

**QUALITY ASSURANCE
LABORATORY ACCREDITATION
PROGRAM GUIDE**

EXHIBITS

Developed by



**7508 Wisconsin Avenue, 4th Floor
Bethesda, Maryland 20814
301-652-7925
www.wacel.org**

Ninth Edition

EXHIBIT 1: Minimum Capabilities to be a WACEL Accredited Laboratory

A testing laboratory that seeks accreditation for concrete testing shall be capable of performing the required ASTM test methods or practices listed below:

1. Sampling, Method C172
2. Slump, Test Method C143
3. Unit Weight, Yield, and Air Content C138
4. Air Content, C173 (volumetric method) and C231 (pressure method)
5. Making and Curing Test Specimens, C31
6. Compressive Strength, C39
7. Capping Cylindrical Concrete Specimens C617 or C1231
8. Temperature, C1064

A concrete testing laboratory that also performs testing on concrete aggregates shall be capable of performing the required ASTM test methods or practices listed below.

1. Organic Impurities, C40
2. Minus No. 200 Wash, C117
3. Specific Gravity, C127 and C128
4. Sieve Analysis, C136

A testing laboratory that seeks accreditation for soils testing shall be capable of performing the required ASTM test methods or practices listed below.

1. Proctors D698 (standard), D1557 (modified), VTM-1, and the equivalent test methodology required by Maryland.
2. Specific Gravity of Coarse Aggregate (oversized particles), C127
3. Specific Gravity of Soils, D854
4. Hydrometer and Sieve Analysis, D422
5. Moisture Content, D2216

6. Field Density Testing D1556 (sand cone), or D2922 (nuclear) or both
7. Atterberg Limits, D4318
8. California Bearing Ratio (CBR)* -- ASTM D1883/VTM-8

*CBR is required only of a principal laboratory in the WACEL service territory. Branch labs in the WACEL service territory need not necessarily have to have the equipment or capability in their particular office to perform CBRs. The region known as the WACEL service territory is defined annually by the Board of Directors.

EXHIBIT 2: Application Form

Accreditation Review No. _____

APPLICATION FOR ACCREDITATION

1. Firm Seeking Accreditation _____

2. Address _____

_____ ZIP _____

3. Authorized Representative _____

4. Work Phone AC _____ Ext _____ Fax No.: _____

If information about the laboratory for which accreditation is sought differs from information conveyed in responses to items 1-4, complete items 5-9. Otherwise skip to item 10.

5. Laboratory Name _____

6. Laboratory Address _____

_____ ZIP _____

7. Authorized Representative _____

8. Rep's Work Phone: _____ Ext _____ FAX: _____

9. If the individual identified in item 4 is not the same as the one in item 8, should the Materials Review and Facilities Inspection Report be sent to the person identified in item 4, item 8 or both? (Circle one) 4 8 Both

10. How many persons employed at the applicant laboratory participate in:

a. soils testing _____

b. concrete testing _____ concrete aggregate _____

11. Indicate the accreditation you seek (check one):

_____soils only _____concrete only _____both soils and concrete

12. Approximately when would you like the Facilities Inspection to occur? _____

13. Are you aware that WACEL's Director of Technical Services may be unable to comply with your preferred schedule? (Circle one) Yes No
14. Are you aware that other organizations offer laboratory accreditation in the fields of soils and concrete and that these may be applied to if WACEL cannot handle your request per your time schedule? (Circle one) Yes No
15. The fees associated with accreditation (which must accompany this application by check payable to WACEL) are based on the number of persons required to serve on the LAT. Inspection fees are: \$1,500 for WACEL Members; \$6,500 for nonmembers. Annual Audit fees are \$750 per members and \$3,000 for nonmembers. The total amount due at this time, and provided herewith, is \$_____.
16. I understand that the scope of the accreditation involves the following:
- an examination of materials identified in Exhibit 3;
 - a review of facilities during a Materials Review and Facilities Inspection (Exhibit 5);
 - a possible reinspection to verify that deficiencies, if any, have been addressed to the satisfaction of the Laboratory Accreditation Team within 90 days of the date of the MRFI Report;
 - an annual audit to assure that the laboratory continues to meet the requirements of the WACEL Laboratory Accreditation Program and
 - the need to complete and return within 30 days of the first and second anniversary date of the accreditation a completed Certificate of Continued Compliance (Exhibit 4) signed by the Professional Engineer in charge of the lab and accompanied by evidence of participation in a reference sampling program for each discipline for which accreditation has been obtained (Circle

one to signify your understanding of the scope of the program) along with an annual audit fee of \$750. Yes No

17. Do you understand that additional costs are associated with the Program? (These include the cost of the Director of Technical Services' transportation to and from various meetings and the applicant laboratory, and their cost of meals for the Materials Review, Pre-Inspection and lunch, feasibly among others.) Do you understand that nonmembers are required to pay an additional fee and additional expenses if reinspection is required for any reason? (Circle one in response to all three questions) Yes No

