

September 24, 2020

File: 4054-20A

Peak Towers Development Ltd
c/o WA Architects Inc.
#228-237 Keefer Street
Vancouver, BC
V6A 1X6

Attention: Barry Weih

Dear Barry:

**Re: Affordable Housing Project – 2492 Kingsway Avenue, Port Coquitlam, BC
Environmental Noise Study**

As requested, BKL Consultants Ltd. (BKL) has undertaken an environmental noise study of the affordable housing development proposed for the above project site. The site spans the area between the intersections of Gately Avenue, Kingsway Avenue, and the Coquitlam river. We have determined that the most significant exterior noise sources for this project are road traffic on Kingsway Avenue and rail noise from train movements on the CP railway corridor. The development includes three 6-story residential buildings, with the north facing facades of Building B and Building C having exposure to both road traffic on Kingsway Avenue and the rail corridor.

Our two-part analysis for this project first involved an assessment of the traffic noise exposure at the building facades. The second part was a review of the project design, including exterior facade construction. The interior noise levels were assessed according to ISO 12354.

Acoustical Criteria

We were provided with a list of comments from the City, which included the following note:

4. **Noise Mitigation:** In addition to the proximity of rail operations, Kingsway Avenue is an arterial road and a truck route which can have noise impacts to adjacent residential uses. Please submit a report from an acoustic consultant assessing the potential noise impacts to the future residents at the site along with proposed mitigation measures to address highway and train noise.

As you are aware, neither the City of Port Coquitlam noise or zoning bylaws currently include requirements for sound isolation of exterior building elements in residential developments (i.e., resulting indoor sound levels from exterior noise sources). While multiple internationally accepted standards for indoor sound levels exist, the Canada Mortgage and Housing Corporation (CMHC) indoor

noise level criteria would be most applicable, given their general acceptance within other municipalities in British Columbia. The interior sound level requirements are summarized below:

Table 1: CHMC Interior Noise Criteria

| Portion of Dwelling Unit | Maximum Permissible Interior Noise Level ($L_{A,eq,24hr}$) |
|--|--|
| Bedrooms | 35 |
| Living, dining, recreation rooms, dens | 40 |
| Kitchen, bathrooms, hallways | 45 |

Site Noise Exposure

A continuous 48-hour noise measurement was conducted at the site by BKL between September 8-10, 2020. A sound level meter was installed on the rooftop north east corner of an existing building at 2470 Kingsway Avenue (see attached site description and measurement locations). We observed, that 24-hour equivalent sound level ($L_{A,eq,24hr}$) moving averages over the full measurement period were mostly consistent at 70 dBA, when rounded to integer values. The measurements included shielding and reflection effects from surrounding buildings. When adjusting for the distance between the location of the proposed façade and the measurement position, the 24-hour noise impact for this development is **$L_{A,eq,24hr} = 69$ dBA.**

According to Canada Mortgage and Housing Corporation (CMHC) criteria, an outdoor noise level between 55 dBA and 75 dBA is considered to be "normally unacceptable" for housing. This generally means that adequate acoustical measures are required to achieve acceptable indoor noise levels.

The following detailed review of the project design is based on the above stated indoor noise level criteria and on project drawings received. We offer the following comments to satisfy the development requirements of the City:

Sound Isolation of Exterior Elements

The sound isolation requirements for the exterior elements are subject to two main factors: floor area and glazing/exterior wall ratios. Given typical exterior wall assemblies, greater ratios of glazing result in increased sound isolation requirements. The most-affected dwelling units of the development have been identified and assessed to determine the required minimum Outdoor-to-Indoor Transmission Class (OITC) acoustic performance to meet the internal noise design criteria. The residential units facing the inner yard of the development are not expected to be significantly impacted by road traffic noise and, therefore, any practical window assembly is considered appropriate.

Exterior Walls

The drawing set under review did not contain information regarding the exterior wall construction assemblies, although based on subsequent email communications with the project architect, it was confirmed that the predominant exterior assembly facing Kingsway Avenue is proposed to be:

- 1/2" Plywood sheathing
- 2 X 6 Wood Studs, with batt insulation filling the cavity
- 1 Layer of 5/8" GWB,

which will provide adequate noise isolation to interior spaces, with the exception of the Kingsway Avenue facing suites in Buildings B and C, where the highest noise exposures are experienced and, as such, the façade treatments should be upgraded to include a second layer of 1/2" plywood (on the exterior side lining), as well as a second layer of 5/8" GWB (on the interior side) of bedrooms and/or living rooms.

Exterior Windows and Balcony/Patio Doors

A standard glazing detail, assumed to be two layers of 3 mm glass separated by a 13 mm airspace (OITC 25) will provide adequate noise isolation to all interior spaces with the exception of the Kingsway Avenue facing suite windows, which will require glazing assemblies capable of an OITC 30 rating. For residential living, dining, recreation rooms, and dens, the requirement is OITC 25.

