

SECTION 100.00 LABORATORY OPERATIONS

The Idaho Transportation Department (ITD), with approval from Federal Highway Administration (FHWA), is responsible for verifying that laboratory operations are performed in accordance with federal and state regulations for the testing of materials incorporated into highway construction projects.

In the event there appears to be a conflict between statements contained in the Laboratory Operations Manual and the current Idaho Standard Specifications for Highway Construction, the Standard Specifications will prevail.

SECTION 110.00 LABORATORY FACILITIES

The ITD Standard Specifications require every laboratory to be qualified according to the ITD Laboratory Qualification Program (see Section 200.00) to perform testing for a Department project. The Federal Code (23CFR 637B) requires the HQ Central Laboratory to be accredited by the American Association of State Highway and Transportation Officials (AASHTO).

110.01 Testing Performed by a Department Laboratory for Government Agencies. Laboratory testing, field testing, or inspection service is occasionally performed for another government agency. A government agency is defined as a federal, county, city, school district, or state agency.

Testing fees are sometimes waived; however, the Department will determine on an individual basis whether testing fees will be collected.

110.02 Testing and Inspection Performed by Department Personnel for the Public. The Department testing facilities are not public service laboratories. The Department cannot perform any testing or inspection services for the general public or for a commercial firm or contractor unless the material is related to a highway project or research project.

110.03 ITD Laboratory Facilities. The ITD Laboratory Facilities consist of HQ Central Laboratory and the District Laboratories.

110.03.01 HQ Central Laboratory. The purpose of the Central Laboratory is to provide testing and technical support to the ITD Division of Highways. This is accomplished through materials research and testing of products and specialized testing of construction materials for highway projects that cannot be performed in the district laboratory facilities. The Central Laboratory also performs dispute resolution testing. Each laboratory unit of the Central Laboratory is AASHTO accredited.

The mailing address for the Central Laboratory is:

Central Laboratory
Idaho Transportation Department
3293 Jordan Street
Boise ID 83702-2151

See Section 300.00 for further description of each laboratory's function and details of the tests performed.

110.03.02 ITD District Laboratories and Field Test Facilities. Testing laboratories are located in each of the Department's districts, namely:

- District 1 – Coeur d'Alene
- District 2 – Lewiston
- District 3 – Boise
- District 4 – Shoshone
- District 5 – Pocatello
- District 6 – Rigby

These district laboratories may perform:

- Acceptance laboratory tests
- Verification Tests
- Preliminary investigation tests
- Independent Assurance (IA) tests
- Test Strip (When Qualified)

Contractual requirements will specify the test methods to be performed by Department laboratories.

Each district uses portable field test trailers where onsite project acceptance and verification field tests are performed for materials (e.g., aggregate, asphalt, and concrete).

110.04 Qualified Laboratories. ITD Standard Specifications require the use of a qualified laboratory when the contractor is responsible for the sampling and testing of project materials. The non-ITD-Qualified laboratories may be permanent facilities, a trailer, or a building temporarily located at a project site.

110.05 Qualification of Test Laboratories. All test facilities must be qualified through the ITD Laboratory Qualification Program to test materials for Department projects. See Section 200.00.

SECTION 120.00 MATERIALS SAMPLES

All laboratories must have policies and procedures in place to ensure that its personnel and technical staff have the ability to select, identify, handle, condition, store, and retain test samples; to ensure facilitation of timely and accurate recording of data and test reports; and to ensure the timely delivery of test reports in an acceptable format to the Department.

All samples received at HQ Central Laboratory or an ITD District Laboratory for testing must be accompanied by a completed Sample Data form. The ITD-1044, Sample Information for Testing form, is used for all materials except as follows:

Table 120.00.1: Materials Not Covered by ITD-1044

Material	Sample Data Form	
Performance graded binder	ITD-859	Performance Graded Binder Sample Identification
Used lube oil samples	ITD-945	Preventive maintenance Oil Analysis Sample
Emulsified and all other asphalts	ITD-1045	Sample Data Sheet Emulsified Asphalt and Cutbacks

All of the required portion of the form must be completed. It is important to complete the Sample Data form as thoroughly as possible. Delays in testing can be avoided when complete information is included on the form.

