CANADIAN STANDARDS ASSOCIATION

A23.1-09/A23.2-09

Concrete materials and methods of concrete construction/Test methods and standard practices for concrete

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CANADIAN STANDARDS ASSOCIATION

CSA Standards Update Service

A23.1-09/A23.2-09
July 2009

Title: *Concrete materials and methods of concrete construction/Test methods and standard practices for concrete*
Pagination: 573 pages (xv preliminary and 558 text), each dated **July 2009**

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CSA Standards

A23.1-09/A23.2-09
Concrete materials and methods of concrete construction/Test methods and standard practices for concrete

Published in July 2009 by Canadian Standards Association
A not-for-profit private sector organization
5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6
1-800-463-6727 • 416-747-4044

The Canadian Standards Association (CSA) prints its publications on Rolland Enviro100, which contains 100% recycled post-consumer fibre, is EcoLogo and Processed Chlorine Free certified, and was manufactured using biogas energy.

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ISBN 978-1-55491-273-5
Technical Editor: *Muktha Tumkur*

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A23.2-09, *Methods of test and standard practices for concrete*

Test methods and standard practices

A23.1-09
Concrete materials and methods of concrete construction

0 Introduction

This Standard is intended to be used in its entirety. Caution should be exercised in extracting individual clauses and using them in project specifications, since taking them out of context can change their meaning.

A number of notes and several annexes, inserted for guidance, can in some cases be made mandatory by appropriate references in contract documents.

Many clauses provide alternatives and require choices to be made by the user of this Standard. The actual choices should be clearly identified in contract documents.

1 Scope

1.1 General

This Standard provides the requirements for materials and methods of construction for

(a) cast-in-place concrete and concrete precast in the field; and

(b) residential concrete used in the construction of buildings conforming to Part 9 of the *National Building Code of Canada (NBCC)*.

1.2

This Standard does not specify the following:

(a) requirements for the design of concrete structures, which are provided in CAN/CSA-A23.3 and CAN/CSA-S6;

(b) designs of specialty concrete products, which are described in separate CSA Standards;

(c) test methods for concrete, which are provided in CSA A23.2;

(d) design provisions governing the fire resistance of reinforced concrete structures, which are set out in the *NBCC*;

(e) requirements for the plant production of precast concrete, which are provided in CAN/CSA-A23.4; and

(f) use of proprietary materials or methods of construction.

Note: *Proprietary materials or methods of construction may be permitted by the owner under a separate specification, provided that the quality of the resulting construction meets the minimum requirements of this Standard.*

1.3 Precasting of concrete in the field

1.3.1

At the option of the owner, precasting of concrete in the field or in a plant (temporary or permanent) is governed by this Standard or by CSA A23.4, except as limited by Clauses 1.3.2, 1.3.3, and 1.3.4 of this Standard.

Note: *Guidelines for such a choice are provided in CSA A23.4.*

1.3.2
Precast products that may be produced in accordance with this Standard include conventionally reinforced elements of structures, such as tilt-up walls, stair flights, landings, balcony slabs, lintels, and sills. Products requiring prestressing or post-tensioning are produced in accordance with CSA A23.4.
Note: *For references to tilt-up construction, see PCA PA163 and ACI 551R.*

1.3.3
If tolerances equivalent to the requirements of CSA A23.4 are desired, then CSA A23.4 is specified for all precasting operations.

1.3.4
The requirements of CSA A23.4 are applicable to pretensioned concrete and precast concrete used in segmental construction.

1.4 Parking garages
For parking garages, the additional requirements of CSA S413 are applicable.

1.5 Supplementary specifications
In addition to the requirements of this Standard, the owner may elect to include supplementary specifications to address proprietary materials and methods of construction, or any other elements not dealt with in this Standard, in order to ensure that the desired quality level is maintained.

