

CCMC 13628-R

CCMC Canadian code compliance evaluation

CCMC number:	13628-R
Status:	Active
Issue date:	2012-11-08
Modified date:	2023-07-06
Evaluation holder:	<p>Superior Walls of America, Ltd. 937 East Earl Rd. New Holland PA 17557 United States Website: www.superiorwalls.com Telephone: 800-452-9255 Email: ehelderman@superiorwalls.com</p>
Product name:	Superior Walls Xi Precast Concrete Insulated Wall Panels
Compliance:	NBC 2010
Criteria:	CCMC-TG-034110.03-10 "CCMC Technical Guide for Precast Insulated Foundation Wall Panels"

In most jurisdictions this document is sufficient evidence for approval by Canadian authorities.

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Compliance opinion

It is the opinion of the Canadian Construction Materials Centre that the evaluated product, when used as a prefabricated foundation wall for housing and small buildings in accordance with the conditions and limitations stated in this evaluation, complies with the following code:

National Building Code of Canada 2010

Code provision	Solution type
9.3.1.1. General	<u>Acceptable</u>
9.4.1. Structural Design Requirements and Application Limitations	<u>Alternative</u>
9.4.2. Specified Loads	<u>Acceptable</u>
9.4.3. Deflections	<u>Acceptable</u>
9.4.4. Foundation Conditions	<u>Alternative</u>
9.13.2. Dampproofing	<u>Acceptable</u>
9.13.3. Waterproofing	<u>Acceptable</u>
9.13.4. Soil Gas Control	<u>Acceptable</u>
9.14.2. Foundation Drainage	<u>Acceptable</u>
9.15.3. Footings	<u>Alternative</u>
9.15.4. Foundation Walls	<u>Alternative</u>
9.25.2.1. Required Insulation	<u>Acceptable</u>
9.25.2.2. Insulation Materials	<u>Acceptable</u>

The above opinion(s) is/are based on the evaluation by the CCMC of technical evidence provided by the evaluation holder, and is bound by the stated conditions and limitations. For the benefit of the user, a summary of the technical information that forms the basis of this evaluation has been included.

Product information

Product name

Superior Walls Xi Precast Concrete Insulated Wall Panels

Product description

The product is a prefabricated, insulated precast foundation wall. The foundation walls are formed from 34.4 MPa normal weight concrete containing synthetic fibres. The walls consist of a 44.5-mm-thick exterior face shell that is monolithically cast with 260-mm-wide top and bottom bond beams and 57-mm × 190-mm concrete studs at 610 mm on centre (o.c.). The shell is bonded to 63.5-mm- or 127-mm-thick polystyrene insulation on the inside face. Each stud is wrapped with 25.4-mm-thick expanded polystyrene insulation on 3 exposed sides and faced with a galvanized steel channel for interior finish fastening. Two chase openings are provided in each stud for plumbing and electrical wiring. Wall panels are available in heights of 1 219 mm, 2 489 mm, 2 743 mm and 3 048 mm, and in various lengths.

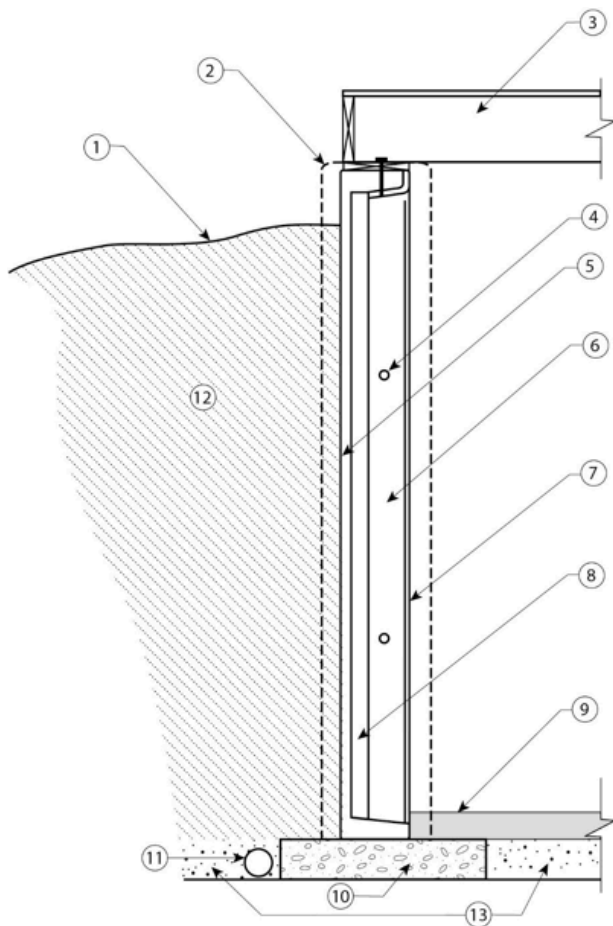


Figure 1. Typical vertical section detail

1. finished grade
2. Superior Walls Xi Precast Concrete Insulated Wall Panel
3. lateral support by joists and/or blocking as specified by construction documents
4. chase opening (typical)

