CSA GROUP™

CSA A23.1:19/CSA A23.2:19

National Standard of Canada

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

Standards Council of Canada
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National Standard of Canada

CSA A23.1:19/CSA A23.2:19
Concrete materials and methods of concrete construction/Test methods and standard practices for concrete

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CSA A23.2:19, *Test methods and standard practices for concrete*

Preface

This is the thirteenth edition of the combined CSA A23.1/CSA A23.2, *Concrete materials and methods of concrete construction/Test methods and standard practices for concrete*. These Standards are part of the CSA A23 series on concrete and supersede the previous editions published in 2014, 2009, 2004, 2000, 1994, 1990, 1977, 1973, 1967, 1960, 1942, and 1929.

There have been many technical, editorial, and formatting changes throughout this edition; the most significant technical changes are the following:

a) Requirements and guidance for materials qualification and for quality assessment, previously included in Clause 4 of A23.1, have been extensively reorganized and clarified into the following new standard practices:
   i) A23.2-30A, *Standard Practice for sampling, testing, and inspection of aggregate products for use in concrete for qualification and acceptance purposes;*
   ii) A23.2-24C, *Standard Practice for sampling, testing, and inspection of concrete for qualification and acceptance purposes;* and
   iii) A23.2-25C, *Standard Practice for sampling, testing, and inspection of concrete for acceptance purposes.*
b) Additional provisions have been added for mass concrete including the submission of a thermal control plan for controlling and monitoring temperature.
c) There is a new requirement for the slump of concrete for interior concrete floors, partly for reasons of health and safety.
d) Annex P on the potentially deleterious impact of sulphide minerals in concrete aggregate has been substantially updated, including a new performance evaluation protocol, revised criteria on maximum sulphur content of aggregates, and three new preliminary test methods for the determination of the sulphide content of aggregate and for assessing the potential for deleterious oxidation of sulphide-bearing aggregates.
e) Annex S, which was first published as an amendment to the 2014 edition, provides information on concrete made with carbon dioxide in either a gaseous or liquid form as an additive to reduce the carbon footprint of cement and concrete.
f) The new Annex T on mass concrete has been added providing information on material properties and their effect on the temperature rise, measures to control and monitor temperature, temperature limits for maximum concrete temperature and maximum temperature difference for concrete in mass placements, and best practices to protect and cure mass concrete.
g) The new Annex U has been added to provide information for materials and methods of construction for the use of ultra-high performance concrete (UHPC) with minimum strengths of 120 and 150 MPa.
h) The new test method has been added to CSA A23.2: A23.2-26C, *Bulk electrical resistivity of concrete.* This test provides an indication of resistance of concrete to the penetration of fluids and aggressive ions.

The Technical Committee includes representatives from most geographical areas of Canada and from all sectors of the industry: concrete producers, specifying and regulatory authorities, materials consultants, concrete testing laboratories, researchers, and teachers. The Technical Committee intends to review and update these Standards on a continuing basis and to maintain a close liaison with the CSA Technical Committees on Design of Concrete Structures and Cementitious Materials.

CSA Group acknowledges that the development of these Standards were made possible in part by the financial support of the Canadian Ready Mixed Concrete Association.

These Standards were prepared by the Technical Committee on Concrete Materials and Construction, under the jurisdiction of the Strategic Steering Committee on Concrete and Related Products, and have been formally approved by the Technical Committee.

These Standards have been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. They have been published as National Standards of Canada by CSA Group.

Notes:

1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
3) *This Standard was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
4) *To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include "Request for interpretation" in the subject line:*
   a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
   b) *provide an explanation of circumstances surrounding the actual field condition; and*
   c) *where possible, phrase the request in such a way that a specific "yes" or "no" answer will address the issue.*

   Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization *and are available on the Current Standards Activities page at standardsactivities.csa.ca.*
5) *This Standard is subject to a review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line:*
   a) *Standard designation (number);*
   b) *relevant clause, table, and/or figure number;*
   c) *wording of the proposed change; and*
   rationale for the change.

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CSA A23.1:19
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 Exclusions

This Standard does not specify the following:

a) requirements for the design of concrete structures, which are provided in CSA A23.3 and CSA S6;
b) designs of specialty concrete products, which are described in separate CSA Group 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 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 this Standard, “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; and “may” is used to express an option or that which is permissible within the limits of the Standard.

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 Group

CAN/CSA-ISO 9001:16
Quality management systems — Requirements

A23.2:19
Test methods and standard practices for concrete

