

Materials Procedures Committee Meeting				
Meeting Date: 2/17/22 at 10:00a				
	MP Number	Champion	MP Title	Up for Vote?
1*	712.05.57	Dave Lipscomb	CRITERIA TO APPROVE FENCE SUPPLIERS AND THEIR MATERIALS	y
2*	MP Insertion	Brayack/Mance	EDITORIAL CHANGE TO QC MPs	y?
3&	709.01.55	Dave Lipscomb	CRITERIA TO APPROVE PLAIN REINFORCING STEEL BARS USED...	n
4&	658.05.06?	Ted Whitmore	ANCILLARY STRUCTURE ANCHOR BOLT TIGHTENING	n
5&	601.03.50	Thapa/Mance	QC OF PORTLAND CEMENT CONCRETE - Section 4.2.4 (old PDF included for Reference)	n
6&	109.20.00	Chapman/Brayack	BASIS FOR CHARGES FOR NON-SUBMITTAL OF SAMPLING & TESTING DOCUMENTATION IN A TIMELY MANNER	n
7&	xxx.xx.xx	Hoskins	Lab Inspection MP	n
8#	Reconfirmation of Batch of MPs (Separate)			y
	*Up for Vote			
	&New			
	#Reconfirmation			

Votes					
MCST	CA	TED	OPP	EGR	p/f

MP Number	Reconfirm?	Comment?
106.00.20		
107.02.22		
107.07.20		
107.07.21		
207.00.00		
207.06.20		
207.07.20		
212.02.20		
401.02.21		
401.02.24		
402.02.20		
601.03.20		
601.03.52		
601.11.20		
608.02.20		
608.02.50		
642.03.50		
642.40.20		
661.00.00		
661.02.40		
679.03.00		
700.00.00		
700.00.22		
700.00.50		
700.00.52		
700.00.55		
700.01.01		
700.03.50		
700.03.52		
700.04.10		
700.05.10		
701.01.11		
702.00.20		
703.00.24		
703.00.28		
703.00.30		
707.02.13		
709.01.51		
709.15.50		
711.00.21		
711.20.59		
711.20.60		
712.04.50		
713.01.50		
715.07.20		
715.28.50		

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE FENCE SUPPLIERS AND THEIR MATERIALS.

1. PURPOSE

- 1.1** To establish procedures for qualifying suppliers of fence materials acceptable for use on West Virginia Division of Highways (WVDOH) projects.
 - 1.2** To establish a procedure for maintaining a record of such information.
 - 1.3** To establish a procedure for transmitting such information to the WVDOH Districts and contractors on WVDOH 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 projects unless project plans state otherwise.
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3. APPLICABLE DOCUMENTS

WVDOH Specifications for roads and bridges.
UL Underwriters laboratories specifications

4. ACCEPTANCE PROCEDURE

- 4.1** With each shipment, of fence material to a WVDOH project, the fence Supplier shall provide shipping documents which contain an APL source number reflecting materials meeting quality specified by the WVDOH.
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5. ACCEPTANCE PROCEDURE (APPROVED SOURCE)

- 5.1** For a 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 Supplier is to complete and submit form HL-468 attainable from the website: https://transportation.wv.gov/highways/mcst/Pages/newproduct_evaluationprocedure.aspx and be submitted to the WVDOH Materials Control, Soils and Testing Division.
- 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 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 Supplier shall be conducted using guidelines set forth in Attachment 1 where applicable.
- 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 projects.
- 5.6** After the initial investigation evaluation has been completed, the Evaluator shall document the findings in an inspection report, indicate 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 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 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 the Evaluator that the Supplier has met the criteria to be included on the APL for Fence Suppliers. This report will be filed under the Supplier's name in the WVDOH electronic filing system.
- 5.9** Once the above requirements are met, Supplier approval status can be verified by accessing the WVDOH online APL for fence items.
- 5.10** If a Supplier is removed from approved source status for not meeting specification requirements, then the Supplier will be removed from the APL listing for one year. After a year, the 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 suppliers of fence items used on WVDOH 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

Attachment 1

Below is a summary of topics that the prospective 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 supplier or a homeowner quality 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,
Suppliers of fence items,
located in Metropolis, Illinois

DATE OF REPORT: October 27, 2021

1 INTRODUCTION

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

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 WVDOT 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

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.

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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.

Applicable MPS:

MP 307.00.50

MP 401.03.50

MP 601.03.50

MP 717.04.21

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE PLAIN REINFORCING STEEL BARS USED IN CONCRETE

1. PURPOSE

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

2. SCOPE

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

3. APPLICABLE DOCUMENTS

WVDOH Specifications for Roads and Bridges, Section 709.1

National Transportation Product Evaluation Program "NTPEP"

American Association of State Highway and Transportation Officials "AASHTO" section M31

WVDOH Form HL-468

4. ACCEPTANCE PROCEDURE

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

5. ACCEPTANCE PROCEDURE (APPROVED SOURCE)

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

- 5.7 If a manufacturer is currently listed on the APL for plain rebar, a yearly renewal evaluation of that manufacturer shall be conducted consisting of the above sections 5.3 thru 5.6.

6 DOCUMENTATION REPORT

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

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

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

MATERIALS PROCEDURE

CRITERIA TO APPROVE FENCE SUPPLIERS AND THEIR MATERIALS.

1. PURPOSE

- 1.1 To establish equipment, procedure, documentation, and documentation transmittal requirements for the tightening of anchor bolt nuts associated with signing, signal, lighting, and intelligent transportation systems (ITS) related roadway ancillary structures.
- 1.1.1 This Materials Procedure is specifically focused on the procedure to be followed when tightening anchor bolt nuts and does not address all requirements and procedures pertaining to the installation of ancillary structures. Individual component pre-inspection and repair, structure pre-assembly, structure installation preparation, pre-application of protective coatings, overall installation procedure, and proper tightening of structural connection bolts are included as part of the Standard Specifications.

2. MATERIALS AND EQUIPMENT

- 2.1 The mandatory materials and equipment required to properly tighten the anchor bolts include lubricant, snug tightening wrenches, and a hydraulic fastener tightening wrench.
- 2.1.1 Wrenches used for a snug tightening are to have an appropriate handle length in order to achieve a level of initial snug tightening as predictable and uniform as possible. The handle length used for fasteners 3/4-inch to 1-1/4-inches in diameter is to be 23-inches. The handle length used for fasteners 1-1/2-inches to 2-1/4-inches in diameter is to be 36-inches.
- 2.1.2 Beeswax or toilet ring wax may be used as lubricant.
- 2.1.3 Hydraulic wrenches and accompanying documentation are to meet the requirements herein.
- 2.1.3.1 The wrenches are to be capable of generating the necessary torque in order to tighten the anchor bolt nuts as described herein.
- 2.1.3.2 The hydraulic wrench consists of a wrench and a hydraulic power pack to power and operate the wrench.

- 2.1.3.3 Hydraulic wrenches are to have the wrench and the pressure or torque readout gauge associated with the power pack calibrated regularly. Prior to the tightening of any anchor bolt nuts, the project Engineer is to be provided with separate calibration certificates for the wrench and the gauge. The dates of the calibrations are to be one year or less prior to the date that the bolt tightening is performed. The certificates are to be from a calibration lab that is International Organization for Standardization (ISO) 17025 accredited, with the certificate indicating as such. The certificate for each is to display a serial number matching that shown on the wrench or gauge. If the gauge does not provide readings directly in torque values, the calibration certificate is to be accompanied by calibration charts which equate gauge pressure readings to torque values. Example calibration certificates and charts are included as part of attached Exhibit B.

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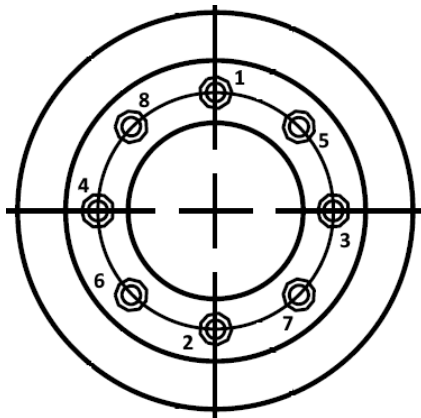
3. DOCUMENTATION

- 3.1 The tightening of all anchor bolt nuts is to be documented using the form "WVDOH ANCILLARY STRUCTURE ANCHOR BOLT TIGHTENING RECORD" (documentation form) attached as Exhibit A.

4. PROCEDURES

- 4.1 Install the top nuts and washers and snug tighten the top nuts using the appropriate handle length wrench. Snug tightening is to proceed from nut to nut in a star pattern and the specific sequence chosen is to be indicated on the base plate by numbering the sequence using a permanent marker (see figures below). Snug tightness is considered to be the tightness which exists due to the full effort of a person using a spud wrench with the appropriate length handle for the bolt being tightened.

Deleted: <#>Clean the anchor bolt threads with a wire brush or equivalent and lubricate the anchor bolt threads.¶
¶ If the lubricant pre-coated nuts have gotten wet at any point, reapply lubricant to the threads and the bearing surface face of the nuts. ¶
¶ After installing the leveling nuts and washers, placing the structure support leg, and adjusting the leveling nuts and washers as described in the Standard Specifications, install the top nuts and washers and

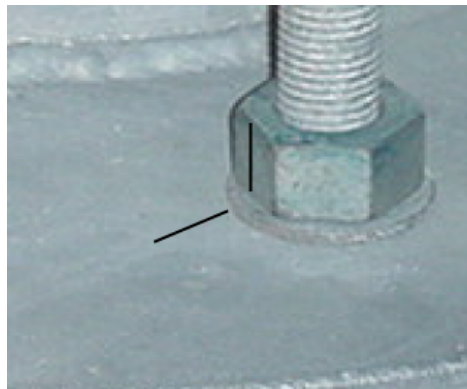


EXAMPLE NUT TIGHTENING SEQUENCE FOR 8 BOLT BASE PLATE



SNUG TIGHTENING SEQUENCE NUMBERING ON BASE PLATE

- 4.2 After verifying that all nuts and washers have been brought into firm contact and the necessity or unnecessity for repeating the snug tightening procedure with beveled washers has been determined and performed if required, a reference position for each nut in snug tight condition is to be established by using a permanent marker to place a mark on one of the nut flats and a corresponding mark on the base plate (see figure below).



MARKING OF NUT SNUG TIGHT REFERENCE POSITION

- 4.3 Fully tighten the top nuts using the hydraulic wrench.
- 4.3.1 Full tightness of each nut is achieved by rotating the nut a prescribed number of flats beyond the reference position. Rotation is to be 1/3 (2 flats) beyond the reference

position for bolts 1-1/2-inches in diameter or less. Rotation is to be 1/6 (1 flat) beyond the reference position for bolts greater than 1-1/2 inches in diameter.

