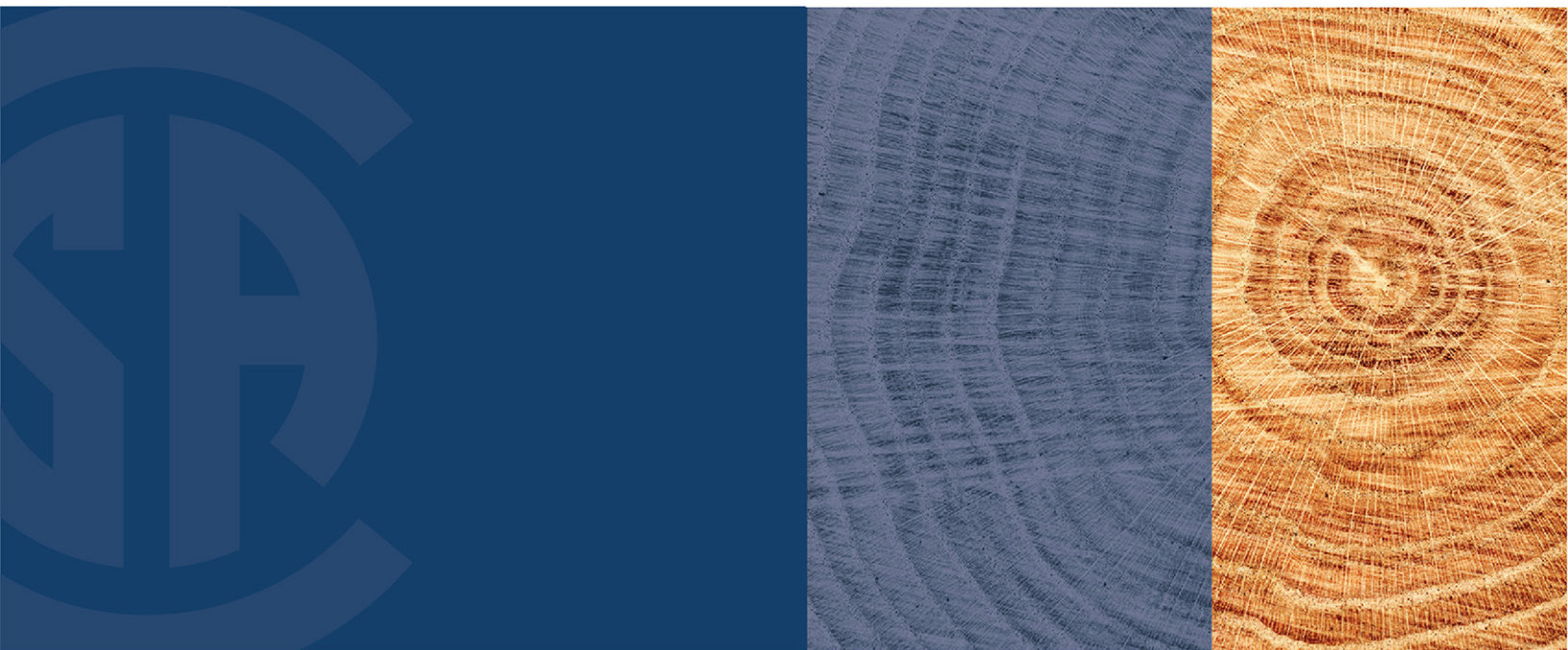


Specification of permanent wood foundations for housing and small buildings



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.



This is a preview. [Click here to purchase the full publication.](#)

Revision History

S406-16, Specification of permanent wood foundations for housing and small buildings

Update No. 1 — October 2017	Revision symbol (in margin)
Clauses 5.7 and 5.11 Tables 3A , 3B , 5A , 5B , 5C , 5D , 5E , 5F , 5G , 5H , 5I , 5J , 5K , 5L , 10A , 10B , 10C , 10D , 10E , 10F , 10G , 10H , 10I , 10J , 10K , 10L , and A.12	①
Errata — June 2016	Revision symbol (in margin)
Clauses 9.8.1 and 14.1.3	Δ

Standards Update Service

S406-16

April 2016

Title: *Specification of permanent wood foundations for housing and small buildings*

To register for e-mail notification about any updates to this publication

- go to www.csagroup.org/store/
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **2424377**.

