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WACEL Certification Program Concept Statement Revised May 2016

1.0 Purpose

The purpose of the WACEL Technician Certification program is to assess an individual's knowledge of information deemed critical to the proper performance of the tasks associated with the work for which certification is sought. Certification implies solely that an individual has met WACEL criteria and prerequisites and has passed a written examination and in some cases, a performance exam. A certification is valid for five years. WACEL criteria, prerequisites and examinations are compatible with guidelines established by ACI, ASTM, NICET, ICC and local governments.

2.0 Scope

The program is applicable to individuals performing work covered by the certification categories delineated below in Section 4 as determined by the Board of Directors.

3.0 Operational Requirements/Impropriety

WACEL offers written testing in the WACEL office, at member offices and laboratories and at designated training facilities. Supervisory personnel are requested to call at least 24 hours in advance of testing to determine availability of testing facilities. WACEL provides testing at members' offices if the member agrees to pay an administrative fee and travel expenses that are set by the Board of Directors.

3.1 Impropriety

Technicians, as part of the application and testing process, must acknowledge in writing that they are aware of and agree with WACEL policy with respect to impropriety and compromising the integrity of the testing process. Technicians who are caught cheating or compromising the integrity of the certification program, e.g. photographing tests, stealing tests, copying test questions, etc. are barred from participating in the WACEL testing program for a period of five years and will have all existing certifications automatically rescinded. If a technician is accused of cheating or compromising the integrity of the testing process, he or she has the opportunity to appeal any disciplinary action to the WACEL Board of Directors.

4.0 Technical Requirements

Individuals considered for WACEL certification programs shall have sufficient education, training and experience to assure understanding of the principles and procedures of the tasks comprising the position for which certification is sought.

4.1 Concrete Inspection and Testing

Concrete inspection and testing comprise two levels of technical qualification. They are:

4.1.1 Level I Concrete Technician: Shall understand the basic concepts of concrete mixes, cements, aggregates and water content and how variations affect the final product, and shall have sufficient education, training and experience to properly perform normal daily control tests for concrete, such as preparation and testing of compressive-strength cylinders and determination of slump, air content and unit weight. The written examination tests a technician's knowledge of ASTM C172, C1064, C143, C31, C138, and C173.

4.1.2 Reinforced Concrete/Masonry Inspection (Level II Concrete Technician): Shall be thoroughly familiar with applicable codes and specifications, as well as various ASTM and ACI standards dealing with concrete and ASTM standards dealing with aggregates, and shall be able to interpret and evaluate test results and able to organize and report field and laboratory tests. In addition, a Level II Concrete Technician shall have sufficient education, training and experience to properly inspect concrete handling and placing, prepare trial batches, test and monitor grout and mortar, inspect simple reinforced masonry, visually inspect reinforcing steel and basic vertical and horizontal formwork, and can interpret plans, specifications, shop drawings and details for material, dimension, size and location.

4.1.3 Structural Concrete/Masonry Inspector

A Structural Concrete/Masonry Inspector shall have sufficient education, training and experience to understand plans and specifications; shall be familiar with ACI standards and other applicable codes, and shall be proficient in field observation procedures to verify compliance with these directives. The Structural Concrete/Masonry Inspector shall be capable of proper observations, inspections and testing of forms, reinforcing steel, post-tensioning, tilt-up construction and other facets of placing, sampling and curing concrete, and shall be familiar with structural masonry construction beyond the basic level, including familiarity with the various codes and directives concerning such construction as well as sampling and testing procedures. In addition, the Structural Concrete/Masonry Inspector must understand advance topics for concrete as a construction material such as the effect of low water-cement ratios, air entrapment, air content and hydration, etc., Additionally, the exam covers basic concepts of batching, consolidation, curing, hot and cold weather concreting and destruction and nondestructive testing methods.

4.2 Aggregate Concrete Laboratory Technician

A certified aggregate laboratory technician shall have sufficient training, education, and experience to conduct the testing of aggregate samples in the laboratory. ASTM C1077 gives guidance as to standard test methods covered in this certification. These include: ASTM C40, C117, C127, C128, and C136. Technicians should be familiar with these standard test methods, able to properly perform the tests, and perform required calculations.

