

CCMC 14039-R

CCMC Canadian code compliance evaluation

CCMC number:	14039-R
Status:	Active
Issue date:	2016-07-28
Modified date:	2023-04-17
Evaluation holder:	<p>Ram Jack Distribution Systems 13655 County Road 1570 Ada OK 74820 United States Website: www.ramjack.com Telephone: 580-332-9980 Email: dwillis@ramjack.com</p>
Product name:	Ram Jack Helical Foundation Systems and Devices
Code compliance:	NBC 2015
Evaluation requirements:	CCMC-TG-316615.13-15A "CCMC Technical Guide for Augered-Installed Steel Piles"

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

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Code compliance opinion

It is the opinion of the Canadian Construction Materials Centre that the evaluated product, when used as an auger-installed steel pile foundation system 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
4.2.3.8.(1)(e) CSA G40.21, "Structural Quality Steel."	<u>Acceptable</u>
4.2.3.10.(1) Where conditions are corrosive to steel, ...	<u>Acceptable</u>
4.2.4.1.(1) The design of foundations, excavations a ...	<u>Acceptable</u>
9.4.1.1.(1)(c)(i) Part 9, or	<u>Acceptable</u>

The above opinion is 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

Ram Jack Helical Foundation Systems and Devices

Product description

The products consist of a lead (shaft) section with helical-shaped blades that have an extension with or without helical blades. The lead section and the corresponding extension consist of a 73 mm or an 89 mm outside diameter steel pipe that has a nominal wall thickness of 5.51 mm or 6.35 mm, respectively.

The lead and extension sections are connected by a solid internally threaded pin and box connection that is welded on the trailing end of the lead section and each end of the extension. Helical-shaped blades that are shop welded to the shaft advance the pile into the soil when rotated. The helical blades are 203 mm, 254 mm, 305 mm or 356 mm in diameter and are 9.5 mm or 12.7 mm thick. The helical blades are pressed using a hydraulic press and die to achieve a 76-mm pitch prior to being welded to the lead (shaft) section.

The lead shaft and extensions are coated with a polyethylene copolymer coating with a minimum coating thickness of 0.46 mm.

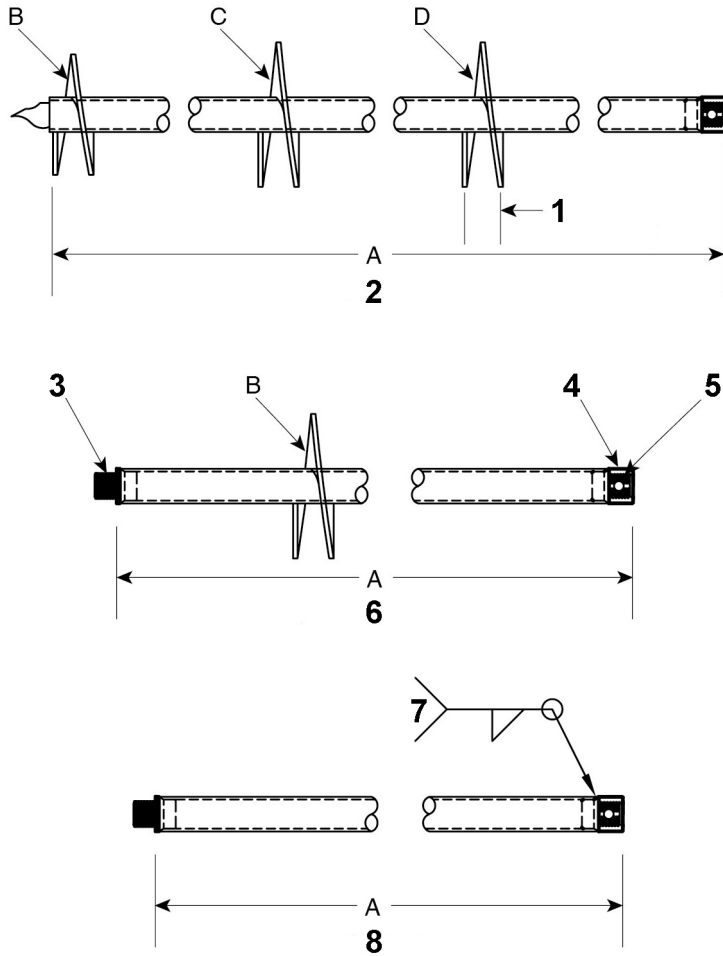


Figure 1. Ram Jack Helical Foundation Systems and Devices

1. 76 mm pitch (typ.)
2. Lead section
3. Threaded pin
4. Threaded box
5. 20 mm Ø drive pin hole
6. Helix extension
7. Typ.
8. Extension

Manufacturing plant

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

Product name	Manufacturing plant
	Ram Jack Helical Foundation Systems and Devices

☑ 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 product under this evaluation is intended to be used as a foundation system to support the following types of construction:
 - Single storey residential buildings within the scope of Part 9 of NBC 2015;
 - Accessory buildings such as sheds, gazebos, sunrooms, carports, and decks/porches within the scope of Part 9 of NBC 2015.

Other applications are beyond the scope of this evaluation, wherein a professional engineer skilled in such design and licensed to practice under the appropriate provincial or territorial legislation must determine the pile capacity and other design parameters.

