



USACE, TAA, Quality Assurance Branch

SUBJECT: STANDARD OPERATING PROCEDURE – CERTIFICATION OF LABORATORIES (MATERIALS & WATER)

DATE: 29 July 2017

BACKGROUND: TAA QAB currently executes the lab certification program through a group of engineers comprising the Lab Certification Team (LCT). The LCT currently consists of engineers from the Afghan Builders Association (ABA) and the Lab Team from the Afghan Technical Support Team (ATST) selected from the USACE Personal Services Contract.

ORGANIZATION: The LCT consists of a minimum of 9 members, at least 3 of which must be present at any lab site evaluation. The program is monitored by a USACE TAA representative designated by the TAA Commander, who has final authority on determining validation certification of all labs as well as questions pertaining to standard operating procedures. The designated TAA representative will oversee and monitor the operations and practices of the LCT. The LCT is comprised of the following members:

USACE is responsible for designating and filling the following positions:

- Afghan Technical Support Team (ATST): USACE will maintain a physical presence in the laboratory inspection process through the participation of USACE employees and/or USACE-contracted employees. These individuals will be directed by the USACE TAA Coordinator and will provide additional manpower, technical expertise and training to the ABA LCT. The ATST Lab Certification Team members consist of three members from the pool of engineers from the USACE Personal Services Contract, including a Team Lead and at two others. All three members shall be civil, geotechnical or mechanical engineers.

ABA is responsible for designating, developing and training individuals to fill the following positions:

- ABA LCT Coordinator. A civil or geotechnical engineer, with a University diploma in that field. This individual shall have no financial interest in any of the companies being evaluated for certification.
- ABA LCT Assistant Coordinator. A civil or geotechnical engineer, with a University diploma in that field. This individual must be qualified, trained and capable of performing all duties of the ABA LCT Coordinator in his absence due to sickness, travel or sudden departure. This individual shall have no financial interest in any of the companies which are being evaluated for certification;
- University Engineering Professor(s). It is desirable that at least one (1) and possibly two (2) geotechnical engineering professors from a University in Kabul be designated by ABA to serve on the LCT on a rotating term assignment. These individuals shall have no financial interest in any of the companies which are being evaluated for certification; and

- Construction Materials Testing Lab Owners or Lab Managers. Two (2) owners or managers of currently certified labs shall be designated by ABA to serve two (2) year term assignments each. Each year one of the two lab owners completes his term and is replaced by the owner of a different lab. This new member being added to the team will join the remaining lab owner who already has one year experience with the team. This “staggered” assignment will ensure consistency in evaluation methods. The selection of lab owners on the team is decided by USACE after receiving suggestions from ABA. These members are vital technical members of the team and are to participate in all lab evaluations except for the lab(s) for which they have a financial interest. Lab owners will be invited by USACE to participate on the team, by requesting they submit a letter to USACE and ABA describing what they have to offer the LCT.

USACE TAA has delegated ABA to operate the Lab Certification Program, while USACE maintains final authority for assuring the conformance of the LCT with USACE quality standards.

The above-described organization is depicted in “Organization Chart of Laboratory Certification Team” (Enclosure 1).

GENERAL GUIDANCE:

Construction Materials Testing Laboratories:

- Laboratories performing tests for construction materials require a certification from the ABA LCT, specific to the tests they prove competence in performing which are required for any USACE-managed project.
- Companies performing materials testing shall receive a Certification from ABA prior to performance of any contracted or QA testing, and a re-certification shall be performed every twelve (12) months thereafter.
- The certification of a laboratory is site-specific and cannot be transferred or carried over to a facility at a different location. Each branch of a lab of the same ownership name, as well as all project labs operated by the same ownership name, must be individually certified.
- All laboratories shall be re-certified every twelve (12) months, after a change in ownership or changed location, or at any time at the discretion of the TAA representative when conditions are judged to differ substantially from the conditions when last certified.

