CCMC CANADIAN CODE COMPLIANCE EVALUATION

CCMC 14008-R

CCMC Canadian code compliance evaluation

CCMC number:	14008-R
Status:	Active
Issue date:	2015-02-16
Modified date:	2025-03-12
Evaluation holder:	**Shouldice Designer Stone** P.O. Box 88 Shouldice Block Road Shallow Lake ON N0H 2K0 Canada Website: www.shouldice.ca Telephone: 519-935-2771
Product name:	Shouldice Fusion Stone
Compliance:	NBC 2015
Criteria:	CCMC-TG-074661-15, "CCMC Technical Guide for Cladding Systems Using Concrete Stone (Installed Directly over Wood Frame Backing by Metal Connectors)"

In most jurisdictions this document is sufficient evidence for approval by Canadian authorities.
Learn more about CCMC recognition Look for the trusted CCMC mark on products to verify compliance.

Compliance opinion

It is the opinion of the Canadian Construction Materials Centre that the evaluated product, when used as an exterior cladding in accordance with the conditions and limitations stated in this evaluation, complies with the following code:

National Building Code of Canada 2015

Code provision	Solution type
9.20.2.1. Masonry Unit Standards	Alternative
9.20.2.7. Compressive Strength	Alternative
9.20.5.1. Masonry Support	Alternative
9.20.6. Thickness and Height	Alternative
9.20.6.4.(4) Masonry veneer shall conform to Subsecti ...	Acceptable
9.27.2. Required Protection from Precipitation	Acceptable

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

Shouldice Fusion Stone

Product description

The product is a concrete stone veneer cladding that is attached mechanically to Shouldice's specific engineered structural wood sheathing and stud framing design.

The product is composed of Portland cement, natural aggregates, and mineral oxide pigments. Other additives such as water repellent and air entraining agents could be added to the mix. The product is cast in rectangular or square moulds that reflect different textures. The finished product is available in different sizes, varying from 203 mm to 508 mm long, 95 mm to 190 mm wide, and 32 mm to 56 mm thick.

The concrete stones are affixed individually to the structural wood sheathing using metal anchors/clips and metal screws. The metal anchors/clips are Type 304 stainless steel that are 50 mm long and 0.61 mm thick. The fasteners are #8 19-mm-long Robertson-head stainless steel wood screws. One screw is used per anchor/clip. A metal starter strip anchor is affixed to the bottom of the first row of stones. Contrary to a conventional brick veneer, the product is not supported directly on the foundation wall, but is instead attached independently to the specific structural sheathing and back-up wall design. The top and bottom edges of the concrete stones include grooves to clip the anchors that are attached to the wood sheathing.

Once installed, the joints between the concrete stones could be grouted or left ungrouted (dry-stack), depending on the chosen design. Figure 1 shows the product installed in the dry-stack joint design, and Figure 2 shows the product installed for the grouted joint design just before grouted. Corner stones are plant manufactured using two stones cut at 45 degree angles and fixed together with an adhesive (see Figure 3).

Instead of masonry supported on the foundation, the product is supported by the wood frame. Therefore, the product must be installed according to the proprietary wood frame construction details. These construction details are in Appendix A and include increased top and bottom plates, less stud spacing, and horizontal sheathing, etc.

Figure 1. Shouldice Fusion Stone installed in dry-stack design

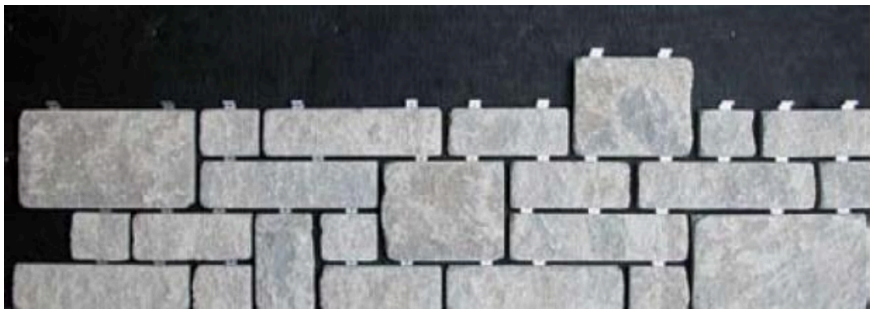

Figure 2. Shouldice Fusion Stone installed for the grouted joint design just before grouted

Figure 3. Corner piece of Shouldice Fusion Stone assembly

Manufacturing plant

This evaluation is valid only for products produced at the following plant:

Product name	Manufacturing plant
	Shallow Lake, ON, CA
Shouldice Fusion Stone	✓

✓ 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.

