



2015-133
July 10, 2015

Mr. Matt Booma
Ca Senior Living Holdings, LLC
161 N. Clark St.
Suite 4900
Chicago, IL 60601

Subject: **Sound Level Measurements and Noise Impact Assessment**
re: 2400 East Lincoln Development
Rail District - East
Birmingham, MI

Dear Mr. Booma:

At your request and authorization Kolano and Saha Engineers, Inc. (K&SE) conducted an updated investigation to review the environmental noise associated with the proposed development at 2400 East Lincoln. Since our last review of this property, the proposed use of the site has been changed from a multi-family residential arrangement to a senior living/care facility. In many respects the use is similar to that of the preceding work. The updated use has some commercial aspects to it however. These commercial aspects include deliveries, potentially more traffic with increased visitations, staff working on site and retail/service shops. This updated investigation includes a review of the measurements at the development site to understand the current ambient noise condition with an evaluation of the proposed development to help assess if noise associated with this development will be compatible at this location.

On-Site Sound Level Measurements

Last year, 2014, we conducted measurements using a *01dB-Harmonie* environmental noise analyzer with a precision outdoor microphone assembly. This instrumentation was calibrated before and after measurements using an acoustic calibrator traceable to the National Institute for Standards and Technology. It was set to measure for a continuous period from July 30th starting at 5:00 PM to July 31st at 6:00 PM. The measurement equipment was located south of East Lincoln, in an approximately central location of the site. See **Exhibit 1** for a site plan showing the measurement location.

The results of the measurements are presented in a graph of sound level versus time in **Exhibit 2**. This graph contains three plot lines; the 5 minute L_{eq} (energy average level), the hourly L_{eq} , and the daytime and nighttime L_{eq} . Spikes in the sound level were caused primarily by planes and helicopters, trains, and local truck activities from nearby facilities and businesses.

From this data we calculated the DNL or day-night sound level average. The DNL is an average of both the daytime and nighttime sound levels where the nighttime sound levels have been raised by 10 dB to account for people's greater sensitivity to noise in the nighttime hours.

Measurement results, in terms of the day-night sound level average (DNL), were determined and compared to U.S. Government guidelines promulgated by the U.S. Environmental Protection Agency (EPA) and the department of Housing and Urban Development (HUD). EPA guidelines define DNL 55dB (or less) as desirable goal for residential land use; HUD guidelines consider outdoor noise levels up to DNL 65dB as “normally acceptable” for residential land use. HUD guidelines consider outdoor noise levels between 65dB and 75dB as “normally unacceptable” for residential land use. The results of these measurements show that the site has a measured sound level of **DNL 55dB**. This falls within EPA as well as HUD guidelines for residential land use.

City of Birmingham Noise Ordinance

The City of Birmingham addresses noise in their ordinance under Part II – City Code, Chapter 50 – Environment, Article II. Nuisances, Division 4 – Noise. This ordinance provides information of Definitions, general prohibitions, specific prohibitions, decibel level prohibitions, general exemptions and test procedures. The objective limits cited in this ordinance (as Table 1) are:

Use of Property Producing the Sound	Use of Property Receiving the Sound	Sunday to Saturday 7:00 a.m. to 7:00 p.m.	Sunday to Saturday 7:00 p.m. to 7:00 a.m.
Residential	Residential	75	60
Commercial	Residential	80	60
Residential	Commercial	80	60
Commercial	Commercial	90	75

Exemptions to these limits include power equipment operations between 7AM and 7PM that do not exceed 100 dB(A) at or beyond the property line, construction noise between 7AM and 7PM Monday-Saturday excluding holidays (with additional provisions), and snow removal which does not exceed 90 dB(A) at or beyond the property line.

Proposed Development Noise Impact

The proposed multi residential senior living with support services development is not unlike other developments in Birmingham. For example, although much larger, the Maple/Elm development is similar. Additionally, other combined residential/commercial buildings in Birmingham are also similar. The anticipated noise sources for the development are:

Individual Residential Unit Heating and Cooling Mechanical Systems

These climate systems are to be located in each living unit. With these systems each unit is expected to have a residential grade condensing unit. These condenser units are expected to be located near the building. We don't anticipate these to be a significant source of noise at or beyond the property line.

Building Wide Heating and Cooling Mechanical Systems

Like other large buildings in Birmingham, centralized roof mounted heating and cooling equipment are expected control the climate of building areas separate from individual resident quarters. If located sufficiently away from the property lines and with screen walls, these elements are not expected to exceed the ordinance limits.

Exhaust Fans

The kitchen and laundry are expected to have exhaust fans to remove unwanted fumes and excess heat. While these elements have some potential to create a noise disturbance, efficient selections of the fans that permit the required airflow while not operating at a very high speed should minimize this issue. Mixed-flow style centrifugal fans tend to be quieter than other types of fans, especially propeller style fans.

Generator

A stand-by electrical generator is expected to be located on the south side of the building, west of the loading dock. While this has the potential for excessive noise, with the proper enclosure and expected minimal use (weekly or bimonthly maintenance cycles are expected), the generator is expected to comply with the ordinance and create little impact.

Loading Dock/Delivery Vehicles

For food service, supplies and other items, multiple deliveries are expected each week. These deliveries are expected to come from small to medium sized commercial vehicles. These deliveries are expected to be comparable to those for restaurants or other moderately sized businesses.

Conclusion

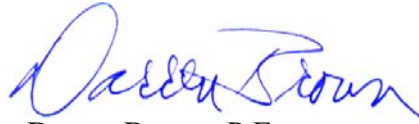
The proposed Birmingham Senior Living development is being considered in an area that is currently predominantly commercial and light industrial. Additionally, this site is subject to significant noise from trains and aircraft. Noises related to these uses are expected to create some impact on the proposed development. However, the existing 24 hour background noise levels are within the noise level guidelines promulgated for residential land use by both US Departments of EPA and HUD.

Based on the information we have been provided, we anticipate that the proposed development will produce no excessive noise contribution to the adjacent community and will be within the Birmingham Noise Ordinance limits.

We appreciate your calling us for this work. Should you have questions or need additional assistance on this matter, do not hesitate to call.

Sincerely,

KOLANO AND SAHA ENGINEERS, INC.



Darren Brown, P.E.
INCE Board Certified
Consultant

EXHIBIT 1

SOUND LEVEL MEASUREMENT LOCATION
AT 2400 EAST LINCOLN



EXHIBIT 2

Ambient Noise Level Measurements in Birmingham; East - MX Zoning
Measured in the Open Space South of the Road at 2400 E Lincoln

Measurements Conducted for: **Ca Senior Living Holdings, LLC**

