



2015-207
November 13, 2015

Mr. Frank Simon
FLS #5, LLC
2950 Walnut Lake Road
West Bloomfield, MI 48323

Subject: **Sound Level Measurements and Noise Impact Assessment**
re: 856 N. Old Woodward Development
Birmingham, MI

Dear Mr. Simon:

At your request and authorization Kolano and Saha Engineers, Inc. (K&SE) conducted an investigation to review the environmental noise associated with the proposed development at 856 N. Old Woodward. The proposed development is a mixed use building with commercial space on the first floor and residential apartments on the floors above. This 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

We conducted measurements using a *Brüel & Kjaer type 2270* 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 October 23rd starting at 5:30 PM to October 26th at 8:00 AM. The measurement equipment was located 50 feet east of N. Old Woodward Avenue at the approximate setback of the proposed building. 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 **Exhibits 2-5**. These graphs contain 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 roadway traffic related noise sources. On October 24th, two periods of rain caused sound levels to be somewhat higher than normal as the precipitation and wet roads contributed to additional noise. Most of the noise impacting this site is due to traffic on Woodward Ave and N. Old Woodward Avenue. Due to the relative close proximity of these roads, the traffic noise levels are somewhat high.

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 63dB**. This falls within 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 commercial/residential development is like many other developments in Birmingham. Sources of noise from these buildings are mostly related to rooftop mechanical equipment, ventilation fans and generators. The anticipated noise sources for the development are:

Individual Space Heating and Cooling Mechanical Systems

These climate systems are split units with the condensers being located on the roof in a mechanical well area. The heating/cooling units will be located within each living, business and common space. We don't anticipate these to be a significant source of noise beyond the property line.

Exhaust Fans

The kitchens and bathrooms for the residents are expected to have either central or individual exhaust fans. 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. Centrifugal fans tend to be quieter than propeller style fans.

Garage Ventilation Fans

With large areas of the garage enclosed below grade, it is anticipated that some sort air ventilation/circulation system will be needed to maintain air quality. These air ventilation systems have the potential to create noise impact to adjacent properties if not carefully planned out. Fan selection is important to minimize noise from the source of these systems. Silencers may also be needed to control the fan noise. Additionally, the location of the ventilation discharge should be carefully considered as its placement can impact adjoining properties and public easements.

Generator

A generator is expected to be located on the east side of the building on one of the parking levels. Being located to the lower middle east of the building provides good buffer space from the adjoining properties to help minimize noise impact. While the exact selection of this generator is not known at this time, the two main sources of generator noise are the engine exhaust and the radiator cooling fan. Combustion exhaust mufflers, generator enclosures and even radiator silencers can help control noise as needed. The expected use of the generator is minimal largely consisting of weekly or bimonthly maintenance cycles. With proper attention to noise control, the generator is expected to comply with the ordinance and create little impact.

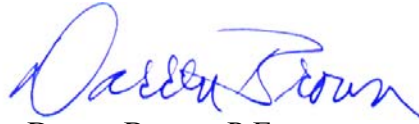
Conclusion

The proposed commercial/residential development at 856 N. Old Woodward is expected to have consistent noise impact from local roadways. However, the existing 24 hour background noise levels fall within the noise level guidelines promulgated for residential land use by US Department of HUD. Additionally, based on the information we have been provided, we anticipate that the proposed development, with careful planning and consideration, 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 856 N. OLD WOODWARD



EXHIBIT 2

Ambient Sound Levels at 856 N. Old Woodward - Birmingham, MI
Measured 50 Feet East of N. Old Woodward

