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Questions and Answers on the Quality Assurance Regulation (23 CFR 637)

Applicability

On non-NHS projects what will govern the State DOTs on material acceptance?

As with any other Title 23 program the States and locals can use their procedures on any non-NHS project.

Can States and locals use their procedures that use contractor results on projects that are not on the NHS without meeting the criteria in 23 CFR 637 since other state procedures are allowed?

Yes, however, it is expected that States to have only one acceptance program. The vast majority of States currently don't make a distinction between Federal-aid and non-federal-aid and it is expected that to continue.

Do the regulations cover "all" materials that are used on Federal-aid highway projects?

Although the regulations do not make any distinction in materials the regulations were meant to cover project produced materials such as embankments, Portland cement concrete, hot mix asphalt and aggregates. These "project produced materials" may be produced by commercial operations not physically located on the project. The regulations were not meant to cover manufactured item. Manufactured items include but are not limited to things such as pipe, reinforcing steel, admixtures, paint, and etc. Some guidance on manufactured items is covered in the non-regulatory supplement to 23 CFR 637 and can be found at this link: <http://www.fhwa.dot.gov/legsregs/directives/fapg/0637bsup.htm>

We are pursuing fabricator process control requirements for precast concrete, structural steel items and other similar shop-fabricated products. Are these regulations applicable in these material areas? Will there be any flexibility allowed for the unique situations which may be found as we develop these specifications?

These regulations do not specifically cover manufactured materials. However, the general principal of verifying the quality of the material and validating contractor or vendor supplied data used in the acceptance decision should be maintained. The frequency of verification sampling and testing will depend on the risk

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implications from premature failures due to the acceptance of substandard or failing materials.

State Department Of Transportation (DOT) Capabilities

The regulations do not require IA sampling and testing nor verification sampling and testing to be done by State DOT personnel, but the regulations do require the State DOT to maintain a central laboratory. Thus it looks like the regulations would permit a State DOT to use the central lab only for such things as research and possibly mix design, while using consultants for all IA and verification work. Is this true?

In the policy portion of the regulation the State is required to maintain an adequate qualified staff to administer the quality assurance program. It is the intent of the regulation that the State central lab be part of the "adequate qualified staff", and therefore responsible for ensuring proper verification and IA sampling and testing regardless of who performs it.

Acceptance Program

Does 23 CFR 637 require construction inspection to be performed as part of the acceptance program?

Yes, 637.203 identifies construction inspection as a component of the States acceptance program. 637.207, (a), (1), (i), (C) requires that the State's acceptance program include identification of specific attributes to be inspected which reflect the quality of the finished product.

Verification Testing

The regulation requires random sampling for verification and quality control (QC) testing. Does a stratified random sampling program meet the requirement?

The intent of the random sampling requirement is to ensure that bias does not enter into the acceptance decision. Stratified random sampling is acceptable.

We are extremely concerned with the apparent requirement that the State DOT must perform independent verification sampling.

The regulation does require verification of the quality of the material with independent samples taken by the State or its designated agent, excluding the contractor and vendor.

"Verification testing shall be performed on samples that are taken independently of the quality control samples" Does "taken independently" infer that split samples are not permitted?

For purposes of verification sampling and testing the samples are required to be independent samples, not split samples. Any split samples that are taken by the State can and should be used as part of the independent assurance (IA) program. Test results from split samples may also be analyzed in a manner that will treat the results as independent test results if they are sampled and split by

the State. The real issue is who is taking the sample and how the test data is being used and analyzed. (See Technical Advisory T 6120.3 "Use of Contractor Test Results in the Acceptance Decision...")

<http://www.fhwa.dot.gov/legsregs/directives/techadvs/t61203.htm>)

What is FHWA's position on sampling for verification testing?

The regulations require sampling for verification testing to be taken independent of the samples used for QC. The regulations also require the verification samples to be sampled by the State or their representative. A split of the verification sample can be performed by the State and given to the contractor for their use, but only one of the split sample test result can be used in determining payment. When comparisons are made between the verification tests and the QC tests, the contractor's test results determined from the split portion of the verification sample **CAN NOT** be included in the population of the independent QC test results. Including the split contractor's results in the population of QC results will bias the data and result in an invalid comparison.

Contractor's technicians can provide labor to assist in verification sampling if the State personnel maintain control of the sampling process. For example, when mechanical sampling is occurring, i.e. belt diversions of aggregate, or when safety is an issue, i.e. hot liquid asphalt binder sampled inline from the hot mix plant.