- 4.3.2 Tightening is to proceed from nut to nut in the same star pattern that was used for the snug tightening procedure and is to be achieved over two cycles. Using a structure with 2-inch anchor bolts as an example, each nut is to be tightened ½ flat. Each nut is to then be tightened an additional ½ flat. The amount of torque, as indicated on the power pack gauge, at the point when the full rotation of each nut is achieved is to be recorded on the documentation form. If the gauge associated with the power pack does not provide a torque readout, the pressure readout is to be recorded and the associated torque is to be determined from the power pack calibration charts and recorded on the documentation form.
- 4.4 Upon completion of the tightening of all nuts, a verification torque (T_v) is to be applied to each nut using the same hydraulic wrench and power pack that was used to tighten the nuts. This step is necessary to verify threads have not been stripped and is not intended to tighten the nuts further. The verification torque should be insufficient to further turn and tighten the nuts. The required verification torque is to be calculated using the following formula and documented on the documentation form:

$$T_v = 0.12 (D_b) F_i$$

Where:

T_v = verification torque (inch-kips)

D_b = nominal body diameter of the anchor bolt (inches)

F_i = 60% of the anchor bolt minimum tensile strength (kips) (= 45 ksi for ASTM F1554 Grade 55)

Multiply T_v by 83.3 to calculate T_v in ft-lbs

If the gauge associated with the power pack does not provide a torque readout, the pressure readout required to achieve the verification torque is to be determined from the power pack calibration charts.

- 4.4.1 The documentation form is to be marked where indicated to indicate that application of the verification torque did not result in further turning of each nut. If the application of the verification torque results in further turning of any nuts, the Traffic Engineering Division should be notified of this issue.
- 4.5 At least 48-hours after the tightening and verification torque procedures are completed, a torque equal to 110% of the T_v torque ($1.10T_v$) is to be applied to each nut using the same hydraulic wrench and power pack that was used to tighten the nuts. This step is necessary to verify threads have not been stripped and is not intended to tighten the nuts further. The $1.10T_v$ torque should be insufficient to further turn and tighten the nuts. If the gauge associated with the power pack does not provide a torque readout, the pressure readout required to achieve a torque of $1.10T_v$ is to be determined from the power pack calibration charts.
- 4.5.1 The documentation form is to be marked where indicated to indicate that application of the $1.10T_v$ torque did not result in further turning of each nut. If the application of

the 1.10Tv torque results in further turning of any nuts, the Traffic Engineering Division should be notified of this issue.

5. DOCUMENTATION TRANSMITTAL

- 5.1 Upon completion of all procedures described herein and the documentation form being completed in its entirety, the Engineer is to transmit an electronic copy of the documentation form to the email address XXXXXXXXX, which is established by the Traffic Engineering Division for this purpose. Prior to transmittal, the calibration certificates for the wrench and power pack pressure or torque readout gauge, as well as the calibration charts for the gauge, should be attached to the documentation form and included with the submittal. The subject line of the email should be named using the following format: D(*District Number*)-(Contract ID Number)-(Sign, Signal, Lighting, or ITS) Structure (*Structure Number as indicated on the project Plans*). Examples of this would be D4-2016000994-Sign Structure 6 and D7-2006001093-Lighting Structure HML1. An example of all documents that should be included as part of a complete transmittal is attached as Exhibit B.

RLS:W

ATTACHMENTS

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

EXHIBIT A

WVDOH ANCILLARY STRUCTURE ANCHOR BOLT TIGHTENING RECORD

District: _____ State Project Number: _____

Contract ID number: _____ Federal Project Number: _____

Plan Assembly Number: _____

Structure Utility: ☐ Signing ☐ Signal ☐ Lighting ☐ ITS

Structure Type: ☐ Cantilever ☐ (Sign) Butterfly ☐ (ITS) Butterfly ☐ Span ☐ Strain Pole
☐ Mast Arm ☐ High Mast Tower ☐ Conventional Light Pole

Anchor Diameter: _____ inches Tv: _____ foot-lbs = _____ PSI

1.10Tv: _____ foot-lbs = _____ PSI

Wrench Serial Number: _____ Gauge Serial Number: _____

Diagram of Structure (Plan view of structure showing all base plates. Show and label diagram with base plate numbers and location/position of structure in relation to a reference feature)

Base Plate 1 Diagram (Plan view of base plate with anchor bolt locations. Number anchor bolts the same as the anchors are numbered and tightened. Label diagram to indicate orientation of base plate in relation to a reference feature)

Full Tightness Gauge Pressure and Torque Values (Pressure recording not necessary if readout of gauge is in torque)

	1	2	3	4	5	6	7	8
PSI								
foot-lbs								

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8

Base Plate 2 Diagram							
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Full Tightness Gauge Pressure and Torque Values								
	1	2	3	4	5	6	7	8
PSI								
foot-lbs								

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Base Plate 3 Diagram							
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Full Tightness Gauge Pressure and Torque Values								
	1	2	3	4	5	6	7	8
PSI								
foot-lbs								

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Base Plate 4 Diagram

Full Tightness Gauge Pressure and Torque Values								
	1	2	3	4	5	6	7	8
PSI								
foot-lbs								

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Date of Tightening

Date of Application of 1.10Tv

Installation Contractor

Bolt Tightening WVDOH Rep. (Print)

Contractor Rep. (Print)

Application of 1.10Tv WVDOH Rep. (Print)

Contractor Rep. (Signature)

WVDOH Project Engineer (Print)

EXHIBIT B

WVDOH ANCILLARY STRUCTURE ANCHOR BOLT TIGHTENING RECORD

District: _____ State Project Number: _____

Contract ID number: _____ Federal Project Number: _____

Plan Assembly Number: _____

Structure Utility: ☒ Signing ☐ Signal ☐ Lighting ☐ ITS

Structure Type: ☐ Cantilever ☐ (Sign) Butterfly ☐ (ITS) Butterfly ☒ Span ☐ Strain Pole

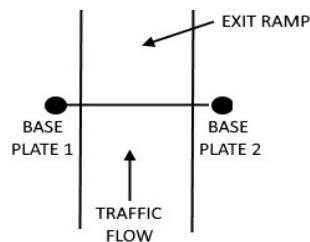
☐ Mast Arm ☐ High Mast Tower ☐ Conventional Light Pole

Anchor Diameter: 2 inches Tv: 900 foot-lbs = 2,787 PSI

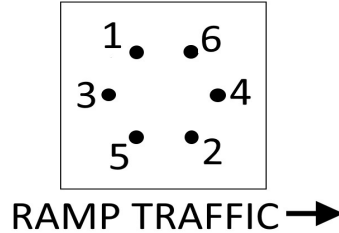
1.10Tv: 990 foot-lbs = 3,110 PSI

Wrench Serial Number: 0916506063 Gauge Serial Number: 353228

Diagram of Structure (Plan view of structure showing all base plates. Show and label diagram with base plate numbers and location/position of structure in relation to a reference feature)



Base Plate 1 Diagram (Plan view of base plate with anchor bolt locations. Number anchor bolts the same as the anchors are numbered and tightened. Label diagram to indicate orientation of base plate in relation to a reference feature)



Full Tightness Gauge Pressure and Torque Values (Pressure recording not necessary if readout of gauge is in torque)

	1	2	3	4	5	6	7	8
PSI	3350	3347	3354	3362	3343	3351		
foot-lbs	1064	1064	1066	1068	1062	1065		

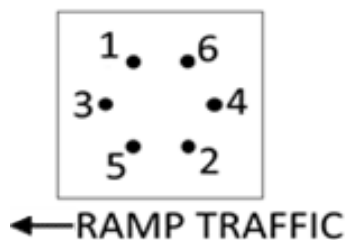
Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8
	x	x	x	x	x	x		

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8
	x	x	x	x	x	x		

Base Plate 2 Diagram



Full Tightness Gauge Pressure and Torque Values

	1	2	3	4	5	6	7	8
PSI	3370	3338	3360	3372	3325	3341		
foot-lbs	1071	1061	1068	1072	1056	1062		

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8
	x	x	x	x	x	x		

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8
	x	x	x	x	x	x		

Base Plate 3 Diagram

Full Tightness Gauge Pressure and Torque Values

	1	2	3	4	5	6	7	8
PSI								
foot-lbs								

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut

	1	2	3	4	5	6	7	8

Base Plate 4 Diagram

Full Tightness Gauge Pressure and Torque Values								
	1	2	3	4	5	6	7	8
PSI								
foot-lbs								

Mark Each Box to Indicate Application of Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

Mark Each Box to Indicate Application of 1.10Tv did not Result in Further Turning of Nut								
	1	2	3	4	5	6	7	8

_____	_____
Date of Tightening	Date of Application of 1.10Tv
_____	_____
Installation Contractor	Bolt Tightening WVDOH Rep. (Print)
_____	_____
Contractor Rep. (Print)	Application of 1.10Tv WVDOH Rep. (Print)
_____	_____
Contractor Rep. (Signature)	WVDOH Project Engineer (Print)

EXAMPLE WRENCH CALIBRATION CERTIFICATE



CERTIFICATE INDICATES LAB
IS ISO 17025 ACCREDITED

CERTIFICATE OF CALIBRATION

CERTIFICATE # TW-01193

Industrial Bolting Technologies certifies that the instrument below has been calibrated in accordance with IBT calibration procedures under the conditions noted below using laboratory standards which are traceable to SI units.

The uncertainty represents an expanded uncertainty at approximately the 95% confidence level using a coverage factor of k=2.

The information on this certificate applies only to the identified instrument and may not be reproduced, except in full, without the written consent of Industrial Bolting Technologies, Inc.

WRENCH MODEL AND SERIAL NUMBER

MODEL	2503MFRMH
SERIAL #	0916506063
TYPE	Click
CAL DATE	9/2/2021
CAL DUE	5/2/2022
ACCURACY	(+/-) 4%
RANGE MAX	260
RANGE MIN	48

Customer	IBT	
Address	6 McCown Circle Charleston, WV 25311	
Tech:	Temp (°F)	RH %
Chris Silva	75.2	52
Test Method:		TI-CAL-1

CALIBRATION
DATE

AS FOUND				
PERCENT OF RANGE	WRENCH SETTING	AS FOUND	TOLERANCE	
100%	250 FTLB	251.56 FTLB	(+/-) 4%	
60%	150 FTLB	147.14 FTLB	(+/-) 4%	
20%	50 FTLB	47.596 FTLB	(+/-) 4%	

AS LEFT				
PERCENT OF RANGE	WRENCH SETTING	AS LEFT	TOLERANCE	
100%	250 FTLB	248.38 FTLB	(+/-) 4%	
60%	150 FTLB	147.98 FTLB	(+/-) 4%	
20%	50 FTLB	48.286 FTLB	(+/-) 4%	

STANDARDS USED FOR CALIBRATION

MODEL USED	MFGR	SERIAL #	CERT #	EXPIRES	RANGE
MTMDP-4L-100	AWS	10963-1	25500-1	7/23/2022	10-100 IN-LBS
MTMDP-4L-500	AWS	10963-2	25501-1	7/23/2022	50-500 IN-LBS
MTMDP-4L-250	AWS	10963-3	25502-1	7/23/2022	25-250 FT-LBS
MTMDP-4L-750	AWS	10963-4	25503-1	7/23/2022	75-750 FT-LBS

Expanded Uncertainty	
Range	k=2
10-100 inlb	1.08 inlb
50-500 inlb	4.98 inlb
25-250 ftlb	7.44 ftlb
75-750 ftlb	8.86 ftlb

Industrial Bolting Technologies, Inc.
6 McCown Circle
Charleston, WV 25313
Phone: (304) 744-9489
Fax: (304) 744-9480
www.torsionx.com www.toolcal.com