18. Are you aware that WACEL may refuse to accredit the applicant laboratory but you will nonetheless be required to pay all charges associated with the accreditation program? (Circle one) Yes No

19. Have you read and become fully familiar with the WACEL document that describes the Quality Assurance Laboratory Accreditation Program? (Circle one) Yes No

20. Do you have authority to act on behalf of the firm herewith seeking accreditation? (Circle one) Yes No

21. Please read the following statement and add your initials where indicated only if you understand it and agree to bind to it the firm you represent:

I understand that this accreditation procedure is being entered into at the request of the firm I represent. I understand, also, that WACEL could feasibly face some liability exposure either from the firm I represent or from third parties who may, among many other things, claim the firm I represent was negligent and that WACEL's accreditation was accorded in a negligent manner. As to liability exposure as a result a of claim or action brought against WACEL by the firm I represent, the firm I represent herewith

agrees to take no action whatsoever against WACEL or any of its agents, voluntary or paid, for implementation of procedures associated with the accreditation process. It is understood that WACEL, for reasons it considers valid, may refuse to accredit the applicant laboratory. Even though I or another representative of that laboratory may disagree with WACEL's judgment or interpretation of facts, it is agreed WACEL's determination is final. It is understood, further, that WACEL will do its best to maintain confidentiality, but that it cannot and does not offer a guarantee that confidentiality will be maintained. And as to claims which may arise from any aspect of this accreditation procedure, when such claims are brought against WACEL by any entity or person other than the firm I represent, this firm hereby declares that it shall hold harmless, indemnify and defend WACEL and/or any of its agents from and against any and all such claims, as well as any losses or damages WACEL and/or its agents may suffer as a result of such claims, demands, costs or judgments.

Initials of Authorized Representative _____

22. By signature affixed below, I certify that I have read and understood WACEL's Quality Assurance Laboratory Accreditation Program Guide, as well as this accreditation application form, and that, by authority vested in me by the firm I represent, herewith bind my firm to all terms and conditions of the Program as made clear in the Program Guide and to all terms and conditions made clear in this application form.

Signature _____

Date _____

RETURN THIS FORM WITH YOUR CHECK

TO: WACEL, 7508 Wisconsin Avenue, 4th Floor, Bethesda, MD 20814

EXHIBIT 3: Materials for Review Listing

Laboratory name and location _____

Materials List

The following list of materials must be available for review by the Director of Technical Services when he performs the facilities inspection. If you are applying for accreditation for both soils and concrete testing, provide relevant materials for each, unless the document in question is equally applicable to both soils and concrete (Note that more than one copy of a given document may be required. The number required is indicated in the space provided in the right-hand margin of the following list.) Please be certain to indicate on each copy of each document furnished exactly what the document is, unless a title or some other inherent identification in or on the document makes its identification self-evident. The documents listed are referenced in the Materials Review and Facilities Inspection Worksheet (Exhibit 5), with the Worksheet reference shown in parentheses. If you have additional materials that you believe are relevant, or which you would like the Director of Technical Services to review and comment upon, include them with other materials furnished, but be sure to describe them in a covering letter or note and explain your reasons for providing them.

ALL MANDATORY DOCUMENTS MUST BE AVAILABLE AT THE TIME THE FACILITIES INSPECTION IS CONDUCTED.

1. *Photocopy of registration certificate of professional engineer in full-time responsible charge of the laboratory in jurisdiction of office location. _____
2. General information concerning the laboratory covered by the application, such as primary function, relationship to larger corporate entity and, if applicable, physical location of the laboratories involved _____
3. Written QA program (Quality Manual). _____
4. Copies internal quality system review records. _____
5. Copies of management review records. _____
6. Copies of policies and procedures to protect clients' confidential information and proprietary rights _____
7. Copies of personnel evaluations for each test or inspection _____
8. If accreditation in concrete testing is sought, a current C.C.R.L. laboratory inspection, Corp of Engineers inspection report or report from another WACEL-recognized program capable of objectively investigating concrete laboratory testing techniques and equipment is required. The applicant must also furnish evidence of participation in a WACEL-recognized Reference Sampling Program within the last year. _____
8. Two recent concrete test reports (if accreditation in concrete testing is sought; delete or obscure names of client and project). _____
9. If accreditation in soil testing is sought, a current laboratory inspection report from A.M.R.L. or another WACEL-recognized program capable of objectively investigating soil laboratory testing techniques and equipment is required. This will include evidence of participation in a WACEL-recognized Reference Sampling Program within the last year. _____
10. Two recent soils test reports (if accreditation in soils testing is sought; delete or obscure names of client and project). _____

*Failure to have this material precludes accreditation.