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.

S406-16

***Specification of permanent wood
foundations for housing and small
buildings***



®A trademark of the Canadian Standards Association, operating as "CSA Group"

*Published in April 2016 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 www.csagroup.org/store/
or call toll-free 1-800-463-6727 or 416-747-4044.*

ISBN 978-1-4883-0338-8

*© 2016 Canadian Standards Association
All rights reserved. No part of this publication may be reproduced in any form whatsoever
without the prior permission of the publisher.*

This is a preview. Click here to purchase the full publication.

Contents

Technical Committee on Wood Preservation	5
Subcommittee on Permanent Wood Foundations	8
Preface	10
1 Scope	11
2 Reference publications	12
3 Definitions	13
4 Design and construction requirements	14
4.1 General	14
4.2 Equivalents	14
4.3 Design assumptions	14
4.4 Other conditions	16
4.5 Structural integrity	16
5 Materials	17
5.1 Treated materials	17
5.1.1 General	17
5.1.2 End cut preservative	17
5.2 Untreated materials	17
5.3 Lumber	17
5.4 Plywood sheathing	17
5.5 Fasteners	18
5.5.1 Nails	18
5.5.2 Staples	18
5.5.3 Framing anchors and straps	18
5.6 Sealants and dampproofing	18
5.6.1 Sealants	18
5.6.2 Dampproofing	18
5.6.3 Other compounds	19
5.7 Moisture and vapour barriers	19
5.8 Manufactured drainage layers	19
5.9 Subflooring	19
5.10 Granular drainage layer	20
5.10.1 New material	20
5.10.2 Native soil	20
5.11 Backfill	20
5.12 Soil gas protection	20
6 Cutting and machining	20
6.1 Treatment of cut lumber and plywood	20
6.2 Foundation wall studs	20
6.3 Installation of electrical services	20

6.4 Floor joists, blocking, and services 21

7 Site preparation 21

- 7.1 Excavation 21
- 7.2 Foundation drainage 21
 - 7.2.1 Continuous granular drainage layer 21
 - 7.2.2 Sump 21
 - 7.2.3 Tile not permitted 21
 - 7.2.4 Drainage through concrete footings 21
 - 7.2.5 Drainage of trenched footings 21

8 Footings 22

- 8.1 General 22
- 8.2 Wood footing plates for walls 22
- 8.3 Wood footings for columns 23
- 8.4 Concrete footings 23

9 Exterior walls with wood sleeper or concrete slab floor 23

- 9.1 Wall studs 23
- 9.2 Framing around wall openings (See Figure [A.12](#)) 24
- 9.3 Wall sheathing 24
- 9.4 Fastenings 25
 - 9.4.1 Nailing 25
 - 9.4.2 Stapling 25
 - 9.4.3 Framing anchors and straps 25
 - 9.4.4 Nailing when backfill height is not uniform 25
- 9.5 Foundation columns 26
- 9.6 Interior loadbearing walls 26
- 9.7 Wood sleeper floors 26
 - 9.7.1 General 26
 - 9.7.2 Support for side wall 26
 - 9.7.3 Support for end wall 26
- 9.8 Concrete slab floors 26
 - 9.8.1 General 26
 - 9.8.2 Support for side and end walls 26

10 Exterior walls with suspended wood floor 27

- 10.1 Wall studs 27
 - 10.1.1 Backfill heights 27
 - 10.1.2 Draft and firestopping 27
- 10.2 Framing around wall openings 27
- 10.3 Wall sheathing 28
- 10.4 Fastenings 28
 - 10.4.1 Nailing 28
 - 10.4.2 Stapling 28
 - 10.4.3 Framing anchors and straps 28
 - 10.4.4 Nailing when backfill height is not uniform 28
- 10.5 Foundation columns 29
- 10.6 Interior loadbearing walls 29

