

PART B – MINIMUM TESTING AND CERTIFICATION REQUIREMENTS

SECTION B1.00 – GENERAL

B1.01 Material Requirements: General. Materials used on State projects must, at a minimum, be certified or tested prior to use. The certification process, which is administered by the Materials Administration Unit, is described in Section B2.00. The various units within Materials & Research test material used on state projects that is not accepted based on certification. Minimum testing requirements on project materials and the assorted types of tests performed are described in Section B3.00.

SECTION B2.00-MATERIALS CERTIFICATION

B2.01 Product Approval / Vendors & Suppliers. DelDOT, unlike some other states, does not maintain an “approved products list”, through which a vendor can submit prospective materials to the State for testing and approval. The State accepts materials on a project basis, with the certification process administered through the Materials Administration Unit.

If a vendor, or supplier, wishes to have their materials used on a DelDOT contract, they must have the awarded contractor submit their material for review. The material will then be verified for conformance to specifications by historical information or testing. A complete description of the submittal and approval process is located in the Materials Administration Unit Manual, provided in Part G.

When the Department has completed its evaluation, and finds the material to meet Department requirements, both the contractor and the vendor are notified in writing as to what steps are required for incorporation of that material into the project. If, upon evaluation, the material does not meet Specification requirements, both the contractor and the vendor are notified in writing as to why the material cannot be incorporated into the project. Although materials may be accepted through this procedure for use on a project, final acceptance of all materials depends on acceptable field performance.

The Department also has a “New Product Evaluation Procedure” that is applicable to all new products and technologies submitted to the Department for consideration for use in highway and/or bridge construction projects. Questions concerning this procedure should be directed to the Research Engineer. Details on the procedures and contact personnel for this policy are available on the Department’s website at:

http://deldot.gov/information/business/prodlists/new_product_eval/index.shtml

B2.02 Certificates of Compliance. The contract or Department’s Material and Testing Schedule will designate the materials that can be incorporated in the work if accompanied by certificates of compliance from the manufacturer. The certificates of compliance shall state that the materials or assemblies provided by the Contractor fully comply with the specification requirements of the Contract. The manufacturer shall sign all certificates of compliance. Each

lot of certified materials or assemblies delivered to the project must be accompanied by a certificate of compliance clearly identifying the materials delivered and the specification requirements satisfied.

The Department may sample and test any materials used by the Contractor on the basis of certification of compliance. If the Department determines that materials or assemblies are not in conformance with Contract requirements, the materials, or assemblies will be rejected in accordance with Section 105.03 of the Standard Specifications.

SECTION B3.00 – SAMPLING AND TESTING

B3.01 General. Sampling and testing performed on State projects follow AASHTO, ASTM, or DOH standards. When a reference is made to any of the aforementioned test procedures in this Manual, it is understood that the reference is to the most current revision at the time of project bidding. It is also understood that the Specifications and procedures applicable to a project shall include all modifications current on the date of advertisement for bids of that project.

In this Manual, sampling and testing procedures are referred to using the following designations:

M – AASHTO Materials Specification

T – AASHTO Test Procedure

ASTM – ASTM Materials Specification or Test Procedure

DOH – Standard Test Procedure used by the department for which no corresponding ASTM or AASHTO procedure exists or sufficient modification of the ASTM or AASHTO procedures have been termed appropriate.

B3.02 Sampling and Testing Procedures. All materials used on State projects are sampled and tested at consistent rates, typically based on project plan quantities. Table B-1 lists the minimum testing frequencies for materials used on State projects. In addition to the testing frequency of the materials, test procedures performed are also listed.

On any DelDOT project, the Engineer reserves the right to increase the sampling rates from the minimums when conditions warrant. All materials are sampled at a project rate, not by total job rate. Sampling and testing is performed throughout the project by cross-section to assure all materials are tested.

B3.03 Rounding Requirements of Sampling and Testing Results. All measurements and calculations for materials sampling and testing will adhere to the rounding and accuracy requirements of the applicable AASHTO, ASTM, or DOH specifications. If there are no specific requirements included in the applicable specification, all items are to be measured in the field to two (three for metric) decimal places, and then calculated to three (four for metric) decimal places when calculations are required.

SECTION B4.00 – QUALITY CONTROL, QUALITY ASSURANCE, AND INDEPENDENT ASSURANCE TESTING PROGRAMS

B4.01 Quality Control (QC) Requirements. The Contractor shall perform all tests required by the Contract and other tests the Contractor determines are necessary to verify the quality and suitability of all materials used in the Project. For all required tests, the Contractor shall submit test results or samples as requested by the Department, and shall obtain necessary approvals prior to using the materials on the Project. The approval of any material or source of supply of such material shall not relieve the Contractor of the responsibility to supply a material that is compatible with all other materials used on the Project, as such materials are normally used, without defect and for the anticipated life of the Project. The Contractor shall warrant that all materials used in the work or Project shall be made, manufactured, processed, or produced by suitable means, that all materials have been tested with satisfactory results, and that all materials may be compatibly incorporated into the work or Project without defect.

Participation in the Quality Control/Quality Assurance program is dependent upon the contractor fulfilling all requirements established by the Materials Engineer. The contractor's QC/QA plan must be submitted to the Department and will be approved based on conformance to the program.

B4.02 Quality Assurance (QA) and Independent Assurance (IA) Requirements. The purpose of the Quality Assurance Program is to prescribe policies, procedures, and guidelines to assure that quality materials are used on all DelDOT projects.