EXHIBIT 4: Certification of Continued Compliance

WACEL Laboratory Accreditation Program Certification of Continued Compliance

Date: _____

Date of Accreditation: _____

Laboratory: _____

Address: _____

Representative: _____

CERTIFICATION OF CONTINUED COMPLIANCE

This form must be completed and returned to WACEL by no later than _____. I have read and am familiar with WACEL's Quality Assurance Laboratory Accreditation Program Guide specifically relative to those factors that affect quality control and the ability of this engineering laboratory to provide accurate, reliable test data. Furthermore, I have read and am familiar with the Materials Review and Facilities Inspection Report issued subsequent to inspection of this facility by WACEL, and any subsequent reinspection. Based on my review and understanding of these materials and based on my knowledge of developments which have occurred in this facility over the past year, I hereby certify that no major events calling for a reinspection have transpired; that the high level of quality control which permitted accreditation is being maintained, and that this laboratory is fit for continued accreditation. In addition, I recognize that the laboratory's current accreditation expires on _____, and that application for reaccreditation should be made no later than three months prior to that date.

I also understand that as a condition of maintaining accreditation, this laboratory must participate annually in a WACEL-recognized reference sample testing program for soils and/or concrete, as appropriate. Evidence documenting the laboratory's participation in soils and/or concrete reference sampling programs as appropriate for the continuation of our accreditation should be provided to WACEL with the Certificate of Compliance and verified during the annual maintenance review audit,

Signed by the registered professional engineer with full-time supervision of the laboratory:

Printed Name of Signatory: _____

THIS SIGNED FORM MUST BE RETURNED BY _____

TO

WACEL

7508 Wisconsin Avenue, 4th Floor, Bethesda, MD 20814; email: bob@wacel.org.

EXHIBIT 5: Materials Review and Facilities Inspection Worksheets

WACEL

QUALITY ASSURANCE LABORATORY ACCREDITATION PROGRAM

LABORATORY ACCREDITATION TEAM MATERIALS REVIEW AND

FACILITIES INSPECTION WORKSHEET

Instructions: The WACEL Director of Technical Services (DTS) will use this form during the Materials Review as part of the Facilities Inspection.

1. GENERAL INFORMATION

1.1. PERSON COMPLETING THIS WORKSHEET _____

1.2. APPLICANT LABORATORY

1.2.1. Name _____

1.2.2. Address _____
_____ ZIP _____

1.2.3. Telephone _____

1.2.4. Professional engineer in full-time responsible charge

- Name _____
- States in which registered _____
- Registration certificate no. _____
- Copy of certificate provided? ___ Yes ___ No

1.2.5. Facility manager (if not P.E. in responsible charge) _____

1.3. ACCREDITATION SOUGHT ___ SOILS ___ CONCRETE ___ E329

1.4. DATE OF APPLICATION _____

1.5. DATE OF FACILITIES INSPECTION _____

2. GENERAL QUALITY ASSURANCE CONSIDERATIONS

2.1. QUALITY ASSURANCE POLICY

2.1.1. Does the applicant have a written Quality Manual? ___ Yes ___ No

2.1.2. Has the laboratory identified a technical (or quality) manager and nominated deputies to serve in their absence? ___ Yes ___ No

- Technical (or Quality) Manager _____
- Deputy to serve in absence _____

2.1.3. Has the laboratory performed and documented an internal quality system review within the past year? ___ Yes ___ No

2.1.4. Has the laboratory performed and documented a management review within the past year? ___ Yes ___ No

2.1.5. Other comments and observations _____

2.2. ORGANIZATIONAL POLICIES AND GENERAL REQUIREMENTS

2.2.1. Does each page of the QM include a preparation or revision date? ___Yes ___No

2.2.2. Does the QM include the legal name and address of the company and that of the main office, if different? ___Yes ___No

2.2.3. Does the QM include ownership and management structure? ___Yes ___No

2.2.4. Does the QM include an organizational chart? ___Yes ___No

2.2.5. Does the QM include position descriptions for each technical operational position shown? ___Yes ___No

2.2.6. Does the QM include resumes for technical staff (or ref. location)? ___Yes ___No

2.2.7. Does the agency use temporary site facilities? ___Yes ___No

- If so, does the QM describe this situation? ___Yes ___No ___NA ___

2.2.8. Does the QM include a document defining its policies and objectives for commitment to good practice and quality of inspection/testing? ___Yes ___No

2.2.9. Does the QM include a statement to the effect that their policies and operational procedures have been established to meet the requirements of ASTM E329?

