangular in shape, place the smallest rectangle around the area that will include all the shaded area.

Divide the rectangle into 2 equal areas (160 feet long by 90 feet wide).

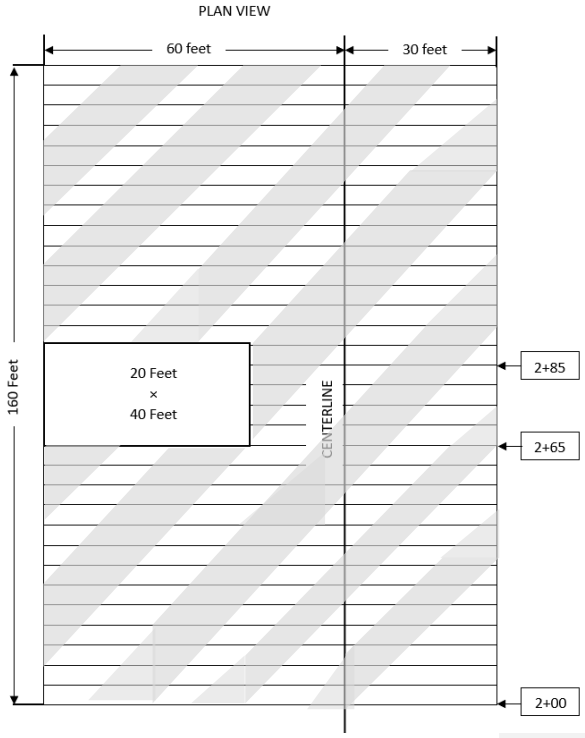
Since the centerline is located within the area to be tested, the offset can be calculated and measured from either side.
For this example, work from the right side.

Determine the station number for the beginning of each sublot.

Sublot No. 1 2+00
Sublot No. 2 2+00 + 80 = 2+80

Random Numbers
Since there is the possibility that the location of a test site may fall outside the area to be tested, an additional set of random numbers was selected.

	Length	Width
A.	.902	.850
B.	.275	.023
C.	.794	.850



Multiply the random number by the length of the sublot (80 x .902 = 72 feet). Add the value of the beginning station number (2+00 + 72 = 2+72). Multiply the width of the sublot by the random number (90 x .850 = 76 feet). By working from the right side, it is 30 feet to the centerline, therefore the test site is 76 – 30 = 46 feet to the left of centerline. The test site falls outside the test area.

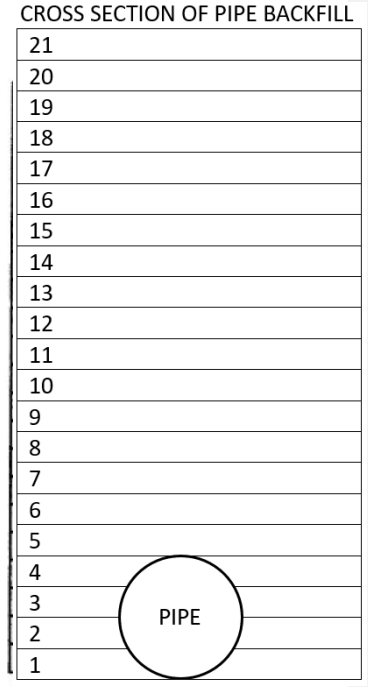
By using the next set of random numbers, calculate the test site location.
80 x .275 = 22 feet
2+00 + 22 = 2+22
90 x .023 = 2 feet
30 – 2 feet = 28 feet right of centerline

The test site for sublot 1 now falls within the test area.

Calculate the test location for sublot 2.
80 x .794 = 64 feet
2+80 + 64 = 3+44
90 x .850 = 76 feet
76 - 30 = 46 feet left of centerline

Metric Example Removed

EXAMPLE 3



21 lifts of material are required to backfill the pipe.

All of the backfill material is included in 1 lot. There are 5 tests required with 1 test in each sublot.

Divide the number of lifts by the number of sublots to determine the number of lifts in each sublot (21/5 = lifts with 1 lift left over). This includes the lift in sublot number 1.

Sublot Number 1	Lifts 1 – 5
Sublot Number 2	Lifts 6 - 9
Sublot Number 3	Lifts 10 - 13
Sublot Number 4	Lifts 14 - 17
Sublot Number 5	Lifts 18 – 21

Random numbers

A. .599
B. .464
C. .675
D. .279
E. .338

Multiply the number of lifts in the sublot by the random numbers.
The values determine which lift in each sublot to test.

A.	5 x .599 = 3	Test lift 3 in sublot number 1, Lift number 3
B.	4 x .464 = 2	Test lift 2 in sublot number 2, Lift number 7
C.	4 x .675 = 3	Test lift 3 in sublot number 3, Lift number 12
D.	4 x .279 = 1	Test lift 1 in sublot number 4, Lift number 14
E.	4 x .338 = 1	Test lift 1 in sublot number 5, Lift number 18

MP 601.03.52 – Deferred to Next Meeting

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).

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.

~~2.2~~2.3 MP 100.00.02: Method of Evaluation Of Non-Standard Or Non-Conforming Materials In Construction Via St-1

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.

4. SUBMISSION OF PRODUCT

4.1 Consideration for new product evaluation shall be requested through completion by the MS&Ps of West Virginia Division of Highways (DOH) Form HL-468, "Preliminary Information for New Product Evaluation". Once completed, DOH Form HL-468 shall be submitted to the Materials Control, Soils and Testing Division (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.

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

5. REVIEW OF SUBMMITED PRODUCT

5.1 Upon receipt of the completed Form HL-468, the Materials Control, Soils and Testing 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 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 the product may be accepted without further evaluation, the Product shall be considered accepted and added to the APL.

5.3 If the reviewing entity determines that the WVDOH does not currently have any specifications for the submitted product, a "No-APL" letter shall be issued~~, which is a non-approval~~. The issuance of this letter does not mean the product cannot be used on a project, but rather, another acceptance method may be used to accept the material. ~~The acceptance criteria in this case is typically an ST-1 as described in MP 100.00.02.~~[2]

5.4 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.

5.4.1 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.

~~5.4~~

5.5 If the evaluation indicates that the product is not acceptable, the Manufacturer/Supplier shall be notified by MCS&T. The MS&P shall not submit the same product for evaluation during the same calendar year.

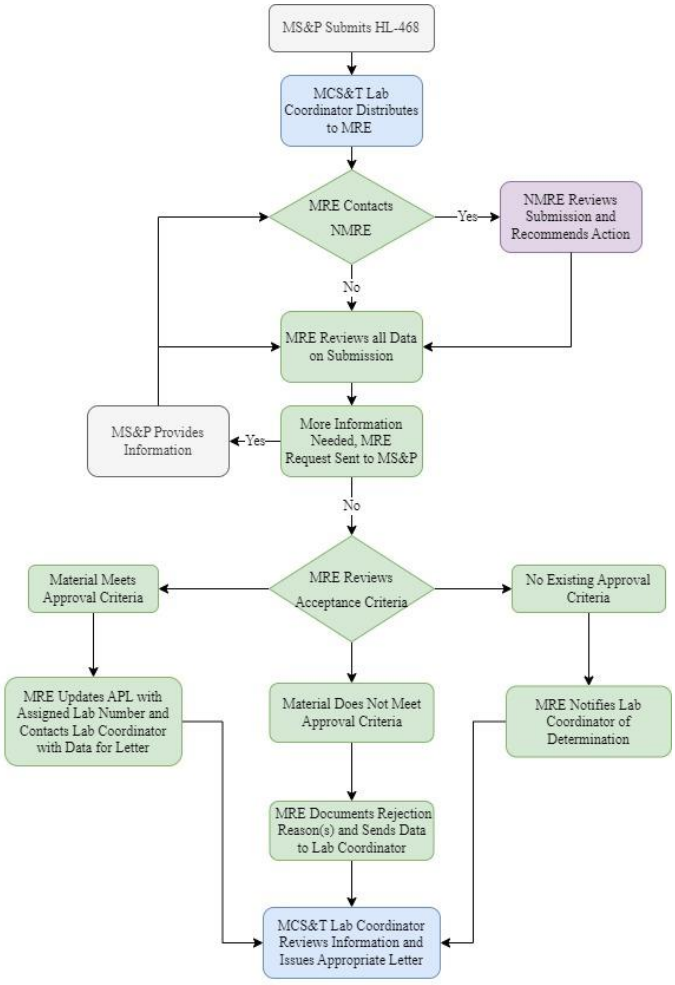
5.6 In the instance where a product has significant approved usage, the Director (or their Designee) of MCS&T may add a product to either a new or existing APL as per MP 106.00.03. If a product is a candidate for being added to the APL in this manner, the MCS&T Lab Coordinator shall contact the MS&P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

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

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

5.8 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

6. DOCUMENTATION OF APPROVED PRODUCTS

6.1 MCS&T shall maintain a directory on the Division's APL Webpage[3] listing all the current approved products.

6.1.1 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.

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

7. REMOVAL OF PRODUCT FROM APL

7.1 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 list.

7.2 In this instance, the reviewing entity shall notify the MS&P.

8. BUY AMERICA

8.1 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.

8.1.1 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.

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

8.2 A notarized CoC shall contain the following information:

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

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

8.2.3 The date of the application

8.2.4 A company statement that demonstrates compliance with Buy America.

8.2.5 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 Name. Part Numbers etc. may also be on the document if the company wishes.

8.2.6 Signature of the Company Official and date.

8.3 The document must be notarized.

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

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

MP 106.00.02 Steward – Lab Support Section
RLS:B
ATTACHMENTS

ATTACHMENT 1 - SAMPLE HL-468 FORM

<For Committee, No Changes to this Form>

See https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx

Attachment 2: Sample APL Response Language

1. 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. The WVDOH does not currently have a specification which applies to your product and therefore cannot approve this product on an "Approved Product List.

We do feel that the product may be beneficial for use on WVDOH projects. The inclusion of the material into project designs does not rest with this Division, but we have no objections to it being specified by 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 WVDOH Contract Documents, this product may be used, pending evaluation.

2. NON-APPROVAL RESPONSE

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

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

3. APPROVAL RESPONSE

West Virginia Division of Highways (WVDOH) Laboratory Approval Numbers 2XXXXXX has been issued to your company <Name of Company >, for the above-mentioned product. The approval number, effective Date 15, 20XX, must appear on all shipping documentation for said product supplied to the West Virginia Department of Transportation (WVDOT), Division of Highways projects.

ATTACHMENT 3: SAMPLE COMPLIANCE FORM

Certification of Buy America, Build America Compliance For Source Approval

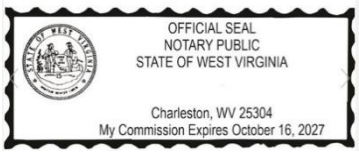
Acme Manufacturing Company
123 Main Street
Charleston, WV
25302

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:

2023 07 10 – QC Updates

Text update to the following QC MPs:

307.00.50

401.03.50

601.03.50

717.04.21

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1. ABSENT TESTING OF MATERIAL

1.1 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.

1.1.1 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.

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

a. 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

b. AASHTO T 22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens

c. AASHTO T 231 - Standard Method of Test for Capping Cylindrical Concrete Specimens

d. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

e. ASTM C1231 - Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Cylindrical Concrete Specimens

f. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

g. ASTM C511 - Standard Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes

h. ASTM C617 - Standard Practice for Capping Cylindrical Concrete Specimens

i. MP 109.00.21 - Basis for Charges for Non-Submittal of Sampling & Testing Documentation by the Established Deadline

j. MP 300.00.51 - Procedural Guidelines for Maintaining Control Charts for Aggregate Gradation

k. MP 601.03.52 – Procedural Guidelines for Maintaining Control Charts for Portland Cement Concrete

l. MP 601.04.20 - Curing Concrete Test Specimens in The Field

m. MP 601.05.50 - Quality Assurance Procedures for Portland Cement Concrete

n. MP 700.00.54 - Procedure for Evaluating Quality Control Sample Test Results with Verification Sample Test Results

o. West Virginia ~~Department of Transportation,~~ Division of Highways~~, Standard~~ Specifications ~~Roads & Bridges~~

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 WVDOT ~~project~~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 on 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 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~~21, 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.

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

5.2.4.2 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 T 22), 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 T 22), ASTM C617 (AASHTO T 231) 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.

5.2.4.3 Any Laboratory which desires to test Contractor hardened concrete QC specimens on ~~WVDOH~~ WVDOT projects shall submit the evidence/documentation, required in Section 5.2.4.2, 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~~ WVDOT projects must be listed on the Division's Approved List of Co

ncrete Cylinder Testing Labs. 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, quality management system, and personnel competency and certification records.

5.2.5 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.

5.2.6 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 5.2.6.1), 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 5.2.6.2 are met for each WVDOT project on which the reduced testing of miscellaneous concrete is applied.

5.2.6.1 Miscellaneous concrete shall be defined as relatively small quantities, not exceeding 25 yd^3 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:

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

~~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 One sample per two days of production (for the same WVDOT 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 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.

5.2.7 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.