9/2/2021

SIGNATURE

DATE

EXAMPLE GAUGE CALIBRATION CERTIFICATE AND CHARTS



CERTIFICATE INDICATES LAB
IS ISO 17025 ACCREDITED

Certificate of Calibration

CERTIFICATE # 14-03066

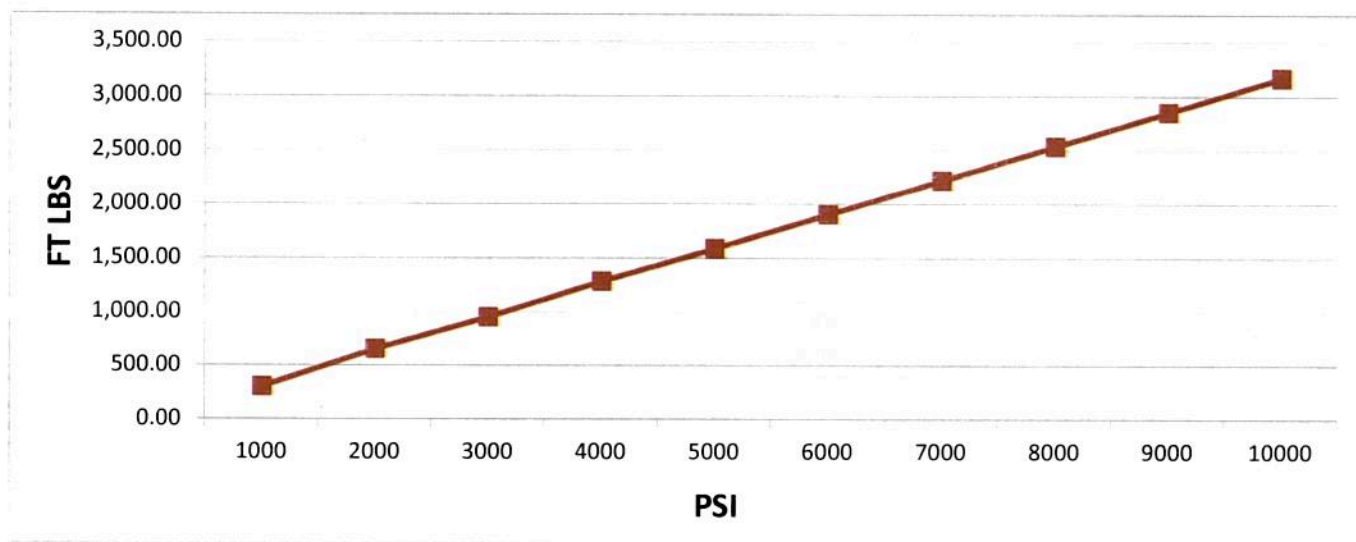
Calibration Date:	August 18, 2021
Calibration Due:	February 18, 2022
Temperature (F):	74.3
Relative Humidity(%)	57
Test Method:	TI-CAL-7, TI-CAL-8

Model Number:	3MD
Serial Number:	353228
Type:	Hydraulic
Technician:	PERRY WHITE
Signature:	

Customer:	IBT
Address:	6 MCCOWN CIRCLE CHARLESTON, WV 2531

GAUGE MODEL AND SERIAL NUMBER

CALIBRATION DATE



TEST EQUIPMENT

Manufacturer	AKO	AKO
Model Number	TSD20011	TSD10KPT
Serial Number	6240	127064
Accuracy (+/-)	0.5%	0.1%
Calibration Certificate #	21238-1	21239-1
Calibration Due Date	10/15/2021	10/15/2021

CALIBRATION CHART



Calibration Date:	8/18/2021	Model Number:	3MD
Calibration Due:	2/18/2022	Serial Number:	353228

PSI	FT/LBS	PSI	FT/LBS	PSI	FT/LBS	PSI	FT/LBS	PSI	FT/LBS
100	2	2100	692	4100	1307	6100	1940	8100	2573
200	52	2200	721	4200	1337	6200	1971	8200	2605
300	93	2300	752	4300	1368	6300	2003	8300	2637
400	125	2400	776	4400	1401	6400	2035	8400	2669
500	163	2500	797	4500	1434	6500	2067	8500	2702
600	195	2600	836	4600	1465	6600	2098	8600	2732
700	228	2700	880	4700	1496	6700	2131	8700	2764
800	259	2800	903	4800	1527	6800	2163	8800	2797
900	287	2900	924	4900	1560	6900	2194	8900	2828
1000	306	3000	956	5000	1591	7000	2225	9000	2860
1100	351	3100	987	5100	1622	7100	2257	9100	2891
1200	397	3200	1017	5200	1654	7200	2289	9200	2923
1300	426	3300	1048	5300	1685	7300	2321	9300	2954
1400	458	3400	1081	5400	1717	7400	2353	9400	2986
1500	491	3500	1113	5500	1749	7500	2384	9500	3018
1600	524	3600	1145	5600	1780	7600	2416	9600	3049
1700	556	3700	1177	5700	1812	7700	2447	9700	3081
1800	589	3800	1222	5800	1844	7800	2479	9800	3112
1900	623	3900	1267	5900	1876	7900	2511	9900	3143
2000	659	4000	1288	6000	1908	8000	2542	10000	3177

Tv = 900 ft-lbs
= 2,787 psi*

1.10Tv = 990 ft-lbs
= 3,110 psi*

Industrial Bolting Technologies certifies that the above instrument has been calibrated in accordance with IBT calibration procedures under the conditions noted above using laboratory standards which are traceable to SI units. The uncertainty represents an expanded uncertainty at approximately the 95% confidence level using a coverage factor of k=2.

***DETERMINED USING LINEAR INTERPOLATION BETWEEN ADJACENT DATA POINTS**

Expanded Uncertainty

Range	k = 2	Units
0-20,000	78.52	FT/LBS

Industrial Bolting Technologies, Inc.

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MP 601.03.50 – Section 4.2.4

ADD THE FOLLOWING AT THE END OF SUBSECTION 4.2.4:

Any QC testing that is not performed in accordance with the methods and procedures required by the Specifications shall be considered an invalid test, and the applicable penalty for the cost associated with that test, in accordance with MP 109.00.20, will be assessed to the contractor, along with the applicable price adjustment in Section 105.3. The test specimen(s) represented by an invalid test shall be considered as not meeting Specifications and documented accordingly. The Division may, however, use the results of an invalid test to determine if material may be accepted and allowed to remain in place and if payment may be made for the material represented by the invalid test.

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. GENERAL REQUIREMENTS

- 3.1 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.
-

4. QUALITY CONTROL PLAN

- 4.1 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.

4.1.1 A QC Plan must be developed by the Contractor and submitted to the Engineer prior to the start of construction on every project. Acceptance of the QC Plan by the Engineer will be contingent upon its concurrence with these guidelines.

4.1.2 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.

4.2 Quality Control Plan Guidelines

4.2.1 The Plan shall identify the personnel responsible for the Contractor's quality control. This should include the company official who will act as the liaison with Division personnel, as well as the Certified Portland Cement Concrete Technician who will direct the inspection program at the plant or in the field depending if it is a plant or field QC Plan. Their phone number and email address must also be included as a means for contact by the Division personnel.

4.2.2 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.

4.2.3 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.

4.2.4 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.

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

4.2.4.2 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 CCRL Concrete Proficiency Sample Program (PSP), Quality Management System documentation, and recordkeeping. The only test required for these laboratories, in the CCRL Concrete PSP, is ASTM C39 (AASHTO T22), but it is recommended that the laboratory perform all the field test portions of these Proficiency Samples and maintain the results of these tests, in order to evaluate any root cause issues pertaining to compressive strength. Each Laboratory shall be inspected and evaluated initially, and at least once every regular inspection tour cycle (approximately 30 months) by the Cement and Concrete Reference Laboratory (CCRL). The ASTM standards pertaining to testing concrete cylinders, with which the subject laboratory must comply, include ASTM C39 (AASHTO T22), ASTM C617 (AASHTO T231) or ASTM C1231, and ASTM C511 (AASHTO M201). The Personnel Qualification requirements in Section 6 of ASTM C1077 regarding PE direction, Laboratory Supervisors, and concrete laboratory personnel testing certifications also apply, except that a Laboratory Supervisor with at least five years experience in construction materials testing shall be a permissible substitution for the licensed professional engineer. Subsequent documentation shall be provided to the Division showing that the subject Laboratory and personnel meet the applicable requirements of ASTM C1077, pertaining to testing concrete cylinders, for a concrete laboratory.

- 4.2.4.3 Any Laboratory which desires to test Contractor hardened concrete QC specimens on WVDOH projects shall submit the evidence/documentation, required in Section 4.2.4.2, confirming compliance with ASTM C1077, with regards to testing concrete cylinders, to MCS&T Division at the following e-mail address: DOHMCSnTconcretelab@wv.gov. MCS&T Division will review this submittal. In this submittal, the subject Laboratory shall also explain how all deficiencies noted in the CCRL Laboratory Inspection Report have been addressed. All deficiencies noted in the CCRL Laboratory Inspection Report shall be resolved to the satisfaction of the Division within 90 days from the date of the CCRL Laboratory Inspection Report. Once MCS&T Division determines that the subject Laboratory is in compliance with the applicable requirements of ASTM C1077, and all deficiencies have been adequately resolved, that Laboratory will be placed on the Division's Approved List of Concrete Cylinder Testing Labs. All laboratories which test Contractor hardened concrete QC specimens on WVDOH projects must be listed on the Division's Approved List of Concrete Cylinder Testing Labs. A listing of these laboratories is available on the WVDOT internet site at the following link: https://transportation.wv.gov/highways/mcst/Pages/APL_By_Number.aspx. 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.

- 4.2.5 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.

4.2.6 Miscellaneous Concrete:

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

- 4.2.6.1 Miscellaneous concrete shall be defined as relatively small quantities, not exceeding 25 yd³ (19 m³) per day, incorporated into items that will not adversely affect the traffic carrying capacity of a completed facility. Such items would not include any concrete intended for major structures, permanent mainline or ramp pavements, or any other structurally critical items part of, or adjacent to the roadway.

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

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

- 1 Sidewalks
2. Curb and Gutter
3. Slope walls for under drain outlet pipes
4. Temporary pavements and pipe crossings
5. Building floors

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

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

4.2.6.3 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.

4.2.7 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.

