

Smart Centres REIT

South Keys Phase 1

Vibration Study

April 30, 2026

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Executive Summary

Arcadis Professional Services (Canada) Inc. was retained to complete a Vibration Study in support of the proposed development at 2200 Bank Street in Ottawa, Ontario. This assessment considered potential vibration from the Line 2 O-Train rail operations to the west of the site. There are no other non-rail sources of vibration within 300 m of the Site.

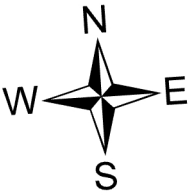
Vibration measurements of train passbys were conducted at a location onsite that would represent the closest possible location of the proposed building façade to the rail line. All vibration levels inside the proposed building were below the applicable vibration limit. The proposed development is not expected to be impacted by rail vibration from the O-Train operations to the west of the site.

1 Introduction

Arcadis Professional Services (Canada) Inc. (Arcadis) was retained by Smart Centres REIT to prepare a Vibration Study for a proposed high rise residential development situated at 2200 Banks Street in Ottawa, Ontario (the Site). This study was completed in response to comments received from the City of Ottawa on March 27, 2026. The context site plan is presented in Figure 2-1.

The Site is exposed to vibration from the rail activities located directly to the west of the property. There are no other non-rail sources of vibration within 300 m of the Site. This assessment considered the Line 2 O-Train rail operations to the west of the Site.

This assessment is based on site plans dated March 2, 2026, which are included in Appendix A.



Legend

- Development
- Phase 1 Boundary
- O-Train

South Keys Phase 1 Vibration

Context Site Plan

Project Number: 30328300

Figure: 1-1

Scale: 1:1,000

Drawn By: K DalBello

Date Exported: 2026-04-30

2 Applicable Criteria

2.1 Railway Association of Canada Guideline

The Railway Associations of Canada (RAC) guideline (RAC, 2013) for new development in proximity to railway operations provides guidance on how to achieve compliance between rail lines and future land uses that may be sensitive to the rail operations. Within the RAC document there are vibration limits for train passbys at sensitive receptors such as residential developments. The generally accepted limit, which is also presented in the RAC document, for sensitive land-uses is the threshold of perception for human exposure to vibration, being a vibration level of 0.14 mm/s RMS in any one-third octave band filtered frequencies of 4 Hz and 200 Hz. This limit is based on 1-second exponentially time-averaged root-mean-square (RMS) vibration velocity level. Additionally, a minimum of five train passbys should be captured at each measurement location.

3 Vibration Impact on the Development

3.1 Vibration Measurements

A site visit to conduct vibration measurements of rail passbys was performed on April 22, 2026. The measurements were conducted using a Sigicom vibration sensor which meets the criteria for vibration measurements set out in the RAC guideline and conducts the measurements in three axes. The vibration measurement location is shown in 3-1.

The selected vibration monitoring location was chosen as it was the closest possible location that of the proposed development building to the rail line which would represent the most impacted location. This location is conservative as the nearest structure is the parking garage which is not a sensitive land use. However, it is known that vibration can travel through structures. Therefore, if the vibration criteria is met at the parking garage it will similarly be met at the residential and commercial portions of the development.



Legend

- Development
- Phase 1 Boundary
- O-Train
- Vibration Monitoring Location

South Keys Phase 1 Vibration	
Vibration Monitoring Location Relative to Proposed Development	
Project Number: 30328300	
Figure: 3-1	Scale: 1:1,000
Drawn By: K DalBello	Date Exported: 2026-04-30

3.2 Vibration Results

During the measurement period a total of 7 train passbys were captured. The measured maximum RMS values in each axis for each train passby are presented in Table 3-1. Although the limit applies to each one-third octave band level, by meeting the total each one-third octave band limit would also be met.

The outdoor measurements are shown to slightly exceed the train passby measurements. However, the predicted indoor vibration levels were calculated to account for coupling loss with the building structure. To conduct these calculations, algorithms from the United States Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual were used based on the following assumptions:

- Large masonry piles building construction
- No sensitive uses are located on the first floor
- Building amplification adjustment

The results indicate that the indoor vibration results meet the vibration requirements as shown in Table 3-1. These results do not include the reduction in vibration that is likely to occur as vibration travels through the parking structure and into the residential/commercial buildings, and are therefore expected to be conservative.

Table 3-1 Measured Outdoor and Predicted Indoor Vibration Measurement Results

Measurement Number	Measured Outdoor Vibration			Predicted Indoor Vibration			Vibration Limit (mm/s)	Compliant with Limits (Yes/No)
	RMS X (mm/s)	RMS Y (mm/s)	RMS Z (mm/s)	RMS X (mm/s)	RMS Y (mm/s)	RMS Z (mm/s)		
1	0.050	0.050	0.000	0.025	0.025	0.000	0.14	Yes
2	0.050	0.050	0.050	0.025	0.025	0.025	0.14	Yes
3	0.050	0.100	0.000	0.025	0.050	0.000	0.14	Yes
4	0.050	0.150	0.100	0.025	0.075	0.050	0.14	Yes
5	0.050	0.050	0.100	0.025	0.025	0.050	0.14	Yes
6	0.050	0.150	0.100	0.025	0.075	0.050	0.14	Yes
7	0.050	0.150	0.050	0.025	0.075	0.025	0.14	Yes

4 Conclusions and Recommendations

Arcadis Professional Services (Canada) Inc. was retained to complete a vibration study to support the proposed development at 2200 Bank Street in Ottawa, Ontario. The measured vibration levels were found to be below the applicable vibration limit, and the development is not expected to be impacted by the vibration from the rail operations.

5 References

1. The Federation of Canadian Municipalities and the Railway Association of Canada (RAC), May 2013, "Guidelines for New Development in Proximity to Railway Operations" (RAC, 2013)
2. Federal Transit Administration (FTA), September 2018, "Transit Noise and Vibration Impact Assessment Manual" (FTA, 2018).

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