



Evaluation Report CCMC 13492-R Form-A-Drain

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “Form-A-Drain”, when used as a concrete footing form and drainage tile in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code (NBC) of Canada 2010:

- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
 - Clause 4.1.1.3.(4)(c), Design Requirements (Structural Loads and Procedures)
 - Article 9.14.3.1., Material Standards (Drainage Tile and Pipe)
 - Article 9.14.3.2., Minimum Size (Drainage Tile and Pipe)
 - Article 9.14.3.3., Installation (Drainage Tile and Pipe)
 - Subsection 9.14.5., Drainage Disposal

This opinion is based on CCMC’s evaluation of the technical evidence in Section 4 provided by the Report Holder.

Ruling No. 10-04-241 (13492-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 2010-04-09 (revised 2018-03-07) pursuant to s.29 of the *Building Code Act*, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

2. Description

“Form-A-Drain” is a foundation product that is intended for use as a concrete footing form and drainage tile. The product is manufactured from an extruded polyvinyl chloride (PVC) compound and is available in 100 mm (4 in.), 150 mm (6 in.), 200 mm (8 in.), and 250 mm (10 in.) depths. The 100-mm drainage channel (lineal) has a single hollow chamber, while the 150 mm, 200 mm, and 250 mm depths have intermediate webs to stiffen the channel.

The product’s system consists of 3.66 m (12 ft.) lineals, which are slotted on the exterior face to allow the entrance of ground water. The system also includes straight couplings, corner couplings, 45° fabricated fittings, 90° vertical “L” fittings, a snap-in adapter, single and double outlet fittings, spacer straps, and grade stakes to facilitate installation and accommodate drainage to the disposal system.



Figure 1. “Form-A-Drain” product sizes



Figure 2. “Form-A-Drain” corner assembly



Figure 3. “Form-A-Drain” corner assembly after concrete placement

3. Conditions and Limitations

CCMC’s compliance opinion in Section 1 is bound by the “Form-A-Drain” being used in accordance with the conditions and limitations set out below:

- The product must be laid on undisturbed or well-compacted soil so that the top of the product is below the bottom of the floor slab or the ground cover of the crawl space.
- The top and sides of the product must be covered with not less than 150 mm of crushed stone or other coarse, clean granular material containing not more than 10% of material that will pass through a 4-mm sieve. Careful attention shall be considered during backfilling to limit impact so as to not cause damage to the product.
- Drainage disposal of the product must be in accordance with Subsection 9.14.5. of Division B of the NBC 2010.
- The product must be stored, protected, and installed in accordance with the manufacturer’s specifications that are stated in Royal Building Products (USA) Inc.’s Installation Guide dated September 2013. The Installation Guide must be available at the job site at all times.

4. Technical Evidence

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

4.1 Material Requirements

Table 4.1.1 Results of Testing the Resistance Properties of the Product

Property	Requirement	Result
Impact resistance	No evidence of cracks or fissures when tested for impact at the perforated and non-perforated specimen face (sides) or the solid wide edge (top).	The 100 mm (4 in.), 150 mm (6 in.) and 200 mm (8 in.) specimens met the requirements. The 250 mm (10 in.) specimen met the requirements for both faces (sides), but did not meet the impact requirements for the solid wide edge ¹ (top).
Chemical resistance	± 2% maximum weight change	The specimens met the requirements when exposed to 12 different potentially damaging chemicals. Results ranged from a weight change of 0.09% to 0.15%.

Note to Table 4.1.1:

¹ 250 mm (10 inch) specimens failed after being impacted by a 1.0-kg tup (hammer head) dropped from a height of 1.0 m. Therefore, careful attention shall be considered during backfilling to limit impact so as to not cause damage to the product.

4.2 Performance Requirements

Table 4.2.1 Results of Testing the Concrete Form Capacity of the Product

Property	Requirement	Result
Stability	The footing form and its accessories must remain within 10 mm of their original position after concrete placement and hardening.	The product met the requirements. A maximum displacement of 4.72 mm was observed.
Concrete leakage	No measurable leakage of concrete through the form.	The product met the requirements. No leakage of concrete through the form was observed.
Load capacity	The form must resist the anticipated loads imposed by the concrete placement.	The product met the requirements. The product resisted the loads imposed by the placement of concrete.

Table 4.2.2 Results of Testing the Drainage Capacity of the Product

Property	Requirement	Result
Flow characteristics and perforation area	Comparative analysis to corrugated polyethylene pipe standard BNQ 3624-115, which has a minimum perforation area of 32 cm ² /m.	The product met the requirements and has a total perforation area of 34.3 cm ² /m for all product sizes.

Report Holder

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