

## 2020 CDOT Field Materials Manual Introduction

The purpose of this manual is to provide an official guide to CDOT Field Materials Technicians, whether the individuals are CDOT personnel or consultant, for the sampling and testing of materials on construction projects and the subsequent documentation. It is not the intent to publish a complete summary of all sampling and testing methods and procedures. Further applicable information may be found in either the referenced AASHTO or ASTM documents.

The testing frequency as shown in the Owner Acceptance (OA) Frequency Guide Schedule for Minimum Materials Sampling, Testing, and Inspection is considered to be the minimum necessary to have the degree of control desired. The Sampling and Testing Procedures have in many cases been modified to make them more applicable to Field testing conditions. Further unauthorized modifications should not be attempted. If a valid reason exists, a shortage of tests can be explained and the work accepted. However, improper test procedures cannot be explained nor accepted.

The testing frequency as shown in the Independent Assurance (IA) Frequency Guide Schedule for Evaluation of OA Sampling and Testing is to be established by the Region Materials Engineer.

It is not our intention to discourage efforts to find better or faster methods of testing. Many of the Colorado Procedures are the result of suggestions from field materials personnel. However, before using a procedure other than that listed, it must be approved by the Materials Advisory Committee (MAC) and the FHWA. In addition, the procedure used must be the same as that specified in the project specifications. If this rule is not followed, the acceptance or rejection action cannot be supported and may result in legal rulings against the Division in cases of litigation. The Frequency Guide Schedule for Minimum Materials Sampling, Testing, and Inspection current at the time of contract advertisement shall apply during the full course of that particular project.

We realize the critical importance of materials and the associated personnel, whether they are Process Control (PC) from the contractor, Owner Acceptance (OA) from CDOT, or Independent Assurance (IA) to any construction project. It is our intent to create a Field Materials Manual (FMM) that always reflects the most current and best procedures, and is as user friendly as possible. Please take the time to review and read this publication, and provide us with the Colorado Procedure (CP) Comment Form or the FMM & CDOT Materials Forms Comment / Correction Form at any time. Download the CP Comment Form or the Comment/Correction form to your computer and open the forms using Adobe Acrobat. Fill in the form, sign electronically, save the form and submit electronically to: [edward.trujillo@state.co.us](mailto:edward.trujillo@state.co.us). The form will be maintained with the FMM, CP, Section or chapter for future reference.

It is critical to follow the *Documentation for SMM / LIMS – Project Materials to Final Materials* or the *Documentation for Design-Build Quality Assurance Program - Project Materials to Final Materials* which is applicable for the vast majority of CDOT projects.

Though the CDOT Field Materials Manual (FMM) has been available in both a published print format and on the CDOT web site; future FMM's may only be available electronically as CDOT is moving toward a paperless work environment. CDOT is also implementing electronic signatures to facilitate the timely transmission of documents and project closure. Any changes prior to the issuance of the 2020 FMM will be conveyed through a CDOT Materials Bulletin.

---

Craig Wieden  
CDOT Materials Engineer

A centralized location for all CDOT Materials related documents and publications is at:

<http://www.codot.gov/business/designsupport/materials-and-geotechnical/>

**Materials Advisory Committee (MAC) information:**

<http://intranet.dot.state.co.us/best-dot/MAC>

**FMM Documents:** A special thank you is extended to the members and participants of the MAC Meetings and the associated task forces who are constantly striving to improve testing methodology and CDOT specifications so that the roads in Colorado are progressively built better and are safer for the public.

## 2020 CDOT Field Materials Manual

### Listed Revisions, Additions, and Deletions

**Changes from the 2020 FMM:** Changes of significance within a particular CP or chapter will contain a “- 20” at the end of the title to coincide with the FMM edition not the calendar year. Changes to specific text (Sections &/or Subsections) from the previous year will have a black side-bar in either the left or right margin.

