



March 16, 2021

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CITY OF OTTAWA

To the Attention of **HARRY ALVEY, P.E., P.ENG, RURAL SERVICES**

**SUBJECT: VIBRATION CONTROL FORM
LARGE SCALE SOIL COMPACTION WORKS
SOMME STREET, OTTAWA, ON**

Sir,

Menard Canada is submitting the vibration control form regarding Dynamic Compaction works planned in relation with the construction of warehouse and office building on a site located at Somme St, Ottawa, ON.

Sincerely yours,

Menard Canada Inc.

Julien Egron, P.Eng., ing.

1. PROJECT

Consolidated Fastfrate Holdings Inc. is planning to build a new warehouse and office building at the North East corner of Somme Street and Rideau Road. The site is covered with a sand fill layer about 6.0 m thick. Ground improvement is required to increase the bearing capacity of the poor existing soil conditions and control total and differential settlement.

This document presents the extent of the zone of influence of the vibrations generated during the works. The pre-condition inspection survey and the monitoring activities planned for this project will be presented. Finally, eventual mitigation actions are discussed.

2. SOIL CONDITIONS

Based on the information provided in the geotechnical reports, the soil consists mainly of loose to compact sand fill over compact native sandy silt/silty sand over glacial till. The depth of the fill is approximately 6.0 m deep. The fill materials cover a natural deposit of compact to dense sandy silt/silty sand. According to the soil reports, the soil adjacent to the property is most likely fill material overlaying native material.

Ground water was found at varying depths from 3.3 to 4.0 m below existing grade.

3. PROPOSED COMPACTION ACTIVITIES

In consideration of the poor existing ground conditions encountered at site, it is required to carry out ground improvement in order to compact the loose fill to increase bearing capacity and limit total and differential settlement below the structures. Dynamic Compaction will be used on this site to improve the ground.

The basic principle of this technique is the transmission of impacts to loose and soft soils that initially have low bearing capacity, high compressibility and/or liquefaction potentials in order to significantly improve their mechanical properties. The impact energy is delivered by repeatedly dropping a heavy weight on the ground.



Figure 1. Dynamic Compaction Rig – Ottawa, ON

ZONE OF INFLUENCE OF VIBRATIONS

The Zone of influence of vibrations is the zone inside which the vibrations can be greater than 5 mm/s.

Based on soil conditions, water table elevation and Menard's experience, we estimate that the zone of influence of vibrations can extend to a maximum of 60 m past the property limits. Drawing in **Appendix 1** shows the influence zone on a map of the site. The extent of the red zone is located approximately 60 m from site limit and the nearest activity to the site is at approximately 240 m away.

PRE-CONSTRUCTION CONSULTATION

Considering the distance of existing structures from the zone of influence, **Menard Canada** deems that a vibrational study is **not necessary** for this ground improvement technique. However, before starting and after completing the work, a pre and postconstruction inspection of the surrounding structures can be conducted to establish their present conditions and post conditions, if deemed necessary.

MITIGATION MEASURES

In the unlikely event that the measured vibrations exceed threshold for safe levels for drywall or for human intolerance as indicated by Wright and Green, 1959 and RI 8507 (Siskind et al, 1980), respectively, there are several ways to reduce the level of vibrations generated by Dynamic Compaction such as:

- 1) Reduce the drop height of the tamper
- 2) Reduce the number of drops per location
- 3) Dig a trench to attenuate the amplitude of the superficial vibrations

APPENDIX 1
ZONE OF INFLUENCE DRAWING

