



CSA S304:24
National Standard of Canada



Design of masonry structures



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Design of masonry structures



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Preface

This is the fourth edition of CSA S304, *Design of masonry structures*, using limit states design principles. It supersedes the previous editions published in 2014, 2004, under the designation CSA S304.1, and 1994, under the designation CSA S304.1 and the title *Masonry Design for Buildings (Limit States Design)*. Prior to the limit states design edition in 1994, there were two working stress design editions, CSA S304-M84 and the first edition of CSA S304 issued in 1977 (imperial version) and 1978 (metric version).

The major changes to this edition include the following:

- a) Large portions of the empirical design annex (Annex F) have been removed and the annex now only covers empirical design of arches.
- b) Simplified design methods that employ engineering principles for design of unreinforced partition walls and veneer ties have been added to Clauses 8.17 and 10.2, respectively.
- c) Prism testing requirements have been changed to reflect a standardized height-to-thickness ratio of 2 leading to an adjustment to masonry compressive strengths in Table 4.
- d) Load factors and other material provided by the *National Building Code of Canada* have been removed.
- e) The design of reinforced and unreinforced walls and columns have been changed, including changes to the effective flange width and when to ignore slenderness.
- f) Requirements have been revised and new figures have been added for the design of bearing, and new requirements for the design of anchors have been added, including post-installed anchors.
- g) Requirements have been revised for the design of fully-grouted reinforced shear walls using the simplified modified compression field theory.
- h) Requirements have been revised for beam design that include the removal of the χ and λ factors based on a new series of required construction procedures.
- i) Limits on the acceptable height-to-thickness ratio for shear walls that contain a plastic hinge have been revised.
- j) Throughout this Standard, technical and editorial changes have been made to correct or clarify previous requirements.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of the Canadian Masonry Contractors Association (CMCA), Canadian Concrete Masonry Producers Association (CCMPA), and Clay Brick Association of Canada (CBAC).

This Standard was prepared by the Technical Committee on Masonry Design, under the jurisdiction of the Strategic Steering Committee on Construction and Civil Infrastructure, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard 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.*