The following table summarizes the required minimum OITC rating, including an *example* window glazing:

Table 2: Example Window Glazing for Required Minimum OITC Ratings

| Minimum OITC Rating | Example Window Glazing |
|---------------------|--|
| 30 | 6 _{Lam} -11-6 _{Lam} (one pane of 6 mm laminated glass separated by a minimum 11 mm airspace) |

Sliding and outswing glass doors typically have lower OITC ratings compared to casement windows with the same airspace and glazing thicknesses. Therefore, OITC ratings should be confirmed by measurements conforming to ASTM E90.

All of the windows and doors should be specified to meet the A3 performance rating for Air Tightness found in the CSA standard CAN/CSA-A440-08, or latest revision. Any other windows or doors meeting the required OITC ratings are acceptable. Note that the OITC rating varies with panel dimensions. As such, any test data or predicted OITC performance must reasonably reflect the panel dimensions adopted for this project. Any increase in glazing thickness or separating airspace thickness beyond that shown above is also acceptable. Effective weatherstripping should be installed in the exterior doorways.

Ventilation

The rated facade noise isolation can only be achieved when the windows are tightly closed. When exterior noise levels exceed 55 dBA (as indicated above), alternative forms of ventilation for occupied spaces is typically required. Please note that the design of the ventilation system is within the scope of the mechanical consultant.

Additional Considerations

Given its surroundings, the site can be considered as a moderately high noise exposure area. In such locations, the required envelope treatments for acoustic isolation can be technically challenging and costly to the project.

While the CMHC acoustical requirements should be considered desirable for residential living and targeted for all spaces within the project, for non-acoustical reasons the municipality may consider that the need for housing could outweigh the acoustical requirements. In such cases, the layout of the noise-sensitive rooms may enable a slight relaxation in the CMHC standards for a limited number of rooms.

Closing

This report completes our environmental noise study of this project. Please note that recommendations contained herein address only the acoustical requirements with respect to exterior noise ingress. Other requirements should be examined for compatibility with our recommendations. Please let us know if you have any questions regarding this report.

Sincerely,

BKL Consultants Ltd.

per:



Joonas Niinivaara, MSc
Project Consultant
niinivaara@bkl.ca

Enclosures: Site Notes

Residential Site - Gately + Kingsway Avenue, Port Coquitlam

Project ID: 4054-20A

Start Date: September 9, 2020

Start Time: 12:00

Duration: 24 hours

Address: 2470 Kingsway Ave, Port Coquitlam

Instrument: 01dB DUO

Serial No: 11004

Measured by: ES

Location Description

The microphone was located 8.5 m above the ground on the northwest rooftop corner of the 2470 Kingsway Ave existing building. The microphone position is 14 m from the Kingsway Ave and 45 m from the rail line centrelines, respectively.

