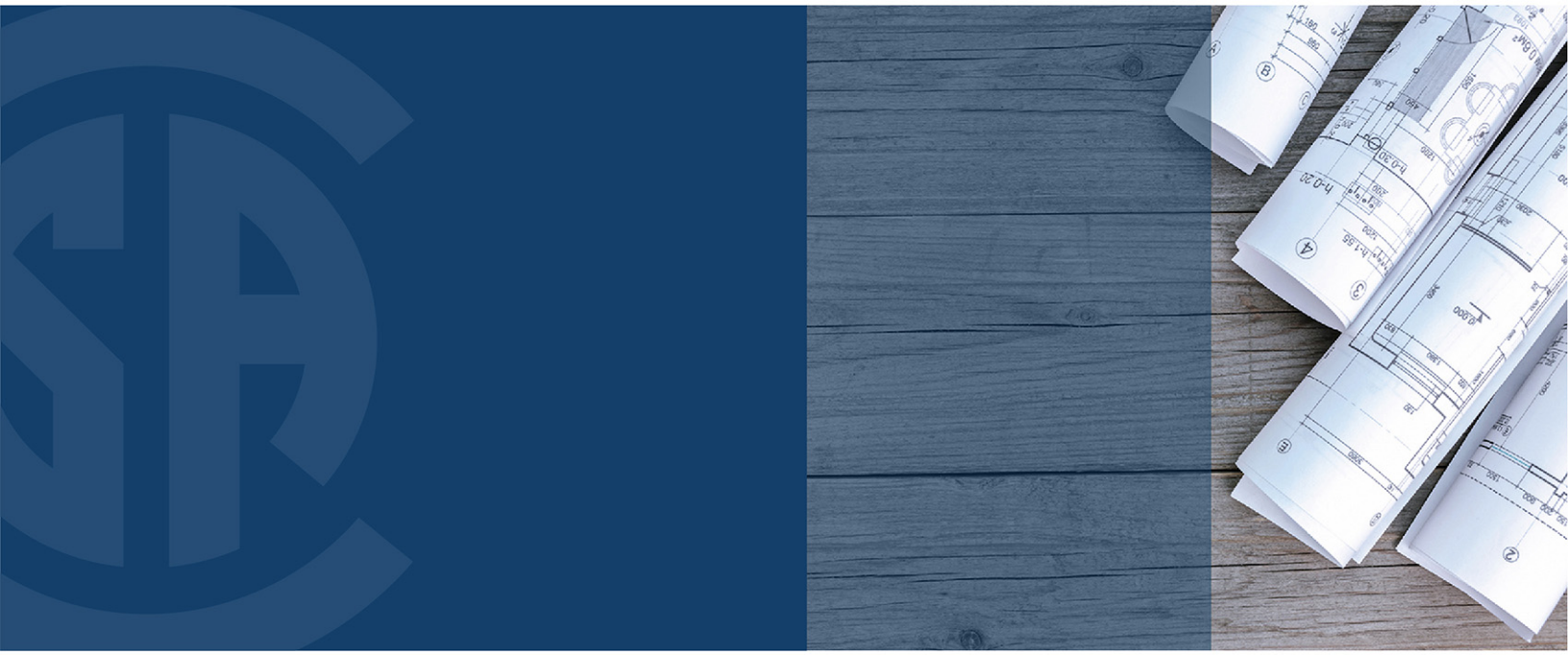
CSA GROUP™

CSA A440.6:20
National Standard of Canada

High exposure fenestration installation



Standards Council of Canada
Conseil canadien des normes

Legal Notice for Standards

Canadian Standards Association (operating as "CSA Group") develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document's fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party's intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document's compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group's and/or others' intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.

Standards Update Service

CSA A440.6:20
March 2020

Title: *High exposure fenestration installation*

To register for e-mail notification about any updates to this publication
- go to **store.csagroup.org**
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **2427638**.

If you require assistance, please e-mail **techsupport@csagroup.org** or call 416-747-2233.

Visit CSA Group's policy on privacy at **www.csagroup.org/legal** to find out how we protect your personal information.

Canadian Standards Association (operating as "CSA Group"), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group's standards development by volunteering their time and skills to Committee work and supporting CSA Group's objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group's total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group's standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada

Standards Council of Canada
Conseil canadien des normes

Cette Norme Nationale du Canada est disponible en versions française et anglaise.