General

- The components of the backup wall construction must be in full compliance with the requirements of Part 9, Housing and Small Buildings, of Division B of the NBC 2015 in conjunction with the conditions and limitations listed in this report.
- The product is limited to use as exterior cladding for the buildings falling within the scope of Part 9, Housing and Small Buildings, of Division B of the NBC 2015 in conjunction with the conditions and limitations listed in this report. It must be applied on structural grade wood sheathing boards that are attached to wood framing in accordance with the Shouldice back-up wall design specified below.
- The product is permitted to be installed in either a grouted and/or dry-stack joint design.
- The product is limited to installation on buildings not exceeding two (2) storeys with 3 m height per floor.
- The product is limited to installations in geographical areas where the 1-in-50 year hourly wind pressure (Q_{50}) is ≤ 0.85 kPa and the building is Category 2 for internal pressure as defined in the NBC 2015. The wind design value has been validated for the product installed over horizontally installed plywood or oriented strand board (OSB) structural sheathing with a minimum thickness of 12.5 mm for plywood and 11 mm for OSB. The wind load resistance test data and hourly wind pressure (Q_{50}) in this report is limited to the geographic areas where the site specific topographic factor, Ct ≤ 1.0. Further calculations are required for the buildings that are constructed on hills or escarpments with a slope as defined in Article 4.1.7.4. of the NBC 2015. For buildings constructed on hills and escarpments, the anticipated wind pressures may be greater than the values covered under this evaluation report.
- The product must be applied in geographical areas where the spectral response acceleration $S_a(0.2)$ is 1.2 or less and the building is on a Class C site or better.
- The 10 mm air space that is created by the anchors must remain unobstructed to form a clear drainage layer behind the product.
- At least one layer of wall sheathing membrane conforming to Article 9.27.3.2., Sheathing Membrane Material Standard, of Division B of the NBC 2015, must be applied beneath the cladding products. The sheathing membrane must be applied in accordance with Article 9.27.3.3., Required Sheathing Membrane and Installation, of Division B of the NBC 2015.
- The product must be installed with suitable flashing to drain water from the drainage layer to the exterior and to protect the exposed top edge of the cladding.
- Flashing must be installed in accordance with the requirements of Articles 9.27.3.7., Flashing Materials, and 9.27.3.8., Flashing Installation, of Division B of the NBC 2015.
- The impact resistance of the product makes it susceptible to hard and soft body impacts. However, the ease of replacing the product makes it suitable for normal use in upper floors and protected ground floors. When used at ground floors exposed to high impacts, special precautions must be taken such as guardrails or raised gardens.
- The requirements of the NBC 2015 regarding fire blocks must be implemented when required.
- The product must be installed in accordance with the manufacturer's current instructions.
- A high level of quality control at all stages of the exterior wall construction is imperative for obtaining an acceptable performance.
- This evaluation is applicable only to products identified by the phrase "CCMC 14008-R."

Structural

- The product is to be installed on Shouldice's pre-engineered wood frame designed to support this proprietary product. The installation of the product must be in accordance with the engineering analysis as prepared by Quaile Engineering Ltd., Report 13-166-2, dated January 27, 2014. The pre-engineered design solutions are produced in the engineering analysis and reproduced in Appendix A of this evaluation, along with the detailed design and construction requirements. The pre-engineered design solutions are provided having the following features:
  - only applied to "new" construction;
  - the top and bottom plates are increased and the stud spacings are reduced;
  - nailing of the top and bottom plates are increased;
  - squash blocks are required to support the I-joists; and
  - exterior sheathing is installed with the strong axis (face grain) oriented horizontally.
- When the product is used outside the scope and limitations of the report "Quaile Engineering Ltd., Report 13-166-2, dated January 27, 2014," a special engineering analysis must be carried out by a licensed professional engineer skilled in structural design who must sign and seal the related analysis confirming its conformance to Part 4 of Division B of the NBC 2015.
- The stud wall must consist of 38 mm × 140 mm stud grade Spruce-Pine-Fir (SPF). A hole not greater than 25 mm in diameter is permitted at the centreline of the stud. The plates used in the framing of the back-up wall must be No. 2 grade SPF plates. The anchor clips must be attached to a minimum 11-mm-thick OSB that is supported by untreated wood studs spaced at 406 mm or less, or 12.5 mm plywood sheathing conforming to CSA O121, "Douglas Fir Plywood," or CSA O151, "Canadian Softwood Plywood."
- A horizontal joint must be provided in the stone at each floor level as indicated in Figure 6.
- The maximum anchor clip spacing along the horizontal joints between stone rows is 150 mm for both the grouted and the dry-stack applications.
- For dry-stack applications, the cladding is installed so that there is at least one row of 95 mm stone above and below any 190 mm stones.
- The fastening screws used to secure the cladding through the anchors/clips must be #8 19-mm-long Robertson-head stainless steel wood screws.
- The cladding attachment must conform with Sentence 9.27.5.1.(1), Article 9.27.5.5., Fastener Materials, and Article 9.27.5.7., Penetration of Fasteners, of Division B of the NBC 2015. For any other mode of attaching a cladding system to sheathing, the structural sufficiency of the sheathing and the whole backing, in conjunction with the anchors/clips and type of fasteners, must be in accordance with the engineering analysis as prepared by Quaile Engineering Ltd., Report 13-166-2, dated January 27, 2014.

