Part I, Sub-Part 1:

Asphalt Binder - 15

(Certifying Suppliers and Contractors)

1. REFERENCED DOCUMENTS

1.1 CDOT Standard Specifications

Table 702-1, Superpave Performance Graded Binders

1.2 AASHTO Standards:

R 29 Practice for Grading or Verifying the Performance Grade of an Asphalt Binder
T 40 Method of Sampling Bituminous Materials
R 18 AASHTO Accreditation Program

1.3 ASTM Standards:

D 8 Definitions of Terms Relating to Materials for Roads and Pavements

1.4 WCTG Bylaws

2. TERMINOLOGY

2.1 Binder - An asphalt based cement that is produced from petroleum residue either with or without the addition of non-particulate organic modifiers.

2.2 PG - Performance Graded, as in Superpave Performance Graded Binders.

2.3 Refinery Facility - A facility that is a producer of petroleum asphalts by refining the residuum from crude petroleum. The three types of petroleum asphalts refined are; Asphalt Cements, Emulsion Asphalts, Cutback Asphalts.

2.4 Terminal Facility - A facility that can receive, store, and distribute petroleum asphalts. May have the ability to modify petroleum asphalts.

2.5 Storage Facility - A facility that can receive, store, and distribute petroleum asphalts. The facility does not have the ability to modify the petroleum asphalt.

2.6 Supplier - A Supplier shall be defined as one who produces, controls, and supplies the final binder product to satisfy the PG binder grade specified in Table 702-1 of the Standard Specifications and/or other appropriate CDOT specifications. A Supplier shall be a refinery, a terminal, an HMA producer, or any facility that holds product for more than 30 days from the date of delivery for unmodified binders or 7 days from the date of delivery for a modified binder regardless of binder quantity. If no modification is made to the PG binder grade after its initial production at the refinery, the refinery shall be the supplier and must provide certification. If there is any grade modification of the PG binder at the terminal, the terminal becomes the supplier and must provide the certification. If an HMA producer blends binder of different grades or binders from different suppliers at the facility, the HMA producer becomes the supplier and must provide the certification to verify the grade of the stored binder and must meet CP 11 requirements for an approved supplier. No PG binder will be produced or blended to specification at the hot mix asphalt (HMA) plant.

2.7 Contractor – The company who places the HMA on the project under contract with CDOT.

2.8 WCTG – Western Cooperative Test Group, a government / industry association.

3. SIGNIFICANCE AND USE

3.1 This Standard specifies requirements and procedures for a certification system that shall be applicable to all suppliers and contractors providing performance graded (PG) binders. The requirements and procedures shall apply to materials that meet the requirements of CDOT specifications for PG binders. These provisions initially apply to the refinery manufacturing the PG binder and/or to terminals where binders are mixed. These provisions subsequently apply to the Contractor, after delivery of the PG binder to the Contractor, for use in hot mix asphalt (HMA) on CDOT projects.

3.2 This Standard specifies procedures intended to minimize disruption of PG binder shipments. This is accomplished by a certification system that evaluates quality control

and specification compliance tests performed by the Supplier and the HMA Contractor according to their quality control plans.

4. SAMPLING

4.1 All test samples required by this standard shall be obtained in accordance with AASHTO T 40. A supplier may propose an alternate method of sampling that will ensure the sampling of a non-segregated product.

5. TESTING REQUIREMENTS

5.1 All specification compliance testing required for this Standard shall be performed by a laboratory currently covered by AMRL accreditation. Any satellite laboratory of a Supplier that performs required testing under this Standard will be identified in the submitted Supplier Quality Control Plan (Section 7) and shall be approved by CDOT.

5.2 All laboratories performing routine Quality Control testing shall participate in WCTG round robin testing or an approved equal.

6. SUPPLIER CERTIFICATION REQUIREMENTS

6.1 The Supplier shall submit to CDOT for approval a complete Quality Control Plan that complies with the requirements of Section 7. If the Quality Control Plan is rejected, the Supplier may modify the plan based on the critique provided and then resubmit it to CDOT for approval.

