# patersongroup

# memorandum

## consulting engineers

re: Vibration Monitoring and Criteria for Adjacent Watermain

Proposed Multi-Storey Building 797 Richmond Road - Ottawa

to: Dentech Holdings - Mr. Joe Tallis - tallisje@gmail.com

**date:** June 14, 2021 **file:** PG5719-MEMO.01

Paterson Group Inc. (Paterson) has prepared the current memo to provide vibration monitoring details and criteria for the watermain located in an easement adjacent to the northern site boundary. This memo should be read in conjunction with the Geotechnical Investigation Report (Paterson Group Report PG5719-1 dated April 26, 2021).

Based on the available drawings, it is understood that the watermain is located approximately 3 m to the north of the subject site boundary and has a diameter of 1200 mm.

The purpose of the vibration monitoring and control program provided herein is to establish acceptable vibration monitoring procedures and limits for the existing 1200 mm watermain. The vibration monitoring and control program also provides protocols in the event that vibration exceedance is measured.

The monitoring program will incorporate real time results at the existing watermain segment adjacent to the subject site. The monitoring equipment should consist of tri-axial seismographs, capable of measuring vibration intensities up to 254 mm/s at frequencies of 2 to 250 Hz. At least 2 vibration monitoring devices should be placed adjacent to the existing watermain. It is recommended that the vibration monitoring devices be installed near the obvert level of the existing watermain and periodically inspected during the construction program.

The VMCP, should be provided to all parties involved with the construction for review. A meeting between Paterson and the site contractor should be conducted prior to any excavation or construction of the subject site to review the following:

- 1. Review the pre-condition/pre-construction survey;
- 2. Control measures (i.e vibrations, noise);
- 3. Monitoring locations;
- 4. Tracking and reporting of excavation progress, and;
- 5. Review procedure for exceedances (i.e vibrations, noise), complaints, evaluation and corrective measures.

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When an event is triggered, Paterson will review the results and provide any necessary feedback. Otherwise, the vibration results will be summarized in a weekly report. The following figure illustrates the vibration limits for the adjacent watermain segment.

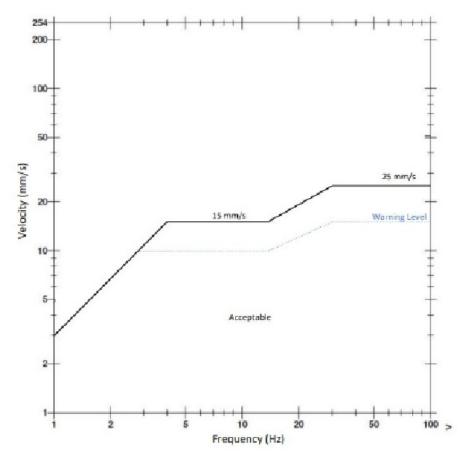


Figure 1 - Vibration Crtieria for the 1200 mm Watermain

Weekly reporting of the monitoring program and recommendations will be provided to the owner and the City of Ottawa. If the recommended vibration limit is exceeded, Paterson will notify the site superintendent and construction operations will be stopped.

The monitoring protocol should include the following information:

### **Warning Level Event**

- Paterson will review all vibrations over the established warning level, illustrated by the blue line in the above figure, and;
- Paterson will notify the contractor if any vibrations occur due to construction activities and are close to exceedance level.

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#### **Exceedance Level Event**

u	the exceedance level, illustrated by the black line in the above figure.
	Ensure monitors are functioning
	Issue the vibration exceedance result
The	data collected should include the following:
	Measured vibration levels
	Distance from the construction activity to monitoring location
	Vibration type
Mon	itoring should be compliant with all related regulations.
Incid	dence & Exceedance Reporting
Proje	ase a vibration incident/exceedance occurs from construction activities, the Senior ect Management and any relevant personnel should be notified immediately. A report uld be completed which contains the following:
	Identify the location of vibration exceedance
	The date, time and nature of the exceedance/incident
	Purpose of the exceeded monitor and current vibration criteria
	Identify the likely cause of the exceedance/incident

The contractor should implement mitigation measures for future excavation or any construction activities as necessary and provide updates on the effectiveness of the improvement. Response actions should be pre-determined prior to excavation, depending on the approach provided to protect elements. Processes and procedures should be inplace prior to completing any vibrations to identify issues and react in a quick manner in the event of an exceedance.

Describe the response action that has been completed to date

Describe the proposed measures to address the exceedance/incident.

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We trust that this information satisfies your immediate requirements.

Paterson Group Inc.

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