Technical information

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

Criteria number	Criteria name
CCMC-TG-074661-15	CCMC Technical Guide for Cladding Systems Using Concrete Stone (Installed Directly over Wood Frame Backing by Metal Connectors)

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

Table 1. Results of testing the material and physical properties of the product (stone)

Property	Requirement	Results
Dimensions – length (mm)	≤ 900	510
Dimensions – width (mm)	≤ 900	128
Dimensions – thickness (mm)	≤ 70	47
Area (m^2)	≤ 0.26	0.07
Deviation from plane of the back face (mm)	≤ 1.0	0.67
Warpage/out-of-square (mm)	Parallel edge dimensions, and out-of-square I any direction ≤ 2	0.01
Dimensional tolerances – length (mm)	±3.0	+1.6
Dimensional tolerances – height (mm)	±2.0	+0.9
Dimensional tolerances – thickness (mm)	±2.0	Pass
Groove thickness (mm)	Report value	1.72
Groove thickness tolerance (mm)	+2.0, –1.0 from specified thickness	0.19 Pass
Weight (kg/m^2)	≤ 75.0	70
Density (kg/m^3)	Report value	1 860
Moisture properties – water absorption (24 h) (%)	Report value	5
Moisture properties – water vapour transmission (if any water repellent coating or additive is used) ($kg/m^2 \cdot s \cdot Pa$)	Report value	N/A (1)
Moisture properties – coefficient of water absorption ($kg/m^2/sec^{½}$)	Report value	0.012 (2) 0.011 (3)
Drying shrinkage (mm/m)	≤ 0.65	0.43
Strength (MPa) – flexural	Report value	2.31

Property	Requirement	Results
Strength (MPa) – compressive	15	28
Freeze-thaw resistance – loss of weight (%)	≤ 1	−0.9
Freeze-thaw resistance – visual observation	Specimen must not show any deleterious effects such as spalling, cracking or crazing	None

Notes

1 Not applicable.

2 Back side.

3 Face side.

Table 2. Results of testing the materials and physical properties of the product (clip/anchor)

Property	Requirements	Results – P_{ult}	Results – factored resistance (1)	Comments
Pullout test (N)	≥ 1000	464 (2)	278	Pass
Pullout test (N)	≥ 1000	427 (2)	256	Pass
Shear bending (N)	Report value	45	27	Pass

Notes

1 Factored resistance calculated as per Section 9.4.2.1.1 of CAN/CSA-A370-04, ”Connectors for Masonry Welding Requirements,” using $\varphi = 0.6$ (buckling failure of the clip).

2 The specified minimum pullout strength of 1 000 N is based on the requirements of CAN/CSA-A370 that cover specific types of masonry and anchors/clips that fall within the intent of the standard. As the spacing for the product is much closer than the standard veneer ties covered by CAN/CSA-A370, and through the engineering analysis provided for the product, the obtained ultimate and factored resistance of the product’s clip/anchors are deemed to meet the intent of the established requirements.

Performance requirements

Table 3. Results of testing the impact resistance of the product

Impact body	Dynamic mass (kg)	Energy (N·m)	Results
Safety impact – large soft	50	100	Pass
Safety impact – hard	1	10	Pass

Impact body	Dynamic mass (kg)	Energy (N·m)	Results
Retention of performance impact – large soft	50	34	Deemed to pass
Retention of performance impact – small soft	30	60	Fail (1)
Retention of performance impact – hard	1	10	Fail (1)

Note

1 The product is susceptible to small soft and hard impacts related to the energy levels stated in this table. Consequently, the cladding must be sheltered from such impact energies and, in the event of any damage resulting from such impact, the cladding units must be replaced immediately.

