

Louisiana Department of Transportation and Development  
**Materials Sampling Manual**

**FOREWORD**

The purpose of the Materials Sampling Manual, (MSM), is to establish and standardize material sampling and testing requirements for the Louisiana Department of Transportation and Development. This manual includes Sampling Frequency Schedules for materials, as well as Sampling Procedures.

All sampling of materials shall be in accordance with this manual unless otherwise specified by Department contract or purchase order requirements.

The Materials Sampling Manual is on the DOTD Materials & Testing website.  
Go to:

[www.dotd.la.gov](http://www.dotd.la.gov) – Business – Construction Services  
Materials Lab – Materials Sampling Manual

This manual is not to be used for the purpose of determining permissible material uses. Any questions concerning the sampling of any material are to be directed to the District Laboratory Engineer. Final authority is vested in the DOTD Materials Engineer Administrator.

These schedules outline sampling & testing requirements for construction. The Department reserves the right to randomly or otherwise inspect, test, and make final acceptance of all material after delivery to the project. Visual inspection at the work site or point of delivery shall be conducted on all materials, regardless of whether previously approved or not.

Sampling and testing requirements for materials or process specified in Supplemental Specifications or Special Provisions are not typically included in this manual. If no requirements are published, sampling and testing will be as directed by the Materials Engineer Administrator.

## INTRODUCTION

### I. General

The Materials Sampling Manual is governed by [EDSM III.5.1.2](#).

The **Construction Sampling Schedules** are arranged in accordance with section numbers of the *2016 Standard Specifications for Roads and Bridges* and include sampling and testing requirements, the purpose for the sample, the sampling entity, the testing entity, the frequency of sampling, the container, the quantity of the sample, and certificates that are required.

The **Sampling Procedures** provide details on how to conduct sampling of specific materials. It also describes the Independent Assurance Program (S-701), and the Source Approval, Sampling and Testing Program for Recycled Portland Cement Concrete (S-801).

**Quality Assurance** refers to the combined effort of the contractor through quality control and the Department through inspection and acceptance to produce a transportation project that will provide the public with a durable product exhibiting a high level of performance. To this end, a system of inspection by qualified personnel, both Department and contractor, and statistically based sampling and testing has been established. To ensure that the quality assurance concept functions properly, it is critical that the contractor's quality control and the Department's inspection process be a cooperative, coordinated effort.

**Random Samples** shall be obtained following a random selection process (i.e., without aim or reason, depending entirely on chance alone). Random Number Tables (S-605) or a Random Number Generator, when allowed, may be utilized to determine sample times or locations.

The **Approved Materials List (AML)** is maintained by the Materials and Testing Section for products which require field or detailed evaluation for which time constraint would delay projects. AML Source Approval sampling, lab testing and field evaluation requirements are included in the material-specific **AML Qualification Procedures**. These companies have proven that they have *the ability* to produce products meeting our specifications. However, qualification of a product is not blanket approval for its use. Qualified products are subject to certification and/or acceptance or verification testing in accordance with the MSM.

**Quality Assurance Manuals (QA manuals)** provide additional information and detailed explanations of DOTD's procedures and specifications used in the implementation of the Department's Quality Assurance program.

**Common Abbreviations** used in the Materials Sampling Manual are:

<b>MSM Abbreviations</b>	
Accept	Acceptance
ATM (was 2059)	Audit of Testing & Materials
CA	Certificate of Analysis
CC	Certificate of Compliance
CD	Certificate of Delivery
Const. Fab. Insp.	Construction Fabrication Inspection
Dist. Lab	District Laboratory
EDSM	Engineering Directives & Standards Manual
FHWA	Federal Highway Administration
IA	Independent Assurance
Mat. Lab	Materials & Testing Section Laboratory
Mfr.	Manufacturer
MSM	Materials Sampling Manual
Batch Cert. (was Prelim Source Approval)	Batch Certification (was Preliminary Source Approval)
PE	Project Engineer
QA Manual	Quality Assurance Manual
QC	Quality Control
RAP	Reclaimed Asphalt Pavement
RPCC	Recycled Portland Cement Concrete
SMM	SiteManager Materials
Valid	Validation
Verif	Verification

- II. Construction Sampling Schedules** - The sampling schedules are listed by Section Number and Name from the Standard Specifications. The terminology and meaning of the MSM are listed below, with key terms in bold.

The **Purpose** can be acceptance, design, verification, validation, quality control, information, independent assurance, batch certification, and source approval.

**Acceptance** - The process of sampling, testing and inspection to determine the degree of compliance with the specifications for acceptance of materials and/or the contractor's work. Acceptance samples are considered on a "pass/fail" basis, or accepted with pay adjustment as allowed by specifications. If a material fails, positive actions should be taken to ensure that unacceptable materials are not incorporated into the work.

Materials are accepted by a sample, certificate or visual inspection. Many products on the Approved Materials List (or those from approved

Producer/Suppliers) require additional sampling to determine the acceptability of the material.

**Design** - Sampling and testing for the purpose of design. Results of these samples provide contractor and Department personnel with numerical data that is used in subsequent designs, mix designs, or tests. Examples are soils for cement content and for Proctor.

**Verification** - Sampling and testing for the purpose of verifying that correct and accurate procedures and equipment are being used and of ascertaining that materials used are of the same quality as the previously tested materials. Verification samples are not considered on a “pass/fail” basis directly for pay. Non-verifying results may warrant investigation and additional acceptance sampling and testing as required by the engineer.

**Validation** - A specific type of verification testing which is used to determine the viability of a laboratory-designed asphalt Job Mix Formula based upon test results of plant-produced mixture.