At the time of receiving, the laboratory section coordinator checks the information on the Sample Data form for accuracy and makes necessary corrections or obtains additional information to complete the form by contacting the section submitting the material. In the unit, the sample is given a laboratory number and recorded in the log book.

At the completion of the testing, a test report will be published and distributed as explained herein. If the test report indicates the material is subject to rejection, there must be action taken to remedy the situation. The Standard Specifications, Subsection 105.03, specifies the material may be:

- Accepted and allowed to remain with a price adjustment
- Removed and replaced by the Contractor
- Corrected at the expense of the Contractor

120.01 Sample Identification. Department samples are identified by numbers followed by a letter to indicate the scope and use of the test results. The identification numbers signify specific materials and the letter signifies the type of test results. Sample Identification Numbers are shown in Table 120.01.1.

Table 120.01.1: Sample Identification Numbers

Sample	Identification Numbers
Soils	1 – 099
Quarry, Pit Run, and Crushed Gravel	101 – 199
Concrete Aggregates	201 – 299
Cement	301 – 399
Steel	401 – 499
Culvert Pipe	501 – 599
Road Mix and Plant Mix (from hot plant, roadway, etc.)	601 – 699
Joint Filler	701 – 799
Filler	801 – 899
Miscellaneous	901 – 950
Fly Ash	951 – 999
Concrete Cylinders (see Table 120.01.2)	10001 – 19999
*Asphalt, Performance Graded Binders and Emulsions	2001 – 2999

*Use ITD-1045 for emulsified asphalts and ITD-859 for Performance Graded Binder.

Concrete cylinders, other than 28-day breaks, are to be marked CX, Information only, unless otherwise specified.

Table 120.01.2: Concrete Cylinder Identification Numbers

Class (in MPa)	Class (in 100 psi)	ID Number
20.5 or lower	30 or lower	10001-10099
24.0	35	11001-11999
27.5	40	12001-12999
27.5A	40A	13001-13999
27.5B	40B	14001-14999
27.5C	40C	15001-15999
31.0	45	16001-16999
34.5	50	17001-17500
38.0	55	17501-17999
41.5	60	18001-18500
SEAL	SEAL	18501-18999
SP*	SP*	19001-19500
SP*	SP*	19501-19999

*Use this class for concrete over 40 MPa (6,000 psi) or any class other than those listed.

Concrete cylinders will be marked as follows:

28-day tests A, B & C
7-day tests D & E
Any additional tests F, G, H, I, etc.

Do not use numbers larger than 20,000.

120.01.01 Control Samples (C). Control samples are indicated by the letter "C." Test results for control samples are either acceptable or subject to rejection as indicated in the report. (see Section 130.01)

120.01.02 Check Samples (CK). Check samples are indicated by the letters "CK." The check samples are tested, with the unit supervisor's concurrence, if the control sample test results indicate out-of-specification material. The check sample must be from the same lot or batch as the original sample. The check samples are treated the same as control samples for publication of acceptance or subject to rejection. The check sample report will include a reference to the control sample laboratory number that is being checked. A passing check sample can replace a failing control sample with concurrence from the Central Laboratory Manager.

120.01.03 Information Only Samples (CX). Samples indicated by the letters "CX" are tested for information only. The material may be project related or product related.

120.01.04 Preliminary Engineering Samples (P). Some samples are taken for investigative reasons during project development. These samples are known as "P" samples, for preliminary engineering. The test results are for information only.

120.01.05 Qualification Samples (QUAL). These samples are known as "QUAL" samples and are submitted for qualification testing to be placed on an ITD-Qualified Products List. These samples are treated the same as control samples for publication.