___Yes ___No

2.2.10. Does the QM include a list showing applicable dates of qualifications, accreditations, and recognition by others? ___Yes ___No

2.2.11. Does the QM include a list of qualifications/accreditations by others?

___Yes ___No

2.2.12. Does the QM include a statement that the policies and procedures have been developed in order to meet the requirements of E329? ___Yes ___No

2.2.13. Other comments and observations _____

2.3. STAFF TRAINING/COMPETENCY/CERTIFICATIONS

2.3.1. Does the QM include a document describing methods used to ensure that personnel are properly trained to perform the work assigned? ___ Yes ___ No

2.3.2. Does the laboratory conduct formal competency reviews of certified technicians annually ___ Yes ___ No

2.3.3. Does the QM include a blank form for recording the results of training and competency evaluations? ___ Yes ___ No

2.3.4. Have training and competency evaluations been performed for all technicians? ___ Yes ___ No

2.3.5. Have all technicians obtained applicable certification(s) within 90 days of hire? ___ Yes ___ No

2.3.6. Does the laboratory maintain records of verification of competency for external organizations used? ___ Yes ___ No

2.3.7.

CONCRETE

SOILS

Supervising Lab Tech

Level of Certification

Supervising Field Tech

Level of Certification

2.3.8. Do supervising technicians have at least 5 years of relevant experience and an adequate certification level? ___ Yes ___ No

2.3.9. Other comments and observations _____

2.4. EQUIPMENT

2.4.1. Does the QM include an inventory of major equipment, or reference the location? Yes No

- Does the inventory list include the name of the equipment, manufacturer, model and serial number, date received and in service, and condition? Yes No

2.4.2. Does the QM include a list of equipment requiring cal/ver? Yes No

- Does the list include the required interval, a reference to the procedure used, and the location of the resulting record? Yes No

2.4.3. Does the QM include in-house calibration/verification procedures, or reference the location?

Yes No

2.4.4. Does the QM include certificates or other documents that establish the traceability of in-house calibration equipment or reference standards, or reference their location? Yes No

2.4.5. Do calibration/verification records include the date that the work was performed, the next due date, the individual performing the work, an identification of any calibration equipment used, and detailed results of the work performed? Yes No

2.4.6. Is all equipment currently calibrated or verified? Yes No

2.4.7. Other comments and observations _____

2.5. TEST RECORDS AND REPORTS

2.5.1. Does the QM include a document describing procedures used to prepare, check, and amend test reports? ___ Yes ___ No

2.5.2. Does the QM include typical reports for the work routinely performed by the laboratory? (Laboratories seeking accreditation for soils should include a few typical soils reports, likewise for laboratories seeking accreditation for concrete.) ___ Yes ___ No

2.5.3. Impressions gained from review of at least two typical reports for each discipline in which accreditation is sought.

- Soils reports (if applicable) _____
- Concrete reports (if applicable) _____

2.5.4. Do corrections or additions to reports clearly reference the report being amended? ___ Yes ___ No

2.6. SAMPLE MANAGEMENT

2.6.1. Does the QM include standard operating procedures for sample identification, transfer of samples from the field to the laboratory, sample storage, retention, disposal, and recording of results? ___ Yes ___ No

2.7. DIAGNOSTIC AND CORRECTIVE ACTION

2.7.1. Does the QM include a document describing participation in proficiency sample and on-site inspection programs? ___ Yes ___ No

2.7.2. Does this document include methods used to identify poor results and procedures followed when poor results or deficiencies occur? ___ Yes ___ No

2.7.3. CCRL or Army COE Report (If the applicant seeks accreditation in concrete testing, it must have on file a report of a CCRL inspection or Army COE inspection performed within the past two years.) ___ Yes ___ No

- Report No. and Date _____
- Have deficiencies noted in the report been corrected within 30 days? ___ Yes ___ No
- Have corrective measures been adequately documented? ___ Yes ___ No

2.7.4. AMRL or Army COE Report (If the applicant seeks accreditation in soils testing, it must have on file a report of an AMRL inspection or Army COE inspection performed within the past two years.) Yes No

- Report No. and Date _____
- Have deficiencies noted in the report been corrected within 30 days?

Yes No

- Have corrective measures been adequately documented? Yes No

2.7.5. Comments and observations _____

2.7.6. Does the QM include a procedure for handling external technical complaints?

Yes No

2.7.7. Does the procedure include who is responsible for handling the complaint, the review system, and the type of reply issued? Yes No

2.8. INTERNAL QUALITY SYSTEM REVIEW

2.8.1. Does the QM include a document describing the scope of internal quality system reviews, the frequency of the reviews, identify the individual responsible for the reviews, distribution of reports to management, and identify the location of the resulting record? Yes No

2.9. SUBCONTRACTING AND EXTERNAL TECHNICAL SERVICES

2.9.1. Does the QM include a document describing the procedures followed relative to subcontracting and ensuring the quality of external technical services? Yes No

2.9.2. Does the subcontracting policy describe procedures for selecting competent subcontractors and how the results obtained from a subcontractor are reported? Yes No

