

AGENDA

Committee 121 Quality Assurance Systems for Concrete

**Kansas City Marriott
Kansas City, MO**

**Sunday, April 12, 2015
3:00 to 5:00 pm
Room: Big Joe Turner B**

MEMBERS:

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Vice Chair

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Johan C. F. Schor

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James R. Turnham

Woody L. Vogt

CONSULTING MEMBERS

Stefanos J. Eapen

Alejandro Graf Lopez

Morris V. Huffman

Larry Mrazek

Gajanan M. Sabnis

Paul Zoltanetzky, Jr.

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Allison John

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Jose Rangel

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Peter Stamps

Rongyun Xu

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Sunday, April 12, 2015

3:00 to 5:00 pm

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1. Call to Order and Welcome
2. Introduction of Members and Guests
3. Update of Membership Status
4. Establish Date of Next Meeting
5. Attendance – Prior Notification of non-attendance, response to email
6. Approval of Minutes from Washington, DC
7. Announcements
8. Old business:
 - A. Revisions to the document – *121R-08 -Guide for Concrete Construction Quality Systems in Conformance with ISO 9001-* Status of the rewrite ***Needs to be done this year.***
9. New Business
 - A. TAC responses to submittal of the text balloted under Ballots 1.1, 2.1 and 3
 - B. Development fo text for chapters on
 1. Batching
 2. Laboratory Testing and Inspection
 3. Precast Manufacture
10. Open discussion on ideas for new projects
11. Adjourn

Outline - Contract Lab Testing and Inspection

1. Scope
2. Roles of Labs
3. Levels of Project Participation
 - A. Scope of services – Types of tests and inspections –
 - Categorization of labs into simple, intermediate, and sophisticated. (*Depends on what level of testing they perform – CSA A283 has a categorization level system for their certifications*)
 - Outsourcing thru liaison and networking with other labs for work not within their capabilities (*resulting in possible longer turn around for services that cannot be done in-house*)
 - Calibration and testing laboratories
 - Inspection service organizations
 - Special Inspections for Building Official or Owner acceptances
 - Quality control services for contractor in-house programs
 - Lab testing to include qualification and confirmation of materials and mix design and trials
 - B. Roles on the project site
 1. Technician work to include only testing and no decision making or leadership roles
 2. Inspection role with the authority to accept or reject
 3. Total quality program management
 - a. QA
 - b. QC
4. Standards for performance and competency as an organization - Applicable standards
 - A. AASHTO R18
 - B. ISO 17028, 17025, 17021, 17020
 - C. ASHTO R18
 - D. CSA A283-06, A23.1,
 - E. ASTM E329 – Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 - F. ASTM C1077 – Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
5. Certification, Accreditation, registration, and licenses – Scope and mechanisms of recognition, overlaps and duplications
 - (*difference between certification and accreditation*)

- *(scopes of certifications – do all only certify or accredit to specific task rather than give blanket certs?)*
 - *(Talk about local licensing. NYC has these requirements. WACEL is required of DC area cities. What about other cities and states?)*
- A. AASHTO –AMRL, CCRL
 - B. NACLA - Laboratory Accreditation Bureau (L-A-B) to accredit calibration and testing laboratories and Inspection Services Accreditation Bureau (IS-A-B) to accredit inspection service organizations
 1. L-A-B
 2. I-S-A-B
 - C. A2LA
 - D. NAVLAP
 - E. WACEL - Washington Area Council of Engineering Laboratories, Inc.
 - F. Local jurisdictions
 - G. NAFLAP???
 - H. NIST
6. Staffing – human resources - counts and certifications of technicians, engineers, lab personnel, PE's, managers, etc.
Are all these persons in-house or only available through outsourcing?
7. Operations
- A. Dispatching, field management, communication with techs, inspectors, client
 - B. Reporting - Turnaround time, management review, accuracy and detail, test results equipment tracking, formats and sensibility of reports *(do they carry a lot of useless, repetitive information and little substance?)*
 - C. Sample marking, storage, handling, transportation, and curing.
 - D. Record keeping, archiving, traceability of information, data bases,
8. Qualification, Competency, and Certifications of personnel (see common Processes - Training
- A. Technicians – Types of certs to include those from CCIL, ACI, WACEL
 - B. Engineers
 - C. Managers
 - *How quickly can they come up with a list of personnel and their qualifications, resumes, certifications, etc, and the associated documentation?*
 - *Do they train in-house or offer training to others as part of an ACI network?*
9. Management of equipment
- A. Inventory
 - B. Condition
 - C. Calibration

How quickly can they come up with a list of the equipment they have and the latest calibration date? It should include year of purchase, make, model, serial number, and calibration date.