Measurements Conducted for: FLS #5 LLC

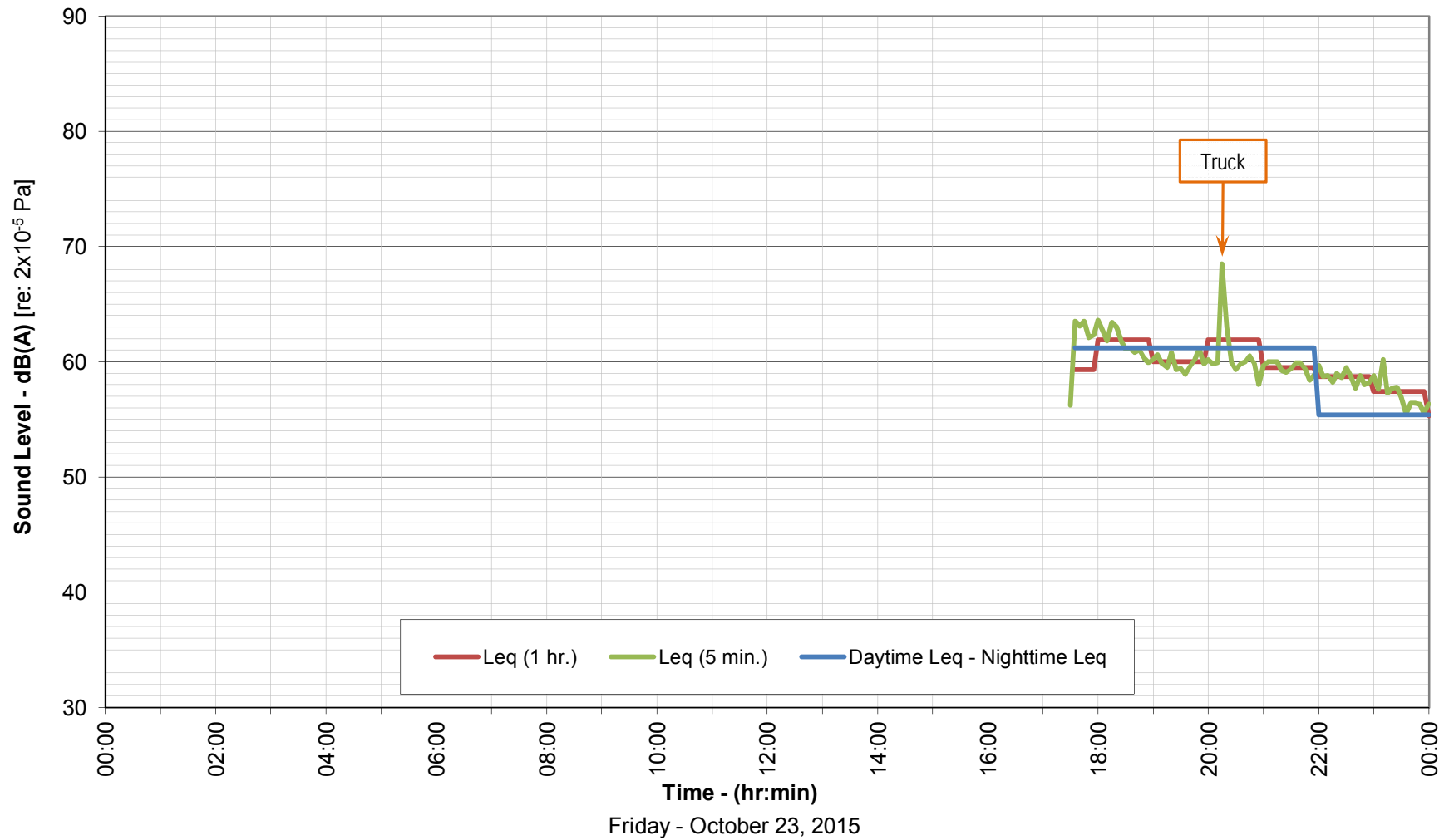


EXHIBIT 3

Ambient Sound Levels at 856 N. Old Woodward - Birmingham, MI
Measured 50 Feet East of N. Old Woodward

Measurements Conducted for: FLS #5 LLC



EXHIBIT 4

Ambient Sound Levels at 856 N. Old Woodward - Birmingham, MI
Measured 50 Feet East of N.Old Woodward