Certification requirements include successful completion of written and performance exams. The performance examination is administered to the technician by a registered Professional Engineer who is approved by WACEL or a member of the WACEL staff. Performance examination grading sheets are available in the “Members Only” section of the WACEL website. Instructions for administering performance exams are included with the grading sheets.

4.3 Soil Inspection and Testing

Soil Inspection and Testing qualifications are:

4.3.1 Soil Technician: Shall have sufficient education, training and experience to identify soils; perform basic laboratory soil tests; obtain soil samples in the field, and perform field density tests for compaction control.

Responsibilities are limited to performance of required tasks and reporting results, without decision-making. More specifically, a Soils Technician shall:

- be familiar with soil types and classification systems in general;
- be proficient in application of the Unified Soil Classification System;
- have a basic understanding of the concepts of specific gravity, void ratio, saturation, etc.;
- be able to interpret moisture content and liquid and plastic limits; sieve analysis; laboratory compaction (moisture-density relationships), and performance of field density tests by sand cone or nuclear methods, and be proficient in the use of a calculator for multiplication and division and have knowledge of the pertinent conversion factors for the units utilized.
- demonstrate proficiency to perform tests to determine moisture content of soil by direct heating (ASTM D4959)
- demonstrate proficiency to perform tests to determine moisture content by calcium carbide gas pressure tester (ASTM D4944-04)

- demonstrate proficiency to perform a one point proctor
- demonstrate proficiency to perform density and unit weight of soil in place by sand cone
- demonstrate proficiency to use a Nuclear Density Gauge per ASTM D6938-07b

Certification requirements include successful completion of written and performance exams and proof of Nuclear Gauge Safety Training Certification from a WACEL-recognized certification program.

A registered Professional Engineer who is approved by WACEL or a member of the WACEL staff must administer performance exams to technicians. Performance examination grading sheets are available in the “Members Only” section of the WACEL website. Instructions for administering performance exams are included with the grading sheets.

4.4 Foundation Technician

A Foundation Technician shall have sufficient education training and experience with general foundation observation and testing requirements and demonstrate an ability to interpret plans and specifications. The exam is divided into two sections: General Knowledge and Specification and Plan Interpretation. The General Knowledge section includes questions addressing shallow foundations, field reporting requirements, density testing, problem soils, and ACI and ASTM requirements.

The second part of the test evaluates a technician's ability to read and interpret plans and specifications. Every examinee is provided with a sample geotechnical report and a set of project drawings. Examinees are asked to identify boring depths, different soil types, slope steepness, fill types, plasticity of soils, bearing capacity, leveling pad and lift thicknesses, design strengths for different foundations, compaction requirements, and optimum moisture contents, among other design, testing and observation criteria.

4.6 Structural Steel Inspector

A Structural Steel Inspector shall have sufficient training, education and experience to understand contract drawings, shop drawings and project specifications. Structural Steel Inspectors should also be familiar with codes and standards promulgated by the American Institute of Steel Construction (AISC) American Welding Society (AWS), Steel Structures Painting Council and appropriate specifications related to steel decking and joints. In addition, the Structural Steel Inspector shall be capable of

- Reviewing approved project documents and field erection documents
- Determining structural shapes, properties and tolerances
- Confirming anchor rods and column bases
- Inspecting bolted and welded connections

- Inspecting column plumb, decking, joists, member sizes and member placement, painting and surface preparation, and
- have knowledge of nondestructive testing of steel and weldments
- Demonstrating proficiency with field procedures to help verify compliance with structural steel specifications, and
- Recognizing and reporting deficiencies and deviations from specifications.

Other areas covered by the certification include structural shear studs, composite decks, steel decks, steel joists, cold-formed steel structural framing, proper reporting methods and general and structural steel topics covered in the IBC's Special Inspection Program relating to structural steel.

There are two levels of certification. Level I is granted when technicians successfully pass the WACEL certification exam. Level II is granted when technicians successfully pass the WACEL certification exam and are certified as an American Welding Society (AWS) Certified Welding Inspector Level I or equivalent.

