March 25, 2021

Morley Hoppner Ltd.
1818 Bradley Side Road
Carp, ON K0A1L0

Attn: David Derouin
dderouin@morleyhoppner.com

Dear Mr. Derouin:

Re: Proposal for Detailed Transportation Noise & Vibrations Study – Granite Curling Club Redevelopment
2740 Queensview Drive, Ottawa
Gradient Wind Proposal #21-144P

1. INTRODUCTION

Further to your recent request, we are pleased to offer a detailed transportation noise and ground vibrations (LRT) study to support a Site Plan Control (SPA) application, for the proposed Granite Curling Club Redevelopment, located at 2740 Queensview Drive in Ottawa, Ontario. As the site is within 75 metres (m) of the proposed O-Train LRT line (West Extension), a detailed transportation noise and ground vibrations study is required to assess roadway and LRT railway transportation noise and vibration impacts on the development to ensure that future occupants are afforded comfortable use of the outdoor and indoor living spaces, as directed by the City of Ottawa's Environmental Noise Control Guidelines (ENCG).

The proposed development comprises a two-storey building (1715 m^2 in area), on a nearly-trapezoidal parcel of land overlooking Queensview Drive to the north and Highway 417 to the south. The ground floor comprises an east-central ice arena (975 m^2), arena support facilities, lounge/dining (320 m^2) and kitchen areas (north), gallery space, storage areas, and other functions. Floor 2 comprises an opening to the ice arena below, games room, and locker/washroom facilities primarily, on a reduced floorplate. 78 surface parking spaces are also featured at grade, with vehicular and one-way access off of Queensview Drive to the north. Building access points are on the south façade. Green frontage surrounds the building/parking. This proposal is based on Option 1 drawings prepared by N45 Architecture Inc., dated February 3, 2021.

2. DETAILED TRANSPORTATION NOISE AND GROUND VIBRATIONS STUDY

The major sources of transportation noise on the development are Greenbank/Pinecrest Road (Arterial) to the west, the Queensway Highway 417 to the south, and the proposed O-Train LRT Line (West extension) to the south. As the proposed LRT corridor is within 75 metres of the proposed development, a ground vibrations assessment will also be required. In accordance with the ENCG, Ministry of the Environment, Conservation and Parks (MECP) guidelines described in Publication NPC-300, and good engineering practice, study highlights include:

- Create a CAD model of site and surroundings.
- Obtain roadway and LRT traffic volumes based on road and rail classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan and from discussions with the city, as necessary.
- Place approximately five (5) discrete noise receptors around the study site to represent specific locations of concern, including building façades, outdoor amenity areas, and window elevations.
- Perform roadway and LRT transportation noise calculations using the MECP computerized noise assessment program, STAMSON 5.04, for daytime and nighttime periods for a typical traffic mix of passenger vehicles, buses, trucks, and trains.
- Compare results with ENCG criteria to ensure that interior and exterior noise levels do not exceed the allowable limits.
- Provide general commentary on stationary noise (impact of the development on surroundings and itself) to satisfy a SPA application.
- Provide ventilation requirements and warning clauses, if required.
- If exterior noise levels exceed the MECP recommended level of 55 dBA, perform additional calculations to determine the required mitigation to protect the Outdoor Living Areas (OLA's).
- If necessary, perform interior noise calculations for a typical unit, assuming building wall details satisfy the minimum Ontario Building Code (OBC) requirements.
- If interior noise criteria are not met, specify construction details, including Sound Transmission Class (STC) rating for windows.

2.1.1 LRT Ground Vibrations Assessment

As the site is in proximity to the proposed O-Train LRT West Extension Line, ground vibration impacts from the future transit system on the proposed development would be considered following the procedures outlined in the Federal Transit Authorities (FTA) protocol. The FTA general vibration assessment is based on a generic set of curves that show vibration level attenuation with distance. These curves are based on ground vibration measurements at various transit and rail systems throughout North America. Vibration levels at the closest points of reception are adjusted by various factors to incorporate known characteristics of the system being analyzed, such as operating speed of vehicles, conditions of the track, construction of the track, and site geology, as well as the structural type of the impacted structure. The outcome of the study would provide the mitigation required to meet MECP and FTA vibration criteria. In a similar fashion, the FTA protocol also provides estimates of ground borne noise.

3. FEE PROPOSAL

Based on the foregoing scope of work, we offer the following lump sum fees for our services as identified in the table below. Fees include all engineering time, incidental expenses, and overhead costs.

SERVICES	COST (CAD)
1. Detailed Transportation Noise and Ground Vibrations Study (LRT) – Acquire roadway traffic and LRT volume information and CAD data – CAD modelling of site and surroundings – Calculate expected transportation noise impacts on development – Provide recommendations for window STC, if required – Provide ventilation requirements and warning clauses – Provide recommendations to mitigate noise levels, if needed – Perform ground vibration calculations based on FTA method – Provide vibration mitigation recommendations, as required – Provide general commentary on sources of stationary noise – Prepare draft and final reports for both transportation noise and vibration impacts	$ 6,000
3. Site Plan Control (SPA) Application Resubmission/Addenda to City Comments – Inclusion of one (1) SPA application resubmission/response to comments from the municipality provided the massing changes are not significant	Included

Any work beyond the stated scope would be charged at our hourly fee. Hourly fees will be determined based on the following unit cost in CAD dollars. The HST will be added to all invoiced amounts.

(i)	Managing Principal	$ 300 / Hour
(ii)	Principal, Senior Associate	$ 250 / Hour
(iii)	Senior Engineer, Senior Project Manager	$ 200 / Hour
(iv)	Intermediate Engineer, Project Manager	$ 175 / Hour
(v)	Junior Engineer, Senior Technologist	$ 125 / Hour
(vi)	Technologist	$ 100 / Hour

4. SCHEDULE & REQUIRED INFORMATION

The work would be completed within three to four weeks following receipt of required documents and authorization to proceed. A final report would be provided as required by the project schedule. To execute the work, we would require a full architectural drawing package in AutoCAD and PDF format.

5. TERMS OF PROPOSAL & PAYMENT

This proposal is valid for a period of 30 days following the date of the proposal. Gradient Wind reserves the right to modify the cost of services after the validity period. The project will be initiated upon receiving the required design drawings and authorization to proceed. The fees would be invoiced upon completion of our draft report and are due on receipt.

If the scope and terms of this proposal are satisfactory, please indicate your acceptance by completing and returning the following *Client Approval* page.

Thank you for considering our services.

Sincerely,

Gradient Wind Engineering Inc.

Maria Tolymbek, B. Sc.
Proposal Coordinator

Joshua Foster, P.Eng.
Principal

Gradient Wind Proposal #21-144P

6. CLIENT APPROVAL

Morley Hoppner Ltd. accepts the terms of Gradient Wind proposal #21-144P, and hereby authorizes Gradient Wind to proceed with the work below as described herein. The undersigned is authorized to sign on behalf of the client. Please forward a signed and completed Client Approval form by email to joshua.foster@gradientwind.com.

SERVICES	COST (CAD)
Detailed Transportation Noise and Ground Vibrations (LRT) Study	$ 6,000

Total for Services: **$ 6,000**

Signature

Name & Title

Date