4.2.8 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 of the 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 WVDOT 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. 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

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

4.2.9 Batch Tickets

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

- 4.2.9.1 All batch tickets for Structural Concrete and Portland Cement Concrete Pavement Concrete transported by truck mixers shall have all of the following items pre-printed on the ticket: Producer/Supplier Code, Producer/Supplier Name, Producer/Supplier Location, Mix Design Laboratory Reference Number, Date, Sequence Number, Volume (yd^3/m^3), Time Batched, Time Unloaded, Contract Identification Number (CID #), Federal and/or State Project Number, Material Code, Material Name, Water Allowed (Gallon/Liter), Water at Plant (gallon/liter), Weight of Ice at Plant (lb/kg), Water at Job (Gallon/Liter), Weight of Cement (lb/kg), Weight(s) of Pozzolan(s) (lb/kg), Weight of Fine Aggregate (lb/kg), Weight of Coarse Aggregate (lb/kg), Admixture Name(s) and Dose (ounces/mL), Temperature ($^{\circ}\text{F}/^{\circ}\text{C}$), Cylinder I.D., Initial Counter, Final Counter, Target Consistency (in/mm), Actual Consistency (in/mm), Target Air (%), Actual Air (%), Truck Number.
- 4.2.9.2 All batch tickets for concrete delivered by means of non-agitator trucks or truck agitators shall have all of the following items pre-printed on the ticket: Producer/Supplier Name, Mix Design Laboratory Reference Number, Date, Sequence Number, Volume (yd^3/m^3), Time Batched, Time Unloaded, CID#, Federal and/or State Project Number, Material Code, Material Name, Water Allowed (Gallon/Liter), Water at Plant (Gallon/Liter), Weight of Ice at Plant (lb/kg), Weight of Cement (lb/kg), Weight of SCM (lb/kg), Weight of Fine Aggregate (lb/kg), Weight of Coarse Aggregate (lb/kg), Admixture Name(s) and Weight(s) (ounces/grams), Temperature ($^{\circ}\text{F}/^{\circ}\text{C}$), Target Consistency (in/mm), Actual Consistency (in/mm), Target Air (%), Actual Air (%), Truck Number.
- 4.2.9.3 The batch ticket in the case of either type of concrete shall be a pre-printed batch ticket prepared by the plant. This ticket may be either computer generated or a standard

pre-printed form with blank spaces 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 space on the batch ticket for completion. Volume is to be reported to the nearest 0.01 yd³ (0.01 m³). Consistencies are to be reported to the nearest 0.25 inch (5 mm). Target and Actual Air are to be reported to the nearest 0.1% (to the nearest 0.25% if the volumetric method is used).

4.2.10 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.

4.2.11 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.

4.2.12 Types of QC Plans:

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

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

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

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

4.3 Master QC Plan

- 4.3.1 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.
- 4.3.2 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.
- 4.3.3 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).
- 4.3.4 The District will review the submitted Master QC Plans to see if they meet the applicable requirements of Sections 4.2 thru 4.2.11.1 and assign a Laboratory Reference Number to each QC Plan upon approval, for future referencing. The District will acknowledge approval of each Master QC Plan to the Contractor and/or Producer/Supplier by letter (see Attachment 4), which will include the Laboratory Reference Number and a copy of the approved Master QC Plan. This will then be scanned and placed in ProjectWise under the appropriate District's Org for that Contractor and/or Producer/Supplier.
- 4.3.5 Once a project has been awarded, if a contractor elects to use the approved Master Plant and Master Field QC Plans on that project, the Contractor shall submit a letter requesting to use the Master QC Plans for that project. This letter must be on the Contractor's letterhead, be addressed to the District Engineer/Manager or their designee, and contain the following information: project number, CID#, project description, type of Quality Control Plan and the laboratory reference number for the Master QC Plan. See Attachment 5 for an example of a plant letter and Attachment 6 for an example of a field letter.
- 4.3.5.1 The District shall review the referenced Master QC Plans to ensure they cover all items in that project. If the referenced Master QC Plan is found to be insufficient for some items on that project, the District shall request the Contractor to submit additional information for quality control of those items as an addendum on a project specific basis. When the District is satisfied with the QC Plan for that project, a letter shall be sent to the Contractor acknowledging approval (see Attachment 7), with the following attached: the contractor's project QC Plan request letter and the Master QC Plan approval letter. This shall then be placed in the project's incoming-mail mailbox in ProjectWise.
- 4.3.5.2 A Master QC Plan that has been approved for project use shall be good for the duration of that project.

- 4.3.5.3 For the use of Division Personnel, the District approval letter for this project must state the ProjectWise link to the referenced Master QC Plan for that Contractor (for example: WVDOT ORGS > District Organization #> Materials > Year > Master QC Plans).
- 4.3.6 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.

5. ACCEPTANCE SAMPLING AND TESTING

- 5.1 Acceptance sampling and testing is the responsibility of the Division. Quality control tests by the Contractor may be used for acceptance.
- 5.2 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.
- 5.3 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.
- 5.4 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.

6. ABSENT TESTING OF MATERIAL

- 6.1 If the Contractor fails to perform testing of the material in accordance with the Contractor's Division Approved Quality Control Plan, payment for the material represented by the failed testing shall be withheld, pending the Engineer's decision whether or not to allow the material to remain in place.
- 6.1.1 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

RLS:Mt

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. 75 μ m | Daily |
| c. $\bar{A}$ 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 | 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 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 and MP 601.04.20. They shall be tested in accordance with AASHTO T 22 and the applicable section of the Standard Specifications.

Example
COMPANY LETTERHEAD

Mr./Ms./Mrs. _____
West Virginia Division 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. 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 4.2.5 of MP 601.03.50.
8. Testing of Miscellaneous Concrete will be as specified in Section 4.2.6 and Sub-Sections 4.2.6.1 thru 4.2.6.3 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 Division 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 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. 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 WVDOT 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 project.

7. *State that batch tickets will conform to requirements of MP601.03.50 Section 4.3.9 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. _____
West Virginia Division 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. _____
West Virginia Division 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: XXXXXXXX
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

\$700.00

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MATERIALS CONTROL, SOILS AND TESTING DIVISION
MATERIALS PROCEDURE

BASIS FOR CHARGES FOR NON-SUBMITTAL
OF SAMPLING & TESTING DOCUMENTATION IN A TIMELY MANNER

1. PURPOSE

- 1.1 Provide a unit cost per test to be assessed to the Contractor when testing is not complete and/or submitted by the contractor in a timely manner. Documentation not submitted is limited to those tests listed in Table 1 of this procedure.

Commented [MMA1]: Do we want to limit ourselves to this?
There may be additional tests that come up later or which are added by SP.

2. SCOPE

- 2.1 This procedure is applicable to those circumstances where a construction item by specification and/or MP is not complete and/or submitted in a timely manner of seven (7) days for compaction, fourteen days (14) for gradations and thirty five days (35) for concrete cylinder breaks from the sampling date.

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3. GENERAL

- 3.1 As stated in Section 106.3.1.2 of the Specifications, it is the intent of the specifications that lots and sublots of materials, products, items of construction or completed construction meet testing specification requirements at the time of submission. In this case submission refers to the time when the contractor has completed the work and offers the finished 'product' to the Division for final acceptance testing.
- 3.2 In the case where no test was performed, or no documentation was submitted for material placed according to the required quality control per specifications, the price for the absent test/documentation will be assessed in accordance with Table 1. The penalty will also include the cost of the material placed that the absent test/documentation was to represent, if the material was left in place.
- 3.3 Test results must be emailed to the District Material Supervisor as a PDF that has been signed in blue. This must be submitted in the time frame stated above in Section 2.1. The original document shall be mailed to the District Materials Supervisor following the email.

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

MP 109.20.00
 SUPERCEDGES: APRIL 2000
 REVISED: FEBRUARY 2022
 ATTACHEMENT 1

TABLE 1 COST PENALTIES PER ITEM

ITEM#	TEST	COST
207	IN-PLACE DENSITY (5 TESTS) GRADATION (EACH TEST) PLASTIC INDEX, LIQUID LIMITS	\$140.00 ea \$700.00 \$700.00
212	IN-PLACE DENSITY (5 TESTS) GRADATION (EACH TEST)	\$140.00 ea \$700.00
307 & 308	IN-PLACE DENSITY (5 TESTS) GRADATION (EACH TEST) PLASTIC INDEX, LIQUID LIMITS	\$140.00 ea \$700.00 \$700.00
311	CRUSHED PARTICLE ANALYSIS GRADATION (EACH TEST)	\$700.00 \$700.00
401 & 402	CORING (EACH CORE) PWL PAVEMENT SMOOTHNESS (PER LANE MILE) ASPHALT MIX TEST	\$700.00 \$700.00 \$700.00
		\$700.00
405	GRADATION (EACH TEST)	\$700.00
495	GRADATION (EACH TEST)	\$700.00
601	A-BAR or OPTIMIZED GRADATION (EACH TEST) CYLINDER TEST REPORT RAPID CHLORIDE PERMEABILITY TEST AIR AND SLUMP TESTS IMPROPER/NO CURING TEMPERATURES FOR CYLINDERS	\$700.00 \$700.00 \$700.00 \$700.00 \$700.00
603	GROUT BREAK REPORT (EACH TEST) GROUT STRENGTH REPORT	\$700.00 \$700.00
604	IN-PLACE DENSITY (5 TESTS) GRADATIONS >60"	\$140.00 ea \$700.00
	REFER TO THE 601 PENALTIES	
609	REFER TO 601 PENALTIES	
501	A-BAR or OPTIMIZED GRADATION (EACH TEST) CYLINDER TEST REPORT IMPROPER/NO CURING TEMPERATURES FOR CYLINDERS AIR AND SLUMP TESTS EARLY CYLINDER BREAK REPORTS REFER TO THE 601 PENALTIES	\$700.00 \$700.00 \$700.00 \$700.00 \$700.00
	REFER TO THE 601 PENALTIES	
606	GRADATION (EACH TEST)	\$700.00
614	IMPROPER/NO CURING TEMPERATURES GROUT CUBE TESTING GROUT STRENGTH REPORT	\$700.00 \$700.00 \$700.00
625	REFER TO THE 601 PENALTIES	

Commented [MMA2]: I'm not sure if we want to list this by item. That could get pretty lengthy. For example, concrete is also used in Sections 609 & 625). I think it's best just to associate the penalty with a test, at least for items that use concrete, but which refer to 501 or 601 for concrete requirements.

Deleted: COST FOR FAILING TO TEST OR SUBMIT DOCUMENTATION FOR MATERIAL PLACED

Deleted: CONTENT

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Commented [MMA3]: I added optimized gradation since that will now be an alternative to A-bar.

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Commented [MMA4]: Are we lumping slump and air together as one test with a \$700 penalty, or are we saying \$700 for air test and \$700 for slump test?

Deleted: 605 → ABAR (EACH TEST) → \$700.00
 → CYLINDER BREAK REPORT → \$700.00
 → PERMEABILITY → \$700.00
 → AIR AND SLUMP TESTS → \$700.00
 → IMPROPER/NO CURING TEMPERATURES → \$700.00

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Commented [MMA7]: We just need to make it clear whether we are we lumping slump and air together as one test with a \$700 penalty, or if we saying \$700 for air test and \$700 for slump test.

Deleted: 506 → CYLINDER BREAK REPORTS → \$700.00

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Deleted: CONCRETE TESTING → \$700.00
 → CYLINDER BREAK REPORT → \$700.00

Commented [MMA9]: I don't think that we need to include this section. Concrete used for 614 items falls under 601.

Commented [CKA10R9]: You are correct. It has to come from an approved source. Grout testing isn't needed either. Grout testing is needed for concrete bridge beam filler.