Water Quality Testing Laboratories:

- Laboratories performing tests for water quality, wastewater, sludge or sediment require a certification from the ABA LCT, specific to the tests they prove competence in performing which are required for any USACE-managed project.
- Companies performing water quality testing shall receive an initial Certification prior to performance of any contracted or QA testing, and a re-certification shall be performed every twelve (12) months thereafter.
- The certification of a laboratory is site-specific and cannot be transferred or carried over to a facility at a different location. Each branch of a lab of the same ownership name, as well as all project labs operated by the same ownership name, must be individually certified.
- All laboratories shall be re-certified every twelve (12) months, after a change in ownership or changed location, or at any time at the discretion of the TAA representative when conditions are judged to differ substantially from the conditions when last certified.

Equipment Calibration Testing Companies:

- Companies performing tests to measure accuracy of testing equipment and follow up repairs and adjustments for equipment calibrations require a Letter of Acceptability from the USACE, to perform such services.
- Every piece of test equipment in laboratories seeking certification/re-certification must be calibrated on an annual basis by a company accepted by the LCT to perform such calibrations.
- Calibration testing companies must have a physical office located in Afghanistan with a full-time staff. No equipment calibrations can be issued without the testing technician personally performing the evaluation testing at the lab facility whose equipment is being analyzed for calibration certification.
- Companies performing equipment calibration certification testing shall be approved for a period of up to two (2) years, expiring on the 31st day of December of the second year of their certification.
- The “SOP for Calibration of Lab and Batch Plant Equipment” is included as **Enclosure 11**, with related **Enclosures 11A, 11B, 11C and 11D**.

Certification Fees: ABA may offset some of their costs related to managing the LCT and executing the LCTP by charging for their inspection services. The fees ABA is authorized to charge laboratories for executing this program are limited to travel, meals and lodging expenses for those labs located outside the Kabul area, and the following fee schedule:

- **Initial Certification Inspection:** \$2000 (US dollars)
Certification Fee for new labs or Renewal Certification Fee for previously certified labs who allow their certification to expire for more than 6 months before successfully preparing for, coordinating and enabling the on-site inspection to be performed by the ABA LCT.
 - **Renewal Certification Inspection** \$1000 to \$2000 (US dollars)
Certification Fee for labs who successfully prepare for, coordinate and enable the on-site inspection by the ABA LCT before their current certification expires.
 - **Re-Inspection of Failed Inspection or Correct Probationary Status** \$200 to \$800 (US dollars)
Fee for labs requiring return (follow-up) inspection to verify deficiencies noted in initial inspection have been adequately corrected.
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LAB CERTIFICATION PROCEDURES:

- A. STANDARDS OF LABORATORY ACCEPTABILITY:** The Laboratory Certification Team (LCT) will conform to the following evaluation criteria in the performance of its responsibilities:
1. **CONSTRUCTION MATERIALS TESTING LABORATORIES:** Labs performing testing of aggregate, concrete, cement, grout, mortar, bituminous materials, soil, rock, steel, brick, masonry block and other construction materials shall be inspected to assure they have the capability to perform tests required in accordance with the applicable ASTM standard method as well as the requirements of “ASTM E329” (**Enclosure 2**).

2. WATER QUALITY TESTING LABORATORIES: Labs performing testing of water, wastewater, sediment, sludge and other samples for chemical analysis shall be inspected to assure that they have the capability to perform analyses and quality control procedures listed in the attached "TAA Water Quality Testing Parameters" (**Enclosure 3**), as appropriate. Analytical methods for procedures not addressed in these references will be evaluated by TAA for conformance with project or program requirements.
3. EQUIPMENT CALIBRATION COMPANIES: Companies performing annual calibrations of lab equipment shall be certified to perform tests required for calibrations, following guidance of ISO/IEC 17025.