- The product may be used as a foundation system to support various constructions provided that it is installed according to the manufacturer's current instructions and within the scope of this Evaluation Report.
- Where the product is installed in granular soil or silt, there is a direct relationship between the applied torque and the allowable compressive loads, which are indicated in the tables:
 - Allowable compressive and tensile loads of 73-mm helical piles
 - Allowable compressive and tensile loads of 89-mm helical piles
- Where the product is installed in a cohesive soil such as clay, the relationship between the applied torque and the allowable compressive load is not predictable; as such, the allowable compressive loads must be confirmed by on-site load tests. These load tests are also required if the allowable loads exceed those stated in the tables under the Technical information section. The tests must be conducted under the direct supervision of a professional geotechnical engineer skilled in such design and licensed to practice under the appropriate provincial or territorial legislation.
- In all cases, a registered professional engineer skilled in such design and licensed to practice under the appropriate provincial or territorial legislation must determine the number and spacing of the auger-installed steel piles required to carry all the loads. A certificate attesting to the conformity of the installation and the allowable loads for the piles must be provided.
- All welding is to be done by welders that are certified.
- Where conditions (soil and environmental) are determined to be corrosive to steel, protection of the steel shall be provided. The determination of the presence of corrosive conditions and the specification of the corrosion protection shall be carried out by a registered professional engineer licensed to practice under the appropriate provincial or territorial legislation". If the determination of the presence of corrosive conditions is not completed before installation, the product, including all its accessories, is required to be hot-dipped galvanized, meeting the requirements of CAN/CSA-G164 (ASTM A123/A123M-17) with a minimum thickness of 610 g/m², or another method that provides an equivalent level of protection and abrasion resistance deemed acceptable by CCMC.
- The installer must be certified by Ram Jack Distribution Systems to be permitted to install the product. The installer must follow the manufacturer's installation instructions, use approved equipment, and heed the uses and limitations specified in this Report. Each installer must carry a certification card with their signature and photograph.
- Each product of auger-installed steel pile must be identified with a label containing the manufacturer's identification and the phrase "CCMC 14039-R."

Technical information

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

Criteria number	Criteria name
CCMC-TG-316615.13-15A	CCMC Technical Guide for Augered-Installed Steel Piles

General

Ram Jack Distribution Systems provide the products in diameters of 73 mm or 89 mm. The piles were tested in accordance with:

- ASTM D1143-81(1994)e1, “Standard Test Method for Piles under Static Axial Compressive Load,” and
- ASTM D3689-90(1995), “Standard Test Method for Individual Piles Under Static Axial Tensile Load.”

The installation torque is directly used to calculate the allowable bearing capacity of the pile by applying the direct correlation method. For the allowable compressive and tensile loads noted in the tables below, the factor of safety is 2.

The protective coating used on the piles was also tested; it performed well during the tests.

Table 1. Allowable compressive and tensile loads of 73-mm helical piles ⁽¹⁾

Applied torque		Torque correlated allowable soil capacity			
N·m	ft.-lb.	Compression		Tension	
		kN	lb.	kN	lb.
678	500	10	2 250	10	2 250
1 356	1 000	20	4 500	20	4 500
2 034	1 500	30	6 750	30	6 750
2 712	2 000	40	9 000	40	9 000
3 390	2 500	50	11 250	50	11 250
4 068	3 000	60	13 500	60	13 500
4 746	3 500	70	15 750	-	-
5 424	4 000	80	18 000	-	-
6 102	4 500	90	20 250	-	-
6 780	5 000	100	22 500	-	-

Note

This PDF is an alternative version. This document was published on 2023-04-17 and may not be the latest version of this evaluation. Users should consult the latest [published assessment](#) on the [CCMC Registry of Product Assessments](#), which contains the most up to date information. This PDF is intended for use as a record, not the latest information available.

1 The allowable loads identified in this Table are only valid when the product is installed in undisturbed or uniformly placed and well-engineered fill soils. Special attention is required when the auger-installed steel piles are installed in recently backfilled sites or in bedrock soils. In these cases, the Allowable compressive and tensile loads of 73-mm helical piles table do not apply and the allowable loads must be determined by on-site confirmatory testing.

Table 2. Allowable compressive and tensile loads of 89-mm helical piles ⁽¹⁾

Applied torque		Torque correlated allowable soil capacity			
N·m	ft.-lb.	Compression		Tension	
		kN	lb.	kN	lb.
678	500	8	1 750	8	1 750
1 356	1 000	16	3 500	16	3 500
2 034	1 500	23	5 250	23	5 250
2 712	2 000	31	7 000	31	7 000
3 390	2 500	39	8 750	39	8 750
4 068	3 000	47	10 500	47	10 500
4 746	3 500	54	12 250	54	12 250
5 424	4 000	62	14 000	62	14 000
6 102	4 500	70	15 750	-	-
6 780	5 000	78	17 500	-	-
7 458	5 500	86	19 250	-	-
8 136	6 000	93	21 000	-	-
8 814	6 500	101	22 750	-	-

Note

1 The allowable loads identified in this Table are only valid when the product is installed in undisturbed or uniformly placed and well-engineered fill soils. Special attention is required when the auger-installed steel piles are installed in recently backfilled sites or in bedrock soils. In these cases, the Allowable compressive and tensile loads of 89-mm helical piles table do not apply and the allowable loads must be determined by on-site confirmatory testing.

Administrative information

Disclaimer

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It is the responsibility of the local AHJs, design professionals, and specifiers to confirm that the evaluation is current and has not been withdrawn or superseded by a later issue. Please refer to [the website](#) or contact:

Canadian Construction Materials Centre

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National Research Council of Canada
1200 Montreal Road
Ottawa, Ontario, K1A 0R6
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Language

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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.

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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 \(NSBOA\)\)](#)

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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.

CCMC's code compliance opinions

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