120.02 Samples Received That Are Improperly Taken. Samples that are known to have been improperly taken will be treated as follows:

1. Receiving laboratory will log sample as usual and note "Improperly Sampled"
2. Receiving laboratory will send notification email to Sampler and Resident Engineer
 - a. cc: Central Laboratory Manager, District IA Inspector (received at Central Lab)
 - b. cc: District IA Inspector (received at District Labs) The email will include:

“The sample of _____ was received and noted as improperly taken because _____. This sample will not be tested. Another sample must be taken as soon as possible, using the correct sampling method, and immediately sent to the lab to replace this sample. Failure to meet the minimum sampling frequency and failure to follow the correct sampling method are deficiencies that can result in actions against the individual sampler and may affect the project funding.”

1. The laboratory will complete a test report for the improper sample without any test results shown, but remarks will show the sample was not tested because it was improperly sampled.
2. Post (HQ pdf file) or distribute the test report as usual.
3. The District IA Inspector will complete a buff IA evaluation form, obtain resolution, and distribute according to the usual procedures, including a copy submitted to the ITD Sampler/Tester Qualification Committee (STQC) for action.

SECTION 130.00 – LABORATORY TEST REPORTS

Test results must be published in a format that will provide all the necessary information to satisfy project contractual requirements. When a sample is tested for a specific Department project, the project identification, sample identification, and quantity of material represented must appear with the test results on each test report. It is important that every sample tested have the test results published and made available to the Department for acceptance of the material.

130.01 Reporting of Test Results. Tests performed in the laboratory may be performed for different purposes which must be conveyed in the published test results. The following is a listing of identifiers describing the purpose of the test and an explanation of the results.

130.01.01 Reporting of Control (C), Check (CK), and Qualification (QUAL) Samples.

- Acceptable – Material is within specification limits.
- Nota Bene (NB) – (Latin for “to note well”) Material is outside of specification limits but within specification tolerances, values are Near Border and attention is advised. Values are identified with the symbol “NB” and/or highlighted.
- Subject to Rejection – Material is outside allowable specification tolerances. Values are identified and/or highlighted.

130.01.02 Reporting of Information Only (CX) Samples.

- These test results are identified as information only.
- Material outside allowable specification limits will be identified and noted as Nota Bene (NB).

130.01.03 Reporting of Preliminary Engineering (P) Samples.

- These test results are for information only.

130.02 Checking Mathematical Computation on and Reasonableness of the Results on Laboratory Reports. A qualified person (i.e., the checker) is responsible for thoroughly reviewing all the data before submitting the laboratory reports. Reports will be initialed by the checker. If errors are found prior to publishing the test report, the test report will be returned to the tester for correcting and then rechecked. If the error is found after the test report has been published and distributed, then the procedure for correcting test reports must be followed.

With the advent of smart forms it is critical to confirm and check the input data, output data, and final results. With smart forms, unless a formula is corrupted or a link is broken, the mathematical calculations produce results that are mathematically correct. This makes the review of the final results critical. The checker must determine if the final results are true and reasonable (i.e., are the results that would normally be expected from the test performed).

All original computations are initialed by the person who performed them.

The Central Laboratory Manager or the District Materials Engineer will periodically review the calculations for Department laboratory test reports.

130.03 Correcting Test Reports. Do not make any changes on the original hard copy test report when correcting laboratory test reports. First, make a legible copy of the original and then make the changes on the copy. Use an arrow to point to the correction and note in the Remarks the change made. A new Date Mailed will be used on the corrected report. The new date will be placed below or to the right of the old date.

Electronic reports will have the correction highlighted and a comment added into the Remarks documenting the corrections and dates.

130.04 Recommendations for Price Adjustments. The Central Laboratory Manager will provide a letter or email of Recommendation for Price Adjustment that will accompany any laboratory test results that are out of specification and subject to rejection. The only exception is for items where a price adjustment is not appropriate and the material must be rejected.