2.9.3. Does the laboratory maintain records of verification of competency for external organizations used? Yes No

2.9.4. Other comments and observations _____

2.10. TEST PROCEDURES

2.10.1. Does the laboratory maintain copies of current standards which relate to the tests performed? Yes No

2.10.2. Have procedures which differ from recognized standards been committed to writing (exclusions)? Yes No

2.10.3. For laboratories seeking accreditation for Soils:

- Has a “Laboratory Procedures Manual” been developed? (A “Laboratory Procedures Manual” is a manual describing the procedures for standard tests performed by the laboratory (not just the ASTM Standards). Yes No NA

2.10.4. For laboratories seeking accreditation in Concrete:

- Has the laboratory participated in a proficiency sample testing program for C128 (Fine Agg Sp. G)? Yes No NA
- If the laboratory also tests concrete aggregates: Have mechanical sieve shakers been verified for each different type of aggregate tested? Yes No NA

2.10.5. Are records maintained for at least 3 years? Yes No

2.10.6. Does the laboratory have documented policies to ensure the protection of clients’ confidential information and proprietary rights? Yes No

2.10.7. Does the laboratory have documented procedures for the purchase, reception, and storage of consumable materials used for the technical operations of the laboratory? Yes No

2.11. IN THE LABORATORY

2.11.1. Is all equipment (including reference materials) labeled/marked/identified to indicate its calibration status? ___ Yes ___ No

2.11.2. Is non-functioning equipment (either out of calibration or not properly working) segregated from use, or clearly labeled as out of service? ___ Yes ___ No

2.11.3. Other comments and observations _____

3. CONCRETE TESTING EQUIPMENT

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.1 COMPRESSION TESTING MACHINE	C39	
3.1.1 Make and model	--	
3.1.2 Serial number	--	
3.1.3 Capacity (lbs.)	--	
3.1.4 Dial readable to nearest ___ lbs.	0.1% Full Scale	
3.1.5 Zero adjustment on dial	Required	
3.1.6 Load Applied Continuously	Required	
3.1.7 Variable rate of loading	--	
3.1.8 Spherical seated upper block	Required	
3.1.9 Date of calibration	1 yr. max.	
3.1.10 Calibration agency	--	
3.1.11 Calibration method*	--	
3.1.12 Copy of calibration certificate available	Required	
3.1.13 Does the certification include curve data	Required	
3.1.14 Safety guards	--	
3.1.15 Other _____ _____ _____		

*Load Cell or Proving Ring

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.2 CONCRETE CYLINDER CAPPING		
3.2.1 Capping with Gypsum Plaster of Sulfur Mortar	C617	--
• Type of capping compound__	--	
• Type of capping plate	--	
• Visual condition of plate	--	
• Suitability of alignment devices	--	
• Caps checked for proper planeness	--	
• Temperature control on melting pot	Required	
• Cube strength records of capping material	--	
• Safety Equipment		
○ Exhaust fans	--	
○ Fire extinguisher	--	
○ First-aid kit	--	
○ Safety glassed	--	
○ Other	--	
3.2.2 Use of Unbonded Caps	C1231	
• Type of pads	--	
• Pad manufacturer	--	
• Durometer hardness	--	
• Are the number of tests on each pad recorded?	--	
• Are the pads used more than 100 times	--	

3.2 CONCRETE CYLINDER CAPPING (CONTINUED)	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
<ul style="list-style-type: none"> If so, has qualification testing been performed (C1231-9.2.2)? 	--	
<ul style="list-style-type: none"> Are cylinder ends checked for perpendicularly prior to testing (< 0.5 degrees or 1/8 inch for 12-inch cylinders)? 	--	
<ul style="list-style-type: none"> How are cylinders that do not meet the perpendicularly or depression checks handled? 	--	
<ul style="list-style-type: none"> Is cylinder verticality checked during load application (1/8 inch in 12 inches)? 	--	
3.2.3. Are cylinders tested to complete failure (C1231 - Note 5)?	--	
3.2.4 Other _____ _____ _____		

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.3 CURING FACILITIES		
3.3.1 Moist room or lime water curing (circle one)	C511	
3.3.2 General description of facility and condition _____ _____ _____ _____		

3.3 CURING FACILITIES (CONTINUED)	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.3.3 Cylinder storage method	--	
3.3.4 Heating and cooling method	Thermostatic Control	
3.3.5 Free moisture on cylinders (no running water)	Required	
3.3.6 Temperature	69.8 to 77.0°F	
3.3.7 Recording thermometer installed	Required	
3.3.8 Temperature records available	Required	
3.3.9 Humidity	95% min	
3.3.10 Method of determining humidity _____ _____ _____ _____		
3.3.11 Other _____ _____ _____		