10. Company resume – scope and scale of experience.

11. Quality Plans

12. Observation of Activities (*Use things from Guide, Chapter 3*).

13. *Measurable indicators of performance (Coefficient of variation in testing results?)*

13. Resources

- A. PE's on staff - *For special inspections, do they have the PE on staff, or do they have to go outside the organization? Do local laws of certification / accreditation requirements require them have a PE on Staff? I think CCIL does in Canada.*
- B. Subconsultants
- C. Networking of other labs for overflow and specialties
- D. Libraries of ASTM, ACI, CRSI, etc. Standards

Ideas - Audit Document – Labs

1. How quickly can they give you a list of the personnel they have on staff and their qualifications / certifications? Do all these people work for them, or are they just “on lone” from another company?
2. How quickly can they come up with the list of their equipment complete with serial numbers, make and model, and most recent calibration date?
3. Do they have a data base for test results tracking, or do they just give you the results and you keep track on them?
4. For special inspections, do they have the PE on staff, or do they have to go outside the organization? Do local laws of certification / accreditation requirements require them have a PE on Staff? I think CCIL does in Canada.
5. Dispatching efficiency. Do they have a central person for this? Are they the manager or just an administrative person that has not clue as to what the work is about?
6. Tracking of cost reports, tests, and charges for services. Do they have electronic records of the reports to be accessed quickly, or is it all done on paper? Do they have an organized billing system? Do they bill you on the basis of itemized charges that are traceable to a specific date, sample, report, or person assigned? Do they have dispatch log to recording the time and location of the employees?
7. Standards for performance:
 - a. ASTM A329?
 - b. ASTM A1074?
 - c. ISO 17025, 17011, 17020
 - d. ASHTO R17
 - e. CCRL
 - f. AMRL
 - g. CSA A283-06, A23.1,
 - h. ASTM E329 – Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 - i. ASTM C1077 – Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
 - j.
8. Accreditations and certifications and registries
9. Auditing, accrediting, and certifying bodies and their hierarchies (who accredits them?)
10. Scope of capabilities – Level of talent and what they can do.
11. Scope of accreditations
12. Performance – Coefficient of variation (Luke Snell Email)
13. What other measureable indicators of performance?
14. Take a look at the ACI 311 specifications that were recently published.
15. Do they have a quality manual?
16. Do they have a library of ASTM’s (or CSA) for the work they cover?

17. Record keeping and archives.
18. Traceability of information
19. Difference between accreditation and certification
20. Calibration of equipment.
21. Their forms and paperwork. Do they make sense. Do they fit your needs?
22. Who reviews the reports. How long does it take to get an official copy? Can you get the report at the end of each day?

From CCIL

Why It Is So Important

Certification is generally defined as the procedure by which an authoritative organization gives formal recognition that a body or person is competent to carry out specific tasks. For a laboratory, it is the formal recognition of a laboratory's capability to carry out specific identified tests.

Certification of testing laboratories is critical to the construction industry. It validates the test results upon which important decisions with significant financial impact are made. The key benefits are the assurance of:

- Qualifications, training and experience of staff
- Equipment and instruments are appropriately calibrated and maintained
- Sustainability of calibrations
- Validity and appropriateness of the methods
- Adequate quality assurance and quality control procedures associated with the laboratory procedures
- Appropriate sampling, handling and sample transportation practices
- Accurate recording and reporting of data
- Appropriate testing environment (facilities, etc)
- Traceability of measurements and calibrations to the correct standards

- Appropriate application of method uncertainty considerations

Overall, laboratory certification results in an enhanced confidence in testing results which in turn leads to fewer disputes during construction projects.

Concrete Certification Program

In 2009, CCIL acquired the Concrete laboratory certification program from CSA International. The acquisition of the CSA program allowed for an orderly transfer and continuation of a quality certification program staffed by highly trained CCIL materials testing engineers, scientists and inspectors.

The certification program for Concrete is a national program which certifies laboratories in accordance with CSA A283-06, the current qualification code for concrete testing laboratories. The concrete certification program is overseen by a National CPAC committee consisting of representatives of various industry stakeholder organizations, including:

Overview

The certification of Concrete laboratories is a national program which certifies laboratories in accordance with CSA A283-06, the current qualification code for concrete testing laboratories, as well as additional criteria as may be established by CCIL.