It is the policy of DelDOT to have a Quality Assurance Program that will assure materials, products, and workmanship incorporated into DelDOT projects are in conformity with the requirements of the approved plans and specifications, including all approved changes.

DelDOT is required to maintain an adequate, qualified staff to administer its Quality Assurance Program. The Code of Federal Regulations (23 CFR Part 637.207) requires that the persons conducting tests used in the acceptance decision or the Independent Assurance inspections be qualified, including employees of DelDOT and designated agents conducting verification and QC testing. A detailed description of the Quality Assurance program is provided in B4.03.

In addition to the Quality Assurance program, DelDOT is also required to have an Independent Assurance (IA) Program as an independent evaluation of sampling, testing, and observation performed by qualified sampling and testing technicians employed by DelDOT, or its designated agent employed by an AASHTO accredited laboratory. A detailed description of the Independent Assurance program is provided in B4.04.

To ensure that Quality Assurance and Independent Assurance technicians are testing materials according to procedure, performance is verified on a yearly basis. An annual procedure check is performed for each type of testing by qualified laboratory staff. Procedure checks are recorded and maintained in the Central Laboratory on various forms. Examples of these forms are located in Part E. Procedure checks for concrete testing are on LB forms 130-135; bituminous concrete testing procedure checks are on LB forms 137-140.

B4.03 Quality Assurance Program Scope. The Quality Assurance program follows the minimum sampling requirements, described in Section B2.00. Using these guidelines, the Quality Assurance supervisor determines the materials to be tested on each project. The number and type of tests are to be documented.

Sampling and testing of materials used in DeIDOT projects, as described in Section B3.00, is the responsibility of Quality Assurance technicians (Field Control). All samples used for assurance sampling and testing are random samples. In addition to the minimum sampling, more samples may be taken at any point in the production for verification of quality. (Where more than one sampling location is permitted, DeIDOT reserves the right to further designate the sampling location.) The results of these tests can be used in the acceptance decision as specified in the contract requirements and all approved changes.

All sampling and testing is performed in close cooperation with Project Inspection personnel. The Project Engineer, or an authorized representative, should be aware of all sampling and testing on the project and must be informed of all test results as soon as possible to ensure sufficient time for corrective action, if necessary. Results of testing are documented on various forms, which are provided in Part E, and are described in Part C for each material.

The ultimate responsibility for the project rests with the Project Engineer. Materials & Research is responsible only for testing project materials, the administration and results of the testing are the responsibility of construction personnel. Quality Assurance technicians are only to direct the Contractor with the Project Engineer's consent or in an emergency situation.

B4.04 Independent Assurance Program. The Independent Assurance program is an internal program administered and performed by DeIDOT personnel or designated agents from an AASHTO accredited laboratory. This program is to be applied to all federally funded projects. The IA supervisor will act in an advisory capacity in carrying out this program and will be the liaison with other DeIDOT sections, other organizations, consultants, designated accredited laboratories, and the FHWA.

IA sampling, witnessing, testing and equipment verification will be performed by DeIDOT technicians, or their designated agents who have no direct responsibility for project verification sampling and testing, using equipment other than that used by the tester assigned to the project. IA sampling and testing, by either actual testing or by observation of State personnel, or designated agents employed by an AASHTO accredited laboratory performing the sampling and testing, will be a minimum of 10% of Quality Assurance testing.

On DeIDOT projects, the test equipment will be evaluated by using calibration checks, testing split samples of verification or proficiency samples, or any combination of these methods. Person(s) observing the QA sampling and testing will inspect project equipment used for acceptance testing to assure that the equipment is adequate for the designated procedure. The equipment will also be checked at the time of the required calibration, if applicable, and ensure that proper documentation of the calibration checks are on file.

Field reviews of IA samples will be documented by signing and dating entries on test reports. IA test results that agree with non-IA test results within the limits in the “IA Sample Comparison Sheet” (LB-110, LB-111, LB-112) will not require any further comments on the reporting form. If IA samples have significant or major differences, greater than the acceptable percentages defined in the aforementioned forms, the supervisor will conduct an investigation to determine the possible cause of the difference. This investigation may be as simple as having all testing technicians run their retained splits of the samples. If, after comparing results of the retained splits, significant or major differences still exist, the supervisor shall conduct a thorough investigation into the sampling, testing, and equipment used to perform the tests. The results of this investigation shall be documented on the appropriate form.

The IA supervisor makes acceptance decisions based on verification sampling and testing and factors relating to the quality of the material or product. IA testing is not performed solely for the purpose of verifying quality, but it is also meant to evaluate technicians and equipment. When the project is completed, the IA supervisor certifies that the IA schedule has been substantially followed and the results of the split sample testing are in close agreement. Exceptions and corrective actions are noted on a form or on an attached sheet.

Independent Assurance technicians are not responsible for the verification of materials and their conformance to specification requirements. IA testing is used solely to verify results obtained from Project Field Control for Procedure and equipment verification.

Prompt and appropriate action will be taken by the Chief Materials & Research Engineer to correct or improve sampling and/or test methods if the need is indicated.

B4.05 Test Documentation and Record Keeping. All material forms must have the appropriate contract number and item number. All document and reporting forms must be dated and signed by the appropriate technicians.

All originating materials records for projects are to be kept in the project file. Copies of product and material reports for acceptance decisions and IA test reports will be retained for all DeIDOT projects in the Central Laboratory. Copies of records cited above will be retained for the period specified by the most current DeIDOT policy.