4.7 Sprayed-On Fireproofing

Sprayed-on Fire Proofing Testing and Certification technical qualifications are:

4.7.1 Technicians shall be familiar with the purpose of sprayed-on fire resistive materials, can describe different types of materials, understands and can discuss safety issues associated with testing and inspecting sprayed-on fire resistive materials and can review and extract required testing and information from approved submittals. In addition, a Technician must:

- know how to properly measure the thickness of sprayed-on fire-resistive materials in accord with ASTM standards;
- understand the wide range of testing frequency requirements that may be found in applicable publications;
- understand the two different density test methods permitted by ASTM E 605;
- can properly describe how to take and record a sample for density testing as required by ASTM E 605;
- understand how to properly conduct an adhesion/cohesion test in accord with ASTM E 736;
- know how to determine and report deficiency test results
- understand the various aspects of proper application, ambient temperature and painted/primed structural members.

4.8 Soil Laboratory Technician

Can visually identify and classify soil in accordance with USCS.

- Has basic knowledge of and can interpret soils laboratory tests (moisture content, sieve analysis, Atterberg limits, proctor tests)

- Can obtain, identify and transport soil samples
- Familiar with requirements of ASTM D2216 Moisture content
- Familiar with requirements of ASTM D422 Grain Size Determination - Hydrometer
- Familiar with the requirements of ASTM D4318 Atterberg Limits
- Familiar with the requirements of ASTM D698, D1557 and VTM -1 Proctor Tests
- Familiar with the requirements of ASTM D1883, VTM-8, California Bearing Ratio
- Familiar with the requirements of ASTM D854 Specific Gravity Testing

4.9. Concrete Masonry Strength Testing Technician

Certification requirements include successful completion of written and performance exams. A registered Professional Engineer who is approved by WACEL administers the performance examination to the technician. Performance examination grading sheets are available in the “Members Only” section of the WACEL website. Instructions for administering performance exams are included with the grading sheets.

The Concrete Masonry Strength Testing Technician program covers:

- Capping cylindrical concrete specimens using molten sulfur mortar as delineated in ASTM C617.
- Using unbonded caps in the testing of cylindrical concrete specimens as specified in ASTM C1231.
- Determining the compressive strength of cylindrical concrete specimens in accordance with ASTM C39.
- Testing a cast, flexural strength test specimen using third-point loading as specified in ASTM C78.
- Preparing and testing drilled cores for compressive strength testing in accordance with ASTM C42.
- Determining the compressive strength of masonry mortar cubes in accordance with ASTM C109 and C780.
- Determining the compressive strength of masonry grout prisms as specified in ASTM C1019.

5.0 OTHER REQUIREMENTS AND PREREQUISITES

All applicants shall complete and submit to WACEL an application for certification for the level of certification being sought. Applications must be received in the WACEL office prior to the test. Failure to submit an application or an application that is incomplete shall be subject to stipulations set forth in Sections 6.4 and 6.5. Other requirements and prerequisites are as follows:

- 5.1 Level I Technician (Concrete, Soils, Fireproofing, Soil Laboratory Technician, Concrete/Masonry Strength Testing Technician and Aggregate Laboratory Technician)

5.1.1 Education: Shall have sufficient formal education to read, understand and execute written instructions, codes and procedures, and shall be capable of keeping accurate field records.

5.1.2 Demonstrated Proficiency

Concrete Level I: The goal of the WACEL concrete practical is for technicians to demonstrate proficiency in performing field tests, including molding cylinders, making a slump test, and performing air and yield tests. Successful completion of a field test administered by WACEL will demonstrate such proficiency.

Soil Level I: The goal of the WACEL soil practical exam is to assess a technician's knowledge and ability to properly perform and record the results of basic soil field tests. Technicians must be familiar with testing procedures for ASTM D4959-07 Water (Moisture) Content of Soil by Direct Heating, ASTM D4944-04 Moisture Content by Calcium Carbide Gas Pressure Tester, One Point Proctor, ASTM D1556-07 Density and Unit Weight of Soil in Place by Sand Cone and ASTM D6938-07b Nuclear Density Gauge.

Concrete/Masonry Strength Testing Technician: The goal of the Concrete/Masonry Strength Testing Technician is for technicians to demonstrate proficiency in performing laboratory tests for compressive strength testing (ASTM C39-05), unbonded caps (ASTM C1231-05), capping cylindrical concrete specimens (ASTM C-617-98 (2003) and flexural strength of concrete (ASTM C78-02)

Aggregate Laboratory Testing Technician: The goal of the Aggregate Laboratory Testing Technician is for technicians to demonstrate proficiency in performing laboratory tests for organic impurities (ASTM C40-04), coarse aggregate specific gravity (ASTM C127-04), fine aggregate specific gravity (ASTM C128-04a), sieve analysis of fine and coarse aggregates (ASTM C136-06) and Minus #200 Wash (ASTM C117-04).