Refer to Technical Advisory T 6120.3 "Use of Contractor Test Results in the Acceptance Decision..." for additional clarification of the verification sampling requirements.

Dispute Resolution

What documentation is necessary to meet the requirements for implementing the dispute resolution requirements? Does all the pertinent information need to be in one document?

The regulations are flexible on the requirements for a dispute resolution system. The philosophy is to insure that there is a system in place to cover the inevitable situation where two sets of data would conflict. While a single document would be preferable, as long as a comprehensive system is in place, a single document is not required. For the system to be effective all parties need access to all the documents that make up the dispute resolution system and all documents need to be properly cross-referenced.

Independent Assurance

Very little information is provided about the "system approach" for the independent assurance (IA) program. Further explanation and, if possible, examples of system-approach IA programs would be appreciated.

The system approach allows a State to look at testing personnel and equipment regardless of how many projects the equipment or tester is used on. For instance, a project laboratory may be performing gradation tests on aggregate that is used for base, Portland cement concrete, and asphalt paving for several projects. Under a system approach the IA testing could be performed several times a year on each tester performing gradation tests in the lab regardless of the number of gradation tests that are run by the individual tester. The gradation testing equipment used could be evaluated on the same cycle. The key point is that all testers

and equipment are covered and evaluated for all procedures, which are being used for acceptance.

The IA procedures do not have to be identical for the State DOT and contractor personnel. Different laboratories could be responsible for performing the IA tests for State DOT and contractor personnel. The State could use the project approach for contractor personnel and the system approach for State personnel. The State could use proficiency samples for State DOT tests and split samples for contractor personnel or vice versa.

When a system approach is used for the IA program, what type of summarized results would be included in the annual report to FHWA?

Number of tests or other actions performed versus equipment and testing personnel covered; the number of discrepancies by test (non-comparing results, noted deficiency in procedure, equipment out of calibration); and a summary of the actions taken as a result of the discrepancies.

Certain tests cannot be practically performed in the field or area office laboratories. The triaxial test on flexible base would be an example. Are those tests, which are performed first at the District laboratory level required to be included in the IA program? If so, this would be a costly requirement in terms of both manpower and travel expenditures. Central laboratory personnel would be required to travel statewide on a continuous basis to be able to observe verification testing in our District laboratories.

Only tests that are used in the acceptance decision need to be covered by an IA program. However, an IA program for a procedure may be comprised of several actions such as: periodic observation of the test procedure, regular calibration of the equipment, and the periodic testing of proficiency and/or split samples. This would cover the technician and the operation of the equipment.

In 637.205(c), the regulation states that "other procedures" will be allowed in lieu of IA sampling and testing. Further explanation or examples of acceptable "other procedures" would be helpful. Will approval of alternative procedures be at the FHWA Division level?

Other procedures are defined under 637.207, (a), (2), paragraphs (i) and (ii). These two paragraphs list the procedures allowed for equipment and personnel. The options are calibration checks, split samples or proficiency samples for equipment and observations, split samples, or proficiency samples for testers. The State has the option of using all or some of these methods. The important issue is to insure that the equipment stays in calibration and proper working order and that the technicians continue to perform the test procedures correctly.

If Contractor quality control (QC) test results are used in the acceptance program, a dispute resolution system is required. Could the dispute resolution process include both State DOT and accredited non-State DOT laboratories or is it restricted to one or the other?

The dispute resolution system can include both. The purpose of

the requirement for dispute resolution system is to ensure there is a process to resolve differences and assist in avoiding unnecessary claims.

If Contractor QC test results are included in the acceptance decision, they must be covered by an independent assurance (IA) program. Could State personnel working in the same project office perform both the contractor IA testing and the verification testing on a project, as long as the same person did not do both?

As long as two different testers are using two different sets of equipment the IA requirement is met. It is the intent of the regulation that the State central lab be responsible for ensuring proper verification and IA sampling and testing regardless of who performs it. Therefore, some traceability back to the central lab should be maintained. The purpose of the IA program is to ensure that the testing is performed uniformly and the equipment stays in calibration.

Do IA procedures applied to the State DOT and those applied to the contractor have to be identical in all aspects?

No.

Could an accredited non-State DOT lab perform the IA function for the contractor's test results?

Yes.

Could a State DOT district laboratory perform the function for the State DOT project laboratory?

Yes.

Could the IA program applied to the State DOT be based on a system approach and that applied to the Contractor be on a project-by-project basis?

Yes.