Ambient Noise Description

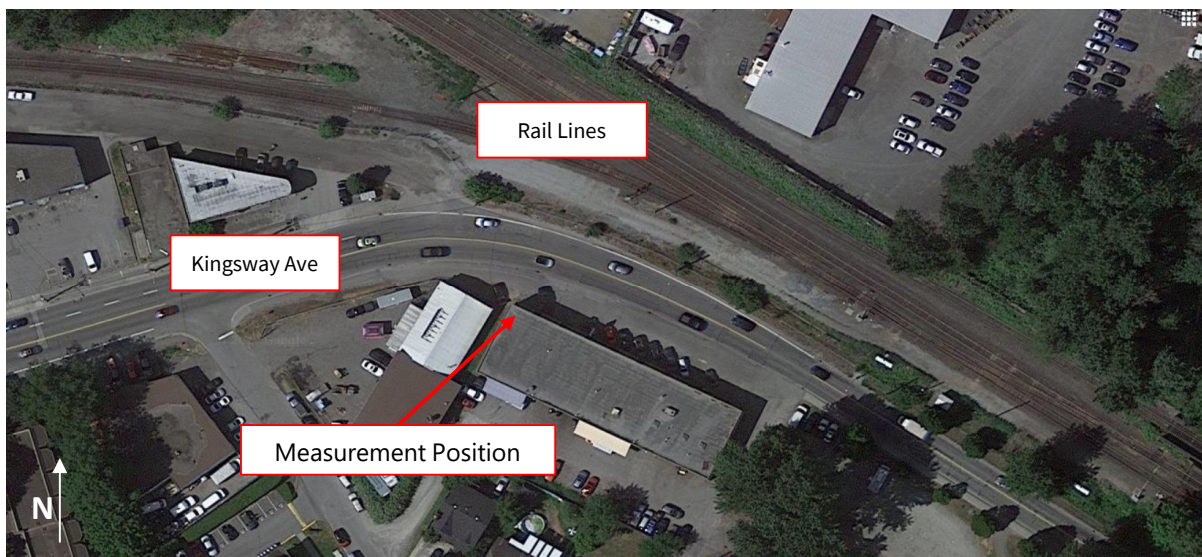
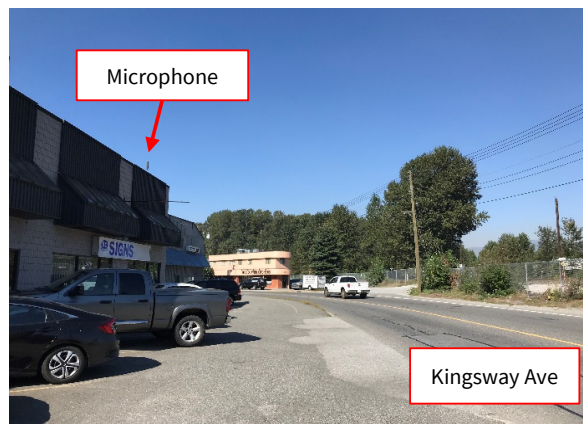
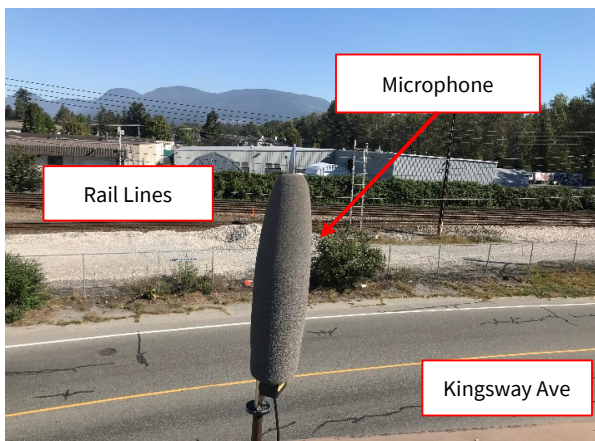
The dominant noise source was train and road traffic. Train whistles and emergency vehicle sirens can be heard.

Environmental Conditions

The weather was sunny throughout the measurement period with calm winds.

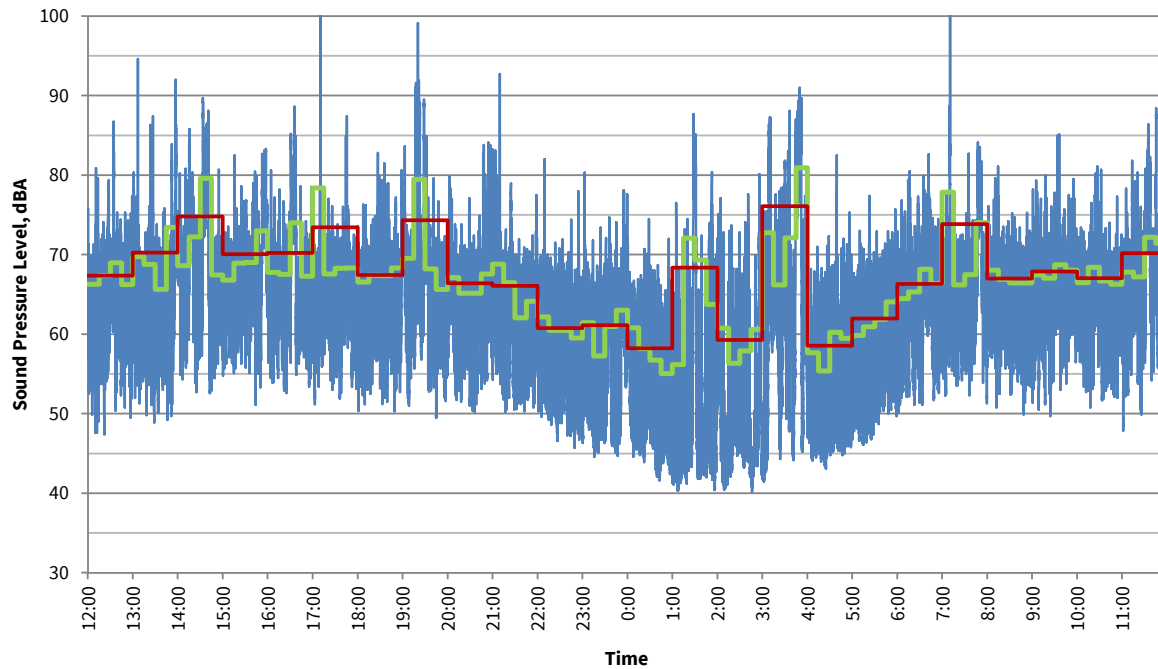
Purpose of Monitoring Location

This monitoring location is representative of the current environmental noise condition near 2470 Kingsway Ave, Port Coquitlam.



