Concrete materials and methods of concrete construction/Test methods and standard practices for concrete
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# Technical Committee on Concrete Materials and Construction

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Beeton, Ontario, Canada  
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*Category: Professional Services*

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*Category: Supplier Raw Materials*

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Association béton Québec,  
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*Category: Producer Interest*

**P. Belanger**
Belanger Engineering,  
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<td>Votorantim Cement North America/St. Marys CBM, Toronto, Ontario, Canada</td>
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<td>Concrete Ontario, Mississauga, Ontario, Canada</td>
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<td>P. Lamothe</td>
<td>SNC-Lavalin, Montréal, Québec, Canada</td>
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<td>W.S. Langley</td>
<td>W. S. Langley Concrete &amp; Materials Technology Inc.,</td>
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<td>P. Masson</td>
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<td>R.J. McGrath</td>
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<td>St. Lawrence Testing &amp; Inspection Company Ltd.,</td>
<td>Cornwall, Ontario, Canada</td>
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<td>E. Moffatt</td>
<td>University of New Brunswick Dept. of Civil Engineering,</td>
<td>Fredericton, New Brunswick, Canada</td>
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<td>J. Patullo</td>
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<td>St. Marys Cement Inc. (U.S.), Detroit, Michigan, USA</td>
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<td>Toronto Transit Commission, Toronto, Ontario, Canada</td>
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<td>W. Thaha</td>
<td>Canada Building Materials, Toronto, Ontario, Canada</td>
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Preface


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

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.
National Standard of Canada

CSA A23.1:19
Concrete materials and methods of concrete construction

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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.