Could the IA program applied to contractors use proficiency samples and the IA program applied to the State DOT use split samples, or vice versa?

Yes.

If a State DOT uses the system approach to IA, can consultants operate the entire IA program, including preparation of the annual report?

Yes, consultants can perform the entire function. However, as stated in another question above, we expect the State to have an adequate qualified staff to administer the program. We expect adequate State DOT oversight of the consultants performing the work.

Qualification Programs

Do States that chose not to use the contractor's results in the acceptance decision need to establish laboratory and testing

personnel qualification programs?

Yes.

The State DOT program to qualify laboratories is required to include "provisions for checking test equipment..." in 637.203. Are equipment checks required to be performed by department personnel or an agent of the department? Or, can our program for qualifying a laboratory (particularly a contractor's field laboratory) require that the laboratory either perform or employ a commercial calibration company to perform equipment calibration checks?

The regulation was left open to allow flexibility. The equipment calibration and checks can be performed by the State, an agent of the State or a third party commercial service but cannot be performed by the contractor.

Who will be responsible for qualifying private laboratories that do either quality control or acceptance testing on State projects? Can qualification of private labs be through AMRL, A2LA, or other qualifying bodies? If the State needs to be responsible for qualifying all private laboratories, this would put a strain on their own training program.

The regulation allows the State to establish the qualification program. The only requirement is that the program must include equipment checks and that records of calibration checks must be maintained. The State can use a service for any or all parts of the qualification program as long as the minimums are met. Qualified personnel must do all testing used in the acceptance decision. All non-State IA testing and dispute resolution testing must be done by qualified personnel in an AASHTO accredited laboratory.

Does FHWA have guidance on the qualification programs for laboratories and testing personnel?

Yes it appears as part of the non-regulatory supplement for 23 CFR 637. See:
<http://www.fhwa.dot.gov/legsregs/directives/fapg/0637bsup.htm>.

Does FHWA encourage the qualification of personnel?

Yes, the FHWA has a long history of encouraging qualification of all highway construction technicians, including construction inspection personnel as well as materials sampling and testing personnel. The most recent example of FHWA's support of qualification programs for technicians is the agencies' commitment to the Transportation Curriculum Coordination Council and the National Partnership for Highway Quality.

Where can we obtain materials to develop technician qualification programs?

Materials for developing qualification programs for both materials testing and construction inspection technicians can be obtained through the [Transportation Curriculum Coordination Council](#).

What element should be included in a qualification program for construction inspection technicians?

Qualification Programs for construction technicians should include:

1) Formal training which includes the specific attributes to be inspected which reflect the quality of the finished product, good construction practices, and specification requirements; 2) written examination; 3) a period of on the job training; 4) requalification time frame and criteria; and 4) procedures to disqualify personnel.

Accreditation

Do the States that chose not to use the results from QC testing in the acceptance decision have to have an accredited central laboratory?

Yes.

What is AAP accredited?

AAP is the acronym for the AASHTO Accreditation Program (AAP). The program is administered by the AASHTO Subcommittee on Materials.

What areas are covered by AAP Accreditation?

AAP has accreditation programs for asphalt cement, emulsions, bituminous concrete, bituminous concrete aggregates, soil, Portland cement concrete, and Portland cement concrete aggregate. The State can be accredited in AASHTO and ASTM methods.

The Federal Register, dated June 29, 1995, indicated that, at the time, the only acceptable accreditation program was the AASHTO Accreditation Program. Since then, has any other accrediting organization been approved or applied for approval?

As indicated in a Notice in the Federal Register on September 22, 2004, the FHWA will use the National Cooperation for Laboratory Accreditation (NACLA) Accreditation Body Recognition Procedure and Technical Requirements for Construction Materials Testing, NISTIR 7012, as the criteria for the approval of comparable laboratory accreditation programs. At this time no other accreditation body has been approved. See the non-regulatory supplement for further information.

<http://www.fhwa.dot.gov/legsregs/directives/fapg/0637bsup.htm>

Many States choose to use modified forms of AASHTO/ASTM procedures as part of their acceptance decision. However, these procedures are not evaluated in the AAP. Is AMRL/CCRL considering revising their position on accreditation of non-standard procedures?

No. Accreditation will only be available on either the AASHTO or ASTM procedures.

Design Build

What is meant by the term contractual provisions?

Contractual provisions may be warranties, performance requirements, and or provisions for the operation of a facility for a specific time frame.

Materials Certificate

What types of projects require materials certificates?

Projects on the NHS system that are subject to construction oversight by FHWA require materials certificates.

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