5.2.8 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 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 Batch Tickets

Each batch of Structural Concrete, including miscellaneous concrete (as defined in section 5.2.6.1), delivered at the WVDOT project shall be accompanied by one batch ticket with all of the items of information listed in Section 5.2.9.1 pre-populated on the ticket. In the case of (PCC) Pavement, each batch of concrete delivered at the WVDOT 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 5.2.9.1 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 5.2.9.2 pre-populated on the ticket.

5.2.9.1 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 (yd^3)
8. Time Batched
9. Time Unloaded
10. Contract Identification Number (CID #)
11. Federal Project Number (If applicable)
12. State Project Number
13. Material Code
14. Material Name

15. Water Allowed (Gallon)
16. Water at Plant (Gallon)
17. Weight of Ice at Plant (lb.)
18. Water at Job (Gallon)
19. Weight of Cement (lb.)
20. Supplementary Cementitious Material(s) (SCM) (lb.)
21. Weight of Fine Aggregate (lb.)
22. Weight of Coarse Aggregate (lb.)
23. Admixture Name(s) and Dose (ounces)
24. Temperature (^{o}F/)
25. Cylinder I.D.
26. Initial Counter
27. Final Counter
28. Target Consistency (in)
29. Actual Consistency (in)
30. Target Air (%)
31. Actual Air (%)
32. License Number of Haul Unit.

5.2.9.2 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 (yd^3)
6. Time Batched
7. Time Unloaded
8. CID#
9. Federal Project Number (If applicable)
10. State Project Number
11. Material Code
12. Material Name
13. Water Allowed (Gallon)
14. Water at Plant (Gallon)
15. Weight of Ice at Plant (lb.)
16. Weight of Cement (lb.)
17. Weight of SCM (lb.)
18. Weight of Fine Aggregate (lb.)
19. Weight of Coarse Aggregate (lb.)
20. Admixture Name(s) and Weight(s) (ounces)
21. Temperature (^{o}F/)
22. Target Consistency (in)

23. Actual Consistency (in)
24. Target Air (%)
25. Actual Air (%)
26. License Number of Haul Unit.

5.2.9.3 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 yd^3. 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 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 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 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 Types of QC Plans:

5.2.12.1 QC Plans which are intended for use on more than one WVDOT project shall be defined as Master QC Plans. Section 5.3 outlines the procedures for Master QC Plan submittal and approval.

5.2.12.2 QC Plans which are intended for use on a single WVDOT 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.

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

5.2.12.4 Once any QC Plan is approved for a WVDOT 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 WVDOT 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 5.2 thru 5.2.11.1 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 WVDOT project has been awarded, if a contractor elects to use the approved Master Plant and Master Field QC Plans on that WVDOT project, the Contractor shall submit a letter requesting to use the Master QC Plans for that WVDOT 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 WVDOT project. If the referenced Master QC Plan is found to be insufficient for some items on that WVDOT 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 WVDOT 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 WVDOT project's incoming-mail mailbox in ProjectWise.

5.3.5.2 A Master QC Plan that has been approved for WVDOT project use shall be good for the duration of that WVDOT project.

5.3.5.3 For the use of Division Personnel, the District approval letter for this WVDOT 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.

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

MP 601.03.50 Steward – Cement and Concrete Section
RLS:Tt
Attachments

TABLE 1
CONTRACTORS PROCESS CONTROL REQUIREMENTS
STRUCTURAL CONCRETE AND
PORTLAND CEMENT CONCRETE PAVEMENT

	Minimum frequency*
A. PLANT AND TRUCKS	
1. Mixer Blades	Prior to Start of Job and Weekly
2. Scales	
a. Tared	Daily
b. Calibrate	Prior to start of Job
c. Check Calibration	Weekly
3. Gauges and Meters-Plant and Truck	
a. Calibrate	Yearly
b. Check Calibration	Weekly
4. Admixture Dispenser	
a. Calibrate	Prior to Start of Job
b. Check Operation and Calibration	Daily
B. AGGREGATES	
1. Fine Aggregate	
a. Gradation	Per section 601.3.2.4 of the Specifications
b. Moisture	Daily

2. Coarse Aggregates	
a. Gradation	Per section 601.3.2.4 of the Specifications
b. Percent passing No. 75µm	Daily
c. Ā for Combined Coarse Aggregates Fine Aggregates and Cement	Per section 601.3.2.4 of the Specifications
d. Moisture	Daily
3. Optimized Aggregates	
a. Gradation	Per section 601.3.2.4.1 of the Specifications
b. Moisture	Daily

C. PLASTIC CONCRETE

1. Entrained Air Content	
Pavement Concrete	Two at the beginning of the paving operation, per Section 501.4.2, then one per 500 yd^3 ~~(380 m^3)~~ or fraction thereof, with a minimum of two per day
Structural Concrete (except Bridge Superstructure)	One per 100 yd^3 ~~(75 m^3)~~ or fraction thereof, with a minimum of one per ½ day of operation
Bridge Superstructure	One per batch
2. Consistency**	
Pavement Concrete with a minimum of two per day	One per 500 yd^3 ~~(380 m^3)~~ or fraction thereof,
Structural Concrete (except Bridge Superstructure)	One per 100 yd^3 ~~(75 m^3)~~ or fraction thereof, with a minimum of one per ½ day of operation

	Bridge Superstructure	One for first batch and one for every fifth batch thereafter
3.	Temperature	Per Specification
4.	Yield	
	Pavement Concrete	Per Section 501.3 of the Specifications and one for each five days of operation after the first five days of operation
	Structural Concrete	Per Section 601.3.2.3 of the Specifications and one for each ten sets of cylinders after the first ten
5.	Compressive Strength***	
	Pavement Concrete	One set of concrete cylinders for each 350 yd^3 ~~(75 m^3)~~ or fraction thereof
	Structural Concrete	For each class concrete delivered and placed on a calendar day from a single supplier, one set of concrete cylinders for each 100 yd^3 ~~(75 m^3)~~ or fraction thereof
6.	Permeability	
	Pavement Concrete	N/A
	Structural Concrete	Per Section 601.4.5 of the Specifications
	Specialized Concrete Overlays	Per Section 679.2.2 of the Specifications

* Frequency for Process Control will vary with the size and type of aggregate or mixture and the batch-to-batch variability of the item.

** When superplasticizer is added to the concrete in the field, additional consistency testing is required as per Section 601.3.2.1 of the Specifications.

*** All cylinders shall be made, cured, and shipped to the Laboratory in accordance with AASHTO ~~T 23~~ R 100 and MP 601.04.20. They shall be tested in accordance with AASHTO T 22 and the applicable section of the ~~Standard S~~Specifications.

Example
COMPANY LETTERHEAD

Mr./Ms./Mrs. _____
West Virginia Department of Highways
District ___ Engineer/Manager
_____, WV #####

RE: Master PCC Field QC Plan

Dear _____,

We are submitting our PCC Field Quality Control Plan, developed in accordance with Sections 501 and 601 of the (year) WVDOH Standard Specifications, the (year) WVDOH Supplemental Specifications, and MP 601.03.50.

1. The Quality Control program is under the direction of_____, who can be contacted in Field/Office, by telephone number _____, cell#_____, and/or e-mail address _____.

2. Sampling and testing will be performed by qualified personnel as per WVDOH specifications Section 106.

3. Class(es) of Concrete to be controlled are listed as follows:

   - All types Class A - All types Class B - All types Class C

   - All types Class D - All types Class K - All types Class H

   - Etc.

4. All items in this QC Plan will be sampled at a minimum frequency as specified in Table 1 of Attachment 1. We acknowledge that additional sampling may be required by the Division in addition to the minimum frequency stated.

5. All sampling and testing will be in accordance with the methods and procedures required by the ~~specifications~~Specifications. All measuring and testing equipment shall be standard and properly calibrated as per the specified test procedure. *(If alternative sampling methods, procedures and inspection equipment are to be used please state in detail what they are and how they will be utilized.)*

6. 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.

7. Calculation of the compressive strength of concrete cylinders will be done as shown in Section 5.2.5 of MP 601.03.50.

8. Testing of Miscellaneous Concrete will be as specified in Section 5.2.6 and Sub-Sections 5.2.6.1 thru 5.2.6.3 of MP 601.03.50.

9. We will maintain adequate records of all inspection and tests. The records will indicate the type of test, number of observations made, the amount and type of deficiency's found, the quantities approved and rejected, and the nature of corrective actions taken as appropriate. Our 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 progression of the work.

10. **Our company** will take prompt action to correct conditions, which have resulted or could result, in the submission to the Division/District of materials and products, which do not conform to the requirements of the contract documents.

11. Non-Conforming Materials -- *State how you will establish an effective and positive system for controlling non-conforming material. This shall include the following:*

    - procedures for non-conforming material identification
    - isolation and disposition of this material

    Reclaiming or reworking of non-conforming materials shall be in accordance with procedures acceptable to the Division.
    Our company will specify and provide holding areas, which shall be mutually agreeable by the Division and Contractor.

Very Truly Yours,

_____
Company Official, Title

Example
COMPANY LETTERHEAD

Mr./Ms./Mrs. _____
West Virginia Department of Highways
District ___ Engineer/Manager
_____, WV #####

RE: Master PCC Plant QC Plan

Dear _____,

We are submitting our PCC PLANT Quality Control Plan, developed in accordance with Sections 501 and 601 of the (year) WVDOH Standard Specifications, the (year) WVDOH Supplemental Specifications, and MP 601.03.50.

1. The Quality Control program is under the direction of_____, who can be contacted in Field/Office, by telephone number _____, cell#_____, and/or e-mail address _____.

2. Sampling and testing will be performed by qualified personnel as per ~~WVDOH s~~Specifications Section 106.

3. The PCC Mix Designs and class of concrete to be controlled are listed below:

	Mix Design Number	Class of Concrete
1.	#######	Class B
2.	_____	_____
3.	_____	_____
4.	_____	_____
Etc.		

4. All items in this QC Plan will be sampled at a minimum frequency as specified in Table 1 of Attachment. We acknowledge that additional sampling may be required by the Division in addition to the minimum frequency stated.

5. All sampling and testing will be in accordance with the methods and procedures required by the ~~specifications~~Specifications. All measuring and testing equipment shall be standard and properly calibrated as per the specified test procedure. *(If alternative sampling methods, procedures and inspection equipment are to be used please state in detail what they are and how they will be utilized.)*

6. Charts and forms

Our Company will make sure 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. 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 Portland cement concrete 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. We may use other types of control charts as deemed appropriate by Division. It is normally expected that testing and charting will be completed within 48 hours after sampling. **Our Company** shall also ensure that all Material Suppliers prepare and submit the HL-441 form (weekly supplier report) in a timely manner. All charts and records will be turned over to the Division upon completion of work for a given WVDOT project.

7. *State that batch tickets will conform to requirements of MP 601.03.50 Section 5.3.9 and its applicable subsections.*

8. **Our company** will 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.

9. Non-Conforming Materials - *State how you will establish an effective and positive system for controlling non-conforming material. This shall include the following:*

- procedures for non-conforming material identification
- isolation and disposition of this material

Reclaiming or reworking of non-conforming materials shall be in accordance with procedures acceptable to the Division.
Our company will specify and provide holding areas, which shall be mutually agreeable by the Division and Contractor.

Very Truly Yours,

_____
Company Official, Title

WVDOH District Master QCP Approval Letter
*** EXAMPLE ***
WVDOH LETTERHEAD

ACME Company
20 First St.
Somewhere, WV #####

RE: PCC Plant or PCC Field *(whichever is applicable)*
Master QC Plan
Description: (YEAR)
P/S code: (only if a plant QCP)

Dear Sir,

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

- All WVDOH approved Designs for PCC Classes of Concrete controlled by the referenced QC plan.

As work progresses throughout the season an addendum(s) may be required to this QCP to keep the QC program current. **Also note that personnel may be required to show proof of certification for testing. Please use Lab Reference # 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,

_____
Name, Title

Example
COMPANY LETTERHEAD

Mr./Ms./Mrs. _____
WV Department of Highways
District ___ Engineer/Manager
_____, WV #####

RE: PCC Quality Control Plan
for Plant ---- Project

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

Dear Mr./Ms./Mrs. _____,

We would like to use our **Producer/Supplier's name** Master PCC Plant QC Plan, reference number _____ for the project referenced above. All PCC items on the referenced project are covered by the Master PCC Plant QC Plan. *(if needed state the Special Provision and that the addendum is attached for Quality Control of Special Provision Item)*

The Quality Control Plan is under the direction of _____, _____(title), and will be the company's contact representative to the Division of Highways District Materials and Construction Departments. He/She can be contacted in person at the plant, by telephone _____or at e-mail at _____.