6.2 Once the Supplier's Quality Control Plan is approved by CDOT, the Supplier shall submit to the CDOT Product Evaluation Coordinator a completed copy of CDOT Form #595 (Pre-Approved Product Evaluation Request & Summary) for each performance graded binder. The Form #595 can be located at: www.coloradodot.info/business/APL/ within the Notice to Manufacturers. The Form #595 is designed as a PDF Writeable form, which must be completed by the Supplier. The completed form shall be returned to CDOT's Product Evaluation Coordinator as an e-mail attachment.

6.2.1 The Form #595 "Product name" field shall identify the submitted performance grade binder and the construction year of the submittal (i.e. "*PG 76 -28 (2011)*").

6.2.2 The Form #595 will serve as the request to CDOT for authorization to ship PG binder as referenced within this Colorado Procedure.

6.3 The Supplier shall forward to CDOT the initial testing data for the performance grade binder identified in the Form #595 and a copy of the MSDS. The Supplier shall also obtain and provide a split sample for the CDOT Central Laboratory from the first production run of the performance graded binder identified on the Form #595. This will be concurrent with the first shipments of the construction season when the performance graded binder is being made for the first time that season.

6.3.1 If the submitted sample required in Subsection 6.3 fails the verification testing and is rejected by CDOT, then the Supplier may submit to CDOT a new test sample with a new CDOT Form #595, updated initial test data, and an MSDS. If CDOT rejects this second submittal then the Supplier may resubmit again. However, this third submittal for the same Product name (binder grade for that calendar year) shall include, in addition to all requirements in Subsection 6.3, a test report from an independent AMRL accredited laboratory.

6.4 The Supplier shall allow CDOT to visit the production and/or shipping site during normal business hours to perform an audit by observing the Supplier's quality control activities, to inspect the facilities, and to obtain samples for test.

6.5 The Supplier shall follow the procedures described in the CDOT approved quality control plan.

6.6 The Supplier shall establish a continuing test record for every test required for each PG binder included in the written request as prepared to satisfy the requirements of Subsection 6.1.

6.7 The Supplier shall submit to CDOT all reports required by this standard in a format approved by CDOT.

6.8 The Supplier shall have a satisfactory record of compliance with CDOT project specifications. Decisions by CDOT concerning this requirement shall be based on the test results furnished by the supplier and satisfactory results when the splits and field tests are compared with supplier tests.

7. SUPPLIER QUALITY CONTROL PLAN (MINIMUM REQUIREMENTS)

7.1 The Supplier's Quality Control Plan shall identify the following:
7.1.1 Facility type (refinery, terminal, HMA producer).

7.1.2 Facility location (actual physical address).

7.1.3 Name and telephone number of the person responsible for quality control at the facility.

7.1.4 Quality control tests and testing frequency to be performed on each PG binder.

7.1.5 Name and location of the laboratory performing quality control tests on the PG binder that is shipped.

7.2 The Supplier's Quality Control Plan shall include a declaration stating that if a test result indicates that a shipment of PG binder is not in compliance with the purchase specifications, the Supplier shall:

(1) Identify the material in the shipment,
(2) Immediately cease the shipment until the material complies with the specification,
(3) Immediately notify CDOT regarding the shipment in question,
(4) Immediately notify the Contractors scheduled to use the material from the shipment in question,
(5) Notify CDOT prior to resuming shipment; and
(6) Implement any mutually agreed upon procedures for the disposition of the material.

7.3 The Supplier's quality control plan shall describe method and frequency for initial testing, specification compliance testing, and quality control testing for guiding the manufacturer.

7.3.1 **Initial Testing** - For each grade of PG binder to be supplied, specification compliance testing shall be initially performed and the results of that testing provided to CDOT, accompanied by a sample of the material represented by the test results. Specification compliance testing shall confirm that the PG binder conforms to all requirements of Table 702-1 of the Standard Specifications. This will be concurrent with the first shipments of the construction season when the performance grade binder is being made for the first time that season. If, during the course of a construction project, the binder used changes such that future binder supply to a project will come from a different refinery, different terminal, or be a different formulation that could potentially affect mix properties, the Supplier shall notify the Contractor and CDOT Project Engineer in writing at least 5 working days before shipment. If the Supplier is changing terminal location and both locations utilize the same formulation, the Supplier shall notify the Contractor and CDOT Project Engineer prior to use on the project and the one point check per CP 52 may be waived with concurrence from the RME.

