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**Introduction**



# Oregon Department of Transportation

## Manual of Field Test Procedures

### INTRODUCTION

#### PURPOSE

This manual is designed to be used by Contractor and Agency technicians for the sampling and testing of construction materials, and to determine their conformance to ODOT specifications. Included herein are the Test Procedures, the Quality Assurance Program, report forms and examples, and the Field Tested Materials Acceptance Guide, to be used by field personnel for guidance, reference and instruction.

#### FORMAT

This Manual is divided into four main sub-sections:

- (1) Test Procedures
- (2) Quality Assurance Program
- (3) Report Forms and Examples
- (4) Field Tested Materials Acceptance Guide

The process control and acceptance test procedures in this manual are to be used for testing construction materials on ODOT projects. English and Metric unit designations are not direct conversions, use the appropriate designation identified by the Project contract documents.

Test results and supporting data shall conform to the following rounding convention, based on the significant digit requirement of the contract specifications or test procedure reporting criteria.

- The final significant digit will not be changed when the succeeding digit is less than 5.
- The final significant digit will be increased by one when the succeeding digit is 5 or greater.

All field test procedures in this manual have ODOT, AASHTO or WAQTC references. Some field test procedures have been written as Field Operating Procedures, e.g., "FOP for AASHTO T-". FOP's conform to the approved AASHTO or other test methods, but may eliminate some of the verbiage and/or combine several test methods to help reduce testing time. If there is a conflict between the FOP and the AASHTO test procedure due to errors or omissions, the AASHTO test procedure will hold precedence over the FOP. The yellow sheet addendums included with the FOP's are utilized to identify preferred methods or modifications observed by the Oregon Department of Transportation.

## HOW TO USE THIS MANUAL

This *Manual of Field Test Procedures* is used in conjunction with the contract plans, specifications, and the Construction Manual. It defines the requirements of ODOT's Quality Assurance Program.

The sampling and testing requirements and test procedures for most work items can be found in this Manual. Testing requirements for other materials will be specified in the contract plans and specifications.

**Section 1 - Test Procedures:** This section includes procedures for all regular field test procedures required by the ODOT specifications.

**Section 2 - Quality Assurance Program:** This section includes ODOT's Quality Assurance Program Manual, which includes the Technician Certification and Laboratory Certification programs. It also includes information on Independent Assurance parameters, random sampling, sampling programs at commercial aggregate sources, and verifying Contractor Quality Control test results.

**Section 3 - Report Forms and Examples:** This section includes copies of ODOT forms that are used to submit samples to ODOT's Central Materials Laboratory (ODOT-CML), and forms that can be used for field test results. It also includes completed examples of the forms and instructions for obtaining electronic versions of the forms.

### Section 4:

**Subsection A – Source Review/Product Compliance Testing Requirements:** This subsection describes the testing requirements and frequencies for raw and processed aggregate material. Specific test requirements are included in the Field Tested Materials Acceptance Guide (FTMAG) in subsection 4(D).

**Subsection B - Small Quantity Schedule:** This subsection describes the criteria under which small amounts of materials can be accepted, without testing, upon satisfaction of the stated criteria.

**Subsection C – Material Sampling Requirements:** This subsection provides the requirements for sample sizes, types of containers, labeling, and other necessary information for samples that will be sent to the ODOT-CML or other laboratories for testing.

**Subsection D - Field Tested Materials Acceptance Guide:** This subsection lists the required tests that are to be performed for construction materials. It also outlines the frequencies at which the tests shall be performed, and the certified technician who shall perform them. The Definition of Visual field acceptance at the Project Managers level is also defined in this section.

## ACRONYMS AND DEFINITIONS

Following are common acronyms and definitions found in this manual. Other acronyms and definitions may be found in Section 00110 of the Standard Specifications.

**AASHTO** - The American Association of State Highway and Transportation Officials

**ACP** - Asphalt Concrete Pavement, refers to either hot mix or warm mix asphalt concrete

**ASTM** - The American Society for Testing and Materials

**ODOT-CML** - The ODOT Central Materials Laboratory located at 800 Airport Road SE in Salem

**Certified Laboratory** - A Quality Control or Quality Assurance laboratory that possesses a valid certification, as described in Section 2 (Quality Assurance Program), issued by the ODOT-CML indicating that the laboratory had proper, calibrated equipment at the time of the inspection.

**Certified Technician** - A technician who is certified to perform a specific material test(s) and who possesses a valid certification, as described in Section 2 (Quality Assurance Program), issued by the ODOT-CML. The certification indicates their knowledge of, and ability to perform, the required test procedures, and to correctly prepare the test reports.

**CGC** - Commercial Grade Concrete (MSC – Minor Structure Concrete)

**CAC** - Certification Advisory Committee See Section 2 (Quality Assurance Program)

**Density of Water** - (62.4 lbs/ft<sup>3</sup> (1000) kg/m<sup>3</sup>). Use the test procedure temperature correction table for AASHTO test method T 121.

**Dispute Resolution Laboratory – Used for Third Party Testing, See Section 2 Quality Assurance Program for more details.**

**EAC** - Emulsified Asphalt Concrete

**FHWA** - The Federal Highway Administration

**FOP** - Field Operating Procedure. FOP's conform to approved test methods, but may eliminate some of the verbiage and/or combine several test methods to reduce testing time.

**FTMAG** – Field Tested Materials Acceptance Guide. See Section 4D

**HMAC** - Hot Mixed Asphalt Concrete or HMA (Hot Mixed Asphalt)

**IA** - Independent Assurance. See Section 2 (Quality Assurance Program)

**JMF** - Job Mix Formula for asphalt concrete

**MDT** – Maximum Density Test (Use 62.4 lbs/ft<sup>3</sup> (1000) kg/m<sup>3</sup> for unit conversion)

**MSE** – Mechanically Stabilized Earth

**MFTP** - Manual of Field Test Procedures (this manual)

**MAMD** - Moving Average Maximum Density

**ODOT** - The Oregon Department of Transportation

**PCC** - Portland Cement Concrete

**PM** - Project Manager (Agency/Owner's Contract Administrator)

**QA** - Quality Assurance - generally refers to the Quality Assurance Program (See Section 2).

**QAC** - Quality Assurance Coordinator. See Section 2 (Quality Assurance Program).

**QAE** - Quality Assurance Engineer

**QAT** - Quality Assurance Technician. See Section 2 (Quality Assurance Program).

**QC** - Quality Control

**QCCS** - Quality Control Compliance Specialist (Agency or Contract Administrator performing the role of the QCCS). See Section 2 (Quality Assurance Program).

**QPL** - Qualified Products List

**RAM** – **Recycled Asphalt Material**

**Random Sample** – A sample of construction material taken at a random time or location. The sampling shall be performed according to a random number scheme. See Section 2 (Quality Assurance Program) for further discussion.

**Random Number** – A randomly selected number used to calculate a sampling time or location. See Section 2 (Quality Assurance Program) for discussion on selection and usage.

**RAP** - Reclaimed Asphalt Concrete Pavement

**RAS** – **Recycled Asphalt Shingles**

**Specifications-** Special Provisions, Plans & Drawings, Supplemental Specifications and Standard Specifications.

**WAQTC** - Western Alliance for Quality Transportation Construction