Very truly yours,

_____

Company Representative

Example
COMPANY LETTERHEAD

Mr./Ms./Mrs. _____
WV Department of Highways
District ___ Engineer/Manager
_____, WV #####

Re: PCC Quality Control Plan
for Field ---- Project

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

Dear Mr./Ms./Mrs. _____,

We would like to use our approved Master PCC Field QC Plan, reference number _____ for the project referenced above. All PCC items on the referenced project are covered by the Master PCC Field QC Plan. *(if needed state the Special Provision and that the addendum is attached for Quality Control of Special Provision Item)*

The Quality Control Plan is under the direction of _____, _____(title), and will be the company's contact representative to the Division of Highways District Materials and Construction Departments. He/She can be contacted in person at the plant, by telephone _____or at e-mail at _____.

Very truly yours,

_____

Company Representative

WVDOH District Master QCP Approval Letter
*** EXAMPLE ***
WVDOH LETTERHEAD

ACME Company
20 First St.
Somewhere, WV #####

RE: PCC Field or PCC Plant *(whichever is applicable)* QC Plan

Project CID#: ########
Fed/State Project #: NHPP- ## - ####-##
Description: Falling Slide
County: XXXXXXX
P/S Code: (If a Plant)

Dear Sir,

Your request to use Master Quality Control Plan **(M# - ######)** for **PCC Plant or PCC Field** (*whichever is applicable)* on the project referenced above, has been reviewed and found to be acceptable for the following items:

- All WVDOH approved designs and classes of PCC controlled by this QCP listed below:

- Class B - Class B modified - Class K -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. Also note that personnel may be required to show proof of certification for testing.** Please make sure that all appropriate personnel have a copy of this plan in their possession.

For Division Reference: The Master Quality Control Plan can be reviewed in ProjectWise at the folder shown below:

WVDOT ORG>D0#>year>MASTER QC PLANS>Contractors or Plant>Company >folder>Name of file (i.e.: 2016 04 05 M#160001 PCC Plant QCP)

Very truly yours,

_____
Name, Title

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

STANDARD METHOD FOR DETERMINING THE STABILITY OF PORTABLE SIGN STANDS

1. PURPOSE

1.1 To establish a procedure for determining the stability (acceptable wind resistance) for portable sign stands.

2. SCOPE

2.1 This procedure shall apply to all portable sign stands submitted for inclusion on the Division's Approved Products List (APL).

2.2 This testing shall be done in addition to the MASH testing as described in the Specifications.

3. REFERENCED DOCUMENTS

3.1 MP 106.00.02 - Procedure for Evaluating Products/Processes for Use in Highway Construction.

3.2 MP 106.00.21 - Acceptance Procedure for Mash Compliant Roadside Departure Hardware.

4. TESTING PROCEDURE

4.1 The manufacturer's portable sign stand shall be assembled according to the manufacturer's instructions on a firm concrete or asphalt surface with legs fully extended.

4.1.1 The testing technician shall inspect the device to ensure that it is functioning properly as per the manufacturer's standards.

~~4.2 A 36"x36" or 48"x48" diamond warning sign or other temporary sign shall be placed in the stand according to manufacturer's instructions.~~

4.34.2 Stands shall be secured such that there is no potential for sliding. This securing mechanism shall in no way alter the stability of the stand.

4.44.3 Attach the dynamometer force gauge to the top of the sign stand~~.~~ 60 inches above the bottom of the sign. If the stand does not have a solid mast at that height, insert a testing rod into the stand for a solid anchor point. With an even motion, parallel to the ground surface at a 90-degree angle to the back of the sign, measure the force required to "tip-over" the sign.

4.4.14.3.1 A final pulling ~~force~~for shall be recorded as the maximum force exerted before the sign becomes unstable and falls.

4.54.4 Repeat the above step two more times and calculate the average of the 3 readings.

4.64.5 The acceptable minimum value shall be 20 lbs.

5. APPROVAL OF PORTABLE SIGN STANDS

5.1 The results of the described test as well as the MASH testing results shall be presented to the Roadway Departure Task Force. The approval of these items shall be at the discretion of this Task Force as described in MP 106.00.21.

Signature Block

RLS:Bm

Specification Change:

715.9.6.1-Product Submission and Approval: Stands to be considered for inclusion on the Division's Approved Products List (APL) shall be submitted to the Materials Division following the current procedures specified in MP 106.00.02. The Division maintains an APL of MASH compliant stands only. Stands utilized based on compliance with NCHRP-350 are not required to be listed on an APL.

The manufacturer should include all relevant documentation and information, including but not limited to Product Data Sheets, Product Flyers, Manufacturer Product Specifications, Product Bulletins, Engineering Drawings, and crash testing performance documentation. The crash testing performance documentation to be submitted shall be in accordance with official guidance issued by the WVDOH.

The stands shall be evaluated as per MP 715.09.20, "Standard Method for Determining the Stability of Portable Sign Stands."

Approvals of stands may be rescinded based on performance on Division projects determined to be non-compliant with these specifications.

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

MATERIALS PROCEDURE

WVDOH BUY AMERICA ACCEPTANCE GUIDELINES

1. PURPOSE

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

2. REFERENCED DOCUMENTS

2.1 WVDOH Standard Specifications, ~~Current~~ Applicable Edition.

2.2 23 U.S.C. 313 and 23 CFR 635.410 "Buy America Requirements."

2.3 Chapter 5, Article 19 and Chapter 5A, Article 3, Section 56 of the West Virginia Code, entitled "West Virginia American Steel Act of 2001."

2.4 Build America, Buy America Act, Section 70914.

2.5 Office of Management and Budget (OMB) Memorandum M-22-11, dated April 18, 2022.

~~2.5~~2.6 West Virginia Notary Handbook, Current Edition.

3. ACCEPTANCE OF MATERIALS

3.1 This procedure applies to the following:

1. Steel and Iron
2. Manufactured Products
3. Construction Materials

3.2 Unless there is an approved exception as outlined in this MP, all applicable materials on construction projects shall conform to the requirements of Section 106.1 of the WVDOH Standard Specifications.

3.3 Buy America Requirements only apply to articles, materials, and supplies that are permanently incorporated into the project. It does not apply to materials brought to the construction site, and removed at, or before the completion of the infrastructure project, such as tools, equipment, temporary scaffolding, or traffic control devices.

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

3.5 Steel and Iron.

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

3.6 Manufactured Products.

3.6.1 Pursuant to Buy America Requirements, all Manufactured Products must be produced in the United States, and the cost of the components of the Manufactured Product that are mined, produced, or manufactured in the United States shall be greater than 55 percent of the total cost of all components of the Manufactured Product.

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

3.7 Construction Materials.

3.7.1 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.

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

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

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

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

3.8 Buy America Certification.

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

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

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

3.8.3.1 Title: Buy America Certification of Compliance.

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

~~3.8.3.3 The Name of the Customer.~~

~~3.8.3.4 The shipping date of the material.~~

~~3.8.3.5~~3.8.3.3 A ~~company~~ contractor statement that demonstrates compliance with Buy America Requirements.

~~3.8.3.6~~3.8.3.4 The statement: "In the event where a supplied material does not meet applicable Buy America Requirements, any payments made for the associated material shall be returned to the Division."

~~3.8.3.7~~3.8.3.5 The Contract ID for the Material (if applicable).

~~3.8.3.8~~3.8.3.6 Both the Federal and State Project Number for the Material (if applicable).

~~3.8.3.9~~3.8.3.7 The name of the material ~~and/or material code~~ referenced in the Certificate of Compliance. This material name shall be a clear, common name of the material ~~that is comparable to the AWP Material Name~~as stated in the proposal. Part Numbers, etc., may also be on the document if the ~~company~~ contractor wishes.

~~3.8.3.10~~3.8.3.8 The Line Item for the Material (if applicable).

~~3.8.3.11~~3.8.3.9 The Bid and/or Placed Quantity of the Material. ~~Shipped.~~

~~3.8.3.12~~3.8.3.10 Signature of the ~~Company Officia~~Contractor~~l~~ and date.

~~3.8.3.13~~3.8.3.11 The document must be notarized as per the "West Virginia Notary Handbook."

3.8.4 Attachment 1 shows a sample Certificate of Compliance.

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

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

4. BUY AMERICA MINIMAL USE EXCEPTIONS

4.1 Steel and Iron Materials.

4.1.1 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."

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

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

4.1.3.1 The Contractor shall submit a letter to the District Construction Engineer requesting a minimal use exception for the use of foreign steel or iron materials. The letter shall demonstrate that the cost of the foreign steel or iron materials to be incorporated into

the project do not exceed one-tenth of one percent (0.1 percent) of the total contract cost or $2,500, whichever is greater. Attached to the letter shall be documentation (e.g., invoices) which demonstrates that the cost of the foreign steel or iron materials requested to be used is the cost of the materials as they are delivered to the project.

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

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

4.2 Steel Products.

4.2.1 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."

4.2.2 Procedure for granting a minimal use exception from West Virginia domestic steel requirements.

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

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

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

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

4.3 Construction Materials.

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

5. BUY AMERICA WAIVERS

5.1 Steel and Iron Materials.

5.1.1 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.

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

6. BUY AMERICA MATERIALS

6.1 Attachment 1 includes a sample Certificate of Compliance

6.2 Attachment 2 includes a list of materials and products used in WVDOH construction projects and the applicability of Buy America Requirements.

6.2.1 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.

~~6.2.1~~6.2.2 Though the material is not addressed in the Specifications, any glass that is added to a permanent paint product requires a Certificate of Compliance.

6.2.3 Attachment 3 includes OMB Memorandum M-22-11, dated April 18, 2022, for additional guidance.

~~6.3~~

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

MP 106.10.50 Steward – Materials Control Section
RLS:B
ATTACHMENTS

Buy America Certification of Compliance

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

~~**Customer**~~
~~Stark Construction Company~~
~~413 Kanawha Boulevard~~
~~Charleston, WV 25305~~

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

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

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

Line: 0020	~~526.003.004 -~~ Widget, Part Qi	500 Cubits
Line: 0025	~~596.003.004 -~~ Widget, Part Hr	300 Cubits

~~Jonathan~~ Janie Doe, ~~Quality Assurance Manager~~Contractor President

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA

Charleston, WV 25304
My Commission Expires October 16, 2027

Attachment 2: A sample from M-22. Full document is available at the WVDOH MCST Toolbox[1].

[1] https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx

Attachment 3 – M-22-11 –
Link to file: https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf

DOH-M-22 WVDOH Buy America Requirement Materials

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

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
707.005.000	Admixture, Latex	No	

DOH-M-22 WVDOH Buy America Requirement Materials

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

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
716.001.004	Borrow Material	No	

DOH-M-22 WVDOH Buy America Requirement Materials

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

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
645.001.001	Elasticized Expanded Polystyrene - E-EPS	Yes	

DOH-M-22 WVDOH Buy America Requirement Materials

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

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
709.052.000	Sign Support, Omni-Directional Breakaway Device, Steel Beam,	Yes	

DOH-M-22 WVDOH Buy America Requirement Materials

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

DOH-M-22 WVDOH Buy America Requirement Materials

AWP Material Code	Material Description	CoC Required	Notes
715.019.000.14	Lift Station & Valve Vault (Precast)	Yes	*1

DOH-M-22 WVDOH Buy America Requirement Materials

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

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

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

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

Note: AWP Material Code is for internal use only.

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE MANUFACTURERS OF ALUMINUM SHEETING FOR TRAFFIC SIGNS

1. PURPOSE

1.1 To establish a procedure for approving manufacturers of aluminum sheeting acceptable for use on ~~West Virginia Division of Highways (WVDOH)~~WVDOT projects.

1.2 To establish a procedure for maintaining a record of such information.

2. SCOPE

2.1 This procedure shall apply to all aluminum sheeting used in the manufacturing of traffic signs for use on ~~West Virginia Division of Highways (WVDOH~~WVDOT~~)~~ projects.

3. APPLICABLE DOCUMENTS

3.1 WVDOH Specifications for Roads and Bridges Section 661

3.2 WVDOH Approved Products List (APL) for Aluminum Sheeting for Traffic Signs

3.3 ASTM B209

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

3.5 WVDOH Form HL-468[1]

3.6 MP 106.00.03 - Guidelines for Establishing and Maintaining Approved Product Lists of Materials, Systems and Sources

4. ACCEPTANCE PROCEDURE

4.1 For aluminum sheeting to be evaluated for acceptance, the manufacturer must comply with the Specifications given in Section 661 of the Specifications.

4.2 In order for a manufacturer to be considered as an approved source on the WVDOH Approved Products List (APL) for Aluminum Sheeting, they must first submit a new product evaluation request. This request may be completed by submitting Form HL-468 “Preliminary Information for New Product Evaluation”. This form can be found on the MCS&T Division’s Materials Procedure Webpage[2]. Once completed, Form HL-468 shall be submitted to the ~~Materials Control, Soils and Testing (~~MCS&T~~)~~ Division via email to the New Products Evaluation email address: DOHNewProducts@wv.gov

4.3 After receipt of the completed Form HL-468, MCS&T Division shall distribute the information to applicable parties for evaluation. This preliminary evaluation shall determine the need/usefulness of the product in ~~WVDOH~~ WVDOT projects.