Measurements Conducted for: FLS #5 LLC

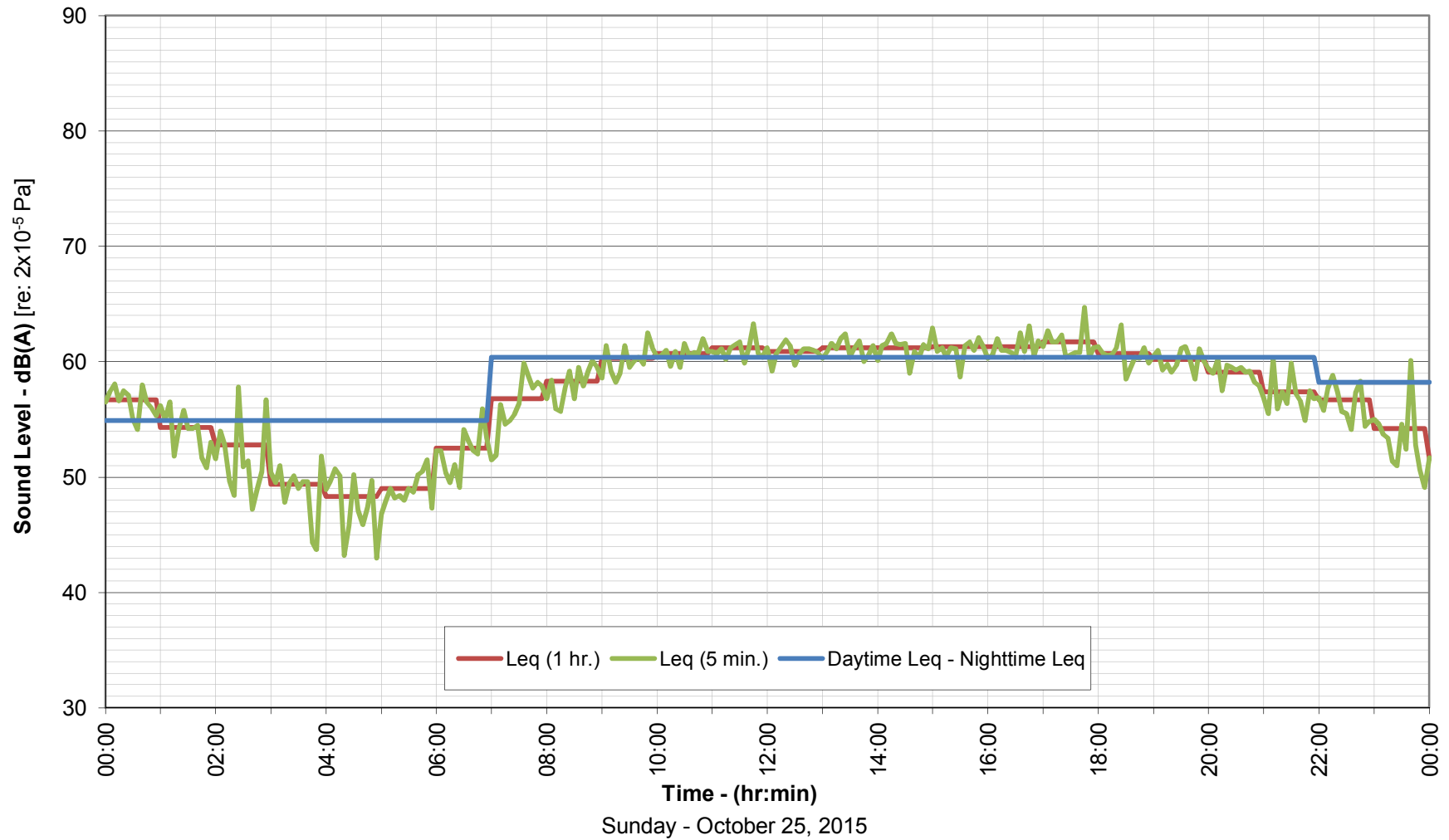


EXHIBIT 5

Ambient Sound Levels at 856 N. Old Woodward - Birmingham, MI
Measured 50 Feet East of N.Old Woodward

Measurements Conducted for: FLS #5 LLC