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MP 109.20.00
SUPERCEDGES: APRIL 2000
REVISED: FEBRUARY 2022
ATTACHEMENT 1

626	IN-PLACE DENSITY (5 TESTS)	\$140.00 ea	\$700.00
	GRADATION (EACH TEST)		\$700.00
	PLASTIC INDEX, LIQUID LIMITS		\$700.00
	REFER TO THE 207 & 601 PENALTIES		
679	CYLINDER TEST REPORT	\$700.00	
	RAPID CHLORIDE PERMEABILITY	\$700.00	
	A-BAR or OPTIMIZED GRADATION (EACH TEST)	\$700.00	
	AIR AND SLUMP TESTS	\$700.00	
	IMPROPER/NO CURING TEMPERATURES FOR CYLINDERS	\$700.00	
720	FAILURE TO RUN PROFILER		\$700.00

Any item that is not mentioned or will be added at a later date and has a required test referenced in the Special Provision or in the Specifications will be subject to a penalty for not performing the test or providing required documentation

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Commented [MMA11]: We just need to make it clear whether we are we lumping slump and air together as one test with a \$700 penalty, or if we saying \$700 for air test and \$700 for slump test.

Commented [CKA12R11]: Every load is tested for this item however Class K is also tested every load but doesn't fall under this item so should I type that in as Air/Slump each

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

MATERIALS PROCEDURE

PREPARING MATERIALS INSPECTION REPORTS

1.	PURPOSE
1.1	To set forth a Standard Materials Inspection Report Format
2.	SCOPE
2.1	To establish a standard format in the style, form, substance, and frequency of Materials Inspection Reports
3.	INSTRUCTIONS
3.1	Format - All Materials Inspection Reports shall conform to the format used herein. See attachments for templates for each section.
4.	MEMORANDUM
4.1	A memorandum conforming to the format contained herein (attachment 1) shall accompany all Materials Inspection Reports
4.1.1	The memorandum shall be sent to the attention of the District Engineer or District Manager with a CC to the District Materials Supervisor and the District Construction Engineer.
4.1.2	The memorandum shall summarize the findings, observations, and deficiencies (if any) of the Inspection.
5.	REPORT
5.1	A report conforming to the format contained herein shall accompany all Materials Inspection Reports. (See attached Template for relevant section)
6.	FREQUENCY
6.1	Materials Inspections shall be conducted bi-annually in conformance with Federal Regulations (Federal Highways Administration's (FHWA's) Testing Program to Control Materials and Construction, section IV, Part 2A).
7.	RESPONSE
7.1	The District Materials Supervisor shall respond within thirty (30) days of receipt of the Materials Inspection Report detailing what corrective action, if any will be taken to ensure compliance with testing procedures.



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

D. Alan Reed, P.E.
State Highway Engineer

Jimmy Wriston, P. E.
Secretary of Transportation
Commissioner of Highways

DATE of MEMO

MEMORANDUM

**TO: NAME OF DISTRICT ENGINEER/SUPERVISOR
DISTRICT NUMBER, TITLE OF ABOVE PERSON**

**FROM: RONALD L. STANEVICH, P.E.
DIRECTOR
MATERIALS CONTROL, SOILS AND TESTING DIVISION**

SUBJECT: INSPECTION OF DISTRICT (#) AGGREGATE LABORATORY

Attached is Materials Inspection Report (MIR) Number XXXXXX pertaining to the subject inspection. It is our intent to perform such inspections at least once every other year in each district.

The (GROUP) Laboratory testing apparatus inspection resulted in XX recommendations as noted in section X and X. It was recommended that (explain deficiencies and what was done to fix them).

The (GROUP) Laboratory testing procedures inspection resulted in X deficiencies (explain deficiencies and what was done to fix them). The AASHTO re:source proficiency samples had X deficiencies (if applicable - explain deficiencies and what was done to fix them - The corrective action reports are attached to the end of this MIR, detailing the ratings and what has been done to mitigate the deficiencies). The District Materials Supervisor is asked to write a response to this Division within 30 days of receipt stating how the deficiencies were or will be corrected.

If you have any questions or need additional information, please feel free to contact Mr. David Matics of this Division at (304) 414-6634.

RLS:Md

Attachment

**cc: MCS&T Group Supervisor
District Construction Engineer, District Materials Supervisor**

REPORT NUMBER:

XXXXXXX

MATERIALS INSPECTION REPORT

SUBJECT:

Inspection of Aggregate Laboratory

LOCATION

Choose an item.

INSPECTED BY:

Inspector's Name

TECHNICIAN:

Technician's Name

DATE OF INPECTION:

Click or tap to enter a date.

DATE OF REPORT:

Click or tap to enter a date.

1. OBJECTIVE

- 1.1. To inspect the laboratory testing equipment, test procedures, operator technique, reporting and documentation of test data, and to verify compliance with standard methods of testing.
- 1.2. To evaluate apparatus and procedures used in performing the tests for aggregate and soil as described in:

AASHTO R 18	Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
AASHTO M 92	Wire-Cloth Sieves for Testing Purposes
AASHTO M 231	Weighing Devices Used in the Testing of Materials
AASHTO T 11	Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
AASHTO T 19	Bulk Density ("Unit Weight") and Voids in Aggregate
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate
AASHTO T 89	Determining the Liquid Limit of Soils
AASHTO T 90	Determining the Plastic Limit and Plasticity Index of Soils
AASHTO T 265	Laboratory Determination of Moisture Content of Soils
ML-25	Procedure for Monitoring the Activities Related to Sieve Analysis of Fine and Coarse Aggregate

MP 700.00.54	Procedure for Evaluating Quality Control Sample Test Results with Verification Sample Test Results
MP 703.00.21	Standard Method of Test for Percent Crushed Particles

- 1.3. To determine if any deficiencies exist, a Division developed procedure checklist is used. This checklist is based on the AASHTO and Division accepted procedures for the applicable tests.

2. DISCUSSION

- 2.1. The subject laboratory inspection is part of this Division's overall Aggregate Quality Assurance Program. It was developed to evaluate the District's proficiency in performing those tests common to project Quality Control. In addition to apparatus and testing inspection, reporting and documentation was also reviewed to ensure adequate handling of the test data.

3. APPARATUS

- 3.1. The laboratory workroom was checked for compliance with the acceptable range for room temperature, 68°F to 86°F (20°C to 30°C). The temperature at the time of inspection was Click or tap here to enter text.°F (Click or tap here to enter text.°C).
- 3.2. The temperature of the oven used for aggregate testing was checked for compliance within the specified limits of 230 ± 9°F (110 ± 5°C). The oven temperature was Click or tap here to enter text.°F (Click or tap here to enter text.°C).
- 3.3. The coarse and fine aggregate splitters used in separating samples for testing purposes were examined and found to be in good physical condition.
- 3.4. The thermometers in use at the time of inspection were checked to determine compliance with applicable requirements. All thermometers were within the acceptable range of 1°F (0.5°C).
- 3.5. The mechanical shaking devices and their respective timers used for sieve analysis of aggregates in use at the time of inspection were examined and found to comply with the requirements of AASHTO T 11 and AASHTO T 27.

- 3.6. The laboratory's balances used for aggregate listed below were examined:

Adam Equipment CPWplus 75	Direct Read – Top Load Digital Balance 0.02kg to 75kg
Mettler PM200	Direct Read – Top Load Digital Balance 0.001 g to 200 g
Mettler PE16	Direct Read – Top Load Digital Balance to 16,000 g
Mettler Toledo XS16001L	Direct Read - Top Load Digital Balance 0.1 g to 16,000 g

The laboratory's balances were found to be in good working order.

- 3.7. The equipment used for the determination of the minus No. 200 material in aggregate was examined and found to conform to the requirements of AASHTO T 11.
- 3.8. Sieves used in determining the particle size of aggregate were examined and found to conform to the specifications in AASHTO M 92 with one exception:
- a) EXAMPLE: The No.8 sieve exhibited corrosion and minor deformations in the wire cloth. The sieve was replaced during the inspection.
- 3.9. All equipment and measures used in determining the unit weight of aggregate were checked and found to conform to the requirements of AASHTO T 19, with the following exception:
- a) EXAMPLE: The 1/3 measure's calibration date was past the yearly calibration deadline. The measure was properly re-calibrated during the inspection. The new calibration date was updated on the measure.
- 3.10. All equipment used in determining the fine aggregate specific gravity were checked and found to conform to the requirements of AASHTO T 84.
- 3.11. The water tank and basket used for holding samples of coarse aggregate for specific gravity were examined and were found to conform to the requirements of AASHTO T 85.

- 3.12. The equipment used for the determination of the liquid limit and plastic limit was examined and found to conform to the requirements of AASHTO T 89 and AASHTO T 90.

4. PROCEDURES

- 4.1. The procedure used in determining the percent crushed particles was observed and was found to conform to the procedure described in MP 703.00.21.
- 4.2. The procedure used in determining the amount of material in aggregate finer than a No. 200 sieve was observed and found to conform to the procedure described in AASHTO T 11.
- 4.3. The procedure used in determining the unit weight of aggregate was observed and found to conform to the procedure described in AASHTO T 19.
- 4.4. The procedure used in determining the sieve analysis of coarse and fine aggregate was observed and found to conform to the procedure described in AASHTO T 27.
- 4.5. The procedures used in determining the specific gravity and absorption of fine and coarse aggregates were observed and found to conform to the procedures described in AASHTO T 84 and AASHTO T 85, respectively.
- 4.6. The procedures used in determining the liquid limit of soils (3-point method) and plastic limit of soils were observed and found to conform to the procedures described in AASHTO T 89 and AASHTO T 90, respectively.

5. AASHTO RE:SOURCE PROFICIENCY SAMPLES

- 5.1. AASHTO re:source proficiency samples are provided, at a cost, to all Districts twice a year. Included with the samples are directions for preparation and a scope of tests to be performed. Once testing has been completed and results obtained each District submits these results via the AASHTO re:source website. AASHTO re:source then compiles the results from all participating laboratories across the nation and calculates a standard deviation that is used to rate each lab on a scale from 0-5, 5 being the best. If a District has a rating less than 3 on any individual test MCS&T requires them to submit a Proficiency Sample Corrective Action Report and the reports are to be kept on record. Corrective action reports are independent to the response from the materials supervisor at the conclusion of the laboratory inspection.
- 5.2. The AASHTO re:source Fine Aggregate Proficiency Samples [Click or tap here to enter text.](#) resulted in zero ratings less than 3.
- 5.3. The AASHTO re:source Fine Aggregate Proficiency Samples [Click or tap here to enter text.](#) resulted in zero ratings less than 3.

- 5.4. The AASHTO re:source Fine Aggregate Proficiency Samples #Click or tap here to enter text. resulted in zero ratings less than 3.
- 5.5. The AASHTO re:source Coarse Aggregate Proficiency Samples #Click or tap here to enter text. resulted in zero ratings less than 3.

6. REPORTING AND DOCUMENTATION OF TEST DATA

- 6.1. Reporting and documentation of completed laboratory results were reviewed and found to be acceptable.

7. CONCLUSIONS

- 7.1. The verification of test equipment and procedures and their conformance to the applicable specification requirements are documented in the preceding sections.
- 7.2. The Aggregate Laboratory testing apparatus inspection resulted in two (EXAMPLES) deficiencies as noted in section 3.8 and 3.9. To correct these deficiencies the technician re-calibrated the measure prior to performing the AASHTO T 85 procedure and replaced one No 8 sieve to comply with AASHTO M92.
- 7.3. The Aggregate Laboratory testing procedures inspection resulted in zero deficiencies.
- 7.4. Deficiencies noted in this report were discussed with laboratory personnel at the time of inspection. The Materials Supervisor is asked to write a response to this Division, stating how any deficiencies were, or will be corrected. There were no AASHTO re:source corrective actions to attach to the Materials Inspection Report, since the scores on the assessment were all satisfactory.