[1] https://transportation.wv.gov/highways/mcst/Pages/MP-100s.aspx
[2] https://transportation.wv.gov/highways/mcst/Pages/newproduct_evaluationprocedure.aspx

4.3.1 If the preliminary review indicates that the manufacturer meets Specifications, MCS&T Division will sample the material at the manufacturer and perform an evaluation. The sampling will include but may not be limited to: one 12-inch by 12-inch sample of each alloy being supplied. The evaluation will consist of a review of product specifications, certified test data, and manufacturer quality control (QC) procedures.

4.3.2 If the test results from the sample(s) or the evaluation indicate that the manufacturer or material do not meet Specifications, the manufacturer will be notified by MCS&T. The manufacturer will be reconsidered for approval once proof of compliance and corrections are supplied to MCS&T Division.

4.4 Once the manufacturer and product have been deemed compliant and approved for use in ~~WVDOH~~ WVDOT projects, MCS&T Division will add the manufacturer to the APL as per MP 106.00.03. The manufacturer will be given written notification of this approval, along with their assigned Lab Number showing their company has been deemed compliant and approved to provide aluminum sheeting to ~~WVDOH~~ WVDOT projects. This approval will remain valid for two years.

4.5 Two years after the initial acceptance and addition of the manufacturer to the APL, and randomly if deemed necessary, MCS&T Division will reevaluate/review the manufacturer to determine if their product still meets the applicable Specifications

4.5.1.1 MCS&T Division will contact manufacturers currently listed as approved sources on the APL to discuss and set up on-site random sampling of approved products. Product samples needed for review are as follows: one 12-inch by 12-inch sample of each alloy being supplied by the approved source to ~~WVDOH~~ WVDOT projects. Each sample must be in compliance with the criteria given in Section 661 of the Specifications.

4.6 If the review indicates that the product is in compliance with Specifications, it will be accepted without further evaluation. The manufacturer will receive written notification that they have been deemed compliant and that they will remain as an approved source on the APL until the next review. Included in this letter will be the new Lab Number that reflects the year the review was completed.

4.7 If the review indicates that the product was not compliant with Specifications, then MCS&T Division will notify the manufacturer, and further testing and/or evaluation will be performed by MCS&T Division. The manufacturer will receive instructions regarding any additional necessary submittals. This evaluation and submittals will include but not limited to further sampling, certified test data, and proof of quality control procedures.

4.7.1 If the manufacturer has been deemed compliant even after this further evaluation, the manufacturer will be notified. Written notification will be sent to the manufacturer, as outlined in Section 4.6, notifying them that they will remain on the APL.

4.7.2 If the manufacturer has been deemed non-compliant even after further evaluation, the manufacturer will be notified. Written notification will be sent to the manufacturer notifying them that they are being removed from the APL and explaining the reason for this revocation decision. The manufacturer will be reconsidered for re-approval once proof of Specification compliance and corrections are supplied.

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

RLS:Hd

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE FENCE PRODUCER/SUPPLIERS AND THEIR MATERIALS.

1. PURPOSE

1.1 To establish procedures for qualifying Producer/Suppliers of fence materials acceptable for use on ~~West Virginia Division of Highways (WVDOH)~~WVDOT 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 Districts and contractors on ~~WVDOH~~ WVDOT projects.

2. SCOPE

2.1 This procedure shall apply to all suppliers who supply fence materials such as chain link fence, farm field fence, fence posts, tie wire, bolts, nuts, gate latches, barb wire, and other related fence materials.

2.2 This procedure shall apply to all fence products used by ~~WVDOH~~ WVDOT projects unless project plans state otherwise.

3. APPLICABLE DOCUMENTS

3.1 WVDOH ~~Standard~~ Specifications ~~for Roads and Bridges and Supplemental Specifications.~~

3.2 UL - Underwriters Laboratories Specifications

4. ACCEPTANCE PROCEDURE

4.1 With each shipment of fence material to a ~~WVDOH~~ WVDOT project, the fence Supplier shall provide shipping documents which contain an APL source number reflecting materials meeting quality specified by the WVDOH.

5. ACCEPTANCE PROCEDURE (APPROVED SOURCE)

5.1 For a Producer/Supplier to be considered an approved source of fence items as stated in Section 2.1 the supplier must comply with the following requirements where applicable.

5.2 The Producer/Supplier is to complete and submit form HL-468 attainable from the website[1] and be submitted to ~~the WVDOH Materials Control, Soils and Testing Division~~(MCS&T~~)~~.

5.3 Once form HL-468 form is correctly submitted, an on-site investigation evaluation will be conducted by an Evaluator from the WVDOH at the supply distribution

[1] https://transportation.wv.gov/highways/mcst/Pages/tbox.aspx

location, to determine if the proposed location should be listed as an approved source for fence items.

5.4 The initial evaluation and yearly renewal of the Producer/Supplier shall be conducted using guidelines set forth in Attachment 1 where applicable. Each supplier's approval status will be analyzed at the time of APL reapproval.

5.5 At the initial and subsequent annual investigation evaluations, all appropriate management, sales, and warehousing personnel will be made aware of specifications, shipping policies and requirements to sell and ship fence materials to ~~WVDOH~~ WVDOT projects.

5.6 After the initial investigation evaluation has been completed, ~~the WVDOH~~MCS&T personnel ~~evaluator~~ shall document the findings in an inspection report, indicating~~e~~ that the location was evaluated and whether it met the criteria to be included on an APL for fence items. If the report notes that the Producer/Supplier didn't meet the required criteria, then the reasons why will be stated in the inspection report.

5.7 Providing the evaluation was found to meet specifications, the inspection report shall be signed by ~~the~~ MCS&T personnel ~~Evaluator~~ and shall be given a laboratory approval number. This laboratory approval number will be the APL number used by the WVDOH. An example of the inspection report can be seen in Attachment 2.

5.8 The signed inspection report is a certification from MCS&T Division ~~the Evaluator~~ that the Producer/Supplier has met the criteria to be included on the APL for Fence Producer/Suppliers. This report will be filed under the Producer/Supplier's name in the WVDOH electronic filing system.

5.9 Once the above requirements are met, Producer/Supplier approval status can be verified by accessing the WVDOH online APL for fence items.

5.10 If a Producer/Supplier is removed from approved source status for not meeting specification requirements, then the Producer/Supplier will be removed from the APL listing for one year. After a year, the Producer/Supplier may be reevaluated to ensure corrective measures have been met.

6. ACCEPTANCE PROCEDURES (NON-APPROVED SOURCE)

6.1 Any fence materials not supplied by an approved source are to be accepted or rejected by the direct coverage process.

6.2 If direct coverage inspection is required, the inspection or evaluation will conclude with a 7-digit Laboratory reference number indicating approval or rejection.

7. DOCUMENTATION REPORT

7.1 The approved source list for Producer/Suppliers of fence items used on ~~WVDOH~~ WVDOT projects may be updated at any time with the addition of a new facility, or with the removal of a facility.

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

MP 712.05.57 Steward – Metals Section
RLS:H
ATTACHMENTS

Attachment 1

Below is a summary of topics that the prospective Producer/Supplier of fence materials will be evaluated in accordance with.

1 To ascertain if the supply location is a business or a storage lot, meaning is the location a bare storage lot with material or a location with an office building with salespeople.

2 To determine if the location is an industrial Producer/Supplier or a homeowner quality Producer/Supplier. Meaning does the location supply for industrial applications or residential applications.

3 To determine if the location is a wholesaler/retailer or just a retailer, meaning does the location provide material to business or to retail customers.

4 To inform sales personnel that materials supplied such as barbed wire, chain link fence, farm field fence, steel posts, post braces, gate frames come from established APL lists, and where to find them online if necessary. All gates must have padlock hardware equipped prior to shipment.

5 To inform sales personnel of shipping procedures, meaning documents must have lab numbers, CID numbers, if direct coverage. If shipped from an approved source, then sales tracking numbers and APL numbers must be listed for WVDOH District personnel.

6 Informing sales personnel of what materials are covered under buy American requirements and what materials are not subject to buy American. This is done mostly during the outdoor evaluation at inventory during the initial evaluation.

7 An outside and inside inventory evaluation of materials describing what materials have their own APL and what do not. Informing what materials are not covered by locations with an APL number.

8 Discuss with sales personnel how to ship backorder material and partial material, also drop shipped materials, or how materials may be obtained by other sources, such as other approved sources or other non-approved sources.

9 Discuss with sales personnel about grounding kits, and that they are to be approved by location APL and not by other means.

10 Discuss with sales personnel that all items shall be coated by hot dip galvanizing or may be aluminumized by deposit coatings, all requiring 20 yr. minimum guarantee unless project plans indicate otherwise

11 All right of way fence shall meet requirements of WVDOH Specification Section 608.

12 Discuss with sales personnel that silt fence is not covered by location APL but is covered by other means.

13 Discuss with sales personnel that all right of way fence posts, braces and grate frames shall meet AASHTO M181 requirements and be on their own APL number covered by other means.

14 Discuss with sales personnel that all studded tee posts shall meet AASHTO M281/ASTM A702 requirements and be approved on their own APL number

15 Discuss with sales personnel that bolts and hardware must be hot dipped galvanized or be cadmium coated to ASTM B766 specifications. And be of industrial quality.

16 Discuss with sales personnel that chain link fence shall be approved only if material meets AASHTO M181

17 Discuss with sales personnel that all barbed wire shall meet AASHTO M280 for the correct classification of barbed wire, class 1 unless otherwise specified by contractor.

Attachment 2

Below is an example of the report from the evaluator to certify that the location is suitable to be included on an APL for fence materials.

REPORT NUMBER	1112458
LOCATION EVALUATION REPORT	
SUBJECT:	Location evaluation of: Wombat Fence Products, Producer/Suppliers of fence items, located in Metropolis, Illinois
DATE OF REPORT:	October 27, 2021

1. INTRODUCTION

1.1 The purpose of this evaluation is to affirm confidence in the ability of Wombat Fence Products, of Metropolis, Illinois to supply industrial fence materials in accordance with WVDOH and ASTM international standards used in ~~West Virginia Department of Transportation, Division of Highways (~~WVDOT~~/DOH)~~ ~~construction~~ projects.

2. INVESTIGATION

2.1 In January 2022, Mr. Brice Banner of the WVDOH Materials Control, Soils and Testing Division traveled to Wombat Fence Products, in Metropolis, Illinois, to meet with Mr. Cecil Kent, General Manager, and Billy Wayne industrial sales coordinator, to discuss specifications and supply demands required by the WVDOH Additionally, an extensive evaluation tour of the entire manufacturing facility was conducted.

3. CONCLUSION

3.1 After the meeting and the supply location evaluation were completed, it was determined that fence materials provided by Wombat Fence Products, of Metropolis Illinois, did meet the requirements for fence materials used in highway construction on WVDOH projects where specified and the criteria noted in Attachment 1 of MP 712.05.57. It is recommended that Wombat Fence Products be added to the approved source list (APL) for fence materials.

Nicholas Fury
Evaluator

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

MATERIALS PROCEDURE

PERCENT OF SOLIDS IN THE LATEX USED IN LATEX MODIFIED COMPOSITIONS

1. PURPOSE

1.1 To set forth a procedure for determining the solids content of the latex for use in latex modified compositions.

1.2 This procedure shall be used to determine the solids content of all latex materials used in latex modified compositions.

2. EQUIPMENT

2.1 Aluminum weighing dishes (approximate~~ly~~ capacity 42ml, depth 17mm, diameter 62mm inner top and 51mm inner base with a flat bottom ~~six centimeters in diameter and two centimeters deep~~), Fisher 8-732 or equivalent.

2.2 A one dram glass lip vial with a cork stopper.

2.3 Analytical balance (accurate to 0.1 milligram).

3. PROCEDURE

3.1 Weigh three aluminum dishes individually to 0.1 milligram. This is weight A.

3.2 Mix sample thoroughly.

3.3 Place sample into three vials, fill to approximately 2/3 of capacity, stopper immediately.

3.4 Weigh each vial and stopper. This is weight B.

3.5 Place approximately one gram of sample from the vial into the pre-weighed dish. Care should be taken to avoid getting the sample on outside of vial.

3.6 Immediately reweigh the vial and stopper. This is weight C.

3.7 Place samples in the oven at 141 ~~+~~± 2~~0~~°C (286°F ± 2°) for two hours.

3.8 Place samples in desiccator to cool.

3.9 Reweigh samples. This is the weight F.

Commented [MMA1]: Should this be changed to English units?

Commented [MJ2]: The description from Fisher Catalog for the item 8-732 is in millimeters for all dimensions of the weigh dish used in the test. See attachment.

Commented [MMA3]: Should this be changed to English units?

Commented [MJ4]: The description from Fisher Catalog for the item 8-732 is in millimeters for all dimensions of the weigh dish used in the test. See attachment.

Commented [5]: The MP committee asked to try and use both English and Metric units. The 0.1 milligrams should stay as metric only due to small size. The temperature can be stated as both Celsius and Fahrenheit. However, it is not a clean conversion from 141 C so I rounded it to 286 F.