130.05 Distribution of Laboratory Test Reports. Distribute Laboratory Test Results as follows:

- In all cases, the original laboratory test report will be retained at the laboratory that performed the testing.
- The Central Laboratory and each District Laboratory will maintain the test reports in the project files and in a numerical file for each year.
- Independent laboratories or Contractor's laboratories must provide copies of all test results when performing testing of materials that will be used or may be used for Department projects. These laboratories may not provide only selected test results and will be required to verify quality control procedures that guarantee accurate testing.

130.05.01 ITD District Laboratory Test Reports. District Laboratory reports will be distributed in the district only, unless the Central Laboratory specifically requests a copy. However, Independent Assurance Reports will still follow the distribution as shown on the forms.

130.05.02 HQ Central Laboratory Test Reports. Test reports will be posted in the district folder on the Department intranet for the district to view and print.

SECTION 140.00 – TESTING REQUIREMENTS FOR AGGREGATE MATERIAL SOURCES

The aggregate material in a source is evaluated for quality according to Standard Specifications, Section 703. The specifications for contractor-furnished sources provide that all costs will be borne by the contractor. Independent laboratories performing the testing will perform the same tests as would be conducted for the Department's own evaluation. The District Materials Engineer will determine if any specified testing may be unnecessary for specific aggregate items.

Refer to the Materials Manual, Section 300.13 – Aggregate Material Sources, and the Contract Administration Manual, Section 106.09 – Material Sources, for additional information about material sources.

SECTION 150.00 – TEST METHODS AND TEST MANUALS

150.00 Test Methods. The ITD Standard Specifications designate the test methods and practices (e.g., AASHTO, ASTM, WAQTC, IDAHO) used to evaluate the materials used by the Department. These test methods, some of which are copyrighted, are published by the respective agencies. Laboratories are required to have the current versions of the test methods when performing sampling and testing.

150.00.01 AASHTO Test Methods. The Central Laboratory maintains an AASHTO Test Methods website for Department personnel. See the following link: <http://itdintranetapps/apps/ihs/ihs.aspx>. Department personnel must not give AASHTO Test Methods to non-department personnel.

150.00.02 ASTM Test Methods. The Central Laboratory maintains an American Society for Testing and Materials (ASTM) Test Methods website for Department personnel. See the following link: <http://compass.astm.org/CUSTOMERS/filtrex40.cgi?index.frm>. Department personnel must not give ASTM Test Methods to non-department personnel.

150.00.03 WAQTC Test Methods. The Construction/Materials Section is responsible for publishing and distributing the current versions of Western Alliance for Quality Transportation Construction (WAQTC) Test Methods that have been adopted by the Department and are contained in Section 570 of the QA Manual. These methods are found in Section 570 of the QA Manual.

150.00.04 Idaho Standard Methods and Practices. The Central Laboratory is responsible for publishing and distributing the current versions of standard practices (IR), and standard test methods (IT), unique to the Department, which are designated in the Standard Specifications as Idaho Test Methods. The publication or revision date month/year is indicated in the bottom margin of the test method. These methods are found in Section 500 of the QA Manual.

150.01 Field Operating Procedures (FOP). The Construction/Materials Section is responsible for publishing and distributing the current versions of field operating procedures (FOPs) that have been adopted by the Department and are contained in Section 570 of the QA Manual.

SECTION 160.00 AMRL & CCRL PROFICIENCY SAMPLES

The HQ Central Laboratory participates in the American Materials Reference Laboratories (AMRL) and Cement & Concrete Reference Laboratories (CCRL) proficiency sample program. Each of the ITD District Laboratories also participates in the AMRL program as part of the laboratory qualification requirements.

The schedule of proficiency samples is based on the testing performed by the individual District Laboratory. The District Materials Engineer will monitor the proficiency sample reports for the ITD District Laboratory to ensure reliability of laboratory testing and will maintain the report records. A copy of the district test reports and any corrective action resolutions will be sent to the Central Laboratory Manager.

FHWA receives notification from AMRL and CCRL of deficiencies of the HQ Central Laboratory. The Central Laboratory Manager will forward a copy of the corrective action to FHWA to show resolution was attained.