5.1.3 Recommendation: Shall be recommended for Level I certification by a qualified supervisor. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.1.4 Other Qualifications: Shall have other or equivalent qualifications established or subject to approval by the WACEL Quality Assurance Committee.

5.1.5 Written Examination: Shall pass the written examination for Level I certification.

5.2 Level II Technician (Concrete, Foundations)

5.2.1 Prior Certification: Shall be certified as a WACEL Level I Soils Technician and/or a WACEL or ACI Field Level I Concrete Technician.

5.2.2 Prior Experience: Shall have one year of satisfactory performance as a Level I Technician or the equivalent or have the equivalent training and experience that in the opinion of the professional engineer in charge of the firm, the individual can perform the duties of a Level II Technician.

5.2.3 Recommendation: Shall be recommended for Level II certification by a qualified supervisor. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.2.4 Other Qualifications: Shall have other or equivalent qualifications established or subject to approval by the WACEL Quality Assurance Committee.

5.2.5 Written Examination: Shall pass the written examination for Level II certification.

5.3 Foundation Technician

5.3.1 Formal Education: Shall have a formal education at least equivalent to that required for a high school diploma. (Additional formal education is expected.)

5.3.2 Prior Certification: Shall be certified as a Level I Concrete Technician and Level I Soils Technician. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.3.3 Field Experience: Shall have at least a years' relevant field experience, or have equivalent education and experience described in writing and attested to by the applicant's supervisor, who shall be a registered professional engineer. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.3.4 Recommendation: Shall be recommended for certification by the professional engineer in charge of services provided by the firm. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.3.5 Other Qualifications: Shall have other or equivalent qualifications established or subject to approval by the WACEL Quality Assurance Committee.

5.3.6 Written Examination: Shall pass the written examination for Foundation Technician.

5.4 Structural Concrete Masonry Inspector

5.4.1 Formal Education: Shall have a formal education at least equivalent to that required for a high school diploma. (Additional formal education is expected.)

5.4.2 Prior Certification: Shall be certified as a Level I and II Concrete Technician and attested to by the applicant's supervisor, who shall be a registered professional engineer. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.4.3 Field Experience: Shall have at least a years' relevant field experience, or have equivalent education and experience described in writing and attested to by the applicant's supervisor, who shall be a registered professional engineer. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.4.4 Recommendation: Shall be recommended for certification by the professional engineer in charge of services provided by the firm. (In the event the applicant is unemployed, self-employed or employed by a nonmember, this recommendation shall be furnished and sealed by a professional engineer familiar with the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.3.5. Other Qualifications: Shall have other or equivalent qualifications established or subject to approval by the WACEL Quality Assurance Committee.

5.3.6 Written Examination: Shall pass the written examination for Structural Concrete/Masonry Inspector certification.

5.4 Structural Steel Inspector

5.4.1 Formal Education: Shall have sufficient formal education to read, understand, and execute written instructions, codes and procedures, and shall be capable of keeping accurate field records. Formal education should be at least equivalent to that required for a high school diploma. (Additional formal education is expected.)

5.4.2 Recommendation: Shall be recommended for certification by a qualified supervisor. (In the event the applicant is unemployed or self-employed, this recommendation shall be furnished and sealed by a professional engineer familiar with

the applicant's capabilities. Such recommendation shall also identify the circumstances that establish its propriety.)

5.4.3 Other Qualifications: Shall have other or equivalent qualifications established or subject to approval by the WACEL Quality Assurance Committee.

5.4.4 Written Examination: Shall pass the written examination for certification.

6.0 EXAMINATIONS

6.1 Administration

Examinations shall be administered by an independent party and shall be graded by an independent party not affiliated with a member firm.

6.2 Study Guides

WACEL has prepared study guides for all levels of certification outlined above except Structural Steel. Study guides are free and can be downloaded at www.wacel.org.

6.3 Passing Grade

To pass an examination, an applicant shall obtain an overall grade of 80 percent with a minimum of 70% correct answers on all plan reading sections.