4. CALCULATIONS

D = B - C

Where D = sample weight

4.1 E = F - A

Where E = weight of solids

4.2 $S = \frac{E}{D} \times 100$

Where S = total solids in percent

4.3 The solids content of the sample is the average of the three tests.

4.4 If the range of the three tests exceeds 1.00 percent, repeat the test procedure.

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

RLS:Mpj

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

MATERIALS PROCEDURE

PREPARING MATERIALS PROCEDURES

1. PURPOSE

1.1 To set forth instructions for drafting Materials Procedures (MP) concerning sampling, testing, reporting, and inspection.

1.1.1 To establish a numbering system for MPs.

1.1.2 To establish a styles guideline for MPs.

1.2 To establish a workflow for the creation, acceptance, and approval for MPs.

1.2.1 To setup a reconfirmation schedule for existing MPs.

1.3 To provide further guidance and clarification from that set forth in DD-105.

2. REFERENCED DOCUMENTS

2.1 WVDOH Specifications Roads and Bridges[1].

2.2 AASHTO Publications Style Manual and Process Guide[2], current edition.

2.3 WVDOH Design Directives DD-105[3].

3. NUMBERING GUIDELINES

3.1 A MP consists of a sequence of numbers such as 120.20.01.

3.1.1 The first set (three digits) of an MP are taken from the WVDOH Specifications Roads and Bridges to denote the general area to which the procedure applies.

3.1.2 The second set (two digits) of an MP are taken from the WVDOH Specifications Roads and Bridges denotes the particular area to which the procedure applies.

[1] https://transportation.wv.gov/highways/contractadmin/specifications/Pages/default.aspx
[2] https://materials.transportation.org/
[3] https://transportation.wv.gov/highways/engineering/Pages/Design-Directives.aspx

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

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

4. COMMON DEFINITIONS

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

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

4.3 Specific Terms:

4.3.1 Specifications: When referring to the WVDOH Standard Specifications, Roads and Bridges, current edition including supplementals, the term to be used is "Specification(s)" with a capital "S".

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

4.3.3 Deputy Secretary: When referring to the final approving entity, the term "Deputy Secretary" shall be used. This position was previously the State Highway Engineer.

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

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

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

4.3.7 All other Divisions shall be spelled out once and then given an appropriate abbreviation. For example, Engineering Division "Engr Division"

4.3.8 APL: When referring to MCS&T Approved Product List, the term to be used is "APL", with all letters capitalized.

~~4.~~5. FORMAT GUIDELINES

~~4.1~~5.1 The style guides for MPs shall follow the general guidelines established in "Section 6.4.3" of AASHTO Publications Style Manual and Process Guide Typography in Design. These guidelines are further refined in this document.

~~4.1.1~~5.1.1 The font shall be Times New Roman, size 12, fully justified for all text except for the section title. The section title shall be all capital letters, fully justified, Times New Roman, size 12 and bold. There shall also be a horizontal line above this text.

~~4.1.2~~5.1.2 The line numbering shall be as follows: "x." For a section title and "x.x" for a section paragraph. From here, follow the format of "x.x.x…" for additional layers of sub paragraphs. This document provides an example of the formatting.

~~4.1.3~~5.1.3 Links shall be blue and clickable[4]. The link path shall also be included as a footnote. An example of this is demonstrated by the "blue and clickable" text and link above and the footer at the bottom of this page.

~~4.1.3.1~~5.1.3.1 Any instances of an email address shall also be clickable and adhere the guidelines for a link.

~~4.1.4~~5.1.4 Figure labels shall follow the guidelines of "Section 2.1.4" of AASHTO Publications Style Manual and Process Guide Typography in Design. This section states: "The title should be succinct noun or noun phrase that describes the figure, but does not provide unnecessary background information, nor repeat information found in the text." Do not abbreviate "Figure" and capitalize key words such; an example of this is as follows: "Conditions Determined to Be Pre-Existing."

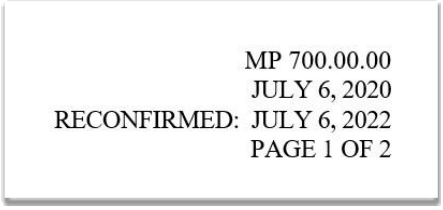
~~4.1.4.1~~5.1.4.1 Formatting for labels shall be the same as normal body text, except that "Figure X." shall be bold. All figure text shall be centered and located below the figure.

~~5.~~6. HEADER GUIDELINES

~~5.1~~6.1 A standard numbering and indexing system shall appear in the upper right-hand corner shall of pages of all MPs. All header text shall be in "All Caps" format.

~~5.1.1~~6.1.1 The letters MP shall appear first, denoting Materials Procedure. The number of the MP shall follow that text and be in the header of every page. The numbering of the MP shall follow the format as described in this document.

~~5.1.2~~6.1.2 All MPs shall contain headers in manner described in this section. There are two instances of a header. If an MP has been reconfirmed, the header will follow the example in Figure 1. This includes the date the latest date the MP was approved, and the date of confirmation.



[4] https://transportation.wv.gov/highways/mcst/Pages/default.aspx

Figure 1 – MP Header with Approval Date and Reconfirmation Date

~~5.1.3~~6.1.3 In the instance of either a new MP or an approved update to a MP, only the Director signature date (located at the end of the body section of the document) is in the header. A sample is provided in Figure 2.

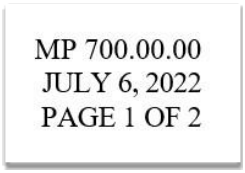


Figure 2 – MP Header With Approval Date

~~5.1.4~~6.1.4 In the instance of an attachment, the first line of the MP header shall be in the format: MP XXX.XX.XX – ATTACHMENT. All other lines shall follow the guidelines previously described. This is demonstrated in Figure 3.

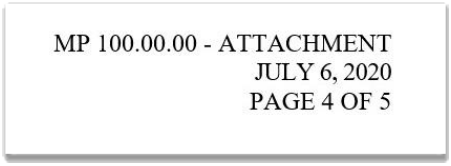


Figure 3 – MP Attachment Header

~~5.1.4.1~~6.1.4.1 In all instances, on all pages (do not use different first page), the text "PAGE X1 to X2" shall be last, with X1 being the current page and X2 being the total pages in the section. The main body and each attachment shall be considered a separate section; numbering shall be restarted on any new attachment instance.

~~6.~~7. MP APPROVAL PROCESS

~~6.1~~7.1 In the instance of any MP Committee work, the champion is a person defined as the person who is the primary author, editor and/or liaison for the document. The champion is responsible for introducing and presenting the document. The champion is also responsible for addressing comments on the document.

~~6.2~~7.2 Attachment 1 provides an overview of the approval process of an MP. First the document is brought to the MP committee chair (chair) by the champion. The document is distributed by the chair and discussed at the next MP committee meeting. After the document has been at a minimum of two consecutive MP meetings, the document may be approved by vote. The document is then reviewed, and if approved, signed by the Director of Materials Control, Soils and Testing Division (Director, MCS&T). The signed document is sent through DOH management for review and approval. Once the review is complete, the document is reviewed and affirmed by Federal Highways (FHWA). Once the document is affirmed by FHWA, the document is posted and distributed. If at any step an approving authority makes comments, the document is cycled back to the MP Committee meeting for review and another approval vote.

~~6.2.1~~7.2.1 In the instance where a document has no content changes (editorial changes only), the MP committee may choose to vote to approve the document after one meeting.

In this case, any voting member of the MP committee or the FHWA representative may veto this decision.

~~6.2.2~~7.2.2 The details of the MP committee, including the submission process, distribution practices, and current voting members is available for review in Design Directive 105 and available at the WVDOH Engineering Webpage[5]

~~7.~~8. RECONFIRMATION PROCESS

~~7.1~~8.1 Each MP shall be periodically reviewed for both relevancy and accuracy. At a minimum frequency, each MP shall be reviewed every 4 years by the applicable MCS&T Section Supervisor (Reconfirmation Champion). In the instances where there is no obvious Section Supervisor, the delegation of the review shall be the responsibility of the chair in liaison with the Director of MCS&T.

~~7.2~~8.2 After reviewing the document, if the Reconfirmation Champion determines that no changes are required, they will submit the document to chair for reconfirmation. The reconfirmation shall be done by the voting members.

~~7.3~~8.3 If approved by the Committee, the MCS&T Director shall review the document and if accepted, sign the document. Because no changes were made to this document, once the document is signed, it shall be posted and distributed.

~~8.~~9. POSTING AND DISTRIBUTION OF MPS

~~8.1~~9.1 Active MPs are available on the WVDOH MCST MP Webpage[6]. The webpage shows the MP number, the title of the MP and the latest approval or reconfirmation date.

[5] https://transportation.wv.gov/highways/engineering/Pages/Design-Directives.aspx
[6] https://transportation.wv.gov/highways/mcst/Pages/WVDOH-Materials-Procedures.aspx

~~8.1.1~~9.1.1 For each document (if appliable), an archived link is available to provide a documented history of updates. Figure 4 provides an example.

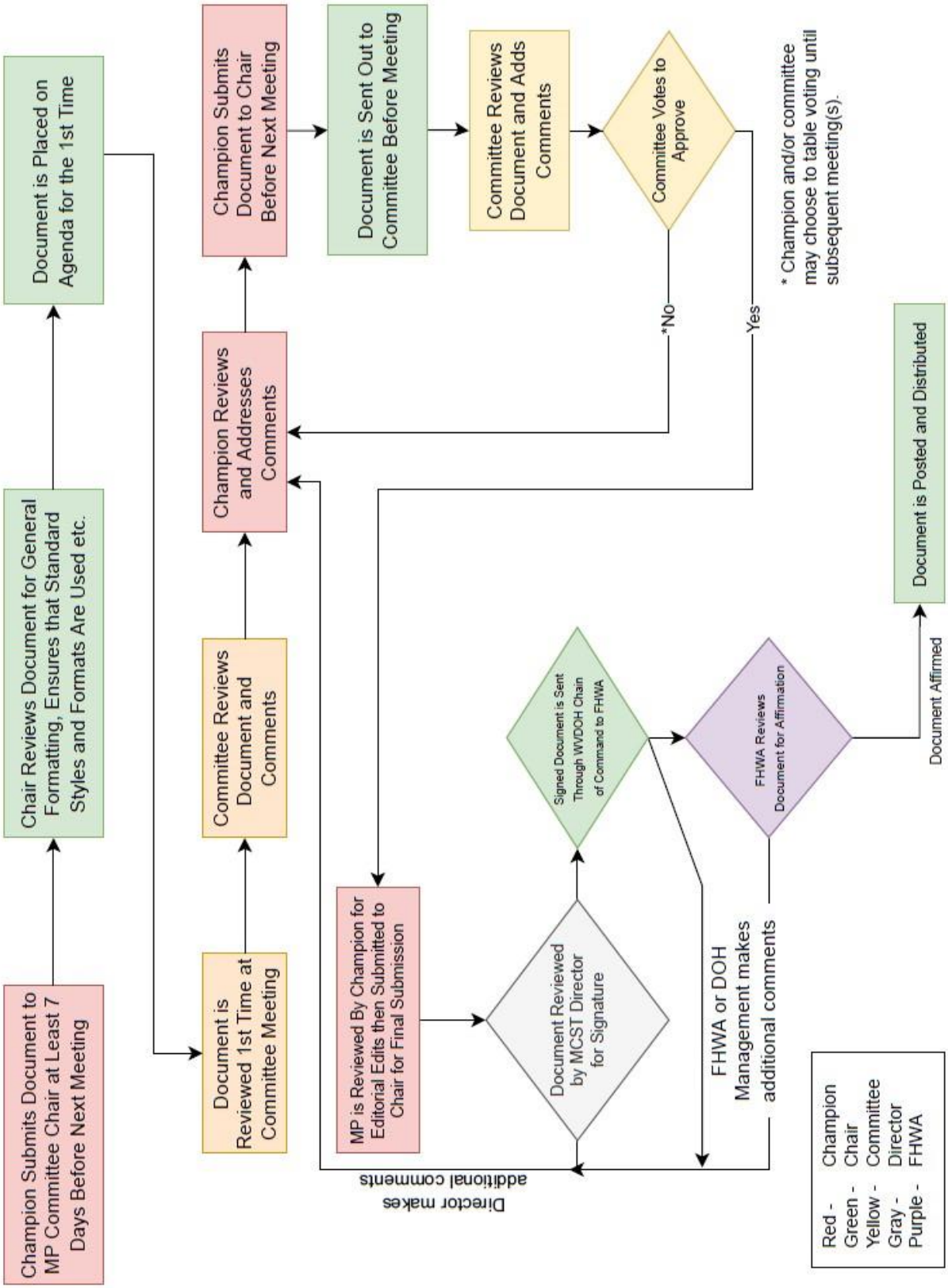
106.00.02 Archive	Procedure for Evaluation of New Products for Use In Highway Construction	November 2016

Figure 4 – MP Committee Webpage Example

~~8.2~~9.2 When a document is affirmed by FHWA, the documents will be distributed to applicable Division Directors, District Engineer/Managers and District Material Supervisors.