Table 4. Results of testing the wind load resistance of the product (1)

Cycle	Pressure (Pa) $Q_{50} \leq 0.85$ kPa	Deflection at midspan of specimen
Sustained loads (P_1, P_1')	± 235	+0.2/−0.2
Sustained loads (P_1, P_1')	± 470	+0.2/−0.2
Sustained loads (P_1, P_1')	± 705	+0.1/−0.1
Sustained loads (P_1, P_1')	± 940 (P_1)	+0.5/+0.5
Sustained loads (P_1, P_1')	Residual	+1.3/0.0
Cyclic loads (P_2, P_2')	0 to ± 1 370 (P_2)	+0.5/0.0
Cyclic loads (P_2, P_2')	Residual	+1.3/+2.1
Gust loads (P_3, P_3')	0 to ± 2 050 (P_3)	+1.0/+0.6
Gust loads (P_3, P_3')	Residual	0.0/0.0

Note

1 This table does not take into account the site-specific topographic factor, where Ct, > 1.0, for buildings that are constructed on hills or escarpments with a slope defined in Article 4.1.7.4., Topographic Factor, of Division B of the NBC 2015. For buildings constructed on hills and escarpments, anticipated wind pressures may be greater.

Appendix A: Pre-engineered design solutions

The pre-engineered solutions must be in full accordance with the engineering analysis prepared by Quaile Engineering Ltd., Report 13-166-2, dated January 27, 2014. The following three tables provide the main pre-engineering solutions for buildings not exceeding two (2) storeys with 3 m height per floor.

A-1. Maximum stud spacing for top floor (supporting roof only)

- Top plate: 2 – 38 mm × 140 mm No. 2 Grade SPF
- Bottom plate: 1 – 38 mm × 140 mm No. 2 Grade SPF
- Stud materials: 38 mm × 140 mm stud grade SPF
- Maximum roof truss span: 12 m
- Dry-stack design of the product

Table 5. Maximum stud spacing (mm) for top floor

Design snow load (kPa)	Wall height (m)	1/50 yr hourly wind pressure (kPa)						
		0.4	0.45	0.5	0.55	0.6	0.65	0.7
1	2.4	400	400	400	400	300	300	300
1	2.7	400	400	400	300	300	300	–
1	3.0	400	400	300	300	300	–	–
1.5	2.4	400	400	400	400	300	300	300
1.5	2.7	400	400	400	300	300	300	–
1.5	3.0	400	400	300	300	300	–	–
2	2.4	300	300	300	300	300	300	300
2	2.7	300	300	300	300	300	300	–
2	3.0	300	300	300	300	300	–	–
2.5	2.4	300	300	300	300	300	300	300
2.5	2.7	300	300	300	300	300	300	–
2.5	3.0	300	300	300	300	300	–	–
3	2.4	–	–	–	–	–	–	–
3	2.7	–	–	–	–	–	–	–
3	3.0	–	–	–	–	–	–	–

Notes

- With conventional two (2) top plates and one (1) bottom plate, the stud spacing is reduced (i.e., 300 mm compared to 600 mm in the NBC 2015).
- The wall must be constructed in accordance with Part 9 of the NBC 2015 unless indicated otherwise.
- The grade and number of wall plates must be as shown in the table heading.
- The inside plate is to be end-nailed to the studs with 3 – 82 mm nails.
- The double plates are to be nailed together with 3 – 82 mm nails between studs.
- Upper walls are to be located directly over the lower walls.
- Engineered rim board and squash blocks are to be provided along with I-joist floors in all cases. The rim board shall be at least 28 mm thick. Minimum 38 × 89 mm squash blocks in the rim joist space are to be at the same spacing and in line with the studs

directly below, except for the rim joist space at the foundation where the squash blocks are to be at the same spacing as the studs in the wall above.
- I-joist blocking at 400 mm o/c is required at the top of the wall where the floor joists are parallel to the wall.
- The floor joists and blocking are to be fastened to the top plate of the wall with 3 – 82 mm nails.
- Gypsum wall board is assumed to be attached to the interior side of the studs.
- Exterior sheathing to be 11 mm OSB (to CSA O325), or 12.5 mm plywood (to CSA O121 or O151) installed horizontally across a minimum of three stud spaces.
- A maximum 25 mm hole is permitted at the centre of the stud.
- A minimum 38 × 140 mm sill plate is required at the foundation level.

