

Health Centre - 222 King St E, Bowmanville

Ground Improvement using Controlled Modulus Columns (CMC®)

Ground Improvement Proposal

Id	**26-7-192 Health Centre - 222 King St E, Bowmanville**	Pages	**13**

Rev	Date	Author	Verified by	Modifications
0	**28/10/2026**	**UID**	**SBU**	**First Issue**

1. PROJECT UNDERSTANDING

1.1. Project description

We understand that this development involves the construction of a 4-storey medical building with a partial basement. The building is part of the Bowmanville Health Centre campus and located at 222 King Street East, Bowmanville, Ontario. The footprint of the building is approximately 600m^2. The final elevation for the ground level is at 94.08m, and the partial basement slab is assumed to be founded 3m below ground level (91.08m).

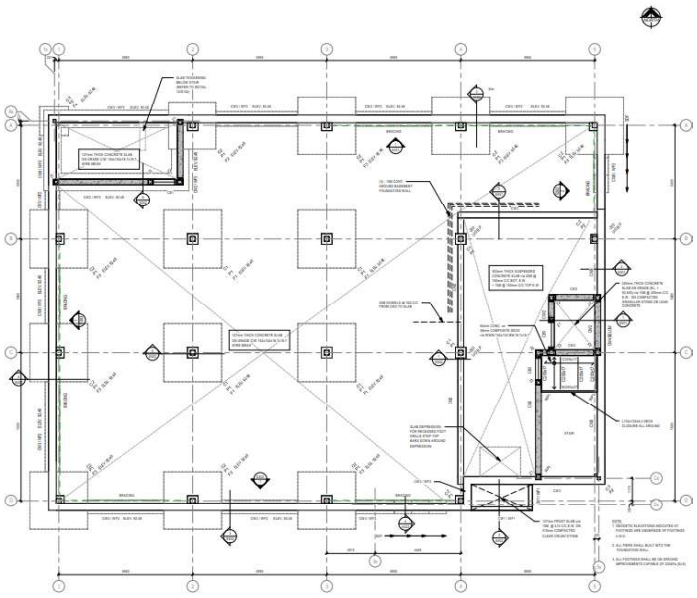


Figure 1: Foundation Plan by BBA for the proposed building

1.2. Reference Documents

This offer is based on the following documents:

- Toronto Inspection Ltd's geotechnical report dated September 17, 2026, reference No. 7299-26-GA
- Barry Bryan Associates's Structural Drawings, issued for post-tender addendum 1 dated Oct 01, 2026

2. SCOPE OF WORK

2.1. Design Intent

The site is challenged by the presence of clayey silt fill extending up to 2.9mbgs underlain by soft clayey silt exhibiting low strength and extending up to 13.4mbgs. Following the soft silt / clay, a very dense silty sand was encountered up to borehole termination at 18.4mbgs, after which presumed bedrock was noted due to auger refusal. Groundwater was encountered at a depth of 2mbgs. Ground improvement is proposed to reinforce the poor soils and provide bearing capacity / settlement control.

2.2. Proposed solution

Based on our review of the available geotechnical and structural details we propose to design and install a Controlled Modulus Column (CMC) ground improvement solution to achieve the following performance:

- Improved bearing capacity of up to 150 kPa SLS (225 kPa ULS)
  - A second option for an improved bearing capacity of up to 200kPa SLS (300kPa ULS) is priced in this proposal.
- Maximum post-construction settlement of 25 mm total
- Maximum differential settlement of 19 mm between footings.
- Support of the slab-on-grade for an applied distributed pressure of 12kPa.

Final foundation plan is to be mutually agreed upon between the Structural Engineer and MENARD.

MENARD will cut off the CMC elements at a level about ±100mm below the underside of footing. Following the CMC installation, the foundation contractor would carefully excavate to expose the CMC element tops and then place a Load Transfer Platform (LTP) as described below in section 2.3.2 between the CMC element tops and the underside of footing.