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

MP 100.00.00 Steward – Materials Control Section
RLS:B
ATTACHMENT



ATTACHMENT 1 – MP Committee Meeting Flowchart

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

MATERIALS PROCEDURE

CERTIFICATION OF FABRICATORS OF CORROSION RESISTANT COATED DOWEL BARS IN BASKET ASSEMBLIES AND COATED DOWEL BARS

1. PURPOSE

1.1 To establish a procedure for Certification of Fabricators of corrosion resistant coated dowel bars in basket assemblies and coated dowel bars, to set fort conditions for certification and to establish inspection and procedures for certified fabricators.

1.2 This procedure shall apply to fabricators of corrosion resistant coated dowel bars in basket assemblies and coated dowel bars who furnish material to WVDOT projects and purchase orders.

2. SPECIFICATIONS

2.1 The coated dowel bars in basket assemblies and coated dowel bars shall meet the requirements of Section 709.15 of ~~West Virginia Division of Highways Standard~~ the Specifications ~~for Road and Bridges as amended by the Supplemental Specifications~~.

3. DOCUMENTATION OF CERTIFIED COATER

3.1 The fabricator shall obtain the following information from the certified coater:

3.1.1 Source ~~of~~for Each Steel Used ~~Steel~~

3.1.2 WV Laboratory Number for the Steel

3.1.3 Source of Coating

3.1.4 Type of Coating

3.1.5 WV Laboratory Number for the Coating

3.1.6 Dry Film Thickness of the Coating

3.1.7 Total Number of Lineal ~~Meters ()~~Feet of Steel Used.

4. WORKMANSHIP AND INSPECTION

4.1 The load transfer unit shall be made in accordance with the applicable West Virginia Division of Highways Standard Detail Sheet.

4.2 The fabricator shall inspect the coating for the following items:

4.2.1 Saw cut ends of the dowel shall be free of burns and projections.

Commented [1]: Should this be "dowel bar" instead of "steel", or does this include the wire for the baskets also?

Commented [2]: I was thinking this was the source of any steel used. So, you would/could have the steel for the dowel bars and the steel used in the wire for the baskets. We could maybe say something like "Source for Each Steel Used."

Commented [3]: Ok. That sounds good to me.

Commented [4]: Should this be "dowel bar" instead of "steel", or does this include the wire for the baskets also?

Commented [5]: I think this would go with 3.1.1 and be the Laboratory Number for Each Steel Source Used.

Commented [6]: Is this the number of lineal feet of dowel bar?

Commented [7]: Yes, I think it is. We could change it to "Total Number of Lineal Feet of Steel Used"

Commented [8]: Ok. Thanks.

Commented [9]: agree

4.2.2 Flaws, such as perforations, cracks, and holidays.

4.2.3 Damage from welding or mechanical fixation shall not extend more than ~~26 millimeter~~1.0 inches from the weld or point of fixation.

5. DIVISION SAMPLING AND TESTING

5.1 The Division may obtain samples at the fabricator's shop and/or at the project site to ensure ~~specifications~~ Specification compliance.

5.1.1 The Division may elect to use other methods of verification, such as material, Division laboratory testing, and/or third-party laboratory testing.

5.1.2 An inspection of the fabricator shall be conducted every two years to verify the ability of the facility to produce products that meet ~~s~~Specification requirements.

6. 6. APPROVED PRODUCT/SOURCE LIST

6.1 The Division will maintain an ~~Approved Product/Source List~~APL for Coated Dowel Bars and Coated Dowel Bars in basket assemblies.

The~~An updated~~ APLs for Coated Dowel Bars and Coated Dowel Bars in basket assemblies ~~each material shall~~will be updated a minimum of once a year ~~issued once a year~~ or as often as deemed necessary ~~. The list may be~~

6.1.1 ~~updated at any time~~ with the addition of a new facility or with the removal of a facility.

If for any reason a fabricator~~plant~~ fails to meet the requirements as set forth above or in the ~~WVDOH s~~Specifications, the fabricator~~plant~~ will be removed from the APL~~Division's approved~~

6.1.2 ~~status~~ until such time as corrective action is taken to meet the acceptance criteria.

~~6.1.1~~6.1.3 The acceptance criteria for the ~~Approved Product/Source List~~APL for Coated Dowel Bars and Coated Dowel Bars in basket assembly shall meet WVDOH Specs 709.15 and MP 709.01.51.

7. DOCUMENTATION

7.1 The fabricator will submit the information contained on Attachment 1 with each shipment. Two copies will be required. One copy is sent with the shipment to the WVDOT project: the other is sent to the following address:

Materials Control, Soils & Testing Division
190 Dry Branch Drive
Charleston, WV 25306~~.~~

7.2 Upon receipt of the coated dowel bars and coated dowel bars in basket assembly from a certified source, coverage will be obtained by entering on form HL-440 the laboratory number for the source which is found on the list of approved suppliers.

Commented [10]: changing from Metric to English Units

Commented [11]: agree

Commented [12]: agree

Commented [13]: agree

Commented [14]: agree

Commented [15]: Need to check with the Control Group and Dan to see if this is still applicable

Commented [16]: Agree. I am not familiar with form HL-440.

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

RLS:Mpr
Attachment

Attachment 1

COATED DOWEL BARS AND COATED DOWEL BARS IN BASKET ASSEMBLY

PROJECT:

FABRICATOR:

LOCATION:

SOURCE OF STEEL BARS:

WV LABORATORY APPROVAL NO. FOR STEEL BARS:

SOURCE OF STEEL WIRE:

WV LABORATORY APPROVAL NO. FOR STEEL WIRE:

COATER:

LOCATION:

SOURCE OF COATING:

WV LABORATORY APPROVAL NUMBER FOR COATING:

QUANTITY OF BASKET ASSEMBLIES:

NO. OF LINEAL ~~METERS~~FEET:

SHIPPED TO:

DATE SHIPPED:

SIGNED_____

DATE_____

Commented [17]: Is there an APL for steel wire, or where does this lab number come from?

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

MATERIALS PROCEDURE

LOS ALAMOS STAINING METHOD FOR ALKALI SILICA REACTION GEL

1. PURPOSE

1.1. To provide a staining method of testing to detect the gel, that is a byproduct of alkali silica reactions, on concrete that may have been affected by alkali silica reactivity.

1.2. While this method provides a way to detect such reaction gels, it is not intended to be a standalone diagnostic, but an aide. Other factors could present the same staining, so it is recommended that a more in-depth look is made with magnification to confirm or deny the results obtained.

2. SCOPE

2.1. This method is applicable to fractured concrete in the field, or with concrete cores in the laboratory.

2.2. For our intent of testing this method will be applied to concrete cores in the laboratory.

3. REFERENCES AND APPLICABLE DOCUMENTS

3.1. Guthrie, G. D., and Carey, J. W., Geochemical Methods for the Identification of ASR Gel, Transportation Research Board, July 1998, Link to Webpage[1].

3.2. Farny, A. James., and Kerkhoff, Beatrix., Diagnosis and Control of Alkali-Aggregate Reactions in Concrete, ~~https://www.cement.org/docs/default-source/fc_concrete_technology/is413-02---diagnosis-and-control-of-alkali-aggregate-reactions-in-concrete.pdf~~Link to Webpage[2].

3.3. Dr. Berry, Micheal, Alkali Silica Reactivity in the State of Montana, February 2019, ~~https://www.mdt.mt.gov/other/webdata/external/research/docs/research_proj/Alkali/Task_1_Report.pdf~~Link to Webpage[3].

~~3.3.~~3.4. MP 601.03.22: Damage Rating Index for Hardened Concrete

[1] https://www.osti.gov/servlets/purl/762098
[2] https://www.cement.org/docs/default-source/fc_concrete_technology/is413-02---diagnosis-and-control-of-alkali-aggregate-reactions-in-concrete.pdf
[3] https://www.mdt.mt.gov/other/webdata/external/research/docs/research_proj/Alkali/Task_1_Report.pdf

4. APPARATUS

4.1. Safety glasses, rubber gloves, apron, respirator

4.2. Saturated Solution of Sodium Cobaltinitrite

4.3. Saturated solution of rhodamine B base

4.4. Large Stone Saw

4.5. Concrete Wet Polisher (50 – 3000 grit pads)

4.6. Distilled water

5. SAMPLE PREPERATION

5.1. Secure a concrete core in accordance with ASTM C856, under section 8 (Samples). Generally, a core shall have a size minimum of 6 inches in diameter and 1 foot in length, however the sizes can be different due to the specific nature of the coring location.

5.2. The concrete specimens should be cut on the large stone saw so as to bisect the cylinder along its longitudinal axis. Care should be taken in avoiding, if possible, the steel reinforcing bars encountered in bridge deck cores.

5.3. Select the better half of the core for the next step, however, set the second half to the side for possible later inspection.

5.4. The half chosen for inspection is now wet polished. Using a concrete wet polisher start with the coarsest grit (50) and work your way to the finest grit (3000). Complete this step until the surface is sufficiently polished.

6. PROCEDURE

6.1. Take the polished concrete slab and rinse the surface of it with gas free, distilled water, making sure to remove any residue from the surface

6.2. Cover the rinsed surface with the sodium cobaltinitrite solution and allow this to sit for 30 to 60 seconds. After allowing the reaction sufficient time to happen rinse the surface again with gas free distilled water.

6.3. After the rinse cover the surface with the rhodamine compound, allow to sit for 30 to 60 seconds. Once the reaction has had time to happen rinse the surface again with gas free distilled water.

7. OBSERVATIONS

7.1. Reaction gel that is present with alkali silica reactions is rich in potassium. The sodium cobaltinitrite reacts with this free potassium creating a yellow stain.

7.2. The rhodamine solution reacts with deterioration by products in concrete. One of which is a modified composition of the ASR that migrates away from the reacted aggregate and replaces its alkali constituents with calcium. This change will cause a reaction with the rhodium that causes a pink stain.

7.3. When all of the staining on the surface has been completed make notes of the extent of staining present on the surface.

7.4. Record any visual damage or deterioration that is seen on the concrete. This includes the amount of cracking present and the severity of the cracking.

7.5. Observations of any damage present on the concrete and the staining that is seen can be a good indicator of the presence (or absence) of ASR. The person making these observations must use their good judgement and knowledge to interpret their findings.

7.6. Further investigation can be made on the stained core using magnification to strengthen the findings from this test, as staining is made possible through other factors that can be ruled out through further investigation. (See ~~**Damage Rating Index** MP~~**MP 601.03.22**)

_____

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

MP 601.03.21 Steward – Aggregate and Soils Section
RLS:Ra

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

MATERIALS PROCEDURE

DAMAGE RATING INDEX FOR HARDENED CONCRETE

1. PURPOSE

1.1. To obtain visual observations of characteristics in hardened concrete that can be interpreted to help quantitate the severity of alkali silica reactivity.

2. SCOPE

2.1. By observing the hardened concrete under magnification characteristics associated with alkali silica reactivity can be identified and counted. Through interpretations of the information collected, along with the process of elimination, determination of the presence or severity of alkali silica reactions can be quantified.

3. EQUIPMENT

3.1. Stone Saw

3.2. Safety glasses, gloves

3.3. Concrete Wet Polisher

3.4. Ruler

3.5. Stereomicroscope

3.6. Photomicrograph equipment

4. REFERENCED AND APPLICABLE DOCUMENTS

4.1. Fournier, B., Tremblay, S., Thomas, M. D. A., & Folliard, K. J. (2011). (publication). Evaluation of Pine Bluff Bypass Concrete Pavement in Pine Bluff, Arkansas. Federal highway Administration. Retrieved August 14, 2023, Webpage ~~from~~ Link[1] .~~https://www.fhwa.dot.gov/pavement/concrete/asr/petrographic/arkansas.pdf.~~

[1] https://www.fhwa.dot.gov/pavement/concrete/asr/petrographic/arkansas.pdf

4.2. Fournier, B., Thomas, M. D. A., & Folliard, K. J. (2010). (publication). Evaluation of Bibb Graves Bride in Wetumpka, Alabama. Federal highway Administration. Retrieved August 14, 2023, ~~from~~ Webpage Link[2].

4.2.4.3. MP: 601.03.21: Los Alamos Staining Method for Alkali Silica Reaction Gel.

5. SAMPLE PREPERATION

5.1. If the core being examined has already been used for the staining method begin this procedure with step 4.6.

5.2. Secure a concrete core in accordance with ASTM C856, under section 8 (Samples). Generally, a core shall have a size minimum of 6 inches in diameter and 1 foot in length, however the sizes can be different due to the specific nature of the coring location.

5.3. The concrete specimens should be cut on the large stone saw so as to bisect the cylinder along its longitudinal dimension. Care should be taken in avoiding, if possible, the steel reinforcing bars encountered in bridge deck cores.

5.4. Select the better half of the core for the next step, however, set the second half to the side for possible later inspection.

5.5. The half chosen for inspection is now wet polished. Using a concrete wet polisher start with the coarsest grit (50) and work your way to the finest grit (3000). Complete this step until the surface is sufficiently polished.