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.4 CYLINDER COMPRESSIVE TEST REPORT FORM	C39	
3.4.0 Contains information required by ASTM C39/CCRL/ACI	--	
3.4.1 Contains information required by WACEL	--	

3.4 CYLINDER COMPRESSIVE TEST REPORT FORM (CONTINUED)	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.4.2 Other _____ _____ _____		

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.5 FIELD CURING OF CYLINDERS	C31	
3.5.1 Type of cylinder molds used	--	
3.5.2 Field curing method reportedly used (ACI 301)_	--	
3.5.3 Maximum/minimum thermometers reportedly used	--	
3.5.4 Cylinders reportedly picked up (48 hours max)	ASTM C31	
3.5.5 Method of transporting reported (protection from air drying/freezing)	--	

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.6 FILED TESTING EQUIPMENT		
3.6.1 Condition of slump cones/rods	C143-5.1/5.2	
3.6.2 Evidence of smooth/nonabsorptive surface use	C143	
3.6.3 Condition of air meters	C-138/C-231	

3.6 FILED TESTING EQUIPMENT (CONTINUED)	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
3.6.4 Calibration of air meters	C-138/C-231	
3.6.5 Condition of unit weight buckets	C-29	
<ul style="list-style-type: none"> ▪ Plexiglas, glass, or metal plate available in the correct size 	--	
3.6.7 Condition of concrete beam molds	C-31	
3.6.7 Additional remarks _____ _____ _____		

4. SOIL AND AGGREGATE TESTING EQUIPMENT

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
4.1 MOLDS AND HAMMERS	D698, D1557, VTM-1	
4.1.1 Adequate molds on hand (4", 6")	--	
<ul style="list-style-type: none"> Evidence of calibration of molds (both water-filled and dimensional) 	--	
4.1.2 Adequate hammers on hand (5.5 lbs, 10 lbs)	--	
<ul style="list-style-type: none"> Evidence of calibration of molds (both water-filled and dimensional) 	--	
4.1.3 Adequate number of accessories (screens pans, trowels, spatulas, water sprinklers, balances, ovens, straight edges, extruder)	--	
4.1.4 Adequate base	200 lb min.	
4.1.5 Automatic Proctor hammer (optional)	--	
<ul style="list-style-type: none"> Evidence of calibration 	--	
<ul style="list-style-type: none"> How was calibration performed? _____ _____ _____ 		
4.1.6. Additional remarks _____ _____ _____		

	<u>APPLICABLE ASTM REQUIREMENT</u>	<u>STATUS</u>
4.2 SIEVES AND SHAKERS	E11	
4.2.1 Correct soils, concrete sieves on hand (see Appendix 1)	--	
4.2.2 Sieves nest easily	--	
4.2.3 No broken wires in use	--	
4.2.4 Each sieve labeled as per ASTM E-	--	
4.2.5 Mechanical sieve shaker functioning properly	--	
4.2.6. Shaker Verified Other _____ _____ _____		

4.3 ATTERBERG LIMIT DEVICES (CONTINUED)	<u>ASTM</u> <u>MANUAL OF</u> <u>TESTING</u>	<u>STATUS</u>
4.3.3 Other		
4.4 DRYING OVENS		
4.4.1 Adequate number, size & condition	Various	
4.4.2 Thermostatically controlled and accurate	--	
4.4.3 Provisions for checking temperature against calibrated thermometer	Not required	
4.4.4 Provisions to eliminate hot spots in oven	--	
4.4.5 Other _____ _____ _____		

	<u>APPLICABLE</u> <u>ASTM</u> <u>REQUIREMENT</u>	<u>STATUS</u>
4.3 ATTERBERG LIMIT DEVICES	D4318	
4.3.1 Liquid limit devices		
<ul style="list-style-type: none"> • Complete devices and accessories 	--	
<ul style="list-style-type: none"> • Liquid limit devices in good condition (no grooves, not worn, tight axle, limited-impact circle, etc.) 	--	
<ul style="list-style-type: none"> • Devices properly calibrated (1 cm drop 	--	
4.3.2 Plastic limit equipment		
<ul style="list-style-type: none"> • Complete accessories 		
<ul style="list-style-type: none"> • Ground glass plate meets criteria 		

	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
4.5 THERMOMETERS		
4.5.1 Adequate number and ranges	Various	
4.5.2 Currently calibrated or traceable to NIST	--	
4.5.3 Other _____ _____ _____		

	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
--	---------------------------------------	---------------

