MATERIALS
CHAPTER 9

The CDOT Project Manager will submit a copy of the award set of plans and specifications to the Region Materials Engineer.

Guidance on activities before, during, and after construction, as well as proper completion of CDOT Forms 250 and 379, and the Letter of Materials Certification can be found in the documentation chapter of the current *CDOT Field Materials Manual*.

9.1 Conduct Materials Preconstruction Meeting

The CDOT Project Manager and the Local Agency determine if a meeting is needed with the CDOT Region Materials Engineer to discuss and define material issues concerning the project and review the LA Contract Administration Checklist, Section 9.

Prior to the meeting, the Local Agency should study the plans to review its involvement in the project materials process. The award set of plans will be reviewed for specifications and budget; e.g., funds availability for pre-inspection, charges for independent assurance sampling and testing, laboratory check tests, and mix designs. The review will also include materials that should be tested but are not identified in a particular bid item.

9.2 Complete CDOT Form 250 – Materials Documentation Record

The CDOT Form 250 is used to track materials used on a project, the number of tests needed, and to identify the forms used to record test results. The form designates test frequencies for project acceptance testing and laboratory check testing.

Prior to Construction

The initial Form 250 should be developed from the award set of plans and specifications. The Form 250 in Appendix A presents the major bid items from a typical project. Based on the Local Agency Contract Administration Checklist, either CDOT will provide the form 250 or the CDOT project manager will provide a computer program to develop the Form 250.

During Construction

The Local Agency shall update the CDOT Form 250 as work progresses.

After Construction

Complete and distribute the Form 250 in accordance with subsection 9.10.

9.3 Perform Project Acceptance Samples and Tests

Project acceptance samples and tests are used to determine the quality and acceptability of the material being sampled and workmanship that have been or are being incorporated into a construction project. The samples and tests are taken and performed by CDOT, Local Agency, or Local Agency approved personnel.

Prior to Construction

Identify any items that require pre-inspection.

During Construction

Acceptance testing and documentation shall be performed on the project. Acceptance testing and documentation will follow the applicable *CDOT Field Materials Manual* or approved equivalent and the project specifications.

Non-Specification Material

If specification material is not being produced or provided, the Local Agency shall take appropriate action as defined in the specifications; i.e., price reduction, rejection, or non-payment. For further direction, refer to Section 105 of the *CDOT Standard Specifications*. See subsections 8.12 and 8.13 of this *Manual* if a change order is required.

9.4 Perform Laboratory Verification Tests

Random representative samples should be submitted to the approved laboratory of the Local Agency to verify acceptability of field-produced material. The laboratory will perform tests that generally are not within the capabilities of the project acceptance testers' equipment.

Prior to Construction

Laboratory verification tests and/or acceptance test methods should be defined; e.g., AASHTO, ASTM (American Society for Testing and Materials), Colorado Procedures, Colorado Procedures – Laboratory, or Marshall vs. Superpave Gyratory compactor.

The *CDOT Field Materials Manual*, CP 13, gives guidance in the "Procedure for Check Testing." With CDOT's concurrence, the Local Agency approves the laboratory to perform check tests.

During Construction

The Local Agency approved laboratory will perform the laboratory verification tests (refer to the Central Lab column in the *CDOT Field Materials Manual* quality assurance (QA) schedule) at the frequency in the *Field Materials Manual* and/or in the specifications. The purpose of verification tests is to assure that all materials incorporated into the project meet the design and specifications. The tests performed by the approved laboratory generally require specialized equipment that is not available to field acceptance testers such as asphalt cement tests for dynamic shear, R values of soils, or hot mix asphalt stability.

9.5 Accept Manufactured Products

Manufactured products are typically accepted based on Pre-Inspection (PI), Certified Test Reports (CTR), Certificates of Compliance (COC), Pre-Approval (APL, listed on CDOT's approved products list website), or a combination thereof. In specific industries the Manufacturers must be first listed on the Qualified Manufacturers List (QML) before product acceptance can be considered. Refer to the Special Notice to Contractors in the applicable *Field Materials Manual*.

If CDOT is responsible for pre-inspection, the CDOT Project Manager should verify that the Staff Bridge Fabrication Inspectors, (303) 757-9192, have a copy of the award set of plans and specifications, a suppliers list, and funding for pre-inspection in the project budget. Inspection of structural components will include, but not be limited to, the following:

- Fabrication of structural steel and pre-stressed concrete structural components
- Bridge modular expansion devices (0" to 6" or greater)
- Fabrication of bearing devices

9.6 Approve Sources of Materials

The Contractors list of material sources and suppliers will be reviewed and approved.

9.7 Independent Assurance Testing

The Independent Assurance Testing Program defines the tests required to provide an independent check on the reliability of project acceptance samples and tests. The Independent Assurance Testing Program is defined in the *CDOT Field Materials Manual*, QA Program and Independent Assurance Schedule sections. Testing requirements are determined by planned quantity.