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5. 44.5-mm-thick face shell
6. 57-mm × 190-mm concrete stud, 610 mm o.c.
7. galvanized stud facing
8. 63.5-mm or 127-mm-thick foam plastic insulation
9. lateral support to be installed before backfilling as specified by construction documents
10. concrete footing
11. foundation drainage system as specified by construction documents
12. backfill area
13. crushed stone

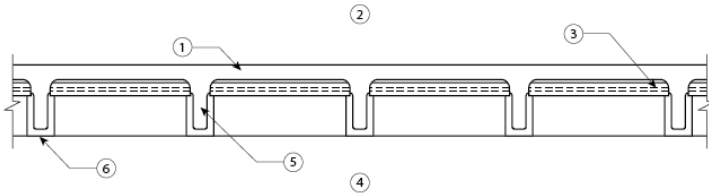


Figure 2. Typical horizontal section detail

1. 44.5-mm-thick concrete face shell
2. exterior
3. 63.5-mm or 127-mm-thick foam plastic insulation
4. interior
5. 57-mm × 190-mm concrete stud, 610 mm o.c.
6. galvanized stud facing

Manufacturing plants

This evaluation is limited to products produced at the following plants:

Product name	Manufacturing plants	
	Claresholm, AB, CA	Lantz, NS, CA
Superior Walls Xi Precast Concrete Insulated Wall Panels	☑	☑

☑ Indicates that the product from this manufacturing facility has been evaluated by the CCMC

Conditions and limitations

The CCMC's compliance opinion is bound by this product being used in accordance with the conditions and limitations set out below.

- The precast foundation walls are for housing and small buildings as directed by Part 9, Housing and Small Buildings, of Division B of the NBC 2010.
- Soil type, drainage characteristics of the soil, frost depth and loadbearing capacity must be determined prior to using the precast foundation walls.
- The precast foundation walls are to be used only in buildings of light-frame construction that are no more than three storeys in building height, with a maximum floor-to-floor height of 3 m, and containing only a single dwelling unit.
- The axial compressive load applied is limited to 109.453 kN/m.
- The design is applicable for seismic zones with $S_a(0.2) \leq 1.2$.
- Exterior surfaces of foundation walls below ground level must be dampproofed in accordance with Subsection 9.13.1., General (Dampproofing, Waterproofing and Soil Gas Control), of Division B of the NBC 2010.
- The builder must prepare site conditions in accordance with Superior Walls Builder Guideline Booklet, MAN42-9027.
- Foundation walls and footings must be installed on stable soils with an allowable bearing pressure of 75 kPa or greater.
- Minimum footing widths must comply with Table 4.2.2.1 of this Report or comply with Subsection 9.15.3. of Division B of the NBC 2010.
- The maximum load applied to a brick ledge is restricted to 42.320 kN/m.
- The foundation must be well drained in accordance with Subsections 9.14.3., Drainage Tile and Pipe, or 9.14.4., Granular Drainage Layer, of Division B of the NBC 2010.
- The proposed wall system must be used with floor systems not exceeding loads and spans as directed by the Subsection 9.4.2. of Division B of the NBC 2010.
- Backfill must be placed in such a way as to avoid damage to the wall and the waterproofing protection.
- The backfill material with surcharge must not exceed 1 602 kg/m²/m.
- The on-site concrete basement floor must be poured prior to backfilling.
- The top of the foundation wall must be supported by the first floor prior to backfilling.
- Where hydrostatic pressure exists, waterproofing must be provided in accordance with Subsection 9.13.3. of Division B of the NBC 2010.
- Installation of the product must be completed by a person certified by Superior Walls of America, Ltd.

Technical information

This evaluation is based on demonstrated conformance with the following criteria:

Criteria number	Criteria name
CCMC-TG-034110.03-10	CCMC Technical Guide for Precast Insulated Foundation Wall Panels

The evaluation holder has submitted technical documentation for the CCMC's evaluation. Testing was conducted at laboratories recognized by the CCMC. The corresponding technical evidence for this product is summarized below.

Material requirements

Insulation

The polystyrene insulation used in Superior Walls Xi Precast Concrete Insulated Wall Panels conforms to CAN/ULC-S701-05, "Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering," Type 2.

Concrete

The concrete used to produce Superior Walls Xi Precast Concrete Insulated Wall Panels conforms to CSA A23.1-09, "Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete."