- 2020 FMM: Revised format to Single column
- Cover Page: Changed CDOT Logo
- CP Comments Form: Changed format and added e-signature block
- Comments Corrections Form: Changed format and added e-signature block
- Table of Contents: Updated changes
- QA Procedures: Subsections 3.19, 5.2.2, 7.2, 7.5.1.1, 7.11.1, 11.9.1, 11.11, 11.12.2, 11.12.3.2, 13.2.3, 17.1
- Documentation for SMM / LIMS: 3.1, 3.1(8), 3.2(17a,b), Added the CDOT Form 473,474 Guidelines and updated the forms
- Documentation for Design - Build QA Program: Section 4 total rewrite, edit & reformat, No side bars added
- Documentation – CDOT Maintenance & Local Agency: This chapter was significantly revised for the 2018 FMM to emphasize documentation requirements for CDOT Maintenance (MTCE) Projects and Local Agency projects. 8 Note 6, Updated the CDOT Form 473LA, 473M and CDOT 474
- Special Notice to Contractors: 4.1G, Note 1, 7.3.a.(Products needing Pre-Inspection), APL User Guidance 9, Note 7, Note 8, APL Category Edits, Contractors APL Verification Form
- OA Schedule and IA Schedule:203, 409, 412, 420, 502, 506, 601, 612
- IA Frequency Guide Schedule: 203, 403, 409, 412, 503, Note 4
- CP 10 : Section 2.3, Table 10-1(1),Note 2, Edits to Table 10-1 Sampling & Testing Personnel Qualifications
- CP 11: Precast Concrete Structures, Section 1.1, 6.3, 9.8.1, , 9.8.1.1, 10.1, 11.4
- CP 12A & 12B: addition of Section 13
- CP 12C: Addition of Section 7
- CP 13: Changes to Table 13-1
- CP 17: Replaced Process Documentation Worksheet with CDOT Form #417
- CP 24: Subsection 2.1
- CP 31: Subsection 3.1.3.1
- CP 37: Subsection 2.7
- CP 41: Section 13.1
- CP 43: Subsection 15.1
- CP 44: The Title, Percent Relative Compaction to, Just Percent Compaction
- CP 45: Section 7.1
- CP 48: Section 4.1.1

- CP 51: The Title, add the word Theoretical, Subsection 1.1, Method B title, Subsection 10.2
- CP 52: Subsection 3.2, 4.2 (added), 4.3 (which was 4.2 is renumbered with 4.2(6) added)
- CP 53: deleted Method C reference, Section 13
- CP 55: 7.3, 11.4, 13.3
- CP 56: Title, Guidelines for Using Theoretical Maximum Specific Gravity (RICE) of Project-Produced HMA to Change the Target Specific Gravity for Compaction Compliance.
- CP 57: Subsection 4.2, 6.3
- CP 59: 3.3 Deleted
- CP 62: Subsection 2.3, 2.3.1, 2.4.1, 2.5, 2.6, 3.4
- CP 65: Text within Example 1 & 2 Table 65-1, Table 65-2, Table 65-3, Table 65-4, Subsection 7.1, 7.6.1, text within Example 3
- CP 69: Section 8.4, 9.5.1, 9.5.2
- CP 74: Added Smoothness Acceptance Data Submittal Form
- CP 77: Section 7.9, 11.7
- CP 78: Section 4.1.1
- CP 79: Added MIT Scan Images for Uncut Dowel Baskets.
- CP 81: The Title, Percent Relative Compaction, to Percent Compaction
- CP 82: New text for Note 6
- Chapters 200: Rewrite of entire chapter
- Chapter 300 thru 700: Change to Form Example reference page
- Chapter 800: Deleted, A copy of Chapter 800 will be located with each Nuclear Gauge. Additional copies will be located with each Region Radiation Safety Officer and the Region Safety Officer
- Materials Forms – Instructions & Examples: previously Appendix O, a new chapter, Added CDOT Form 473,474 guidelines and examples
- JSA: 1 test addition
- AASHTO / ASTM Online: Added New Instructions
- Inspections: Table of Contents (V)
- Protocol for Round Robin Materials Testing of CDOT Region & Consultant Laboratories: Participants, Flexible Pavement, Plant Mixed Produced, Notification of Results, Rating Scale, Report, Table of Contents, Miscellaneous
- Protocol of the Audit of Region Materials, IA Sampling and Testing Program by the Central Materials Laboratory: Overview
- Protocol of the Audit of Region Materials, Finals Materials Review and Acceptance Process by the Central Materials Laboratory: Note
- Protocol of the Audit of the Local Agency, Finals Materials Review and Acceptance Process by the Central Materials Laboratory: Overview
- Appendix: Appendix A (MAC Charter) revisions as noted: Membership change from 10 to 9 with the removal of Research Group. Scope, Guests and Guests Uninvited, Appropriate Topics & Discussion, Task force Business, MAC meeting minutes and Executive Summary.
- Appendix A (FPOG): Meetings
- Appendix C (Statewide Roster) Updated names and phone numbers
- Appendix D (Definitions) Owner Verification
- Appendix E: OA, OVT, QAP
- Appendix G: Added CP-L 4301, CP-L 4302
- Appendix I: Changed % Soils Relative Compaction (Report to Nearest 0.1%), Base Aggregate Relative Compaction (Report to Nearest 0.1%)
- Appendix J: Deleted 301 Plant Mix Bituminous Base
- Appendix N: Results of Laboratory Check Tests

{Page Intentionally Left Blank}