The CMC system would also be designed to provide support for the structure's floor slab elements. The load transfer platform for the CMC elements supporting the slab-on-grade is detailed in section 2.3.2.

The CMC system uses a displacement auger which generates minimal to no drill spoils, significantly reducing excess soil generation at the site.

During footing excavation, an estimated 15m^3 of unreinforced cured concrete in the form of small diameter columns will need to be removed and disposed of by the Contractor.

2.3. Construction Requirements

The Owner / Contractor is to provide suitable access for equipment, fuel, personnel, and concrete / material delivery into and out of the work areas as well as survey control points and at least one elevation benchmark. Layout of CMC elements is by MENARD.

The CMC system would be installed from a dry, relatively level, free draining, and competent drilling platform placed at about the underside of ground floor slab drainage level, assumed to be about ±93.8m as described below.

2.3.1. Working Platform

Drilling platform consisting of 300mm of Granular B Type II material compacted to 98% SPMDD and placed throughout the work area plus a 3m buffer (or as agreed) is to be provided. The drilling platform will be approved by MENARD prior to mobilization. MENARD will provide the design report for the working platform. Installation of the working platform is to be certified by the project's Geotechnical Engineer with written reports provided to MENARD.

Any dewatering required to provide the working platform during installation should be completed using perimeter trench drains as opposed to well points to avoid potential impacts to the CMC

elements during curing. No shale is permitted within or below the working platform. Maintenance of the working platform is the responsibility of others.

2.3.2. Load Transfer Platform

Following the CMC installation, the foundation contractor would carefully excavate to expose the CMC elements and then place a Load Transfer Platform (LTP) between the CMC element tops and the underside of footing.

The Load Transfer Platform is to consist of about a 100mm concrete mud mat (UCS = 20MPa) placed (by others) and extending throughout the foundation footprint. The load transfer platform below the slab-on-grade is to consist of 300mm of Granular B Type II material placed and compacted (by others) to 98% SPMDD. At grade level, the working platform material can be re-used as the LTP for the slab. A graphic which depicts a typical foundation supported by the CMC system is below in Figure 1.

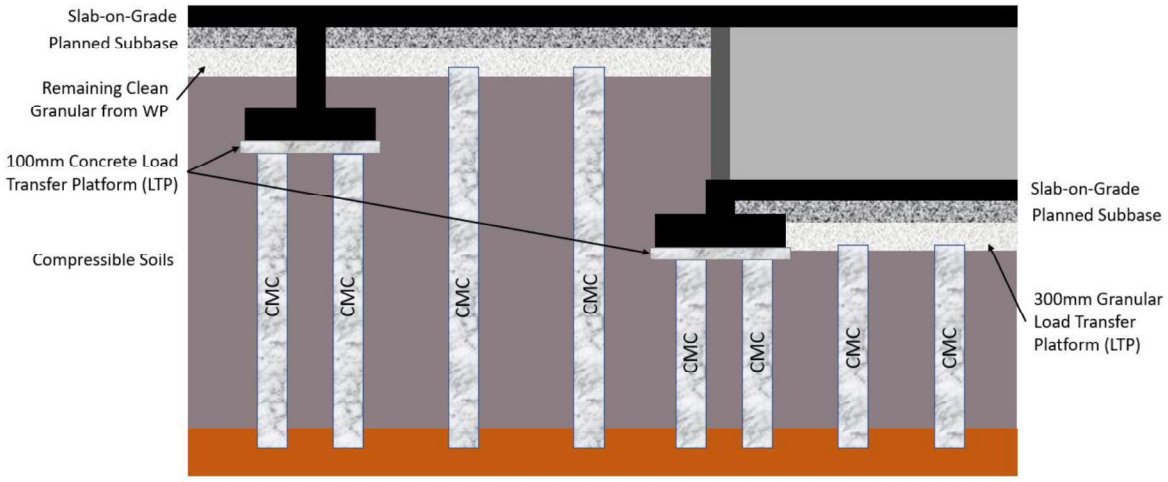


Figure 2: CMC Supported Foundations and Slab-on-grade with Partial Basement