Prescriptive requirements

The following tables demonstrate the compliance data to the NBC 2010 for Superior Walls Xi Precast Concrete Insulated Wall Panels on which the CCMC based its compliance opinion.

Performance requirements

Table 1. Results of testing of performance requirements of the product at maximum height

Property	Test	Requirement	Result
Water vapour permeance	ASTM E 96	$\leq 170 \text{ ng/Pa}\cdot\text{s}\cdot\text{m}^2$	20.8 ng/Pa·s·m ²
Lateral load	ASTM E 72-05	$\geq 1\,602 \text{ kg/m}^2/\text{m}$	Pass
Axial load	ASTM E 72-05	$\geq 109.453 \text{ kN/m}$	> 669.929 kN/m
Brick ledge	ASTM E 72-05	$\geq 42.320 \text{ kN/m}$	Pass
Interior transverse loading (negative wall pressure)	ASTM E 72-05	Tested to failure	11.6 kPa
Exterior transverse loading (positive wall pressure)	ASTM E 72-05	Tested to failure	22.4 kPa

Design requirements

Table 2. Footing design requirements for the product ⁽²⁾

Minimum depth and width of 13-mm clean crushed stone footing (mm) ⁽³⁾									
Construction type (assumed wall loading)		Soil loadbearing capacity (kPa)							
		75		100		150		≥ 200	
		Depth	Width	Depth	Width	Depth	Width	Depth	Width
Conventional light-frame construction	1 storey (16.05 kN/m)	102	378	102	378	102	378	102	378
	2 storeys (26.29 kN/m)	153	437	102	378	102	378	102	378
	3 storeys (42.34 kN/m)	331 (1)	642	204 (1)	496	102	378	102	378
Masonry veneer over light-frame construction	1 storey (21.91 kN/m)	102	378	102	378	102	378	102	378
	2 storeys (39.41 kN/m)	305 (1)	613	178	466	102	378	102	378
	3 storeys (58.38 kN/m)	534 (1)	877	331 (1)	642	153	437	102	378

Notes

- 1 Crushed stone must be compacted in 200-mm lifts with a plate vibrator.
- 2 The table allows 5.27 kN/m for the load due to self-weight of foundation wall.
- 3 Consult project drawings or Table 2 in the "Builder Guideline Booklet – Canadian Edition" by Superior Walls for drawings illustrating the required depth of the crushed stone footing.

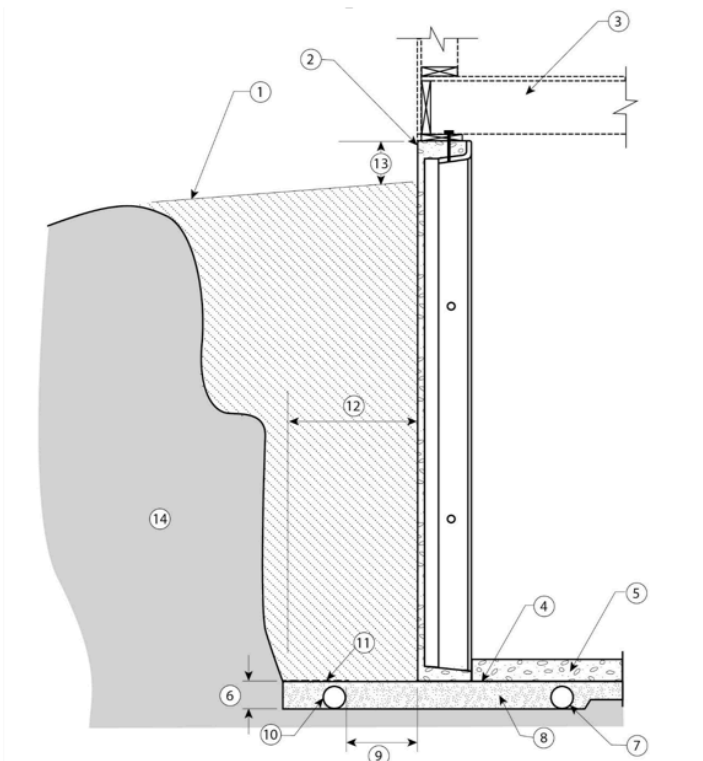


Figure 3. Crushed stone footings

1. slope away from foundation
2. Superior Walls
3. lateral support by joists and/or blocking as specified by construction documents
4. vapour barrier
5. concrete floor (lateral support) to be installed before backfilling as specified by construction documents
6. 13-mm clean crushed stone (determine stone depth from Table 2 above)
7. alternate drain pipe position
8. 13-mm diameter clean crushed stone
9. locate drain pipe at least 300 mm beyond panel/wall
10. drain pipe to sump or daylight
11. filter membrane (provided by builder)
12. minimum 600 mm over dig at base of excavation
13. 150-mm minimum distance between top of slope and top of wall
14. virgin soil