10.7	Suspended wood floors	29
10.7.1	General	29
10.7.2	Support for side wall	29
10.7.3	Support for end wall	30
11	Exterior walls for crawl space foundations (See Figure A.7)	30
12	Floors at top of foundation	30
12.1	General	30
12.2	Support for side walls	30
12.2.1	Solid sawn wood joists	30
12.2.2	Top chord bearing trusses and I-joists	31
12.2.3	Bottom chord bearing trusses and I-joists	31
12.3	Support for end walls	31
12.3.1	Lateral loading of solid sawn wood joists	31
12.3.2	Lateral loading of truss or I-joist at top chord	31
12.3.3	Lateral loading of truss or I-Joist at bottom chord	32
12.4	Stairwell openings	32
12.4.1	General	32
12.4.2	Dimensions	32
12.4.3	Framing at side wall	32
12.4.4	Framing at end wall	32
13	Requirements for high wind and seismic forces	32
13.1	General	32
13.1.1	Applicable locations	32
13.1.2	Extreme wind and seismic forces	32
13.1.3	Non-uniform backfill height	33
13.2	Uniform backfill height	33
13.3	Nailing requirements	33
13.3.1	General	33
13.3.2	Staples	33
13.3.3	Doubled top plate	33
13.4	Foundation wall bearing on backfill	33
13.4.1	General	33
13.4.2	Foundation wall bearing on compressible materials	33
13.5	Wall openings	33
13.6	Masonry veneer	33
13.7	Wall sheathing connection	34
13.7.1	Exterior foundation walls	34
13.7.2	Interior bearing walls	34
14	Support for accessory materials and structures	34
14.1	Support for masonry veneer	34
14.1.1	General	34
14.1.2	Masonry veneer on knee wall	34
14.1.3	Masonry veneer on main foundation wall	35
14.2	Support for exterior concrete slabs	35
14.3	Support for exterior steps and landings	35

- 14.4 Garage frost walls 35
- 14.5 Walk-out basement frost wall (Figure [A.30](#)) 35

15 Exterior moisture barrier 35

- 15.1 General 35
- 15.2 Attachment of polyethylene sheet 36
- 15.3 Protection by cover plate 36
- 15.4 Protection of corners 36
- 15.5 Extent of coverage 36

16 Backfilling and site grading 36

- 16.1 Timing 36
- 16.2 Safe placement of backfill 36
- 16.3 Backfill material 36
- 16.4 Use of manufactured drainage layers 37
- 16.5 Foundations not requiring drainage 37
- 16.6 Problem soils 37
- 16.7 Site grading 37

Annex A (informative) — Figures 95

Annex B (informative) — Commentary on safe use and handling of pressure-treated wood 128

Annex C (informative) — Requirements for design and supervision 130

Technical Committee on Wood Preservation

H. Walthert	Wood Preservation Canada, Ottawa, Ontario <i>Category: Producer Interest</i>	<i>Chair</i>
R.A. Stirling	FPIInnovations, Vancouver, British Columbia <i>Category: Regulatory Authority/General Interest</i>	<i>Vice-Chair</i>
D.L. Alexander	DL Alexander and Associates, Beaconsfield, Québec <i>Category: Regulatory Authority/General Interest</i>	
K.J. Archer	Viance, LLC, Charlotte, North Carolina, USA <i>Category: Producer Interest</i>	
C.F. Baker	C. F. Baker Consulting Group, Burlington, Ontario <i>Category: Regulatory Authority/General Interest</i>	
C. Barber	Timber Products Inspection Incorporated, Conyers, Georgia, USA	<i>Associate</i>
D. Brooks	Western Wood Preservers Institute, Vancouver, Washington, USA	<i>Associate</i>
P.A. Cooper	University of Toronto, Toronto, Ontario <i>Category: Regulatory Authority/General Interest</i>	
P.C. Dandy	Arch Wood Protection Canada Corp., A Lonza company, Mississauga, Ontario <i>Category: Producer Interest</i>	
J.W. Dubois	Health Canada - Pest Mgmt Regulatory Agency, Ottawa, Ontario <i>Category: Regulatory Authority/General Interest</i>	