



Seals of Quality Concrete

Application and Check List

TO BE COMPLETED BY AUDITING ENGINEER (PLEASE PRINT)

COMPANY NAME _____

FACILITY LOCATION _____

STREET OR HIGHWAY LOCATION OF FACILITY _____

CONTACT PERSON _____

PHONE _____ EMAIL _____

NAME OF CERTIFYING ENGINEER _____

DATE OF INSPECTION _____

SEAL OF QUALITY CONCRETE

SEAL OF SPECIAL QUALITY CONCRETE

FOR RMCAO USE ONLY

NEW EXPIRY DATE _____

Date

Initial

RECEIVED _____

CHECKED _____

CERT. MAILED _____

CONTACT _____



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Foreword

The Ready Mixed Concrete Association of Ontario, the representative organization of ready mixed concrete producers in the Province of Ontario performs several important functions for its members and industry.

One of these functions is to enable the member producers to provide quality assurance to their customers. In order to do this, each production facility is inspected to ensure that by virtue of equipment, facilities, materials, statistical control and procedures, the proper "capability" of producing quality concrete exists. The Association offers an "Audit and Check List" for Ready Mixed Concrete and Mobile Mix Concrete Production Facilities.

RMCAO Certification also includes ECO CONCRETE Facility Certification (effective January 2013). This **ECO CERTIFIED Concrete Facility** Certification program is designed to provide owners and customers with the highest degree of assurance that the concrete facility, company and products they have selected to supply their project, address sound and responsible Environmental and Sustainable Development Facilities management and operations, and that manufacturing practices and protocols support their choice of Responsible Material Procurement.

ECO identifies Environmental and Sustainable Development stewardship and responsibility of the facility's processes following LEED rating system to minimize the environmental footprint.

A second function of the Association is to provide authoritative, accurate information about the quality of ready mixed concrete to specifiers and users in the construction industry -- architects, engineers, contractors, builders, government agencies, etc. The Association and Check List publication "*Seals of Quality*" of which this is the Foreword, details the requirements of the Association for demonstrating to the customer the quality of concrete from a *member* plant.

The qualifying procedures prescribed in this publication are in general agreement with the current requirements of CSA-A23.1 and CSA-A23.2 - documents that are generally referred to in concrete specifications in current use.

Copies of this Application and Check List will be furnished by the RMCAO for each member plant for which an application for a Seal is to be made.

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REFERENCES

1. CSA Standards CSA A23.1/2 – current edition
2. American Concrete Institute Standard 214 "Evaluation of Strength Test Results of Concrete" – current edition
3. Ontario Provincial Standard Specification - OPSS 1350 MUNI - Material Specification for Concrete - Materials and Production – current edition
4. Ontario Provincial Standard Specification – OPSS 1350 PROV – Material Specification for Concrete – current edition

Application Instructions

Qualification

The granting of a *Seal of Quality Concrete* or a *Seal of Special Quality Concrete* by this Association is restricted to RMCAO members who possess a valid "Certification of Ready Mixed or Mobile Mix Concrete Production Facilities". A *Seal of Quality* shall be granted for a period of one (1) year from the date of RMCAO Facility Certification. Applications for a seal of quality in the proceeding year must be based on new test data that is within 12 months of the date of the application.

Application for a *Seal of Quality Concrete* or a *Seal of Special Quality Concrete* may only be made for a plant currently producing concrete. Seals of Quality are granted to a specific concrete plant facility and are not transferable within the plants of a member company. A change of ownership of a producing plant invalidates the Seal.

Requirements

Seal of Quality Concrete - A minimum of thirty (30) consecutive tests of the same class of concrete (the mass of all ingredients remaining substantially unchanged), made within a total elapsed time of not more than six (6) months, are required for evaluation. The specific conditions stated in this document must be met and the concrete compression cylinder test data, upon analysis shows a coefficient of variation of twelve (12%) percent or less. The same "lot" of concrete tests may not be used for more than one (1) application. No more than one set of concrete cylinders can be tested for every load of concrete produced.

Seal of Special Quality Concrete - A minimum of thirty (30) tests of the same class of concrete (the mass of all ingredients remaining substantially unchanged), made within a total elapsed time of not more than six (6) months, are required for evaluation. The specific conditions stated in this document must be met and the concrete compression cylinder test data, upon analysis shows a coefficient of variation of eight (8%) percent or less. The strength of this concrete must be **a minimum of 30 MPa and contain air entrainment, or the concrete must have a strength of at least 50 MPa if it is not air entrained**. The same "lot" of concrete tests may not be used for more than one (1) application. Furthermore, the corresponding air test for each strength test result must also be in the acceptable range for the mix design (if applicable).

Concrete Testing Requirements

All concrete testing shall be in strict conformance to CSA A23.1/.2 testing requirements. All tests are to be completed by certified field personnel (ACI or CCIL certified) and concrete testing laboratory certified to CSA A283. Tests not in conformance shall be identified as "Non-Conforming" and excluded from all calculations. Furthermore, any individual strength result which is found to deviate from the average strength by more than ± 2.5 times the calculated standard deviation can be classified as an "outliner" and excluded from the final calculations.