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Click or tap here to enter text.
Aggregate and Soils Group Supervisor

RLS: Me

REPORT NUMBER:	XXXXXXX
MATERIALS INSPECTION REPORT	
SUBJECT:	Inspection of Asphalt Laboratory
LOCATION	Choose an item.
INSPECTED BY:	Inspector's Name
TECHNICIAN:	Technician's Name
DATE OF INPSECTION:	Click or tap to enter a date.
DATE OF REPORT:	Click or tap to enter a date.

1.0 OBJECTIVE

- 1.1. To inspect the laboratory testing equipment, test procedures, operator technique, reporting and documentation of test data, and to verify compliance with standard methods of testing.
- 1.2. To evaluate laboratory equipment and procedures used to conduct testing for the quality assurance of Asphalt mixture, Superpave mix design and Marshall mix design as described in:

AASHTO R-47	REDUCING SAMPLES OF HMA TO TESTING SIZE (QUARTERING METHOD)
AASHTO R-68	PREPARATION OF ASPHALT MIXTURES BY MEANS OF THE MARSHALL APPARATUS
AASHTO T 312	DETERMINING THE DENSITY OF HOT MIX ASPHALT SPECIMENS BY MEANS OF THE SUPERPAVE GYRATORY COMPACTOR
AASHTO T 166	BULK SPECIFIC GRAVITY OF COMPACTED BITUMINOUS MIXTURES USING SATURATED SURFACE-DRY SPECIMENS
AASHTO T-331	BULK SPECIFIC GRAVITY (GMB) AND DENSITY OF COMPACTED HOT MIX ASPHALT (HMA) USING AUTOMATIC VACUUM SEALING METHOD
AASHTO T 209	MAXIMUM SPECIFIC GRAVITY OF BITUMINOUS PAVING MIXTURES
AASHTO T 245	RESISTANCE TO PLASTIC FLOW OF BITUMINOUS MIXTURES USING MARSHALL APPARATUS AND THE MATERIALS SECTION'S GUIDE FOR REHEATING AN ASPHALT MIX SAMPLE

AASHTO T 308 DETERMINING THE ASPHALT BINDER CONTENT OF HOT-MIX ASPHALT (HMA) BY THE IGNITION METHOD, (METHOD A)

AASHTO T 30 ANALYSIS OF EXTRACTED AGGREGATE

- 1.3. To determine if any deficiencies exist based on a Division developed procedure checklist. This checklist is based on the AASHTO and Division accepted procedures for the applicable tests.

2.0 DISCUSSION

- 2.1. The subject laboratory inspection is part of this Division's overall asphalt Quality Assurance Program. It was developed to evaluate the District's proficiency in performing those tests common to project Quality Control. In addition to equipment and testing inspection, reporting and documentation will also be reviewed to ensure adequate handling of the test data.

3.0 APPARATUS

- 1.1. As specified in AASHTO T 166 and T 209, the laboratory workroom was checked for compliance with the range for standard room temperature, $77\pm 9^{\circ}\text{F}$ ($25\pm 5^{\circ}\text{C}$). The temperature at the time of inspection was [Click or tap here to enter text.](#) $^{\circ}\text{F}$ ([Click or tap here to enter text.](#) $^{\circ}\text{C}$).
- 1.2. The thermometers in use at the time of inspection were checked to determine compliance with applicable requirements. All thermometers were within the acceptable range of 1°F (0.5°C).
- 1.3. The temperature of the oven used for aggregate testing was checked for compliance within the specified limits of $300\pm 15^{\circ}\text{F}$ ($149\pm 8^{\circ}\text{C}$). The oven temperature was [Click or tap here to enter text.](#) $^{\circ}\text{F}$ ([Click or tap here to enter text.](#) $^{\circ}\text{C}$).
- 3.1. The balance(s) in use at the time of inspection [Choose an item.](#) with the Division's calibrated weights. All balance(s) were within tolerances ($0.1\text{g} \pm 0.1\%$) set forth in AASHTO M231 for general purpose balances.
- 3.2. The Sieve shaker(s) in use at the time of inspection were checked for condition and were found to be in good working condition.
- 3.3. The Hot Plate(s) in use at the time of inspection were checked for condition and were found to be in good working condition.

4.0 PROCEDURES

- 4.1. The Inspector reviewed procedure AASHTO R-47, to reduce an Asphalt mixture sample to an appropriate testing size. The Technician was not required to demonstrate the procedure however the Technician's equipment used was found to [Choose an item.](#) to the AASHTO specification.

- 4.2. The Inspector reviewed procedure AASHTO R-68, to prepare a Marshall sample. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.3. The Inspector reviewed procedure AASHTO T-312, to prepare a Superpave sample. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.4. The Inspector reviewed procedure AASHTO T-166, to test a pill for Bulk specific gravity. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.5. The Inspector reviewed procedure AASHTO T-331, to test a pill for Bulk specific gravity using the Vacuum sealing device. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- a) EXAMPLE OF NON_CONFORMITY: Technician did not engage the retention latch on the CoreLok device
- 4.6. The Inspector reviewed procedure AASHTO T-209, to test a sample for Theoretical Maximum specific gravity. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- a) EXAMPLE OF NON_CONFORMITY: Sample was cooled to the touch, but not cooled to room temperature.
- 4.7. The Inspector reviewed procedure AASHTO T-245, to test a pill for stability and flow. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.8. The Inspector reviewed procedure AASHTO T-308, to test an asphalt mixture sample for asphalt content. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.9. The Inspector reviewed procedure AASHTO T-30, to test an asphalt mixture sample for gradation. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.

5.0 REPORTING AND DOCUMENTATION OF TEST DATA

- 5.1. Several District acceptance/verification samples were reviewed and found accurate and free from errors in calculations and data transfer.
- 5.2. Several acceptance and verification samples evaluation, using MP 700.00.54 were reviewed and found accurately performed according to the Materials Procedure.
- 5.3. Several T401 and T407 compaction forms were reviewed and found to be complete and accurately calculated.
- 5.4. Several JMF field design verifications were reviewed and found to be complete and accurately calculated. Proper targets were selected with appropriate ranges assigned.

6.0 CONCLUSION

- 6.1. The verification of test equipment and procedures and their conformance to the applicable specification requirements are documented in the preceding sections.
- 6.2. The asphalt laboratory general testing equipment inspection resulted in zero findings as noted in Section 3.1.
- 6.3. The asphalt laboratory testing procedure inspection was conducted this year and resulted in two (EXAMPLE) deficiencies as noted in Section 4.5. and 4.6.
- 6.4. The asphalt laboratory procedural equipment inspection resulted in zero deficiencies, as noted in Section 4.6.
- 6.5. Any deficiencies noted in equipment and/or procedures were discussed with laboratory personnel at the time of inspection.
- 6.6. The documentation inspection resulted in no deficiencies, as noted in Section 5.0.
- 6.7. Any deficiencies noted in reporting and documentation were discussed with district personnel at the time of the inspection.

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Asphalt Group Supervisor

REPORT NUMBER:

XXXXXXX

MATERIALS INSPECTION REPORT

SUBJECT:

Inspection of Concrete Laboratory

LOCATION

District 6 - Moundsville, WV

INSPECTED BY:

Inspector's Name

TECHNICIAN:

Technician's Name

DATE OF INPSECTION:

Click or tap to enter a date.

DATE OF REPORT:

Click or tap to enter a date.

1. OBJECTIVE

- 1.1. To inspect the laboratory testing equipment, test procedures, calibration of equipment, documentation of test data, and to verify compliance with standard methods of testing.
- 1.2. To evaluate apparatus and procedures used in performing the tests for concrete as described in:

AASHTO M 201	Curing Facilities
AASHTO R 18	Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
AASHTO T 22	Determining Compressive Strength of Cylindrical Concrete Specimens
AASHTO T 23	Making and Curing Concrete Test Specimens in the field
AASHTO T 119	Slump of Hydraulic Cement Concrete
AASHTO T 121	Unit Weight of Concrete
AASHTO T 152	Air Content of Freshly Mixed Concrete by the Pressure Method
AASHTO T 196	Air Content of Freshly Mixed Concrete by the Volumetric Method
AASHTO T 309	Standardization of thermometer
ASTM C39	Standard Test Method for Compressive Strength of Cylinders Concrete Specimens

ASTM C 1231 Use of Unbonded Caps in Determination of
Compressive Strength of Hardened Cylindrical
Concrete Specimens

- 1.3. To determine if any deficiencies exist by a Division developed procedure checklist. This checklist is based on the AASHTO, ASTM, and Division accepted procedures for the applicable tests.

2. DISCUSSION

- 2.1. The subject laboratory inspection is part of this Division's overall Concrete Quality Assurance Program. It was developed to evaluate the District's proficiency in performing those tests common to project Quality Control. In addition to testing and inspection, calibration of apparatus and recordkeeping were also reviewed to ensure that apparatus meet the specifications.

3. APPARATUS

- 3.1. The laboratory water storage tank was checked for compliance with the acceptable range for water temperature, 69.8°F to 77.0°F. The temperature at the time of inspection was °F.
- 3.2. The water in the storage tank was saturated with lime to comply with the requirement of AASHTO M 201.
- 3.3. The specimens were fully immersed in the tank storage water.
- 3.4. The laboratory was keeping temperature record of water storage tank.
- 3.5. The water in the storage tank is being thoroughly stirred more than once a month.
- 3.6. The tank is being cleaned and refilled with water containing 3 g/L of calcium hydroxide every two-year period.
- 3.7. The field thermometer was standardized to comply with the requirement of AASHTO T 309.
- 3.8. The apparatus and testing accessories used in the test for slump for hydraulic cement concrete were examined and found to conform to the requirements of AASHTO T 119. The critical dimensions of equipment were checked by the district on [Click or tap to enter a date..](#)

- 3.9. The standardization records and equipment for volumetric air content test were not checked during this inspection because the district noted that this test has not been performed in a long time (more than 10 years). The equipment and standardization for this test method will be verified if a project, requiring this test, arises in this district. **does this need to stay in here since they don't seem to do it?**
- 3.10. The apparatus and testing accessories used in the test for air content of freshly mixed concrete by pressure method was examined and found to conform to the requirements of AASHTO T 152. The standardization record of apparatus was maintained by the district (date of standardization - Click or tap to enter a date.).
- 3.11. The apparatus and testing accessories used in the test for unit weight of cement concrete was examined and found to conform to the requirements of AASHTO T 121. The calibration record of apparatus was maintained by the district (date of calibration - Click or tap to enter a date.).
- 3.12. The scale used for measuring the weight in the test for unit weight was examined for the standardization and found to comply with the requirements of AASHTO M 231.
- 3.13. The Unbonded caps and Retaining Rings for determination of compressive strength of hardened cylindrical concrete specimens were examined and found to comply with the requirements of ASTM C 1231. The record of caps usages was maintained by the district.
- 3.14. Molds for concrete test specimens were examined and found to comply with the requirements of AASHTO T 23.
- 3.15. The method of transportation of Specimens from field to laboratory was discussed with the district, and the response was found to comply with the requirements of AASHTO T 23.
- 3.16. The apparatus for testing compressive strength of cylindrical concrete specimens was examined and found to comply with the requirements of AASHTO T 22. The calibration record of testing machine was maintained by the district (calibrated date - Click or tap to enter a date.).