**Quality Control** - Sampling, testing and inspection by the contractor for the purpose of making adjustments in plant production or field construction operations such as mixing, proportioning, temperature control, moisture content, density, etc. usually specified at a rate sufficient to ensure that the work conforms to contract requirements or specifications.

**Information** – Sampling and testing at the discretion of the PE or District Laboratory Engineer to gain information. Although not typically used for quality control or acceptance purposes, it may be used for design, analysis, mitigation, and investigation.

**Independent Assurance (IA)** - Sampling and testing, required by FHWA, for the purpose of making an independent random check on the reliability of the results obtained in acceptance sampling and testing. The IA Program checks equipment, and personnel procedures, but does not determine material quality. (See S 701)

**Batch Certification (was Preliminary Source Approval)** - Preliminary test representing a specified batch quantity of material sampled at the source or the distribution facility by the supplier or the Department. If the material meets specifications, the test results are referenced on a Certificate of Delivery and the batch is certified. Certified batch materials can be accepted at the project site by Certificate of Delivery. Batch certification may also provide reference data for comparison with subsequent verification or acceptance test results. Batch Certification (was preliminary source approval) sampling is not routinely

performed by the PE.

**Source Approval** - Submitting products to the Department for initial approval and for maintaining approved status. For AML approval procedures or to maintain approved status see [Qualification Procedures](#) on the Materials & Testing website.

The PE does not routinely take source approval samples. Project-based deliveries are exceptions, such as stockpiles of RPCC.

**Minimum Frequency** - The minimum frequency establishes the rate of sampling of a material for a given quantity of material. If the frequency is 1/1000 CY, and the total quantity is 2500 CY, then 3 samples would be required. The sampling entity may require additional sampling to establish that a material meets the Department's criteria (for example, an obvious change in materials or processes within a lot, would justify an additional sample).

**Represented Quantity** – This is the amount of material that 1 sample represents. If the 1 sample passes, (or fails), then we assume that the “represented quantity” passes (or fails). If the frequency is 1/1000 CY, then 1 sample represents up to 1000 CY of material.

**Minimum Quantity** - The minimum quantity is the amount of material required for each physical sample (e.g., 1 gal, 1 sack). When “2 of each item” appears, such as for “Hardware”, then 2 bolts, 2 nuts and 2 washers are to be submitted as the sample.

**Container** - The container is used to hold and protect the sample until the material is tested (e.g., friction top can).

**Certificates** - Certificates are often required per lot or shipment of material. A shipment is when similar material from one source arrives at the destination in one load. See the *2016 Standard Specifications* Subsection 106.04 for further details. Regardless of an approved certificate, sampling and testing may still be required if the material is questionable upon delivery. The abbreviations and definitions of certificates are as follows:

- CA** = Certificate of Analysis - Certificate from the manufacturer or supplier of actual test results of the material properties. (This also includes "mill test reports.")
- CC** = Certificate of Compliance - Certificate from the manufacturer or supplier stating that the material complies with the required specifications.
- CD** = Certificate of Delivery - Certification on a Department-approved form from a manufacturer or supplier listing particular materials shipped. A lab number on a CD indicates that DOTD has already approved the test results for this

batch of material. To clarify, test results of a sample taken for the purpose of “Batch Certification” are reported on a CD, but the CD is often required for the purpose of “acceptance” for a specific project.

**Small Quantities Rule** – Sampling is not required if the project quantity is less than this amount, unless the material is questionable. If no quantity is defined, the material does require sampling.

**Typical Handling Time** - The typical handling time approximates the time for the complete process of a sample including transportation, testing and documentation. This time can be affected by sample load, transportation etc.

**Remarks** provide additional information for sampling and testing.

**Visual inspection** shall always be performed at the work site or point of delivery, even if the material has been previously sampled, tested, or certified. For some materials, the MSM specifically requires visual inspection. In this case, the visual inspection may be considered as “acceptance” in accordance with the MSM, and will not require further testing. For still other materials, the MSM says, “**Visual inspection, sample if questionable.**” Regardless of the acceptance method, all materials may require sampling if they are regarded to be questionable through visual inspection.

### III. **Sample Discrepancies and Failures**

When materials fail, the PE is to resample, have the material removed, or otherwise determine the appropriate course of action to ensure that project quality is not compromised by the material.

**Resampling** is appropriate when the original material is changed either by reworking the material or by adding new material and reworking. The resampled material will be used for determining the material's conformance to contract requirements.

Resampling can also occur when a sample is determined to be “not representative”, **whether passing or failing**. One or two new samples shall be taken from the same material and area as the original sample to check the original results. At the discretion of the engineer, the “check” samples will be used for determining the material's conformance to contract requirements.

Resampling will not be conducted to avoid a payment adjustment for failing results unless there is a defective sample.

**Disposition of Failing Tests** - Upon notification of a failing test, the engineer shall describe the disposition of the failing material directly in the Disposition of Failing

Materials field of the DOTD approved software. See EDSM III.5.1.2. The disposition explains the action taken in response to the failing test and provides justification for that action.

**Transfer of Test Results and Quantities from Project to Project** - When material represented by a sample from one project is later used on a different project, it is allowable to transfer part of this pretested quantity to another project rather than to sample and test the same material again. SMM allows users to associate a sample ID to multiple contracts.

#### **IV. TESTING PRIORITIES**

The following represents a general prioritization schedule used by the District Laboratories and the Materials & Testing Section:

1. Retests or resamples
2. Acceptance samples
3. Design samples
4. Batch Certification samples
5. Verification samples
6. Independent assurance
7. Source Approval

Typically samples of material with the same priority are tested in the order received. The Laboratory Engineer may override the above to accommodate unusual circumstances and improve efficiency. To assist in prioritization, the PE may communicate “date needed” to the receiving laboratory; however, the availability of results are not guaranteed by that date.

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