B. REQUEST FOR LAB CERTIFICATION (APPLICATION PACKAGE):

1. The process for Lab Certification is shown on the "Lab Certification Process Flow Chart" (**Enclosure 4**).
2. ABA Lab Certification Coordinator notifies lab that their certification is soon to expire and they need to reschedule a re-certification;
3. Lab requests certification (if not a current certified lab), or re-certification (if current certification period is expiring) by ABA in an email. Package to ABA to include the following:
 - a. MINISTRY OF COMMERCE AND INDUSTRY BUSINESS LICENSE (Formerly AISA License)
In 2016 the Afghan Investment Support Agency (AISA) turned over responsibility for business licensing to the Ministry of Commerce and Industry. The Lab name should be identified on this document as it appears on the ABA records, along with a photo of the Lab owner. The license should be current. See sample "Ministry of Commerce and Industry Business License" (**Enclosure 5**).
 - b. MANAGEMENT PLAN
 - 1) Organization Chart - show each position title and name of person filling that position. The lines drawn between positions indicate who the lower person on the chart reports to. At the top or bottom of the chart, it should state when the chart was last updated or revised. "Updated on xx-xx-xxxx"
 - a) Mobile labs should show the same thing, listing personnel located only at that lab, but with the reporting line from the Mobile Lab Manager back to someone at the Main Lab.
 - c. QUALITY MANAGEMENT PLAN (May be a Section in the "MANAGEMENT PLAN")
 - 1) TRAINING:
 - a) Lab Manager to make frequent daily coaching visits with each Section Leader, reviewing test procedures he happens to be working on that day or will be working on the next day.

- b) Lab Manager to perform regular (at least once a month) training classes to the all Section Leaders to cross-train these leaders in tests from other sections.
 - c) Section Leaders to perform regular (at least once a month) training classes to their Technicians, spending half the class reviewing ASTMs presented in previous sessions, and half the class presenting a new ASTMs.
 - d) All training sessions are to be documented with date, name of instructor, names and signatures of students, ASTM methods reviewed, with summary of key issues learned. Training documentation to be filed in the "TRAINING" chapter of the QUALITY MANAGEMENT PLAN.
- d. DIPLOMAS, CVs and CERTIFICATES
Diplomas for all Key Personnel are to be translated to English
- e. SAFETY
- 1) MSDS for all chemicals used in the lab to be included in the Lab Safety Manual (or Safety Section of the Lab Management Plan)
 - 2) No open-toed sandals to be worn in lab test areas
 - 3) Eye protection for asphalt extraction area. Full seal with skin.
 - 4) Lab Safety Manual (or Safety Section of the Lab Management Plant) to include Training sheet, at least monthly, with names and signatures of those who attended, name of instructor, date of training, location of training session, subjects discussed, and any assignments made for the next training session.
- f. EQUIPMENT CALIBRATIONS
- 1) 1 photo for each calibration certificate. Photos of several certificates spread out on a table are unacceptable.
 - 2) Certificates only from USACE – approved Calibration Companies
 - 3) Verify precision of all weight scales, ovens and thermometers, to match requirements of ASTM for each test. (For example: 0.1g or 0.01g; 1°C, 0.5°C or 0.1°C).
 - 4) Refer to separate SOP for Calibration for details on performing Calibrations (**Enclosure 11**).
- g. LOG BOOK
Show all samples received and all tests performed since date of last inspection. Use notebook with fixed pages (not binder).
- h. TEST VIDEOS, RECORDED BEFORE LCT SITE VISIT EVALUATION (General Comments)
- 1) Each certification cycle (each year), each lab will prepare video recordings of their technicians performing up to eight (8) different tests as determined by ABA-LCT. The exact number of video tests shall match the number of sections from the Master Test Tables for which the lab is requesting certification (1 video test from each Master Test Table Section). The specific tests shall be determined by ABA-LCT and ABA-LCT will notify the lab in advance of the site inspection, so the videos can be completed and

turned over during the lab site evaluation visit. The technician performing the test may use notes. If he uses the ASTM as his notes he should make reference to the paragraph numbers as much as possible, as he performs the activity explained in that paragraph. If the technician does not speak English he will describe each step of the test and a translator will repeat what the technician has said, but in English.

- 2) Technician should explain any preliminary work which has been done on the sample before it is ready for the test to be performed in the video.
- 3) Technician should explain the engineering significance of the test. What field conditions is it trying to duplicate? How will the engineers use the test results in their designs?
- 4) Ensure that each test report form includes all field data and test information required by ASTM. If not, Lab Manager is to revise the form.
- 5) Technician is to explain each step he is performing
- 6) Technician is to enter all test data on the form during the video. Technician or Sr Technician is to perform any calculations required, explaining each step.
- 7) Field tests are to include how the sample is properly obtained and stored to prepare to ship to the Lab.

i. ON-SPOT VIDEOS, RECORDED DURING LCT SITE EVALUATION

During the site evaluation, the ABA-LCT will request a technician from two or three sections to perform a random test selected by the LCT coordinator. The random test will be a test commonly performed in that section. The technician will perform the test following guidelines stated in 2-6 of the previous paragraph (“h – Test Videos Recorded Before LCT Site Evaluation”).