7.3.2 **Specification Compliance Testing** - Specification compliance testing shall be run on a routine basis and the results submitted to CDOT at a minimum of once per month.

7.3.3 **Quality Control Testing for Guiding the Manufacturer** – Tests to determine conformance with Table 702-1 of the Standard Specifications tests shall be conducted as needed for quality control. The Quality Control Plan shall indicate the frequency of this testing. Non-Table 702-1 tests, of the Standard Specifications, may be used for guiding the manufacturer. The use of non-Table 702-1 tests does not preclude the need to meet Table 702-1 requirements or to run complete Table 702-1 tests as indicated in the Quality Control Plan.

7.4 The Supplier's quality control plan shall include a statement that the Supplier will prepare and maintain summary reports for all quality control and specification compliance tests performed, and will submit them to CDOT on request.

7.5 The Supplier’s quality control plan shall provide an outline of the procedure to be followed for checking transport vehicles before loading to prevent contamination of shipments. The outline shall include a statement that the Transport Vehicle Inspection Report, signed by the designated inspector, shall be maintained in the Supplier's records and will be made available to CDOT on request.

7.6 If the supplier’s facility has the capability of introducing any additives to the binder at the point of load-out, then the QC plan shall outline the procedures to control, monitor, and report on the exact amount of additive. Only CDOT approved additives shall be allowed at load-out.

7.7 If the Supplier's facility has acid, alkaline, or recycled engine oil bottom modification equipment in place for producing acid, alkaline, or recycled engine oil bottom modified binders for sale in non-CDOT markets, the Supplier's Quality Control Plan shall include a description of the precautions that will be taken to prevent acid, alkaline, or recycled engine oil bottom modified binders from being inadvertently shipped to CDOT.

8. CDOT EVALUATION PROCEDURE

8.1 CDOT will verify that the Supplier's quality control plan is adequate. CDOT may visit the shipping site when required.

8.2 CDOT will notify the Supplier whether or not the Supplier's application for Certified Binder Supplier status has been granted. The notification shall include a list of the PG binder(s) covered.

8.3 CDOT may verify that the Supplier's specification compliance testing laboratory is currently covered by AASHTO accreditation.

8.4 CDOT may verify that the Supplier's specification compliance testing laboratory participates in the WCTG round robin testing program or an equal program.

8.5 CDOT may perform split sample testing in accordance with Section 10.

8.6 CDOT will perform quality assurance testing.

8.7 CDOT may inspect the operations of the Supplier's facility including those related to the PG binder shipments if required.

8.8 CDOT will post the Supplier's approved binder type with the associated Supplier's facility name on CDOT's Approved Products List. Reference to the web site is at www.coloradodot.info/business/APL/ .

9. REQUIREMENTS FOR SHIPPING PG BINDER BY AN APPROVED SUPPLIER

9.1 The Supplier's Quality Control Plan as approved by CDOT (Section 8) shall be implemented.

9.2 Each shipment shall be accompanied by two copies of the bill of lading, which shall include:

(1) The name and location of the Supplier, as stated in the Supplier's Quality Control Plan,
(2) The performance grade of material,
(3) The quantity of material shipped,
(4) The type and quantity of any approved additive introduced at load-out,
(5) The date of shipment,
(6) A certificate of compliance (COC) certifying the material meets specification requirements. The COC statement will certify the material was manufactured and tested in accordance with CDOT's approved Quality Control Plan (Section 7) and, therefore meets State requirements and,
(7) A statement certifying that the transport vehicle was inspected before loading and was found acceptable for the material shipped. The COC statement will certify the material was manufactured and tested in accordance with the CDOT approved Quality Control Plan (Section 7) and, therefore, meets State requirements.

9.3 If the specification compliance test results do not conform to PG binder specifications, the Supplier shall remove the non-compliant material from the shipping queue as per Subsection 7.2.

10. SPLIT SAMPLE TESTING

10.1 CDOT may request split sample testing. The test results will be exchanged as soon as they are available.

10.2 If the split sample test data is not within the precision specified for that particular test a review of both sampling and testing procedures will be conducted by both the supplier and CDOT. If precision statements are not available, the test results should not differ by more than two standard deviations of the latest available WCTG Round Robin test results for that test.