Table 3. Lateral support and sill plate anchorage of product to wood-frame floors

Top of foundation wall fastening schedule					
Backfill height	Joist height	Sill plate bolting	Brace and block spacing	Number of solid blocks required	Minimum distance of blocking
2.286 m to 2.896 m	≥ 254 mm	One 12.7-mm bolt at 609.6 mm o.c.	1 220 mm o.c. and 305 mm from the interior of each corner	3	1 524 mm
2.286 m to 2.896 m	< 254 mm	One 12.7-mm bolt at 609.6 mm o.c.		2	1 220 mm

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Top of foundation wall fastening schedule					
Backfill height	Joist height	Sill plate bolting	Brace and block spacing	Number of solid blocks required	Minimum distance of blocking
0 m to 2.286 m	Any height	One 12.7-mm bolt at 1 219.2 mm o.c.		1	610 mm

Administrative information

Use of Canadian Construction Materials Centre (CCMC) assessments

This assessment must be read in the context of the entire [CCMC Registry of Product Assessments](#), any applicable building code or by-law requirements, and/or any other regulatory requirements (for example, the [Canada Consumer Product Safety Act](#), the [Canadian Environmental Protection Act](#), etc.).

It is the responsibility of the user to confirm that the assessment they are using is current and has not been withdrawn or superseded by a later version on the [CCMC Registry of Product Assessments](#).

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The National Research Council of Canada (NRC) has evaluated only the characteristics of the specific product described herein. The information and opinions in this evaluation are directed to those who have the appropriate degree of experience to use and apply its contents (such as authorities having jurisdiction, design professionals and specifiers). This evaluation is valid when the product is used as part of permitted construction, respecting all conditions and limitations stated in the evaluation, and in accordance with applicable building codes and by-laws.

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Language

Une version française de ce document est disponible.

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CCMC recognition

The Canadian Construction Materials Centre (CCMC) assesses compliance with Canadian building, energy and safety codes. We are the only construction code compliance service supported and operated by the Government of Canada. Trusted by over 6,000 regulators across Canada.

Most Canadian authorities having jurisdiction (AHJs) consider CCMC product assessments acceptable as evidence for product approval.

CCMC assessments are recognized by construction authorities across Canada:

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(Alliance of Canadian Building Official Associations (ACBOA))

First Nations National Building Officers Association (FNNBOA)



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Canadian Home Builders' Association (CHBA)



(Canadian Home Builders' Association (CHBA))

Alberta Building Officials Association (ABOA)



(Alberta Building Officials Associations (ABOA))

Saskatchewan Building Officials Association (SBOA)



(Saskatchewan Building Officials Association (SBOA))

Manitoba Building Officials Association (MBOA)



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Ontario Building Officials Association (OBOA)



(Ontario Building Officials Association (OBOA))

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For more information, contact the CCMC by phone at (613) 993-6189 or by email at ccmc@nrc-cnrc.gc.ca

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Code compliance as an acceptable solution

Code Compliance via Acceptable Solutions

If a building design (e.g. material, component, assembly or system) can be shown to meet all provisions of the applicable **acceptable solutions** in Division B (e.g. it complies with the applicable provisions of a referenced standard), it is deemed to have satisfied the objectives and functional statements linked to those provisions and thus to have complied with that part of the Code.

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(a)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Acceptable Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

CCMC's code compliance opinions

All CCMC evaluation reports are opinions of code compliance established in accordance with the National Building Code of Canada, Subsection 1.2.1. "Compliance with this Code," which requires compliance to be achieved by:

- complying with the applicable acceptable solutions in Division B, or
- using an alternative solution that will achieve at least the minimum level of performance required by Division B in the areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

The CCMC assesses compliance with Canadian building, energy and safety codes, and is trusted by over 6,000 regulators across Canada.

Code compliance as an alternative solution

Code Compliance via Alternative Solutions

Where a design differs from the acceptable solutions in Division B, then it should be treated as an **"alternative solution."** A proponent of an alternative solution must demonstrate that the alternative solution addresses the same issues as the applicable acceptable solutions in Division B and their attributed objectives and functional statements. However, because the objectives and functional statements are entirely qualitative, demonstrating compliance with them in isolation is not possible. Therefore, Clause 1.2.1.1.(1)(b) identifies the principle that Division B establishes the quantitative performance targets that alternative solutions must meet. In many cases, these targets are not defined very precisely by the acceptable solutions [...] Nevertheless, Clause 1.2.1.1.(1)(b) makes it clear that an effort must be made to demonstrate that an alternative solution will perform as well as a design that would satisfy the applicable acceptable solutions in Division B—not “well enough” but “as well as.”

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(b)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Alternative Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

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