National Standard of Canada

CSA A440.6:20

High exposure fenestration installation

Published in March 2020 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3

To purchase standards and related publications, visit our Online Store at ***store.csagroup.org*** *or call toll-free 1-800-463-6727 or 416-747-4044.*

ICS 91.060.50
ISBN 978-1-4883-2570-0

Contents

Technical Committee on Performance Standard for Windows (A440)

J. Baker	WESTLab Canada, Ottawa, Ontario, Canada *Category: User Interest*	*Chair*
G. Hildebrand	exp Services Inc, Brampton, Ontario, Canada *Category: User Interest*	*Vice-Chair*
J. Marois	Energi Fenestration, Laval, Québec, Canada *Category: Producer Interest*	*Vice-Chair*
E. Alkhoury	Can-Best Testing Laboratories, Brampton, Ontario, Canada *Category: User Interest*	
C. D. Anderson	A.F.A Forest Products Inc., Surrey, British Columbia, Canada	*Non-voting*
A. Becker	National Certified Testing Laboratories, York, Pennsylvania, USA	*Non-voting*
L. Bergeron	Jeld-Wen, Inc., St-Apollinaire, Québec, Canada *Category: Producer Interest*	
B. T. Breen	Golden Windows Limited, Kitchener, Ontario, Canada	*Non-voting*
J. F. Chainey	P.H. Tech inc., Lévis, Québec, Canada *Category: Producer Interest*	
D. Charest	NRCan, Ottawa, Ontario, Canada	*Non-voting*
P. Ciantar	Flynn Canada Ltd, Woodbridge, Ontario, Canada *Category: General Interest*	

F. D'Amours	Masonite International, Lévis, Québec, Canada	*Non-voting*
D. De Rose	Synergy Partners Consulting Ltd., Toronto, Ontario, Canada	*Non-voting*
M. L. Diallo	CSA Group Testing & Certification Inc, Toronto, Ontario, Canada	*Non-voting*
I. E. El-Hajj	Woodbridge, Ontario, Canada	*Non-voting*
D. Feil	Vision Extrusions Ltd, Woodbridge, Ontario, Canada	*Non-voting*
V. Fernandes	Intertek, Mississauga, Ontario, Canada	*Non-voting*
B. Fevold	Marvin Windows and Doors, Warroad, Minnesota, USA *Category: Producer Interest*	
F. Fulton	Fultech Fenestration Consulting, Guelph, Ontario, Canada *Category: User Interest*	
D. Goldsmith	Ply Gem Canada, Calgary, Alberta, Canada *Category: Producer Interest*	
J. Grandoni	Alumicor Limited, Toronto, Ontario, Canada	*Non-voting*
M. Guzzo	Engineering Link Inc., Toronto, Ontario, Canada	*Non-voting*
K. Habib	CSA Group, Edmonton, Alberta, Canada	*Non-voting*
J. A. Hayden	Pella Corporation, Pella, Iowa, USA	*Non-voting*
B. Hubbs	RDH Building Science Inc., Vancouver, British Columbia, Canada *Category: User Interest*	

G. B. Hughes	Lifestyle Oasis, Aurora, Ontario, Canada *Category: Producer Interest*	
A. Jaugelis	RDH Building Science Inc., Burnaby, British Columbia, Canada *Category: Producer Interest*	
R. Jutras	CLEB Consulting Inc, Varennes, Québec, Canada *Category: User Interest*	
D. D. Kerr	Kerr Associates Technology Transfer, Sutton West, Ontario, Canada *Category: General Interest*	
J. F. Kogovsek	Gestion Maxam Inc, Saint-Bruno, Québec, Canada	*Non-voting*
A. Kogovsek	MaxFen, Saint-Bruno, Québec, Canada	*Non-voting*
M. Koszela	WESTLab, Edmonton, Alberta, Canada	*Non-voting*
K. Kuperman	Pro-Active Fenestration Solutions Inc, Richmond Hill, Ontario, Canada	*Non-voting*
A. M. Lakhdhir	Westech Building Products, Calgary, Alberta, Canada *Category: Producer Interest*	
M. T. Mikkelson	Andersen Corporation, Bayport, Minnesota, USA	*Non-voting*
E. Pivniceru	Burlington, Ontario, Canada *Category: General Interest*	
D. T. Prohaska	prohaska engineering inc, Brechin, Ontario, Canada *Category: User Interest*	
P. Richards	Waterloo, Ontario, Canada	*Non-voting*

R. Rinka	American Architectural Manufacturers Association (AAMA), Schaumburg, Illinois, USA	*Non-voting*
C. Sacilotto	Sunview Patio Doors Ltd, Vaughan, Ontario, Canada	*Non-voting*
J. Singh	Allan Windows Inc., Concord, Ontario, Canada	*Non-voting*
R. J. Singlehurst	Natural Resources Canada, Ottawa, Ontario, Canada	*Non-voting*
H. Soghrati	UL CLEB building science, Toronto, Ontario, Canada	*Non-voting*
L. Szczepanski	Building Envelope Engineering, Oakville, Ontario, Canada	*Non-voting*
G. R. Torok	Morrison Hershfield Limited, Ottawa, Ontario, Canada	*Non-voting*
A. Walker	Pollard Windows Incorporated, Burlington, Ontario, Canada	*Non-voting*
R. Warren	Tremco Limited, Toronto, Ontario, Canada	*Non-voting*
M. Webb	IGMA, Ottawa, Ontario, Canada *Category: General Interest*	
A. Kwong	CSA Group, Toronto, Ontario, Canada	*Project Manager*