5.6. Use a ruler to outline a grid of 1 cm X 1 cm squares on the surface of the concrete. There are no restrictions on the length or width of the grid, however, a minimum of 100 squares is required. The layout of the grid will depend on the working surface available.

6. PROCEDURE

6.1. Observe each square under a stereomicroscope with a magnification of at least 15X.

6.2. Count and write down the characteristics that are associated with alkali silica reactions that present themselves in each square. Attached at the end of document is a table with each characteristic and their respective weighing factors(figure 1) (Shrimer, F.).

6.3. While ~~look~~looking for these characteristics take note of the particles that are in the core, especially the ones that are associated with the presence of gel and/or cracking.

6.4. NOTE – there are several resources available to aid in identification of the different characteristics, and some aggregate particles. Some of these documents are attached.

[2] https://www.fhwa.dot.gov/pavement/concrete/asr/petrographic/alabama.pdf

7. RESULTS

7.1. Multiply the number of each feature tallied to their respective weighing factor.

7.2. Sum all of the calculations of each feature to get the Damage Rating Index (DRI).

7.3. The DRI gives a good indication of the severity of ASR if it is present. While there is no standard system for rating, generally values less than 250 a low degree of reaction, 500 is moderate, and 1000 is high. Values exceeding 1000 are a very high reaction and deterioration.

Petrographic feature	Abbreviation	Weighing factor
Coarse aggregate with cracks	CrCA	x 0.75
Open crack in coarse aggregate	OCrCA	x 4.0
Coarse aggregate with cracks and reaction products	Cr + RPCA	x 2.0
Coarse aggregate debonded	CAD	x 3.0
Reaction rims around aggregate	RR	x 0.5
Cement paste with cracks	CrCP	x 2.0
Cement paste with cracks and reaction products	Cr+RPCP	x 4.0
Air voids lined or filled with reaction products	RPAV	x 0.50

Figure 1 (Fournier, B., Tremblay, S., Thomas, M. D. A., & Folliard, K. J. (2011))

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

MP 601.03.22 Steward – Aggregate and Soils Section
RLS:Ra

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

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

1. PURPOSE

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

2. GENERAL

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

3. SCOPE

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

4. POLICIES AND ADMINISTRATION

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

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

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

4.2 Administration - The program will be administered by the Director of the MCS&T ~~Division~~ (hereafter referred to as "Director"). The Director will have the assistance of an Implementation Committee appointed by the Deputy Secretary ~~State Highway Engineer~~ as follows:

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

4.2.1 In addition the Certification Board may jointly select representatives of producers and contractors to work with the Implementation Committee at such times and on such matters as the Director and the representatives mutually agree. These representatives shall not be candidates for certification.

4.2.2 The Implementation Committee will meet upon call of the Director, or person authorized by the Director. The board shall have a minimum of three (3) members in order to form a quorum for a meeting.

4.2.3 The Program Administrator shall be appointed by the Director. The Program Administrator will be assigned to assist the Director in administering the program and to handle planning, administration, and coordinating functions as may be delegated within the scope of appropriate WVDOH directives.

5. REQUIREMENTS

5.1 Where applicable, quality control representatives of a contractor or producer will be certified in one (or more) of the certifications listed in Section 6.0, depending upon the individual's duties or responsibilities. Responsibilities and qualification requirements are listed in appropriate support documents such as Materials Procedures, Quality Control Plans and others.

5.2 For purposes of the WVDOH Quality Assurance Program, a non- WVDOH certified technician/Inspector represents the company of which he/she is a full-time employee on the WVDOT project, owner, or partner (as defined by the Federal Wage and Hour Legislation). If said company has subsidiary or affiliated organizations, each organization will be required to have its own certified Technicians/Inspectors where applicable unless the Deputy Secretary~~State Highway Engineer~~ makes an exception. Exceptions will be granted only when it can be proven that the certified Technician/Inspector actually performs the duties of the technician/inspector for all of the subsidiary or affiliated organizations.

5.3 Designated WVDOH personnel will be certified where applicable in one (or more) of the certifications listed in Section 6.0 depending upon the individual's duties and responsibilities.

6. CERTIFICATIONS

6.1 All certifications listed in the sections below require written examinations. Some of the listed certifications require a practical examination after successful completion of the written examination. It is the responsibility of the applicant to determine which certification is applicable to his/her assignment. Following is a description of the certifications listing relevant information about each:

6.2 AGGREGATE CERTIFICATIONS

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

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

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

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

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

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

6.3 COMPACTION CERTIFICATIONS

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

1. Specifications
2. Soil Compaction Test Procedures

3. Radiation Safety and Nuclear Gauge
4. Test Procedure Problems

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

6.4 CONCRETE CERTIFICATIONS

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

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

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

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

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

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

6.5 ASPHALT MIXTURE CERTIFICATIONS

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

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

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

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

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

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

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

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

1. West Virginia Specifications
2. AASHTO and ASTM Specifications
3. Knowledge of operation and analysis of collected data

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

6.5.4 Radiation Safety

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

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

7. TRAINING

7.1 Training - The Division of Highways, contractors, and producers may sponsor courses of instruction consisting of schools and seminars to help prepare personnel for certification under one or more of these certification programs. To the extent possible, these courses of instruction will be joint efforts of the industry and WVDOH. Nothing in this document shall be interpreted to prohibit any party from conducting courses of instruction for their personnel to assist in preparation for these exams.

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

8. EXAMINATIONS

8.1 Examinations, both written and practical, will be coordinated by the MCS&T ~~Division of the WVDOH~~. The locations and dates of the examinations will be announced on the ~~Division's~~ MCS&T's ~~website~~Webpage[1]. The examinations may be held on a regional basis when feasible. Most written examinations will be an 'open-book' type, with a time limit. Practical examinations require performance of the tests required by the ~~specifications~~ Specifications for the material type involved.

[1] http://transportation.wv.gov/highways/mcst/Pages/techcert.aspx

8.2 To pass the written examinations, the applicant must obtain a score of at least 70 percent. The Inertial Profiler Operator exam requires a minimum of 75% to pass. The applicant will be allowed two attempts within a 12-month period to obtain a passing score per each certification class attended.

8.3 After the applicant passes the written examination, he/she will have two attempts within a 12-month period to pass the practical exam. (Where applicable)

8.4 Certificate Non-Transferable - The status of the certification for a Technician or an Inspector is not transferable and is valid only for the quality control procedures designated by the bearer's certificate.

8.5 Revocation of Certificate - If at any time a WVDOH, contractor's, producer's, or supplier's Technician or Inspector is found to have altered or falsified test reports or is found to have improperly performed tests or reported their results, the individual's certification may be rendered invalid by the Deputy Secretary ~~State Highway Engineer~~ upon recommendation of the Implementation Committee and/or the Board.

8.6 Renewal and Certification – Certifications shall be renewed as required in the Technician Inspector Certification Program (TICP) handbook. General guidance and information for renewal will be recommended by the Board as required by the Deputy Secretary~~State Highway Engineer~~. All certifications shall terminate on December 31st of the year of expiration. There may be written, and practical examination required for recertification where applicable. More recertification information can be found in the Technician Inspector Certification Program (TICP) handbook available on the MCS&T ~~Division~~'s Webpage[2].

8.6.1 The responsibility for obtaining re-certification shall lie with the certified individual.

8.6.2 The Implementation Committee or other designated party shall establish internal criteria for renewal. The Technician Certification Handbook with the current rules and requirements shall be posted on the MCS&T ~~Division~~'s Webpage.

8.6.3 Upon obtaining renewal of certification, a renewal card may be printed from the MCS&T ~~Division's website~~Webpage.

8.7 For further information on classes, recertification, schedules, class calendars and other helpful information please visit the ~~Division's~~ MCS&T's ~~website~~Webpage.

[2] ~~http://transportation.wv.gov/highways/mcst/Pages/techcert.aspx~~

9. FUNCTIONS AND RESPONSIBILITIES

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

9.1.1 Technician/Inspector - A Quality Control representative of a contractor or producer should be a certified Technician/Inspector as outlined in Section 5. and whose responsibilities may include such duties as proportioning and adjusting the mix, sampling and testing the product, and preparing control charts.

9.2 The WVDOH - The WVDOH is responsible for all acceptance decisions.

9.2.1 District Materials Supervisor - District Materials activities are the responsibility of the District Materials Supervisor.

9.2.2 Division Technicians and Inspectors – The WVDOH Technicians and Inspectors will be assigned as necessary to carry out the required acceptance decision activities. The WVDOH representatives will not issue instructions to the contractor or producer regarding process control activities. However, the WVDOH representatives have the responsibility to question, and where necessary to reject, any operation or sequence of operations, which are not performed in accordance with the contract documents.

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

RLS:~~BB~~Eh
ATTACHMENT

WEST VIRGINIA
TECHNICIAN INSPECTOR CERTIFICATION PROGRAM HANDBOOK

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Revised ~~July 2021~~XXXXXXXX

1. INTRODUCTION

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

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

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

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

2. CERTIFICATION BOARD

As per MP 106.03.50 the certification board members are:

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

3. APPLICATION AND CLASS SIGN-UP INSTRUCTIONS

For course registration, instructions, please visit the WVDOH MCST Webpage[1] for Instructions:

4. CERTIFICATIONS

The TICP offers certification classes in the following disciplines:

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

[1] https://transportation.wv.gov/highways/mcst/Pages/techcert.aspx

7. Asphalt Field & Compaction Technician
8. Radiation safety

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

5. CLASS SUPPLY LIST

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

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

6. SPECIAL NEEDS AND REQUESTS

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

7. RECIPROCAL CERTIFICATIONS

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

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

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

8. TRAINING

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

[2] https://transportation.wv.gov/highways/contractadmin/specifications/Pages/default.aspx

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

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

9. CERTIFICATIONS

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

10. AGGREGATE CERTIFICATIONS

10.1 Aggregate Sampling Inspector

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

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

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

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

10.2 Aggregate Technician

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

1. Specifications
2. Aggregate Specifications and Procedures

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

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

11. COMPACTION CERTIFICATIONS

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

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

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

12. CONCRETE CERTIFICATIONS

12.1 Portland Cement Concrete Technician

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

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

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

12.2 Portland Cement Concrete Inspector

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

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

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

13. ASPHALT CERTIFICATIONS

13.1 Asphalt Plant Technician

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

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

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

13.2 Asphalt Field and Compaction Technician (AFCT) –

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

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

After successful completion of the written examination, applicants will be

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

14. RADIATION SAFETY

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

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

15. EXAMINATIONS

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

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

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

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

16. CERTIFICATION AND RE-CERTIFICATION

16.1 Certification

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

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

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

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

16.2 Re-Certification

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

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

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

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

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

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

17. TESTING PROTOCOL

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

18. REVOCATION OF CERTIFICATION

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

these conditions.

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

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

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

19. APPEALING A DECISION

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

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

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

20. THE LENGTH OF REVOCATION:

20.1 First Offense

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

20.2 Second Offense

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

20.3 Third Offense

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

21. CONTACT INFORMATION

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

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

MATERIALS PROCEDURE

INSPECTION AND ACCEPTANCE PROCEDURES FOR PRECAST CONCRETE PRODUCTS

1. PURPOSE

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

2. SCOPE

2.1 This procedure will apply to all precast concrete products supplied for use on West Virginia Division of Highways projects 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. REFERENCED DOCUMENTS

a. ACI R5.3 – Proportioning on Basis of Field Experience or Trail Mixtures, or Both

b. AASHTO T 22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens

c. AASHTO M 6 - Standard Specification for Fine Aggregate for Hydraulic Cement Concrete

d. AASHTO - R 100 - Standard Practice for Making and Curing Concrete Test Specimens in the Field

e. AASHTO - T 280 - Standard Method of Test for Concrete Pipe, Manhole Sections, or Tile

f. AASHTO T 303 - Standard Method of Test for Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali–Silica Reaction

g. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

h. ASTM C497-20e1- Standard Test Methods for Concrete Pipe, Concrete Box Sections, Manhole Sections, or Tile

i. ASTM C1577-20 - Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD

j. ASTM C1610/C1610M-10 - Standard Test Method For Static Segregation Of Self-Consolidating Concrete Using Column Technique

k. ASTM A1064/A1064M-10e1 - Standard Specification for Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

l. ASTM C1611 – Standard Test Method for Slump Flow of Self-Consolidating Concrete

m. ASTM C1621 – Standard Test Method for Passing Ability of Self-Consolidating Concrete by J-Ring

n. ASTM C642-21 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete

o. MP 603.02.10 - Guide For Approval Of Component and Ship Loose Materials Pertaining To Precast And Prestressed Concrete Items

p. MP 642.03.50 - Contractors Quality Control for Surface Water and Sampling Procedures for Quality Determination

q. MP 700.00.01 - Sampling and Testing of Materials at the Source (Coverage)

r. MP 703.00.22 - Soundness of Aggregates Using Sodium Sulfate

s. MP 703.00.25 - Method of Determination of Percent of Thin or Elongated Pieces in Coarse Aggregate

t. MP 700.00.30 - Certification of Batch Scales and Calibration of Standard 50 Pound Test Weights

u. MP 703.00.25 - Method of Determination of Percent of Thin or Elongated Pieces in Coarse Aggregate

v. MP 703.01.20 - Standard Method of Test for Friable Particles in Aggregates

w. MP 709.04.40 - Acceptance Criteria for Steel Wire Reinforcement Used in Concrete

x. MP 711.03.23 - Mix Design for Portland Cement Concrete

y. MP 714.03.30 - Quality Assurance of Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe

z. West Virginia Department of Transportation, Division of Highways, Standard Specifications Roads & Bridges

4. FABRICATOR APPROVAL

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

4.2 In order for a Fabricator to be approved and listed on the WVDOH Approved List of Precast Concrete Fabricators, they must be NPCA (National Precast Concrete Association) certified, QCAST (American Concrete Pipe Association) Certified, or have an equivalent type of certification.