4. PROCEDURES

- 4.1. The Technician was asked to demonstrate the procedure to determine the compressive strength of cylindrical concrete specimen and was found to comply with the requirements of AASHTO T22 (ASTM C39) with the following exception:
- a) Technician did not recheck perpendicularity of specimen before reaching 10% of anticipated load was applied as per ASTM C39 (Section 8.4.2).

5. CONCLUSIONS

- 5.1. The concrete laboratory testing apparatus inspection resulted in no deficiencies.
- 5.2. The laboratory testing procedures inspection resulted in one deficiency and is noted in section 4.1a.

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Concrete Supervisor's Name
Cement and Concrete Group Acting Supervisor

RLS: Mtwd

Attachment



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

D. Alan Reed, P.E.
State Highway Engineer

Jimmy Wriston, P. E.
Secretary of Transportation
Commissioner of Highways

DATE of MEMO

MEMORANDUM

**TO: NAME OF DISTRICT ENGINEER/SUPERVISOR
DISTRICT NUMBER, TITLE OF ABOVE PERSON**

**FROM: RONALD L. STANEVICH, P.E.
DIRECTOR
MATERIALS CONTROL, SOILS AND TESTING DIVISION**

SUBJECT: INSPECTION OF DISTRICT (#) AGGREGATE LABORATORY

Attached is Materials Inspection Report (MIR) Number XXXXXX pertaining to the subject inspection. It is our intent to perform such inspections at least once every other year in each district.

The (GROUP) Laboratory testing apparatus inspection resulted in XX recommendations as noted in section X and X. It was recommended that (explain deficiencies and what was done to fix them).

The (GROUP) Laboratory testing procedures inspection resulted in X deficiencies (explain deficiencies and what was done to fix them). The AASHTO re:source proficiency samples had X deficiencies (if applicable - explain deficiencies and what was done to fix them - The corrective action reports are attached to the end of this MIR, detailing the ratings and what has been done to mitigate the deficiencies). The District Materials Supervisor is asked to write a response to this Division within 30 days of receipt stating how the deficiencies were or will be corrected.

If you have any questions or need additional information, please feel free to contact Mr. David Matics of this Division at (304) 414-6634.

RLS:Md

Attachment

**cc: MCS&T Group Supervisor
District Construction Engineer, District Materials Supervisor**

REPORT NUMBER:

XXXXXXX

MATERIALS INSPECTION REPORT

SUBJECT:

Inspection of Aggregate Laboratory

LOCATION

Choose an item.

INSPECTED BY:

Inspector's Name

TECHNICIAN:

Technician's Name

DATE OF INPECTION:

Click or tap to enter a date.

DATE OF REPORT:

Click or tap to enter a date.

1. OBJECTIVE

- 1.1. To inspect the laboratory testing equipment, test procedures, operator technique, reporting and documentation of test data, and to verify compliance with standard methods of testing.
- 1.2. To evaluate apparatus and procedures used in performing the tests for aggregate and soil as described in:

AASHTO R 18	Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
AASHTO M 92	Wire-Cloth Sieves for Testing Purposes
AASHTO M 231	Weighing Devices Used in the Testing of Materials
AASHTO T 11	Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
AASHTO T 19	Bulk Density ("Unit Weight") and Voids in Aggregate
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate
AASHTO T 89	Determining the Liquid Limit of Soils
AASHTO T 90	Determining the Plastic Limit and Plasticity Index of Soils
AASHTO T 265	Laboratory Determination of Moisture Content of Soils
ML-25	Procedure for Monitoring the Activities Related to Sieve Analysis of Fine and Coarse Aggregate

MP 700.00.54	Procedure for Evaluating Quality Control Sample Test Results with Verification Sample Test Results
MP 703.00.21	Standard Method of Test for Percent Crushed Particles

- 1.3. To determine if any deficiencies exist, a Division developed procedure checklist is used. This checklist is based on the AASHTO and Division accepted procedures for the applicable tests.

2. DISCUSSION

- 2.1. The subject laboratory inspection is part of this Division's overall Aggregate Quality Assurance Program. It was developed to evaluate the District's proficiency in performing those tests common to project Quality Control. In addition to apparatus and testing inspection, reporting and documentation was also reviewed to ensure adequate handling of the test data.

3. APPARATUS

- 3.1. The laboratory workroom was checked for compliance with the acceptable range for room temperature, 68°F to 86°F (20°C to 30°C). The temperature at the time of inspection was Click or tap here to enter text.°F (Click or tap here to enter text.°C).
- 3.2. The temperature of the oven used for aggregate testing was checked for compliance within the specified limits of 230 ± 9°F (110 ± 5°C). The oven temperature was Click or tap here to enter text.°F (Click or tap here to enter text.°C).
- 3.3. The coarse and fine aggregate splitters used in separating samples for testing purposes were examined and found to be in good physical condition.
- 3.4. The thermometers in use at the time of inspection were checked to determine compliance with applicable requirements. All thermometers were within the acceptable range of 1°F (0.5°C).
- 3.5. The mechanical shaking devices and their respective timers used for sieve analysis of aggregates in use at the time of inspection were examined and found to comply with the requirements of AASHTO T 11 and AASHTO T 27.

- 3.6. The laboratory's balances used for aggregate listed below were examined:

Adam Equipment CPWplus 75	Direct Read – Top Load Digital Balance 0.02kg to 75kg
Mettler PM200	Direct Read – Top Load Digital Balance 0.001 g to 200 g
Mettler PE16	Direct Read – Top Load Digital Balance to 16,000 g
Mettler Toledo XS16001L	Direct Read - Top Load Digital Balance 0.1 g to 16,000 g

The laboratory's balances were found to be in good working order.

- 3.7. The equipment used for the determination of the minus No. 200 material in aggregate was examined and found to conform to the requirements of AASHTO T 11.
- 3.8. Sieves used in determining the particle size of aggregate were examined and found to conform to the specifications in AASHTO M 92 with one exception:
- a) EXAMPLE: The No.8 sieve exhibited corrosion and minor deformations in the wire cloth. The sieve was replaced during the inspection.
- 3.9. All equipment and measures used in determining the unit weight of aggregate were checked and found to conform to the requirements of AASHTO T 19, with the following exception:
- a) EXAMPLE: The 1/3 measure's calibration date was past the yearly calibration deadline. The measure was properly re-calibrated during the inspection. The new calibration date was updated on the measure.
- 3.10. All equipment used in determining the fine aggregate specific gravity were checked and found to conform to the requirements of AASHTO T 84.
- 3.11. The water tank and basket used for holding samples of coarse aggregate for specific gravity were examined and were found to conform to the requirements of AASHTO T 85.

- 3.12. The equipment used for the determination of the liquid limit and plastic limit was examined and found to conform to the requirements of AASHTO T 89 and AASHTO T 90.

4. PROCEDURES

- 4.1. The procedure used in determining the percent crushed particles was observed and was found to conform to the procedure described in MP 703.00.21.
- 4.2. The procedure used in determining the amount of material in aggregate finer than a No. 200 sieve was observed and found to conform to the procedure described in AASHTO T 11.
- 4.3. The procedure used in determining the unit weight of aggregate was observed and found to conform to the procedure described in AASHTO T 19.
- 4.4. The procedure used in determining the sieve analysis of coarse and fine aggregate was observed and found to conform to the procedure described in AASHTO T 27.
- 4.5. The procedures used in determining the specific gravity and absorption of fine and coarse aggregates were observed and found to conform to the procedures described in AASHTO T 84 and AASHTO T 85, respectively.
- 4.6. The procedures used in determining the liquid limit of soils (3-point method) and plastic limit of soils were observed and found to conform to the procedures described in AASHTO T 89 and AASHTO T 90, respectively.

5. AASHTO RE:SOURCE PROFICIENCY SAMPLES

- 5.1. AASHTO re:source proficiency samples are provided, at a cost, to all Districts twice a year. Included with the samples are directions for preparation and a scope of tests to be performed. Once testing has been completed and results obtained each District submits these results via the AASHTO re:source website. AASHTO re:source then compiles the results from all participating laboratories across the nation and calculates a standard deviation that is used to rate each lab on a scale from 0-5, 5 being the best. If a District has a rating less than 3 on any individual test MCS&T requires them to submit a Proficiency Sample Corrective Action Report and the reports are to be kept on record. Corrective action reports are independent to the response from the materials supervisor at the conclusion of the laboratory inspection.
- 5.2. The AASHTO re:source Fine Aggregate Proficiency Samples [Click or tap here to enter text.](#) resulted in zero ratings less than 3.
- 5.3. The AASHTO re:source Fine Aggregate Proficiency Samples [Click or tap here to enter text.](#) resulted in zero ratings less than 3.

5.4. The AASHTO re:source Fine Aggregate Proficiency Samples #Click or tap here to enter text. resulted in zero ratings less than 3.

5.5. The AASHTO re:source Coarse Aggregate Proficiency Samples #Click or tap here to enter text. resulted in zero ratings less than 3.

6. REPORTING AND DOCUMENTATION OF TEST DATA

6.1. Reporting and documentation of completed laboratory results were reviewed and found to be acceptable.

7. CONCLUSIONS

7.1. The verification of test equipment and procedures and their conformance to the applicable specification requirements are documented in the preceding sections.

7.2. The Aggregate Laboratory testing apparatus inspection resulted in two (EXAMPLES) deficiencies as noted in section 3.8 and 3.9. To correct these deficiencies the technician re-calibrated the measure prior to performing the AASHTO T 85 procedure and replaced one No 8 sieve to comply with AASHTO M92.

7.3. The Aggregate Laboratory testing procedures inspection resulted in zero deficiencies.

7.4. Deficiencies noted in this report were discussed with laboratory personnel at the time of inspection. The Materials Supervisor is asked to write a response to this Division, stating how any deficiencies were, or will be corrected. There were no AASHTO re:source corrective actions to attach to the Materials Inspection Report, since the scores on the assessment were all satisfactory.

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Aggregate and Soils Group Supervisor

RLS: Me

REPORT NUMBER:	XXXXXXX
MATERIALS INSPECTION REPORT	
SUBJECT:	Inspection of Asphalt Laboratory
LOCATION	Choose an item.
INSPECTED BY:	Inspector's Name
TECHNICIAN:	Technician's Name
DATE OF INPSECTION:	Click or tap to enter a date.
DATE OF REPORT:	Click or tap to enter a date.