4. Site Evaluation: The Lab Certification Team of ABA (a minimum of 2 individuals: ABA coordinator, ABA assistant coordinator, one or two lab owners and possibly a university professor) and USACE (a minimum of 1 Versar Employee LNQAs assigned to the Afghan Technical Support Team, or ATST) travel to the lab and spend 6-12 hours (1-2 days) interviewing management and technical staff, interviewing technicians, verifying data included in the application packet and collecting any remaining documentation not yet received from the application packet. The results of the on-site evaluation are recorded by the ATST members on the “Lab Evaluation Checklist” (**Enclosure 6**).
5. Evaluation Report Preparation: Based on notes recorded on the Lab Evaluation Checklist and photos taken during the Evaluation, the “ABA Evaluation Report” (**Enclosure 7**) and “ATST Report” (**Enclosure 8**) are prepared over the next 3 work days. The reports include evaluations of all aspects of lab management with equipment photos, copies of documents, references to personnel interviews and a recommendation for non-certification, 6-month probationary certification, or 12-month full certification. The ABA checklist and the ATST report (along with photos taken, collected documents and videos of lab techs performing pre-determined test procedures) are emailed to USACE QAB Lab Certification Coordinator for final review and summary comments.
6. USACE QAB Lab Certification Coordinator reviews each of the tests performed by the lab technicians, recorded on video, noting deficiencies in procedures and/or equipment and/or safety

as required by ASTM and other standards. Also reviewed are the test forms for completeness and compliance with all requirements of ASTM, and accuracy of calculations. Also reviewed and verified are CVs against the Org Chart, Calibration Certificates, Log Book of Tests, completeness and quality of Safety Plan and Quality Management Plan.

7. USACE QAB Lab Certification Coordinator compiles the "USACE Lab Evaluation Summary" (**Enclosure 9**) in an email to the ABA Lab Certification Coordinator with final direction for issuing certification or non-certification. Included is a summary of any deficiencies noted in the review which need to be corrected prior to the next evaluation cycle.
8. ABA Lab Certification Coordinator prepares the "Laboratory Certification Document" (**Enclosure 10**) and forwards it in an email, along with the USACE list of noted deficiencies, to the lab manager. ABA maintains copies of the Certification report for four (4) years or as otherwise deemed necessary.

ADDITIONAL ABA PROGRAM MANAGEMENT RESPONSIBILITIES: The following are key ABA responsibilities for program management after a lab is certified.

- **MAINTAIN LIST OF CERTIFIED LABORATORIES:** The ABA will maintain a current and up-to-date listing of certified testing laboratories and make it available on-line at no cost to the general public. The list will include the laboratory contact information (Lab manager name, cell phone numbers, email addresses, physical address of lab, expiration date of current certification, and list of qualifying tests).
- **CAPABILITY CHECK:** The LCT will perform unannounced inspections at currently certified laboratories to ensure they are maintaining an acceptable level of compliance with certification standards.
- **MAINTAIN RECORDS OF PAST EVALUATIONS:** ABA will maintain copies of the Certification report for four (4) years after the Certification or as otherwise deemed necessary

Enclosure 1: Organization Chart of Laboratory Certification Team
Enclosure 2: ASTM E329
Enclosure 3: TAA Water Quality Testing Parameters
Enclosure 4: Lab Certification Process Flow Chart
Enclosure 5: Ministry of Commerce and Industry Business License
Enclosure 6: Lab Evaluation Checklist
Enclosure 7: ABA Evaluation Report
Enclosure 8: ATST Report
Enclosure 9: USACE Lab Evaluation Summary
Enclosure 10: Laboratory Certification Document
Enclosure 11: SOP for Calibration of Lab and Batch Plant Equipment
Enclosure 11A: Sample Letter of Acceptability to Perform Calibration Services
Enclosure 11B: Asphalt Test Equipment Calibration Recommendations
Enclosure 11C: Concrete Test Equipment Calibration Recommendations
Enclosure 11D: Soils Test Equipment Calibration Recommendations