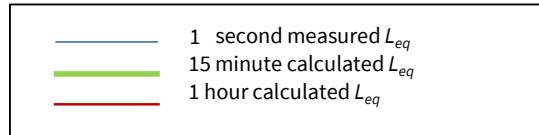
Residential Site - Gately + Kingsway Avenue, Port Coquitlam

The graph below shows the measured, and calculated time histories beginning on September 9, 2020



Hourly Interval Report starting at September 9, 2020

All Sound Pressure Levels presented in dBA



| Date | Time | Duration | L_{eq} | L_{max} | L_{min} | L_1 | L_5 | L_{10} | L_{50} | L_{90} | L_{99} |
|--------|----------|----------|----------|-----------|-----------|-------|-------|----------|----------|----------|----------|
| Total | - | 24:00:00 | 70 | 105 | 40 | 82 | 73 | 70 | 64 | 48 | 43 |
| Sep 9 | 12:00:00 | 1:00:00 | 67 | 87 | 47 | 75 | 71 | 70 | 66 | 58 | 51 |
| Sep 9 | 13:00:00 | 1:00:00 | 70 | 95 | 49 | 83 | 72 | 70 | 65 | 58 | 51 |
| Sep 9 | 14:00:00 | 1:00:00 | 75 | 90 | 53 | 86 | 83 | 78 | 68 | 61 | 55 |
| Sep 9 | 15:00:00 | 1:00:00 | 70 | 83 | 51 | 81 | 75 | 73 | 68 | 62 | 56 |
| Sep 9 | 16:00:00 | 1:00:00 | 70 | 89 | 53 | 80 | 75 | 74 | 67 | 61 | 55 |
| Sep 9 | 17:00:00 | 1:00:00 | 73 | 105 | 51 | 76 | 72 | 70 | 67 | 60 | 54 |
| Sep 9 | 18:00:00 | 1:00:00 | 67 | 83 | 50 | 77 | 72 | 70 | 66 | 58 | 52 |
| Sep 9 | 19:00:00 | 1:00:00 | 74 | 99 | 50 | 87 | 80 | 74 | 67 | 59 | 52 |
| Sep 9 | 20:00:00 | 1:00:00 | 66 | 84 | 50 | 75 | 71 | 69 | 64 | 57 | 52 |
| Sep 9 | 21:00:00 | 1:00:00 | 66 | 93 | 50 | 76 | 71 | 69 | 61 | 53 | 51 |
| Sep 9 | 22:00:00 | 1:00:00 | 61 | 82 | 46 | 69 | 67 | 65 | 56 | 50 | 47 |
| Sep 9 | 23:00:00 | 1:00:00 | 61 | 80 | 45 | 70 | 67 | 65 | 55 | 47 | 45 |
| Sep 10 | 0:00:00 | 1:00:00 | 58 | 75 | 41 | 68 | 66 | 64 | 49 | 45 | 43 |
| Sep 10 | 1:00:00 | 1:00:00 | 68 | 88 | 40 | 80 | 78 | 69 | 47 | 43 | 41 |
| Sep 10 | 2:00:00 | 1:00:00 | 59 | 80 | 40 | 72 | 66 | 62 | 47 | 43 | 41 |
| Sep 10 | 3:00:00 | 1:00:00 | 76 | 91 | 42 | 87 | 85 | 82 | 63 | 45 | 42 |
| Sep 10 | 4:00:00 | 1:00:00 | 59 | 83 | 43 | 69 | 65 | 62 | 48 | 46 | 44 |
| Sep 10 | 5:00:00 | 1:00:00 | 62 | 77 | 46 | 71 | 68 | 67 | 56 | 49 | 47 |
| Sep 10 | 6:00:00 | 1:00:00 | 66 | 83 | 50 | 75 | 71 | 70 | 64 | 55 | 51 |
| Sep 10 | 7:00:00 | 1:00:00 | 74 | 104 | 51 | 82 | 77 | 74 | 66 | 58 | 53 |
| Sep 10 | 8:00:00 | 1:00:00 | 67 | 81 | 50 | 74 | 71 | 70 | 66 | 59 | 53 |
| Sep 10 | 9:00:00 | 1:00:00 | 68 | 85 | 50 | 76 | 72 | 70 | 66 | 59 | 53 |
| Sep 10 | 10:00:00 | 1:00:00 | 67 | 81 | 51 | 75 | 71 | 69 | 66 | 59 | 53 |
| Sep 10 | 11:00:00 | 1:00:00 | 70 | 88 | 48 | 80 | 74 | 72 | 67 | 59 | 52 |