11. REPORT AND DATA SHEETS

11.1 Supplier Reports - The Supplier shall prepare the reports described in Subsections 6.1, 6.2, 6.3, 6.6, 6.7, 7.2, 7.4, 7.5, 9.2, and 9.3.

12. DECERTIFICATION

12.1 Certification may be withdrawn from suppliers when one or more of the following additional conditions exist:

12.1.1 Acid, alkaline, or recycled engine oil bottom modification are discovered in the binder.

13. FIELD QUALITY CONTROL OF PERFORMANCE GRADED ASPHALT BINDER(S)

13.1 The field quality control of the binder shall be the responsibility of the Contractor. Prior to accepting deliveries of binder, the Contractor shall submit a Field Quality Control (FQC) Plan for binder addressing all key elements as listed in Section 14. This FQC Plan will be included within the Contractor's quality control plan for asphalt concrete. The FQC Plan shall be submitted at least 10 days prior to commencing paving operations. The purpose of the FQC Plan is to describe proper handling techniques for the binder to maintain specification conformance of binder properties during transportation, storage, and production operations. The Engineer will review the FQC Plan, and paving operations will not begin until the FQC Plan has been approved in writing.

13.2 The contents of the binder FQC Plan shall be project specific and shall be kept current to the production and mixture operations employed at any time. Prior to executing any change to binder handling, the FQC Plan shall be revised to incorporate the change. Engineer approval of the revised FQC Plan, in writing, will be required before the change is made to binder handling. Failure to keep the FQC Plan current may affect subsequent decisions by the Engineer, such as those made to address correction of failed material.

13.3 The Contractor shall confirm and document that the Supplier that manufactures the binder and the specific binder is on CDOT's Approved Products List as referenced in Subsection 8.8.

13.4 The Contractor shall indicate, in writing, what steps will be taken to ensure that the FQC Plan is followed and what action will be taken to correct the situation if it is found that the plan is not being followed.

14. MINIMUM REQUIREMENTS FOR THE CONTRACTOR'S BINDER FIELD QUALITY CONTROL PLAN

14.1 The FQC Plan shall identify all subcontractors responsible for handling the binder. This will include the firm hauling the binder unless that firm is the binder supplier or is employed by the binder supplier.

14.2 The responsibilities of each party having a role in executing the FQC Plan shall be identified.

14.3 The FQC Plan shall describe how changes in grade or supplier of the binder, used in the paving mix, will be implemented. The change must not result in mixing of different binders. If mixing does occur, the mixed binder shall not be incorporated into the paving mix placed on the project. The Contractor shall inform the Engineer in advance of any change in grade or supplier of the binder.

14.4 The anticipated mode of binder delivery shall be described. The process of tank inspection, prior to initial filling, will be described. The tanks on the project site must be completely empty and free of contaminants to avoid contamination of the binder delivered to the project.

14.5 Any special handling or storage requirements of the binder shall be fully described. These shall comply with the manufacturer's recommendations for that grade of binder. The FQC Plan shall conform to these special requirements.

14.6 As detailed by the binder supplier, based on the type of asphalt used to produce the specific grade (i.e. Blended asphalt, Modified asphalt, etc.), any potential limitations of the binder relative to prolonged storage, exposure to prolonged and/or elevated heating, susceptibility to stratification and/or separation, etc. shall be fully described. The Contractor's FQC Plan shall describe how these limitations of the binder shall be addressed.

14.7 If agitation is used in binder storage tanks, the capacity and methods of agitation within the storage tank(s) shall be described.

14.8 Provisions to avoid damage to binder during the suspension of paving operations shall be described. These provisions will detail limits to storage times and corresponding temperature limits.

14.9 The binder rotation FQC Plan shall be described. (i.e. First-in / First-out basis).

14.10 Any on-site sampling and testing shall be described with respect to sampling location, tests to be conducted, and control limits for test results. On-site sampling methods and facilities shall be fully described. It is a good practice for the Contractor to obtain and retain samples of binder when delivered to the project. These samples can be tested if binder problems occur. These test results can help isolate the cause of problems with binder properties. Binder performance test requirements are contained in Table 702-1 of the Standard Specifications.

14.11 The FQC Plan shall describe methods for identifying the binder contained in each storage tank. Clear and consistent labeling of each tank shall be included in these methods.