Note: *The producer and the examining engineer will note carefully that the documents constituting an application for the Seals of Quality are highly confidential. The test data and analysis are kept completely unidentifiable and anonymous in all records and files of the examining engineer and the Association. The examining engineer will, of course, satisfy himself/herself of the validity of the data offered for approval, but in this and other considerations he/she will observe professional secrecy.*

Check List

The list of questions that follow is for the purpose of establishing the validity of the test data to be considered for analysis.

All tests are to be verified by a professional engineer registered in the Province of Ontario (PEO). The examining engineer is required to satisfy himself/herself that the actual test data is extracted from actual job records, and to satisfy himself/herself concerning the competency of persons performing the tests. If the test data is not issued by a laboratory certified to the CSA A283 standard, then each test result shall bear the stamp of a licensed professional engineer in the province of Ontario who is certifying the accuracy of the test results.

The examining engineer shall put his/her signature and PEO Registration # on the Check List and submit the signed application to RMCAO.

To qualify the test data for analysis (to determine the coefficient of variation) for the Seal of Quality (Section 1), the answers to all questions must be "Pass".

SECTION 1

Requirements for Seal of Quality

	Pass	Fail
1. Does the test data submitted for evaluation comprise of thirty (30) or more <u>consecutive tests</u> of the same class of concrete collected within the last twelve (12) months? <i>Note: All test results must be acceptable, as per CSA 23.1.</i>	_____	_____
2. Were the test cylinders all made within a six-month period and taken from separate loads of concrete? <i>Note: The same "lot" of concrete cannot be used for more than one (1) application for the Seal of Concrete Quality.</i>	_____	_____
3. Has the testing program been conducted over more than two weeks with no more than 15 test results taken in a one week period? <i>Note: If more than 15 tests are conducted in a one week period, all of the test data will be used for the coefficient of variation calculations, but only 15 of the results will count towards the 30 test result minimum testing requirement.</i>	_____	_____
4. Is the test data submitted for evaluation representative of the plant's performance? <i>Note: The examining engineer must satisfy himself/herself that the test data were not procured selectively*. All concrete compression cylinder test results must be dated and listed in the Analysis Section of the Application.</i>	_____	_____
5. Were the test methods used for production of this data in accordance with the provisions of the current CSA-A23.2?	_____	_____

Note: Attach photocopies of the test reports to the statistical analysis calculations.

*See "Concrete Testing Requirements"

Engineer
Initials

To now qualify the test data for analysis for the Seal of Special Concrete Quality (Section 2), the answers to all questions in Section 1 and 2, must be "Pass".

SECTION 2

Requirements for **Seal of Special Quality**

	Pass	Fail
1. Was a 30 MPa or greater air entrained concrete or a 50 MPa or greater non air entrained concrete evaluated?	_____	_____
2. Did each compressive strength result have a corresponding passing plastic air concrete test result (if applicable)?	_____	_____
3. Was the coefficient of variation for the test data 8% or less?	_____	_____

Note 5: To Examining Engineer

Please be sure to include in the tabulation of test data, the compressive strength values of each of the two cylinders constituting a test and the plastic air content for each test. Attach photocopies of the test reports to the statistical analysis calculations.

Evaluation of Concrete Compression Test Results

To evaluate the concrete compression test results submitted and to derive therefrom the coefficient of variation, the examining engineer may only use one of the following methods:

- (a) RMCAO's Mix Design Statistical Analysis Program Guidelines & Excel Spreadsheet (available at www.concreteontario.org).

or

- (b) The root mean square method explained in **ACI Standard 214** "Evaluation of Strength Test Results of Concrete" (available at www.aci-int.org).

The examining engineer shall submit the Application for Seals of Quality, which shall include:

- a) A tabulation of test values, with corresponding slumps and if required, the entrained air content. The tabulation of test values should be headed by a statement of the design strength requirements of the concrete.
- b) The derivation of the coefficient of variation.

The tabulation of test results and the derivation of the coefficient of variation shall bear the signature and seal of the examining engineer.

Application

PASS



SEAL OF QUALITY CONCRETE
- coefficient of variation of 12% or less

OR



SEAL OF SPECIAL QUALITY CONCRETE
- coefficient of variation of 8% or less

Engineer's and Owner's Conformance Agreement

ENGINEER'S CONFORMANCE AGREEMENT

I, a registered Professional Engineer in the Province of Ontario, have examined and analyzed strength test data representing concrete from the ready mixed concrete plant described as:

(Facility)

(Address)

Owned by: _____
(Concrete Producer Company)

and asserts that in my professional judgement, a Seal of Quality may be granted to the above plant in one of the two classes listed below for a period of one year commencing from the date of plant certification.

Engineer's Signature

Phone

Print Name

Fax

Address

Email

City/PC

Inspection Date

PEO Registration #

OWNER'S CONFORMANCE AGREEMENT

Terms and Conditions

1. The Company agrees to maintain these facilities and equipment in compliance with the Approved Quality Program[®] Audit and Check List requirements at all times and will promptly correct any deficiencies that develop.
2. The Company agrees that all facilities shall be RMCAO certified at all times.
3. The Company agrees to operate in accordance to the RMCAO Best Management Practices and directions and policies.
4. The Company confirms that the test data submitted as part of this application, accurately reflects the quality of the concrete produced at this plant.

Name of Company's Signing Authority (please print)

Email Address

Signature of Company's Signing Authority

Date

Title of Company's Signing Authority