A-2. Maximum stud spacing for top floor with increased top and bottom plates (supporting roof only)

- Top plate: 3 – 38 mm × 140 mm No. 2 Grade SPF
- Bottom plate: 2 – 38 mm × 140 mm No. 2 Grade SPF
- Stud materials: 38 mm × 140 mm stud grade SPF
- Maximum roof truss span: 12 m
- Dry-stack design of the product

Table 6. Maximum stud spacing (mm) for top floor with increased top and bottom plates

Design snow load (kPa)	Wall height (m)	1/50 yr hourly wind pressure (kPa)						
		0.4	0.45	0.5	0.55	0.6	0.65	0.7
1	2.4	400	400	400	400	300	300	300
1	2.7	400	400	400	300	300	300	–
1	3.0	400	400	300	300	300	–	–
1.5	2.4	400	400	400	400	300	300	300
1.5	2.7	400	400	400	300	300	300	–
1.5	3.0	400	400	300	300	300	–	–
2	2.4	400	400	400	400	300	300	300
2	2.7	400	400	400	300	300	300	–
2	3.0	400	400	300	300	300	–	–
2.5	2.4	400	400	400	400	300	300	300
2.5	2.7	400	400	400	300	300	300	–
2.5	3.0	400	400	300	300	300	–	–
3	2.4	400	400	400	400	300	300	300
3	2.7	400	400	400	300	300	300	–
3	3.0	400	400	300	300	300	–	–

Notes

- With increased top and bottom plates, some stud spacing may be increased (i.e., 400 mm compared to 300 mm for the same design snow load, wall height and 1/50 year hourly wind pressure in Table 5).
- The wall must be constructed in accordance with Part 9 of the NBC 2015 unless indicated otherwise.
- The grade and number of wall plates must be as shown in the table heading.
- The inside plate is to be end-nailed to the studs with 3 – 82 mm nails.
- The double plates are to be nailed together with 3 – 82 mm nails between studs.
- Upper walls are to be located directly over the lower walls.
- Engineered rim board and squash blocks are to be provided along with I-joist floors in all cases. The rim board shall be at least 28 mm thick. Minimum 38 × 89 mm squash blocks in the rim joist space are to be at the same spacing and in line with the studs directly below, except for the rim joist space at the foundation where the squash blocks are to be at the same spacing as the studs in the wall above.
- I-joist blocking at 400 mm o/c is required at the top of the wall where the floor joists are parallel to the wall.
- The floor joists and blocking are to be fastened to the top plate of the wall with 3 – 82 mm nails.
- Gypsum wall board is assumed to be attached to the interior side of the studs.
- Exterior sheathing to be 11 mm OSB (to CSA O325), or 12.5 mm plywood (to CSA O121 or O151) installed horizontally across a minimum of three stud spaces.
- A maximum 25 mm hole is permitted at the centre of the stud.
- A minimum 38 × 140 mm sill plate is required at the foundation level.

A-3. Maximum stud spacing for ground floor (supporting roof and 1 floor)

- Top plate: 2 – 38 mm × 140 mm No. 2 Grade SPF
- Bottom plate: 2 – 38 mm × 140 mm No. 2 Grade SPF
- Stud materials: 38 mm × 140 mm stud grade SPF
- Maximum roof truss span: 12 m
- Maximum floor joist span: 8 m

Table 7. Maximum stud spacing (mm) for ground floor

Design snow load (kPa)	Wall height(m)	1/50 yr hourly wind pressure (kPa)						
		0.4	0.45	0.5	0.55	0.6	0.65	0.7
1	2.4	400	400	400	400	300	300	300
1	2.7	400	400	300	300	300	300	–
1	3.0	400	300	300	300	300	–	–
1.5	2.4	400	400	400	400	300	300	300
1.5	2.7	400	400	300	300	300	300	–
1.5	3.0	400	300	300	300	300	–	–
2	2.4	400	400	400	400	300	300	300
2	2.7	400	400	300	300	300	300	–
2	3.0	400	300	300	300	300	–	–
2.5	2.4	400	400	400	400	300	300	300

Design snow load (kPa)	Wall height(m)	1/50 yr hourly wind pressure (kPa)						
		0.4	0.45	0.5	0.55	0.6	0.65	0.7
2.5	2.7	400	400	300	300	300	300	–
2.5	3.0	400	300	300	300	300	–	–
3	2.4	400	400	400	400	300	300	300
3	2.7	400	400	300	300	300	300	–
3	3.0	300	300	300	300	300	–	–