14.12 The binder temperatures in the tanks shall be routinely monitored, at a minimum of once per day. Procedures and equipment for this monitoring shall be described. Results of this monitoring shall be made available to the Engineer upon request.

CP 11, Asphalt Binder Supplier Certification Checklist - 2014

Supplier Name: _____ Date: _____
Refinery Name: _____ Refinery Location: _____
Supplier Lab: _____ Supplier Lab Location: _____
PG Binder: _____

Subsection		Yes / No
5.1	Does supplier's lab have current AMRL accreditation?	_____
5.2	Do the labs performing routine QC testing participate in WCTG Round Robin testing or equal?	_____
6.1	QC Plan submitted to CDOT?	_____
6.2	Completed CDOT Form #595 sent to CDOT as an e-mail attachment?	_____
6.3	Initial test data supplied?	_____
6.3	MSDS supplied?	_____
6.3	Split sample provided to CDOT once per construction season?	_____

SUPPLIER QC PLAN:

Subsection		
7.1.1	Facility type listed?	_____
7.1.2	Facility location listed?	_____
7.1.3	Name of person responsible for QC at the facility listed?	_____
7.1.4	List of QC tests and frequency to be used on PG binder?	_____
7.1.5	Name & location of lab performing these tests listed?	_____
7.2	Does Plan state that, if a shipment is not within specification, the supplier shall:	
	(1) Identify the material in the shipment?	_____
	(2) Immediately cease shipment until material complies with the specification?	_____
	(3) Immediately notify CDOT regarding the shipment in question?	_____
	(4) Immediately notify the Contractors scheduled to use the material from the shipment in question?	_____
	(5) Notify CDOT prior to resuming shipment?	_____
	(6) Implement any mutually agreed upon procedures for the disposition of the material?	_____
7.3	Does plan describe the method and frequency for initial testing, QC testing, and specification compliance testing?	_____
7.3.1	Results of specification compliance testing supplied to CDOT along with a sample?	_____
7.3.1	Results confirm that the PG binder conforms to Table 702-1?	_____
7.3.2	Plan states that specification compliance testing is performed routinely and results submitted to CDOT monthly?	_____
7.3.3	Plan indicates frequency of testing to determine conformance with Table 702-1?	_____
7.4	Plan states that supplier will maintain summary reports for all QC & Spec Compliance tests performed, and will submit to CDOT upon request?	_____

[Continued on the next page.]

Subsection		Yes / No
7.5	Plan contains an outline of the procedure for checking transport vehicles before loading to prevent contamination?	_____
7.5.1	Outline includes statement that the transport vehicle inspection report, signed by the designated inspector, shall be maintained in the supplier's records, and will be made available to CDOT upon request?	_____
7.6	If the Supplier has equipment in place for acid, alkaline, or recycled engine oil bottom modification of binder, are precautions described that will be taken to prevent acid, alkaline, or recycled engine oil bottom modified binders from being shipped to CDOT?.....	_____

CP 11, Asphalt Contractor Field Quality Control Checklist - 2014

Contractor Name:_____ Date:_____
Contract ID:_____
Project Number:_____
Project Location:_____

FIELD QUALITY CONTROL OF PERFORMANCE GRADED ASPHALT BINDER (S)

Subsection		Yes / No
13.1	Was the Contractor's Field Quality Control (FQC) Plan submitted 10 days prior to paving?	_____
13.2	Is the binder FQC plan specific to this Project?	_____
13.2	Does the binder FQC plan apply to current binder handling?	_____

Does the Contractor's Binder Field Quality Control Plan Address the Following:

Subsection		
14.1	List of the subcontractors handling the binder?	_____
14.2	Responsibilities of the parties executing the binder FQC Plan?	_____
14.3	How grade changes will be handled?	_____
14.4	Delivery mode and tank inspection before filling?	_____
14.5	Special handling and suppliers recommended handling?	_____
14.6	Limitations on the type of binder with respect to handling?	_____
14.7	Method of agitating binder in the tank (if any)?	_____
14.8	Binder handling during paving delays?	_____
14.9	Binder rotation plan (i.e. First-in / First-out)?	_____
14.10	On-site sampling plan (if any)?	_____
14.11	Binder identification plan (tank labeling)?	_____
14.12	Binder temperature monitoring (minimum once per day)?	_____

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