Prior to Construction

For projects on the NHS:

Federal law requires Independent Assurance Testing on projects on the NHS. The Local Agency may, under the direction and approval of the Region Materials Engineer, administer the Independent Assurance Testing Program on projects, provided it uses an AASHTO Accredited Laboratory, that is independent from the project acceptance testing lab, uses qualified personnel for testing and observations, performs the calibration equipment checks, and follows all applicable sections of *CDOT Field Materials Manual* chapters on the "QA Program" and "Frequency Schedule for Independent Assurance Evaluation".

The initial CDOT Form 379 – Project Independent Assurance Sampling Schedule (see Appendix A), developed from the award set of plans and specifications, will be prepared by the Local Agency or the CDOT Region Materials Engineer as established on the Local Agency Contract Administration Checklist. It will be distributed to the:

- Project file of entity managing construction, original
- Local Agency
- Project Manager
- Region Materials Engineer
- Materials and Geotechnical Branch, Documentation Unit

For projects not on the NHS:

CDOT requires Independent Assurance Testing. The Local Agency shall use its established, documented procedures to independently verify the adequacy of testing equipment and personnel.

Independent Assurance Test Notification

If CDOT performs the Independent Assurance Testing, the Local Agency is responsible for notifying the CDOT Region Independent Assurance Tester a minimum of one week prior to the start of work on the project and a minimum of one week prior to the need for the Independent Assurance Tester as defined on the CDOT Form 379.

During Construction

For projects on the NHS:

The Independent Assurance Testing laboratory or the CDOT Region Materials Laboratory will perform Independent Assurance Testing and sampling as described on the CDOT Form 379 as the work progresses. The Independent Assurance Tester will update the CDOT Form 379 as the assurance tests are performed. The Independent Assurance Tester in partnership with the Local Agency will address discrepancies in test values. Assurance test results will be distributed to the Local Agency through the Project Manager and the Region Materials Engineer when CDOT performs the Independent Assurance Testing

For projects not on the NHS:

Independent Assurance Testing shall be performed as defined by the Local Agency's policies and procedures.

9.8 Approve Mix Designs

All mix designs for concrete and hot mix asphalt will be reviewed for acceptance. Mix design approval is required prior to the use of any paving material.

Local Agency Responsibility for Approving Concrete and Hot Mix Asphalt

If the Local Agency is responsible for approving concrete and hot mix asphalt mix designs and if required by the Region, the Local Agency will submit the approval of the designs to the Region Materials Engineer through the Project Manager. The Local Agency may ask the Region Materials Engineer to concur on the design mix. For approval of hot mix asphalt items, a form similar to CDOT Form 43 – Job-Mix Formula (see Appendix A) should be used. The test results used to establish the job mix formula and the project specifications with the approved mix design submittal should be included. See CP 52 from the current Field Materials Manual for guidelines.

CDOT Responsibility for Approving Concrete and Hot Mix Asphalt

If CDOT is responsible for approving concrete and hot mix asphalt mix designs, the Local Agency shall submit all mix design information to the Region Materials Engineer through the CDOT Project Manager.

A CDOT Form 43 – Job Mix Formula, will be issued by the Region Materials Engineer.

Asphalt Content Correlation Samples

When CDOT performs the Independent Assurance Test, the Local Agency is responsible for submitting hot mix asphalt content correlation or ignition oven correction samples to the Region Materials Laboratory prior to placement of hot mix asphalt on the project. This submittal shall be a minimum of one week before placement of hot mix

asphalt. The asphalt content correlation or correction samples are necessary for assurance tests as well as laboratory check tests.

9.9 Check Final Materials Documentation

All project materials shall be in compliance prior to final project acceptance.

An independent check of the final materials documentation should be performed by an individual not directly involved in the project. The final review will follow a reasonable procedure, such as that described in the *CDOT Field Materials Manual*, "Documentation" section.

9.10 Complete and Distribute Final Materials Documentation

The Local Agency shall prepare and submit to the CDOT Project Manager a "Letter of Materials Certification.". The letter shall certify that the material incorporated into the construction work is in reasonably close conformity with the approved plans and specifications. The following documents, or similar, shall be attached to the letter (see Appendix A for copies of these forms):

1. Letter of Materials Certification, page 2, Explanation of Exceptions with all supporting documentation that addresses any exceptions or deviations.

2. A copy of the completed CDOT Form 379 – Project Independent Assurance Sampling Schedule.

3. The completed CDOT Form 250, checked and signed by the Local Agency.

The CDOT Project Manager will distribute as follows:

- Project file of entity managing construction, original
- Resident Engineer
- Region Materials Engineer
- Materials and Geotechnical Branch, Documentation Unit
- CDOT Records Management

Distribute Final Independent Assurance Testing Results

For Projects on the NHS:

The Independent Assurance Testing Laboratory or the CDOT Region Materials Laboratory will complete and distribute the CDOT Form 379 and the explanation of deviations concerning the Independent Assurance Testing Program as follows:

- Project file of entity managing construction, original
- Local Agency
- Resident Engineer
- Region Materials Engineer
- Materials and Geotechnical Branch, Documentation Unit

For Projects not on the NHS:

Distribute to CDOT Project Manager only.