1.6 Terminology
In CSA Standards, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; "may" is used to express an option or that which is permissible within the limits of the standard; and "can" is used to express possibility or capability. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and may be written as requirements. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications
This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

CSA (Canadian Standards Association)
A23.2-09
Test methods and standard practices for concrete

CAN/CSA-A23.3-04
Design of concrete structures

A23.4-05
Precast concrete — Materials and construction

A283-06
Qualification Code for concrete testing laboratories

CAN/CSA-A371-04 (R2009)
Masonry construction for buildings

CSA Standard

A23.2-09
Test methods and standard practices for concrete

Published in July 2009 by Canadian Standards Association
A not-for-profit private sector organization
5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6
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A23.2-09
Test methods and standard practices for concrete

1 Scope

1.1 General
This Standard covers the principal test methods for hardened and freshly mixed concrete and for concrete materials, as specified in CSA A23.1 and CSA A23.4. The test methods are organized as follows:
(a) aggregate test methods;
(b) miscellaneous;
(c) concrete test methods; and
(d) dimensional (moulds).

1.2 Safety and health practices
This Standard does not purport to address the safety problems associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.3 Dimensions
This Standard is presented in metric units in accordance with CAN/CSA-Z234.1.
Note: *The ASTM Standards that are referenced herein are often based on the imperial system, with soft metric equivalents. Where ASTM Standards are referenced, the appropriate metric units in the ASTM Standards should be used wherever possible.*
When the ASTM Standards refer to other ASTM Standards for which there are equivalent CSA Standards, the latter Standards should be used to ensure a continuity in such things as sieve sizes, metric units, and other particular differences between the Standards.

1.4 Terminology
In CSA Standards, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; "may" is used to express an option or that which is permissible within the limits of the standard; and "can" is used to express possibility or capability. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and may be written as requirements. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications
Publications to which this Standard makes reference are listed in Clause 2 of CSA A23.1. For user convenience, relevant publications have also been added to the test methods in which they are referenced.

3 Definitions
For definitions of terms used in this Standard, see Clause 3 of CSA A23.1.

4 Reporting

The reporting section of each test method is typically divided into two sections, Required Information and Optional Information. If required information is not known at the time of testing, it shall be identified as "unknown" on the test report. Lack of availability of any portion of the Required Information does not necessarily invalidate the test results.

A23.2-1A
Sampling aggregates for use in concrete

1 Scope
This Test Method describes the procedures for sampling fine and coarse aggregate for use in concrete.

Notes:

(1) *Such sampling is intended for preliminary investigation of supply source, acceptance or rejection of supply source, inspection of shipments of materials, and inspection of materials on the work site.*

(2) *Acceptance and control tests vary with the type of construction in which the material is used.*

2 Reference publications

CSA (Canadian Standards Association)
A23.2-7B-09
Random sampling of construction materials

3 Significance and use
This Test Method is intended to provide standard requirements on sampling aggregates for use in concrete. It also identifies responsibilities of all parties involved in the sampling of aggregate.

4 Sampling responsibility
Samples for preliminary investigation tests shall be obtained by the party responsible for the development of a potential source.

Samples of materials for control of the production at the source or control of the work at the site shall be obtained by the manufacturer, contractor, or other parties responsible for accomplishing the work. Samples to be used in tests for the acceptance or rejection decisions by the owner shall be obtained by the owner.

Notes:

(1) *For guidance on sampling aggregate from stockpiles or transportation units, see Attachment A1.*

(2) *The sampling for preliminary investigation of potential aggregate sources and types occupies a very important place in determining the availability and suitability of the largest single constituent entering into construction. It influences the type of construction from the standpoint of economics and governs the necessary material control to ensure durability of the resulting structure from the aggregate standpoint. This sampling should be performed only by an experienced person. For more guidance, see Attachment A2.*

5 Securing and obtaining samples

5.1 General

5.1.1
Every precaution shall be used when obtaining samples so that samples reflect the nature and condition of the materials they represent.