6.4 Fulfilling Requirements and Prerequisites

Applicants shall meet all requirements and prerequisites for certification within three calendar months from the date on which examination results are received in the WACEL office. If requirements and prerequisites are not fulfilled within that time period, or if the WACEL office is not informed of such fulfillment within that time period, except applicants for Concrete Technician Level I, Soil Level I, Concrete/Masonry Strength Testing Technician and Aggregate Laboratory Testing Technician, the examination will be considered void. Applicants must take field and written sections of the Concrete Level I, Soil Level I, Concrete/Masonry Strength Testing Technician and Aggregate Laboratory Testing Technician exams within 90 days of one another and provide evidence of doing so. Results of the test must be reported to the WACEL office within 45 days of the technicians being notified of exam results. Such voidance shall not disencumber the applicant from fulfilling certification-related financial obligations to WACEL.

6.5 Applications

Applicants for WACEL certification must submit a completed application for each certification sought to the Program Coordinator at the WACEL office. Applicants who do not submitted a completed application signed by a laboratory supervisor acceptable to WACEL or (nonmembers) registered professional engineer will not be certified. Applications are available at www.wacel.org.

6.6 Examination Costs

WACEL members bear the majority of examination costs through their dues payments. Rates in effect at the time of this document's issuance are as follows. (Note: rates are subject to change at any time. Current rates are published on www.wacel.org.)

Written Examination

WACEL Member Firm Rates

Soils I, Concrete I, Concrete II, Foundation Technician, Fireproofing, Structural Concrete/Masonry Inspector, Structural Steel Inspector, Soil Lab Technician, Concrete/Masonry Strength Testing Technician	\$100 per examination
Practical Examinations	
Concrete Technician Level I	\$100 per examination
Soils Level I	\$50 per examination*
Concrete/Masonry Strength Testing Technician	\$50 per examination*
Aggregate Laboratory Testing Technician	\$50 per examination*

*The cost applies to proficiency exams that are given in-house that are overseen by the firm's PE of record. The price increases to \$100 per exam if administered by WACEL.

Testing at member's facility (five tests minimum)	\$250 per visit plus exam costs
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Nonmember Firm Rates

Nonmembers must prepare for all exams. Applications will not be honored unless accompanied by payment.

Written Examination

Soils I, Foundation Technician Concrete I, Concrete II, Structural Concrete/Masonry Inspector, Structural Steel Inspector and	\$355 per examination
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Practical Examination

\$355 per examination

Government or Nonprofit Organization Representatives Rates

Written Examination

Soils I, Concrete I, Concrete II, Foundation Technician, Fireproofing, Structural Concrete/Masonry Inspector, Structural Steel Inspector, Soil Lab Technician, Concrete/Masonry Strength Testing Technician	\$110 per examination
Practical Examinations	
Concrete Technician Level I	\$110 per examination

Soil Level I	\$110 per examination
Soils Level I	\$110 per examination
Concrete/Masonry Strength Testing Technician	\$110 per examination
Aggregate Laboratory Testing Technician	\$110 per examination

6.7 No-Show Charge

Technicians who apply to the training courses but fail to attend are billed a no-show charge. Member technicians are charged a no-show charge if they fail to attend a scheduled practical examination. Nonmember technicians will forfeit their testing fee if they fail to show for the practical exam.

6.8 Release of Information

Information about an applicant's test score will be made known by WACEL only to the duly authorized representative of the WACEL member firm employing the applicant, or to the duly authorized representative of some other organization employing the applicant when such other organization has paid all fees associated with the certification examination involved.

7.0 CERTIFICATES

7.1 Issuance and Display

Upon successful completion of all requirements, wall and wallet certificates shall be issued to the certified individual by WACEL. Wallet certificates should be carried at all times to provide evidence of certification.

7.2 Issuance Restrictions

7.2.1 Member Firm Personnel: Certificates shall not be issued to individuals employed by any member firm which is more than 90 days in arrears of dues or other payments to WACEL, unless certification fees are paid separately at nonmember rates.

7.2.2 Nonmember Firm Personnel: Certificates shall not be issued to individuals employed by any nonmember firm until all certification fees then owing have been paid in full and other prerequisites satisfied.

8.0 RECERTIFICATION

In order to be recertified, technicians must retake and pass the written exam and appropriate proficiency (field) tests every five years.