Subcommittee on High Exposure Fenestration Installation

D. De Rose	Synergy Partners Consulting Ltd., Toronto, Ontario, Canada	*Chair*
G. Hildebrand	exp Services Inc, Brampton, Ontario, Canada	
B. Hubbs	RDH Building Science Inc., Vancouver, British Columbia, Canada	
A. Jaugelis	RDH Building Science Inc., Burnaby, British Columbia, Canada	
R. Jutras	CLEB Consulting Inc., Varennes, Québec, Canada	
D. D. Kerr	Kerr Associates Technology Transfer, Sutton West, Ontario, Canada	
S. Waechter	Dow Corning Corp., Lewiston, New York, USA	
F. Zechner	Frank J. E. Zechner Professional Corporation, Toronto, Ontario, Canada	
Z. Zuchelkowski	Toro Aluminum, Concord, Ontario, Canada	
A. Kwong	CSA Group, Toronto, Ontario, Canada	*Project Manager*

Preface

This is the first edition of CSA A440.6, *High exposure fenestration installation.*

This Standard was prepared by the Subcommittee on High Exposure Fenestration Installation, under the jurisdiction of the Technical Committee on Performance Standard for Windows and 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.*
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 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*
   d) *rationale for the change.*

CSA A440.6:20
High exposure fenestration installation

0 Introduction

This Standard applies to the installation of fenestration products in buildings of four or more storeys in height of all occupancies, including residential.

Fenestration products in taller buildings are exposed to higher wind pressures and driving rain wind pressures than housing and small buildings and consequently require more robust control of rainwater penetration. These products are also subjected to additional loads and effects such as guard loads, seismic loads, static and dynamic building movements.

The effectiveness, safety, and durability of installed fenestration products depend on the choice and quality of materials and design, adequate assembly, the support system, and proper installation. Improper installation of fenestration products can reduce their effectiveness, cause excessive condensation, unacceptably high levels of air, water, and sound leakage, and premature deterioration of the wall and roof systems into which they are installed.

Specific design and material selection decisions should also be consistent with the durability characteristics consistent with a building's intended use and occupancy.

This Standard was developed to address issues that can adversely affect the performance of fenestration products when installed in building walls and roofs, and into both new and existing buildings subject to high environmental exposures. Performance issues related to installation can affect not only the buildings in which the fenestration products are installed, but also the performance of the fenestration products with respect to the requirements contained in the following Standards:

- AAMA/WDMA/CSA 101/I.S.2/A440-17, NAFS — *North American fenestration standard/Specification for windows, doors, and skylights*;
- CSA A440S1-19, *Canadian supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, North American fenestration standard/Specification for windows, doors, and skylights*;
- CAN/CSA-A440.2:19, *Fenestration energy performance*; and
- CAN/CSA A440.3:19, User Guide to CSA A440.2:19, *Fenestration energy performance*.

Most, though not all, of these issues are addressed in Part 5 of the *National Building Code of Canada*. Addressing these issues successfully requires the participation of architects, engineers, and their consultants, fenestration product manufacturers, and fenestration installers.

Fenestration design decisions can affect the way in which fenestration products can be installed. Therefore, the provisions of this Standard are to be considered by responsible parties at the product design stage, at the building design stage, and at the field installation stage. The users of this document include persons engaged in the design, selection, and detailing of fenestration products and their installation into wall or roof assemblies, installers of fenestration products, specifiers of fenestration systems, technical staff of fenestration manufacturers engaged in designing fenestration systems, and persons and organizations that train fenestration installers.

In writing this Standard, the members of the Subcommittee have attempted to strike a balance between performance and prescriptive requirements for the window installation techniques described in this Standard. In general, a performance approach has been taken. Prescriptive requirements are provided

where installation methods require special attention to avoid problems with fenestration products after installation. The intent is to allow flexibility to adapt to the wide variety of existing installation practices and different wall and roof construction techniques and preferences and to give guidance for new construction techniques and installation practices that, inevitably, will emerge over time.

Annex H provides some information on how climate change could impact fenestration product design and application. It is anticipated that fenestration designers will need to incorporate changes in climate loads resulting from climate change into fenestration product design and that adjustments will need to be made to installation detailing. Annex H provides some information on these topics for consideration by building design team, authorities having jurisdiction, and installers. As information on climate change evolves, so too will the requirements of this Standard.