1.0 OBJECTIVE

- 1.1. To inspect the laboratory testing equipment, test procedures, operator technique, reporting and documentation of test data, and to verify compliance with standard methods of testing.
- 1.2. To evaluate laboratory equipment and procedures used to conduct testing for the quality assurance of Asphalt mixture, Superpave mix design and Marshall mix design as described in:

AASHTO R-47	REDUCING SAMPLES OF HMA TO TESTING SIZE (QUARTERING METHOD)
AASHTO R-68	PREPARATION OF ASPHALT MIXTURES BY MEANS OF THE MARSHALL APPARATUS
AASHTO T 312	DETERMINING THE DENSITY OF HOT MIX ASPHALT SPECIMENS BY MEANS OF THE SUPERPAVE GYRATORY COMPACTOR
AASHTO T 166	BULK SPECIFIC GRAVITY OF COMPACTED BITUMINOUS MIXTURES USING SATURATED SURFACE-DRY SPECIMENS
AASHTO T-331	BULK SPECIFIC GRAVITY (GMB) AND DENSITY OF COMPACTED HOT MIX ASPHALT (HMA) USING AUTOMATIC VACUUM SEALING METHOD
AASHTO T 209	MAXIMUM SPECIFIC GRAVITY OF BITUMINOUS PAVING MIXTURES
AASHTO T 245	RESISTANCE TO PLASTIC FLOW OF BITUMINOUS MIXTURES USING MARSHALL APPARATUS AND THE MATERIALS SECTION'S GUIDE FOR REHEATING AN ASPHALT MIX SAMPLE

AASHTO T 308 DETERMINING THE ASPHALT BINDER CONTENT OF HOT-MIX ASPHALT (HMA) BY THE IGNITION METHOD, (METHOD A)

AASHTO T 30 ANALYSIS OF EXTRACTED AGGREGATE

- 1.3. To determine if any deficiencies exist based on a Division developed procedure checklist. This checklist is based on the AASHTO and Division accepted procedures for the applicable tests.

2.0 DISCUSSION

- 2.1. The subject laboratory inspection is part of this Division's overall asphalt Quality Assurance Program. It was developed to evaluate the District's proficiency in performing those tests common to project Quality Control. In addition to equipment and testing inspection, reporting and documentation will also be reviewed to ensure adequate handling of the test data.

3.0 APPARATUS

- 1.1. As specified in AASHTO T 166 and T 209, the laboratory workroom was checked for compliance with the range for standard room temperature, $77\pm 9^{\circ}\text{F}$ ($25\pm 5^{\circ}\text{C}$). The temperature at the time of inspection was [Click or tap here to enter text.](#) $^{\circ}\text{F}$ ([Click or tap here to enter text.](#) $^{\circ}\text{C}$).
- 1.2. The thermometers in use at the time of inspection were checked to determine compliance with applicable requirements. All thermometers were within the acceptable range of 1°F (0.5°C).
- 1.3. The temperature of the oven used for aggregate testing was checked for compliance within the specified limits of $300\pm 15^{\circ}\text{F}$ ($149\pm 8^{\circ}\text{C}$). The oven temperature was [Click or tap here to enter text.](#) $^{\circ}\text{F}$ ([Click or tap here to enter text.](#) $^{\circ}\text{C}$).
- 3.1. The balance(s) in use at the time of inspection [Choose an item.](#) with the Division's calibrated weights. All balance(s) were within tolerances ($0.1\text{g} \pm 0.1\%$) set forth in AASHTO M231 for general purpose balances.
- 3.2. The Sieve shaker(s) in use at the time of inspection were checked for condition and were found to be in good working condition.
- 3.3. The Hot Plate(s) in use at the time of inspection were checked for condition and were found to be in good working condition.

4.0 PROCEDURES

- 4.1. The Inspector reviewed procedure AASHTO R-47, to reduce an Asphalt mixture sample to an appropriate testing size. The Technician was not required to demonstrate the procedure however the Technician's equipment used was found to [Choose an item.](#) to the AASHTO specification.

- 4.2. The Inspector reviewed procedure AASHTO R-68, to prepare a Marshall sample. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.3. The Inspector reviewed procedure AASHTO T-312, to prepare a Superpave sample. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.4. The Inspector reviewed procedure AASHTO T-166, to test a pill for Bulk specific gravity. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.5. The Inspector reviewed procedure AASHTO T-331, to test a pill for Bulk specific gravity using the Vacuum sealing device. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- a) EXAMPLE OF NON_CONFORMITY: Technician did not engage the retention latch on the CoreLok device
- 4.6. The Inspector reviewed procedure AASHTO T-209, to test a sample for Theoretical Maximum specific gravity. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- a) EXAMPLE OF NON_CONFORMITY: Sample was cooled to the touch, but not cooled to room temperature.
- 4.7. The Inspector reviewed procedure AASHTO T-245, to test a pill for stability and flow. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.8. The Inspector reviewed procedure AASHTO T-308, to test an asphalt mixture sample for asphalt content. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.
- 4.9. The Inspector reviewed procedure AASHTO T-30, to test an asphalt mixture sample for gradation. The Technician was required to demonstrate the procedure. The Technicians procedure was found to Choose an item. to the AASHTO procedure. The Technician's equipment used was found to Choose an item. to the AASHTO specification.

5.0 REPORTING AND DOCUMENTATION OF TEST DATA

- 5.1. Several District acceptance/verification samples were reviewed and found accurate and free from errors in calculations and data transfer.
- 5.2. Several acceptance and verification samples evaluation, using MP 700.00.54 were reviewed and found accurately performed according to the Materials Procedure.
- 5.3. Several T401 and T407 compaction forms were reviewed and found to be complete and accurately calculated.
- 5.4. Several JMF field design verifications were reviewed and found to be complete and accurately calculated. Proper targets were selected with appropriate ranges assigned.

6.0 CONCLUSION

- 6.1. The verification of test equipment and procedures and their conformance to the applicable specification requirements are documented in the preceding sections.
- 6.2. The asphalt laboratory general testing equipment inspection resulted in zero findings as noted in Section 3.1.
- 6.3. The asphalt laboratory testing procedure inspection was conducted this year and resulted in two (EXAMPLE) deficiencies as noted in Section 4.5. and 4.6.
- 6.4. The asphalt laboratory procedural equipment inspection resulted in zero deficiencies, as noted in Section 4.6.
- 6.5. Any deficiencies noted in equipment and/or procedures were discussed with laboratory personnel at the time of inspection.
- 6.6. The documentation inspection resulted in no deficiencies, as noted in Section 5.0.
- 6.7. Any deficiencies noted in reporting and documentation were discussed with district personnel at the time of the inspection.

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Asphalt Group Supervisor

REPORT NUMBER:

XXXXXXX

MATERIALS INSPECTION REPORT

SUBJECT:

Inspection of Concrete Laboratory

LOCATION

District 6 - Moundsville, WV

INSPECTED BY:

Inspector's Name

TECHNICIAN:

Technician's Name

DATE OF INPSECTION:

Click or tap to enter a date.

DATE OF REPORT:

Click or tap to enter a date.

1. OBJECTIVE

- 1.1. To inspect the laboratory testing equipment, test procedures, calibration of equipment, documentation of test data, and to verify compliance with standard methods of testing.
- 1.2. To evaluate apparatus and procedures used in performing the tests for concrete as described in:

AASHTO M 201	Curing Facilities
AASHTO R 18	Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
AASHTO T 22	Determining Compressive Strength of Cylindrical Concrete Specimens
AASHTO T 23	Making and Curing Concrete Test Specimens in the field
AASHTO T 119	Slump of Hydraulic Cement Concrete
AASHTO T 121	Unit Weight of Concrete
AASHTO T 152	Air Content of Freshly Mixed Concrete by the Pressure Method
AASHTO T 196	Air Content of Freshly Mixed Concrete by the Volumetric Method
AASHTO T 309	Standardization of thermometer
ASTM C39	Standard Test Method for Compressive Strength of Cylinders Concrete Specimens

ASTM C 1231 Use of Unbonded Caps in Determination of
Compressive Strength of Hardened Cylindrical
Concrete Specimens

- 1.3. To determine if any deficiencies exist by a Division developed procedure checklist. This checklist is based on the AASHTO, ASTM, and Division accepted procedures for the applicable tests.

2. DISCUSSION

- 2.1. The subject laboratory inspection is part of this Division's overall Concrete Quality Assurance Program. It was developed to evaluate the District's proficiency in performing those tests common to project Quality Control. In addition to testing and inspection, calibration of apparatus and recordkeeping were also reviewed to ensure that apparatus meet the specifications.

3. APPARATUS

- 3.1. The laboratory water storage tank was checked for compliance with the acceptable range for water temperature, 69.8°F to 77.0°F. The temperature at the time of inspection was °F.
- 3.2. The water in the storage tank was saturated with lime to comply with the requirement of AASHTO M 201.
- 3.3. The specimens were fully immersed in the tank storage water.
- 3.4. The laboratory was keeping temperature record of water storage tank.
- 3.5. The water in the storage tank is being thoroughly stirred more than once a month.
- 3.6. The tank is being cleaned and refilled with water containing 3 g/L of calcium hydroxide every two-year period.
- 3.7. The field thermometer was standardized to comply with the requirement of AASHTO T 309.
- 3.8. The apparatus and testing accessories used in the test for slump for hydraulic cement concrete were examined and found to conform to the requirements of AASHTO T 119. The critical dimensions of equipment were checked by the district on Click or tap to enter a date..

- 3.9. The standardization records and equipment for volumetric air content test were not checked during this inspection because the district noted that this test has not been performed in a long time (more than 10 years). The equipment and standardization for this test method will be verified if a project, requiring this test, arises in this district. **does this need to stay in here since they don't seem to do it?**
- 3.10. The apparatus and testing accessories used in the test for air content of freshly mixed concrete by pressure method was examined and found to conform to the requirements of AASHTO T 152. The standardization record of apparatus was maintained by the district (date of standardization - Click or tap to enter a date.).
- 3.11. The apparatus and testing accessories used in the test for unit weight of cement concrete was examined and found to conform to the requirements of AASHTO T 121. The calibration record of apparatus was maintained by the district (date of calibration - Click or tap to enter a date.).
- 3.12. The scale used for measuring the weight in the test for unit weight was examined for the standardization and found to comply with the requirements of AASHTO M 231.
- 3.13. The Unbonded caps and Retaining Rings for determination of compressive strength of hardened cylindrical concrete specimens were examined and found to comply with the requirements of ASTM C 1231. The record of caps usages was maintained by the district.
- 3.14. Molds for concrete test specimens were examined and found to comply with the requirements of AASHTO T 23.
- 3.15. The method of transportation of Specimens from field to laboratory was discussed with the district, and the response was found to comply with the requirements of AASHTO T 23.
- 3.16. The apparatus for testing compressive strength of cylindrical concrete specimens was examined and found to comply with the requirements of AASHTO T 22. The calibration record of testing machine was maintained by the district (calibrated date - Click or tap to enter a date.).

4. PROCEDURES

- 4.1. The Technician was asked to demonstrate the procedure to determine the compressive strength of cylindrical concrete specimen and was found to comply with the requirements of AASHTO T22 (ASTM C39) with the following exception:
- a) Technician did not recheck perpendicularity of specimen before reaching 10% of anticipated load was applied as per ASTM C39 (Section 8.4.2).

5. CONCLUSIONS

- 5.1. The concrete laboratory testing apparatus inspection resulted in no deficiencies.
- 5.2. The laboratory testing procedures inspection resulted in one deficiency and is noted in section 4.1a.

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Click here to enter text.

Concrete Supervisor's Name
Cement and Concrete Group Acting Supervisor

RLS: Mtwd

Attachment