Notes

- With two (2) top plates and two (2) bottom plates, the stud spacing must be either 300 mm or 400 mm as indicated in the table above.
- The wall must be constructed in accordance with Part 9 of the NBC 2015 unless indicated otherwise.
- The grade and number of wall plates must be as shown in the table heading.
- The inside plate is to be end-nailed to the studs with 3 – 82 mm nails.
- The double plates are to be nailed together with 3 – 82 mm nails between studs.
- Upper walls are to be located directly over the lower walls.
- Engineered rim board and squash blocks are to be provided along with I-joist floors in all cases. The rim board shall be at least 28 mm thick. Minimum 38 × 89 mm squash blocks in the rim joist space are to be at the same spacing and in line with the studs directly below, except for the rim joist space at the foundation where the squash blocks are to be at the same spacing as the studs in the wall above.
- I-joist blocking at 400 mm o/c is required at the top of the wall where the floor joists are parallel to the wall.
- The floor joists and blocking are to be fastened to the top plate of the wall with 3 – 82 mm nails.
- Gypsum wall board is assumed to be attached to the interior side of the studs.
- Exterior sheathing to be 11 mm OSB (to CSA O325), or 12.5 mm plywood (to CSA O121 or O151) installed horizontally across a minimum of three stud spaces.
- A maximum 25 mm hole is permitted at the centre of the stud.
- A minimum 38 × 140 mm sill plate is required at the foundation level.

A-4. Exterior sheathing and fastening

The exterior sheathing requirements are illustrated in Figure 4, and their fastening schedules are shown in Table 8.

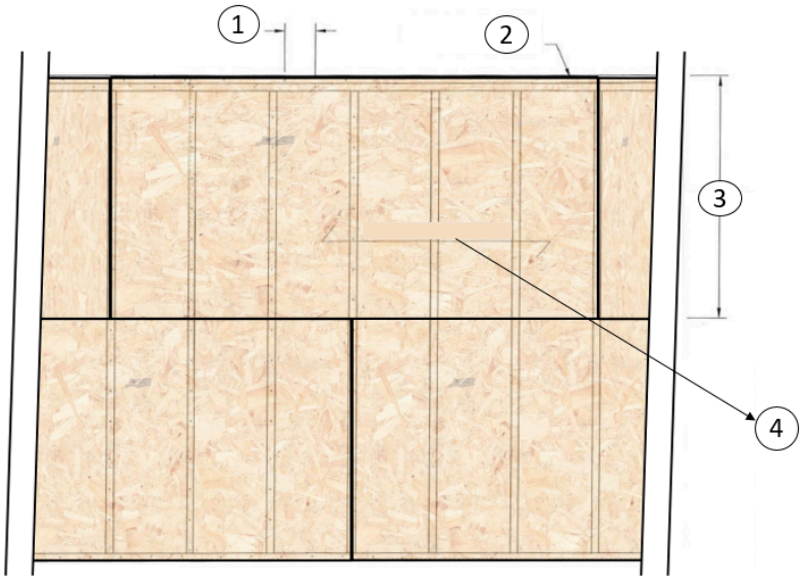

Figure 4. Exterior sheathing and fastening for the product

1. nail spacing in accordance with Table 8 along all supports
2. 11 mm OSB to CSA O325, or 12.5 mm plywood to CSA O121 or O151
3. 600 mm minimum
4. face grain horizontal

Table 8. Nail spacing for 11 mm OSB or 12.5 mm plywood sheathing fastened to 38 mm × 140 mm SPF studs

Stud spacing (mm)	Spiral nail size – length (mm)	Spiral nail size – diameter (mm)	1/50 year hourly wind pressure					
			0.45	0.50	0.55	0.60	0.65	0.70
300	63	2.77	150	150	150	150	140	–
300	76	3.1	150	150	150	150	150	–
400	63	2.77	140	130	120	110	105	95
400	76	3.1	150	150	150	150	145	135

A-5. Details of stud wall construction

The details of the stud wall construction are illustrated Figure 5. The details in the figure are designed to accommodate the worst case scenario for the range of conditions covered by the pre-engineered solutions.