CSA A283-06 defines several mandatory components, including:

1. The laboratory shall have the equipment and trained staff capable of performing the test procedures for the category under which the laboratory is certified.
2. The equipment shall be maintained and calibrated to comply with the appropriate requirements of CSA A23.2 and CSA A283.
3. Each certified laboratory shall employ at least one technician who holds a valid CCIL Certified Concrete Field Testing Technician card. In addition, laboratories must employ one or more technicians qualified in the appropriate category, and for all additional tests listed on the laboratory's certificate.
4. The laboratory shall maintain records of test results, within-laboratory proficiency, calibration and verification of equipment, qualifications of staff, and identified deficiencies and corresponding corrective measures.

5. The laboratory must be under the supervision of an engineer licensed to practice in the jurisdiction in which the laboratory is located and who has a minimum of two years of working experience in the operation of a concrete testing laboratory and is a full-time employee of the laboratory.
6. The laboratory shall execute a formal undertaking in writing to abide by the test methods and procedures in the applicable standards.
7. The laboratory shall demonstrate continued compliance by undergoing an audit by CCIL at least once per year to maintain its certification.

In addition, all new Concrete laboratories applying for certification must participate in correlation testing to demonstrate their proficiency and ability to produce reliable test results on compression samples.

There are four categories of Concrete laboratory certification:

- Category 0 - Basic certification. This category includes the most common field procedures for sampling and testing plastic concrete, and measuring the compressive strength of concrete.
- Category 0 - Basic certification plus the flexural test option. This category includes all the tests in Category 0, as well as the field and laboratory procedures for measuring the flexural strength of concrete.
- Category 1 - Intermediate certification. This category includes all the tests in Category 0, as well as laboratory and field procedures for sampling and testing concrete aggregates, more tests on plastic concrete, and the obtaining and testing of drilled cores.
- Category 2 - Advanced certification. This category includes all the tests in Category 1, as well as more specialized tests on aggregates and concrete.

Laboratories certified as Category 1 or 2 may also be certified for several test methods defined in CSA A283-06 as additional tests. In general, these are specialized tests performed on aggregates, concrete, groundwater, and grout.

Concrete technicians employed by certified laboratories must demonstrate their proficiency in carrying out the test procedures for which the laboratory is certified, through practical tests and written examinations. Technicians passing the written and practical Field Exams are issued a CCIL Certified Concrete Field Testing Technician card valid for a period of 5 years. The laboratory is provided with a written record of technicians passing the written and practical Laboratory Exams. The qualifications of a laboratory technician are also valid for five years.

Program Details and Tests

The test methods included in the CCIL certification program for Concrete laboratories are those listed in Update No. 2 of CSA A283-06 (dated June 2013). Test method ASTM E1155M is not included in the program because it applies to construction tolerances rather than material properties. The following test methods are included in each category:

- Category 0 - Basic Certification: CSA A23.2-1C, 3C (compression specimens only), 4C, 5C, 9C, 17C and 19C;
- Category 0 - Basic Certification plus the flexural test option: Category 0 tests methods plus CSA A23.2-3C (flexural test specimens) and 8C;
- Category 1 - Intermediate Certification: Category 0 test methods plus CSA A23.2-1A, 2A, 3A, 4A, 5A, 6A, 7A, 10A, 11A, 12A, 13A, 6C and 14C;
- Category 2 - Advanced Certification: Category 1 test methods plus CSA A23.2-8A, 2C, 11C and 12C (including 18C).
- Laboratories certified as Category 1 or 2 may be certified for any of the following additional tests: CSA A23.2-9A, 14A, 16A, 17A, 23A, 24A, 25A, 26A, 29A, 1B, 2B, 3B, 4B, 6B, 8B, 3C (flexural test specimens), 7C, 8C, 10C, 13C, 15C, 16C, 18C, 20C, 21C and ASTM C457, C666/C666M and C1202.

Reference and Working Documents

The following documents provide info and the terms of references for the certification program:

- [CCIL Concrete Certification Program Application for Services Form](#)
- [Information for New Concrete Laboratory Applicants](#)
- [CCIL Concrete Testing Laboratory Certification Program Description](#)
- [CCIL Concrete Testing Laboratory Certification Compliance Report](#)
- [CCIL Concrete Testing Laboratory Certification Checklist](#)
- [Procedures for Upgrading the Certification of Concrete Laboratories](#)
- [CCIL LC-102 , Concrete Laboratory Certification Document](#)

Laboratories must purchase copies of:

1. CSA Standard A283-06 "Qualification code for concrete testing laboratories"
2. CSA Standard A23.1-09 "Concrete materials and methods of concrete construction and CSA Standard A23.2-09 "Test methods and standard practices for concrete"
3. All ASTM Standards for which the laboratory is certified.