4.6 SAMPLE PREPARATION APPARATUS		
4.6.1 Sample splitter	C702	
<ul style="list-style-type: none"> Physical condition with flat scoop, etc. 	--	
4.6.2 Quartering method	Acceptable	
4.6.3 Evidence of presoaking proctors	D698, D1557	
4.6.4 Evidence of low-temperature drying of samples	D4318	
4.6.5 Dispersion apparatus	D422	
<ul style="list-style-type: none"> High-speed mechanical stirrer 	--	
<ul style="list-style-type: none"> Proper physical dimensions of cup, baffles, and stirrer 	--	
<ul style="list-style-type: none"> Proper motor speed 	10,000 rpm	
<ul style="list-style-type: none"> Air jet (unlikely to see) 	--	
<ul style="list-style-type: none"> Proper design and dimensions 	--	
4.6.6 Other _____		

	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
4.7 IN-PLACE DENSITY EQUIPMENT		
4.7.1 Sand cone method	ASTM D1556	
• Sand	--	
• Evidence of calibration (apparatus and sand)	--	
• Jar, funnel, and plate	--	
• Miscellaneous equipment	--	

4.7 IN-PLACE DENSITY EQUIPMENT (CONTINUED)	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
<ul style="list-style-type: none"> Complete set (balances, drying equipment, spoons, chisels, pans, brush, etc.) 	--	
4.7.2 Nuclear method	ASTM D2922	
<ul style="list-style-type: none"> NRC and/or state license on hand 	--	
<ul style="list-style-type: none"> NRC and/or state regulations on hand 	--	
<ul style="list-style-type: none"> Procedures manual available for operators 	--	
<ul style="list-style-type: none"> Documentation of training 	--	
<ul style="list-style-type: none"> Notice to employees identifying emergency contact 	--	
<ul style="list-style-type: none"> Film badge records 	--	
<ul style="list-style-type: none"> Shipping, transfer, and survey records 	--	
<ul style="list-style-type: none"> Transport containers properly labeled 	--	
<ul style="list-style-type: none"> Sign-in/sign-out records 	--	
<ul style="list-style-type: none"> Evidence of bill of lading use 	--	
<ul style="list-style-type: none"> Field book with copy of license, charts, and daily standard counts 	--	
<ul style="list-style-type: none"> Calibration within 18 months 	--	
<ul style="list-style-type: none"> Standardization blocks (serial no. matched gauge) 	--	
<ul style="list-style-type: none"> Condition and workability of equipment 	--	
<ul style="list-style-type: none"> Evidence of standardization checks 	--	
4.7.3 Other _____ _____ _____		

	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
4.8 SCALES AND BALANCES	D4753	
4.8.1 All scales (field and laboratory) clean and operable	--	
4.8.2 Scale conditions	--	
4.8.3 Recent calibration traceable to NIST	--	
4.8.4 Scales used for purpose intended to proper accuracy range	--	
<ul style="list-style-type: none"> Concrete weight (sufficient capacity accurate to 3.0%) 	C138	
<ul style="list-style-type: none"> Sensitivity 	--	
<ul style="list-style-type: none"> Range 	--	
<ul style="list-style-type: none"> Aggregate weight (at least 100# capacity accurate to 0.1%) 	--	
4.8.5 Proctor	D698, D1557	
<ul style="list-style-type: none"> 20kg capacity readability to ± 1 gram 	--	
<ul style="list-style-type: none"> At least 1,000 grams capacity readable to ± 0.01 gram 	--	
4.8.6 Sand cone	D1556	
<ul style="list-style-type: none"> 20 kg readable to ± 5 gram 	--	
<ul style="list-style-type: none"> 1,000g readable to ± 0.1 gram 	--	
4.8.7 Atterberg limits (balance accurate to 0.01 gram)	D4318	
4.8.8 Sp. gravity of coarse aggregate (5kg accurate to 0.5 gram)	C127	
4.8.9 Sp. gravity of fine aggregate (1kg readable to 0.1 gram)	C128	

4.8 SCALES AND BALANCES (CONTINUED)	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
4.8.10 Sp. gravity of soils (accurate to 0.1% of recorded mass)	D854	
4.8.11 Moisture content	D2216	
<ul style="list-style-type: none"> sample < 200 g GP1 readable to 0.01g 	--	
<ul style="list-style-type: none"> sample > 200 g GP2 readable to 0.1g 	--	
4.8.12 Other _____ _____ _____		

	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
4.9 SPECIFIC GRAVITY TESTING	ASTM C124	
4.9.1 Coarse aggregate	--	
<ul style="list-style-type: none"> Container (wire basket or bucket) 	C138	
<ul style="list-style-type: none"> Suspension – wire of smallest practical size 	--	
<ul style="list-style-type: none"> Thermometer (minimum range of 21 to 25°C) 	--	
<ul style="list-style-type: none"> Oven and suitable containers 	--	
<ul style="list-style-type: none"> Towels or clothes 	--	
<ul style="list-style-type: none"> No. 4 and 1 ½-inch sieve 	--	
4.9.2 Soils	ASTM D854	
<ul style="list-style-type: none"> Pycnometer (100ml volumetric flask or larger or 50ml stoppered bottle) 	--	
<ul style="list-style-type: none"> Thermometer (minimum range 10 - 40°C) 	--	
<ul style="list-style-type: none"> Oven and suitable containers (cooler) 	--	