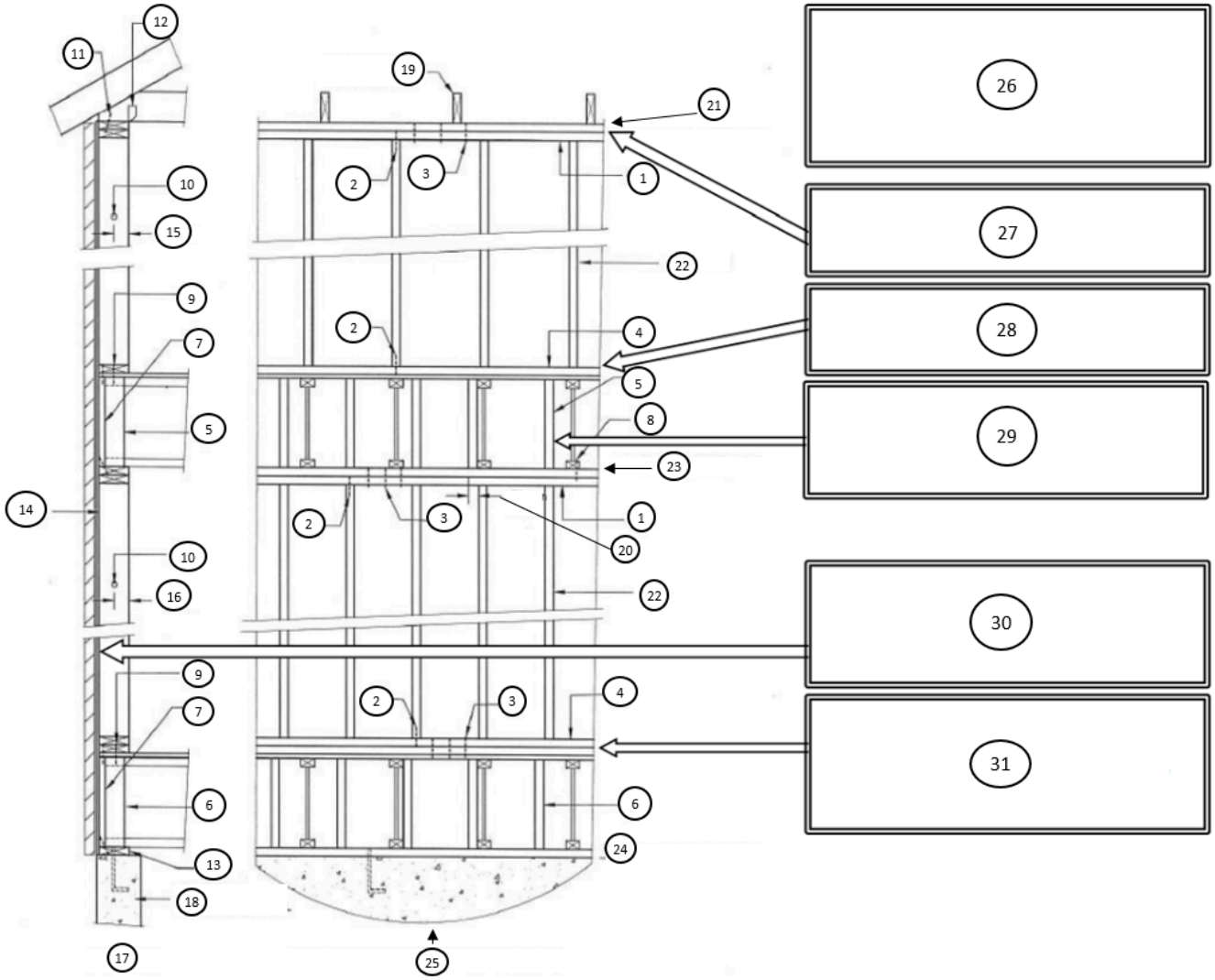

Figure 5. Stud wall construction for the product (wall elevation, interior face)

1. 2 × 6 top plate (2 or 3 ply in accordance with stud tables)
2. 3 – 82 mm end nails per stud
3. 3 – 82 mm plate-to-plate nails between studs
4. 2 × 6 bottom plate (1 or 2 ply as per stud tables)
5. 2 × 4 squash block aligned with wall studs below (maximum 76 mm offset from stud below)
6. 2 × 4 squash blocks above foundation at the same spacing as the studs in the wall above
7. minimum 28 mm engineered rim board fastened with 82 mm toe nails at 150 mm o.c.
8. floor joist or blocking at maximum of 406 mm o.c., fastened with 3 – 82 mm nails
9. bottom plate fastened to floor with 82 mm nails at 150 mm o.c.
10. maximum 25 mm diameter hole at centre of stud
11. 3 – 82 mm toe nails from truss to plate
12. Simpson strong G-Tie H 10A anchor on each truss
13. 2 × 6 sill plate
14. 11 mm 1 R 24/2f 16 OSB or 12.5 mm softwood or Douglas fir plywood fastened in accordance with Table 8
15. 70 mm
16. 70 mm
17. section
18. concrete foundation wall

19. roof trusses at 24" o.c. max.
20. 76 mm max.
21. top of 2nd floor plate
22. 2 × 6 studs
23. top of 1st floor plate
24. top of foundation wall
25. wall elevation (interior face)
26. deviation from conventional wood frame construction
27. 2 or 3 top plates
28. 1 or 2 bottom plates
29. must have squash blocks
30. must have exterior sheathing horizontally
31. must have 2 bottom plates

A-6. Maximum lintel span

The maximum lintel span is provided in Table 9. It is important to note that the lintel span tables provided in Part 9 of the NBC 2015 are not applicable to walls supporting this product.