1 Scope

1.1

This Standard sets forth characteristics of effective and durable installation methods, in both new and existing buildings, of fenestration products within the scope of AAMA/WDMA/CSA 101/I.S.2/A440 that are intended for installation in buildings of all occupancies to which NBC Parts 3, 4, 5, and 6 of Division B apply.

1.2

In addition to fenestration products within the scope of AAMA/WDMA/CSA 101/I.S.2/A440, this Standard also applies to the installation of

a) fenestration products installed as ribbons, strips, or punched windows that are fabricated with components typically used in curtain wall systems;
b) window walls; and
c) storefronts (where exposed to the exterior).

1.3

This Standard covers the installation process from pre-installation procedures through to post-installation and includes fenestration design features that allow improved performance of products installed in high exposure conditions. This Standard also outlines processes related to fenestration installation, such as shop drawing review, field testing, and mock-up testing, to improve the performance of the installed product. Therefore, the provisions of this Standard should be considered by responsible parties at the product design stage, at the building design stage, at the field installation stage, and at the post-installation stage.

1.4

This Standard provides minimum requirements for the installation of fenestration products in high exposure situations and where compliance is required to Part 5 of the NBC, or comparable requirements in applicable local codes. CSA A440S1 provides guidance on the determination of the design wind pressure and driving rain wind pressure exposure conditions that fenestration products are subjected to.

This Standard addresses issues that could compromise the performance of the fenestration product as established by testing to the requirements of AAMA/WDMA/CSA 101/I.S.2/A440 or as otherwise required by Part 5 of the NBC.

1.5

Where installation methods are not specifically addressed in this Standard, or where there are differences between this Standard and installation instructions of the manufacturer of a fenestration product, a design professional should be consulted for a solution consistent with the intent of the minimum requirements and principles in this Standard and with the intent of Part 5 of the NBC or comparable section in applicable local codes.

1.6

This Standard describes laboratory testing procedures for combination window assemblies, including window walls.

1.7

The application of this Standard requires a working knowledge of applicable federal, provincial, and local (municipal) building codes and regulations specifically concerning, but not limited to, required means of egress, fire safety requirements, and requirements for safety glazing.

1.8

This Standard does not apply to

a) selection of fenestration products for a given application;
b) installation of
    i) storm windows or storm doors;
    ii) fire-rated fenestration;
    iii) vehicular-access doors (garage doors);
    iv) commercial entrance systems;
    v) revolving doors;
    vi) commercial steel utility doors (e.g., roof access doors or doors to electrical rooms);
    vii) sloped glazing (other than unit skylights, roof windows, or tubular daylighting devices);
    viii) curtain wall, except as noted in Clause 1.2 a);
    ix) interior fenestration products;
    x) sunrooms;
    xi) bay and bow windows;
    xii) balcony enclosures; and
    xiii) glazed architectural structures as referred to in Part 5 of the NBC;
c) maintenance of installed fenestration products (see Annex G for guidance);
d) rebuilding of fenestration products; and
e) fabrication of fenestration products, whether such fabrication takes place in a factory or at the installation site (i.e., stick-built assemblies).

Notes:

1) *For product performance selection information, see CSA A440S1.*
2) *For recommendations for product selection for high exposure locations, see Annex L.*

1.9

This Standard does not purport to address all of the safety problems associated with its use. It does not set out requirements relating to the safety of the person installing the units. It is the responsibility of

the installer to obtain necessary health and safety training and to follow proper procedures for safe handling and application of installation materials and fenestration products.

Note: *Installers should be aware of existing hazardous materials, such as asbestos or lead paint. They should request a copy of the hazardous material survey or designated substance survey for the building prior to commencing any work.*

1.10

This Standard is not intended to replace professional advice. When information provided in this document is incorporated into buildings, it must be reviewed by knowledgeable building professionals and reflect the specific conditions and unique design parameters of each building. Use of this Standard does not relieve designers of their responsibility to comply with local building codes, standards, and by-laws with respect to the selection, interface design, and installation of fenestration products.

1.11

This Standard assumes that its users are familiar with the terminology, procedures, requirements of good building practice and the available installation information provided by fenestration product manufacturers.

1.12

This Standard does not address the qualifications and skills that a installers should possess. It assumes familiarity with the fundamentals of building construction in Canada as described in Division B, Part 5 of the NBC or equivalent local code and of installation techniques for fenestration products normally available in Canada. Although guidance is provided in the manner of installation of fenestration products, it is not a training manual.

1.13

Annex H provides information on climate change, its potential effects on fenestration in buildings and provides guidance for climate change resilient design for fenestration products and installation.

1.14

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.

1.15

The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only.