4.9 SPECIFIC GRAVITY TESTING (CONTINUED)	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
<ul style="list-style-type: none"> Vacuum or suitable heat source to expel entrapped air 	--	
<ul style="list-style-type: none"> Distilled water available 	--	

	<u>ASTM MANUAL OF TESTING</u>	<u>STATUS</u>
4.10 MISCELLANEOUS		
4.10.1 Sieves (see item 4.2)	--	
4.10.2 Hydrometer bulb for mechanical analysis	D422	
4.10.3 Evidence of calibration of hydrometer bulb	D422	
4.10.4 Other _____ _____		

Appendix

1

SIZES OF SIEVES REQUIRED

ASTM E11

A. For soils testing, ASTM D422 (Particles Size Analysis) lists the following as a complete set of sieves:

3 inch	No. 10
2 inch	No. 20
1 1/2 inch	No. 40
1 inch	No. 60
3/4 inch	No. 140
3/8 inch	No. 200
No. 4	

Optionally, the following sieves may be used:

3 inch	No. 16
1 1/2 inch	No. 30
1 inch	No. 50
3/4 inch	No. 100
No.4	No. 200
No.8	

Additionally, the following sieves are required:

No. 10 for ASTM D854, Specific Gravity

No. 40 for ASTM D422, Liquid Limit

B. The following would be considered an acceptable set of sieves for soils and concrete testing:

3 inch	No. 10
2 1/2 inch	No. 16
2 inch	No. 20
1 1/2 inch	No. 30
1 inch	No. 40
3/4 inch	No. 50
1/2 inch	No. 60
3/8 inch	No. 100
No. 4	No. 200
No. 8	

EXHIBIT 6: MFRI Report Format and Sample Wording

(Date)

Accreditation Review No (#)

REPORT OF MATERIALS REVIEW AND FACILITIES INSPECTION

Performed in conjunction with an Accreditation Review of (name of laboratory, address)

This report has been prepared by the Director of Technical Services

BACKGROUND

On (date), the DTS inspected the facilities of (name of laboratory), relying in part on WACEL-developed worksheets.

FINDINGS

Findings can be segregated into two distinct categories: tolerable weaknesses, and deficiencies.

Tolerable Weaknesses

A tolerable weakness comprises material or activity which in its current form is marginally acceptable. The nature of the weakness is not so serious as to degrade quality to an unacceptable level, but improvement is strongly encouraged. The items involved, and generally stated suggestions for improvement, are as follows:

1. Comment
2. Comment
3. Comment
4. Comment
5. Comments

Deficiencies

A deficiencies occurs when material or activity in its current form is not acceptable. A given

deficiency may comprise one or several distinct items or it may comprise a number of tolerable weaknesses which, taken together, create a deficiency.

In the opinion of the DtS, tolerable weaknesses listed as items 3, 4, and 5 above are interrelated. While any one on its own is tolerable, as indicated, the interaction between the three is such that it creates a deficiency. Accordingly, improvement of tolerable weakness 3, 4, and 5 is listed as deficiency item no. 1, below, followed by other specific deficiencies.

1. Comment
2. Comment
3. Comment
4. Comment
5. Comments

CONCLUSION

Given the deficiencies cited, the DTS cannot accredit (name of laboratory) either for soils or for concrete.

RECOMMENDATION

Deficiencies nos. 1, 2 and 3 all relate to written materials which affect both soils and concrete. It is not necessary to reinspect the facility in order to evaluate whether or not improvements made are sufficient. Accordingly, it is suggested that these improvements be made and that, when complete (name of laboratory) forward to the DTS. Assuming the revised materials are found acceptable, the DTS can recommend accreditation in the field of soils.

Deficiencies nos. 4 and 5 both relate to improvement of concrete testing equipment.

Reinspection is required before accreditation can be accorded. Reinspection will be performed by the DTS. As soon as the laboratory is ready for reinspection, the DTS should

be contacted: DTS telephone and email

NOTE: IMPROVEMENTS MUST BE MADE WITHIN ~~THREE MONTHS~~ THIRTY DAYS FROM THE DATE OF THIS REPORT. We strongly suggest they be made well before that date. Failure to make the changes within three months, or failure to notify the DTS of changes within three months, results in automatic and irrevocable termination of this accreditation engagement.

COMMENT

(Name of DTS) will be pleased to communicate with a responsible representative of (name of laboratory) relative to findings, conclusions, and recommendations.

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Copies of this document and its attachments have been furnished the WACEL Program Administrator, who will deal with the copy as specified in the Program Guide.

Respectfully submitted,

WACEL, Inc.

DTS