4.3 The process for approving a Fabricator shall include, but not be limited to, an on-site visit to the fabrication plant by a WVDOH representative from MCS&T Division. During this visit, the WVDOH Quality Assurance (QA) personnel shall inspect the fabrication facility, the Quality Control (QC) lab, and meet with QC and other key personnel from the Fabricator. Component materials which will be used in the fabrication of precast items shall be sampled for testing. Batch scales shall be calibrated in accordance with MP 700.00.03 at a minimum once per year.

4.3.1 Sampling and testing of component materials shall be done in accordance with MP 603.02.10. Copies of recent component delivery tickets should be presented on the day of sampling. All component materials must be approved prior to the start of fabrication.

4.3.1.1 Any Fabricator which does not produce for the WVDOH for a period of 2 years shall be removed from the Approved Fabricator list. After removal from the approved list, before a Fabricator can again produce for the WVDOH, they must repeat the approval process. Sampling of component materials will not continue when the plant is not listed on the Approved Fabricator list.

4.3.2 Personnel from the Fabricator required to be present during the initial on-site visit and meeting between WVDOH and Fabricator shall include representatives from Production and Quality Control. Any questions and concerns regarding WVDOH

requirements, including applicable Specifications, Materials Procedure (MP's), Standard Details, and QC/QA Inspections shall be addressed at this meeting.

4.3.3 The Fabricator must submit the Quality Control Manual/Plan for review at this meeting.

4.4 All Concrete Mix Designs which will be used on products fabricated for the WVDOH must be submitted for review & approval, prior to the start of fabrication. Any design mix with an aggregate(s) that has a reactivity class~~es~~ R1, R2, or R3, as shown as in Approved Aggregates Source List, shall be developed in accordance with WVDOH specifications, subsection 601.3.1.1. If an aggregate Source is not listed on the Approved Aggregates Source List, the Division will test the fine and coarse aggregate from the Source, in accordance with AASHTO T 303, to determine the reactivity class of the aggregate prior to its use on any WVDOH project. The Division will inform the Fabricator of the reactivity class of aggregates that they are proposing to use. If a cement Source and/or a SCM Source are not listed on the Approved Source List, the Division will test cement and/or SCM from that Source prior to its use on any WVDOH project.

4.5 The Fabrication Plant QC Personnel, as a minimum, shall be a certified ACI Grade I Concrete Field Testing Technician and/or a WVDOH PCC Inspector. In addition, if Self-Consolidating Concrete (SCC) is used, Fabrication Plant QC Personnel shall be a certified ACI SCC Testing Technician.

4.6 All Precast Concrete items shall be accepted by Direct or Master Coverage except when a Fabricator is certified as an Approved Source of concrete lagging as defined in Section 7.

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

5.1 Prior to beginning fabrication of any precast concrete products, the Fabricator shall provide written or email notification to MCS&T Division at least one calendar week in advance of the date on which fabrication is to begin.

5.1.1 Depending upon the precast items being fabricated, MCS&T Division may choose to monitor fabrication. Fabrication of structurally significant products such as box culverts and 3-sided bridge units shall be monitored. Other items may be monitored at the discretion of MCS&T.

5.1.2 After fabrication has begun, the Fabricator shall keep MCS&T Division and the Inspector (whether a WVDOH employee or a contract employee representing the WVDOH) informed in advance of the days on which fabrication will take place.

5.2 Shop Drawings must be approved by the West Virginia Division of Highways prior to the start of any work by the Fabricator. The Inspector must have a copy of these approved shop drawings prior to start of any work by the Fabricator.

5.3 Concrete cylinders shall be made for compressive strength testing with 6-inch by 12-inch 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.

5.3.1 For both conventional wet cast concrete and SCC mixes, a minimum of one set of compressive strength cylinders shall be fabricated from every 7 yards of concrete, or fraction thereof, with a minimum of one set per day per mix design. Both the form removal strength and the 28-day strength must be confirmed by a set of cylinders. Cylinders shall be the same size as those used in the initial approved mix design. For conventional concrete, slump, temperature, and air content tests shall be conducted on the first batch of concrete each day and every time that cylinders are fabricated. For SCC mixes, spread, temperature, and air content tests shall be conducted on every batch. For all types of concrete, unit weight and yield tests shall be conducted on the first batch of concrete each day and thereafter as deemed necessary by Quality Control and Quality Assurance Personnel.

5.3.2 For dry cast mixes, the 28-day strength shall be confirmed by a set of compressive strength cylinders. Compressive strength testing for form removal is not required for dry cast mixes. A minimum of one set of compressive strength cylinders shall be fabricated for each item fabricated. The cylinders are to be fabricated in the molds on the vibration table in accordance with ASTM C497. For dry cast mixes, slump testing is not required, and concrete temperature testing shall be performed on the first batch of concrete each day and every time that cylinders are fabricated.

5.4 For precast manholes fabricated with wet cast and SCC mixes, absorption tests are to be conducted in accordance with ASTM C642. Tests should be conducted on a weekly basis for each mix design used, at a minimum, unless otherwise specified.

5.5 For precast products fabricated with dry cast mixes, absorption tests are to be conducted in accordance with ASTM C642, and tests should be conducted on a weekly basis for each mix design used. The maximum allowable absorption shall be 9%.

5.6 Unless otherwise specified, for conventional wet cast and SCC mixes, plastic concrete shall have an air content measured at 7.0 ± 2.0%. For dry cast concrete, the air content test requirement is waived.

5.6.1 Prior to the use of Self-Consolidating Concrete in precast items all mix designs must be submitted to MCS&T for approval and meet the requirements of the following table. Test results from trial batches produced by the laboratory which designed it shall be included in the submittal. The compressive strength of the design mix shall be at least 15% above the specified design strength.

Table 4.6.1 - SCC Mix Design Acceptance

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

5.6.2 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 $\leq T \leq$ 7 seconds Visual Stability Index ≤1.0
Concrete Temperature	<90°F
Unit Weight and Yield	±2% of Theoretical

5.6.3 SCC should only be given minimal vibration; and shall not be dropped from a distance greater than 4 feet relative to the top of the form.

5.6.4 Precast products fabricated with dry cast concrete shall be limited to a maximum wall thickness of 12 inches when single sided vibration is used and 18 inches when double sided vibration is used.

6. FINAL INSPECTION

6.1 After fabrication is completed and prior to shipment, the precast items will be stored on dunnage. The Fabricator shall provide MCS&T Division with a written or email request for final inspection a minimum of one calendar week prior to the desired date of inspection. Effective communication from the Fabricator to MCS&T Division and Consultant Inspection Agency is the key to avoiding any scheduling conflicts regarding final inspection.

6.2 At the final inspection, the fabricator shall provide the inspector with documentation of required data pertinent to the product(s) being produced. Attached to this document is a sample inspection sheet to be used as a guide for presenting this information. This documentation is also available on the MCS&T Division Website[1].

6.2.1 For the final inspection, the Inspector may witness compressive strength tests if required, inspect repairs as needed, and conduct a thorough visual examination of each member. A copy of the Inspector's daily reports, a copy of the final inspection report, and all other pertinent information provided to the Inspector by the Fabricator shall be kept on file by MCS&T Division.

6.2.2 For box culverts, trial fitting of adjacent pieces, prior to shipping, will be required as part of the final inspection process. Each adjacent box culvert will be trial fitted in pairs horizontally or vertically; the gaps between each pair will be measured. Dunnage will be placed on a smooth level surface below the bottom of the culvert to prevent damage.

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

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

7. ACCEPTANCE & REJECTION

7.1 Upon completion of final inspection, if a precast product meets all specification requirements and does not contain any defects, the Inspector will stamp the precast product as accepted by MCS&T Division and provide a 7-digit Laboratory Reference Number for shipment.

7.2 If, however, the precast product does not meet all specification requirements due to damage, defect, or dimensional tolerance, the product must be further evaluated before potential acceptance by the MCS&T Division as described in the following subsections.

7.2.1 Minor defects may be repaired in accordance with the pre-approved repair procedures which should be incorporated within the Fabricator QC Plan. Cracks 4 mils 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.

7.2.2 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 ± ¼'' from the specified dimension, and all other items must meet relevant tolerances in AASHTO and ASTM Standards. Items with major defects shall be rejected by MCS&T Division, and a 7-digit Laboratory Reference Number will be assigned documenting MCS&T Division's rejection. When items are load bearing, they shall be evaluated by the Designer for structural adequacy and then may be accepted by DMIR, pending concurrence by the District, and or the Engineer of Record. If a product is approved for repair, and if repairs appear satisfactory, the Inspector shall proceed with a final shipping inspection of the

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

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

f'_c – 28 Day Compressive Strength (psi)
$\overline{X}$ – Average 28 – day Compressive Strength (psi)
IC - The invoiced cost of the precast item only.

Formula 1 (Constructed by Contractor)

$$\text{Price Reduction} = \left[\frac{f'_c - \mathbf{X}}{.5\, f'_c}\right] x\ 40\%\ \text{Unit Bid Price}$$

Formula 2 (Constructed by Division)

$$\text{Price Reduction} = \left[\frac{f'_c - \mathrm{X}}{.5\, f'_c}\right] x\ \mathrm{IC}$$

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

8. PROCEDURE FOR APPROVED SOURCE OF PRECAST CONCRETE LAGGING

8.1 Precast concrete Fabricators may be classified as an Approved Source of precast concrete lagging if they have met the requirements of Section 3 and are producing lagging which is made in accordance with the relevant WVDOH Standard Details. Once classified as an Approved Source of precast concrete lagging, an Approved Source Lab Number will be assigned to the Fabricator for material tracking.

8.2 MCS&T Division may perform regular quality assurance inspections prior to shipment and/or, monitor fabrication of lagging from a Fabricator that is an Approved Source. The Approved Source Lab Number shall be noted on all shipping documents from the fabricator, and material coverage will be requested under the assigned Approved Source Lab Number. All relevant concrete test data, component material information, QC inspection data, and shipping information shall be kept on file at the Fabricator for the last three years of fabrication and shall be available upon request by the Division.

Failure to produce requested documentation may result in revocation of the Fabricator's Approved Source certification status.

8.3 Approved Sources will be evaluated by the Division by random audits. Audits will be conducted on the material that is available to the Inspector at the time of the audit. All documentation and records for the pieces must be made available to the Inspector on the day of the audit and must be complete, current, and accurate. Failure to produce records shall be a cause for decertification.

8.3.1 All shipping documentation, concrete test data, and component material certifications shall be made available to the Inspector for review. These documents shall include all documents from material that has been shipped to state projects 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.

8.3.2 In addition to documentation, the audit will consist of fabrication monitoring, test observance, and a visual inspection of material that is stocked for shipping on the day of the audit.

8.3.2.1 Each material test monitored during the audit must be performed in accordance with the applicable Standards, and Specifications. Visual inspection of stocked material will include quality checks of surface finish for cracks, spalls, and other surface blemishes after all repairs have been performed and dimensional checks. The material shall be properly stored to avoid handling damage and be accessible to the Inspector. Audits shall be graded on a point system deducted from 100 and weighted based on the Non-Conformance Points found per Table 7.3. A minimum score of 75 shall be considered passing.

TABLE 7.3

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

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

the Fabricator's Approved Source status for one year from the date of the last failed audit. Any evidence of document falsification shall result in immediate loss of Approved Source status, and removal from the Approved List of Concrete Fabricators for a minimum 2 years. Depending on the severity and the legality of the falsified documents the removal may be permanent.

8.5 Non-Conforming material received by 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.

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

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

PRECAST CONCRETE PRODUCTS
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: _____

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)**
1st			
2nd			
3rd			
4th			
Placement of Concrete Completion Time			
Comments:			

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

Sample Concrete Post Pour Product Inspection

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

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

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

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

Sample Inspection Sheet

Inspection Date_____ QC Personnel_____ QC Signature_____

Fabricator_____ Location_____

Project Name_____ WV State Project #_____ Federal Project #_____

Authorization # _____ Inspection done by_____

Steel Reinforcement

Reinforcement Supplier _____

Description_____ Approved Lab #_____

Description_____ Approved Lab #_____

Description_____ Approved Lab #_____

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