Table 9. Maximum lintel span (1)

Design snow load (kPa)	Maximum lintel clear span (m)					
	Lintel supporting roof only			Lintel supporting roof and one (1) floor		
	3 – 38 mm × 184 mm	3 – 38 mm × 235 mm	3 – 38 mm × 286 mm	3 – 38 mm × 184 mm	3 – 38 mm × 235 mm	3 – 38 mm × 286 mm
1	1.97	2.43	2.79	1.29	1.59	1.82
1.5	1.72	2.13	2.44	1.27	1.58	1.80
2	1.55	1.91	2.20	1.21	1.50	1.71
2.5	1.42	1.75	2.01	1.14	1.37	1.62
3	1.32	1.63	1.86	1.08	1.19	1.53

	Note
1	Applicable to No. 2 grade SPF, with a maximum roof truss span of 12 m and a maximum floor joist span of 8 m.

A-7. Movement joints

The movement joints required for this product are illustrated in details in Figure 6.

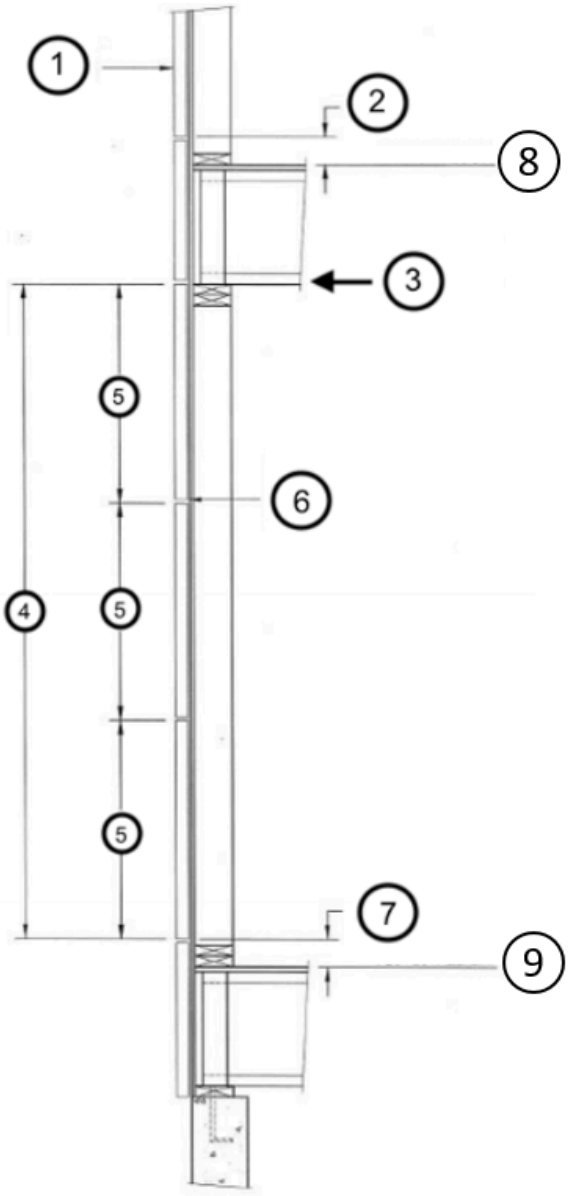

Figure 6. Required movement joints in applications for the product

1. movement joints in upper floor to be the same as shown below
2. 100 mm to 125 mm
3. top of wall
4. height
5. 1/3 height
6. 3 mm gap (movement joint) between stone where shown
7. 100 mm to 125 mm
8. top of floor
9. top of floor

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.

Disclaimer

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

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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:

Alliance of Canadian Building Official Associations (ACBOA)	(Alliance of Canadian Building Official Associations (ACBOA))
First Nations National Building Officers Association (FNNBOA)	(First Nations National Building Officers Association (FNNBOA))
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)	(Manitoba Building Officials Association (MBOA))
Ontario Building Officials Association (OBOA)	(Ontario Building Officials Association (OBOA))
New Brunswick Building Officials Association (NBBOA)	(New Brunswick Building Officials Association (NBBOA))
Nova Scotia Building Officials Association (NSBOA)	(Nova Scotia Building Officials Association (NSBOA))

> The CCMC provides code compliance assessments to Canadian code requirements, consulting nationwide with construction regulators to elicit regional variations in code requirements as well as provincial and local interpretations. Users are advised to review the technical information presented in CCMC assessments when making approval decisions. Learn more about how the CCMC provides a unique service for Canada.

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

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.

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.

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