**K & S Engineers, LLC**
Consultants in Acoustics, Noise and Vibration
PO BOX 930066
Wixom, MI 48393
248-674-4100
www.kandse.com

# Review of the Project Flex Data Center Application Sound Study

[1st Submittal of Final Site Plan]

Prepared For:

Jenny Moule
Planning Coordinator
Charter Township of Lyon
Oakland County, MI

Prepared By:

Darren J. Brown, P.E.
INCE Board Certified

Prepared: March 19, 2026
Project No. 2026-003

**Review of the Project Flex Data Center Application Sound Study**

We have conducted a technical review of the predictive noise study report submitted by Kimly Horn for the proposed Project Flex data center, assessing the study's completeness, methodology, and consistency with applicable noise regulations and standard engineering practice.

Community noise assessment is a specialized area within noise control engineering that requires an understanding of environmental acoustics and the standards that govern it. Evaluating community noise impacts involves a broad and detailed analysis of diverse noise sources, operational characteristics, site-specific conditions, and a wide range of modeling variables. The Kimly Horn report does not demonstrate that the study was prepared by an individual qualified to conduct a comprehensive community noise assessment for a development of this scale. While some experience with traffic noise may be relevant to certain aspects of environmental acoustics, it does not, on its own, provide the knowledge and expertise needed to conduct a viable community noise assessment.

The application sound study report prepared by Kimly Horn describes the proposed Project Flex development as a large-scale data center occupying approximately 173 acres. The project is proposed to include six (6) buildings totaling approximately 1,839,600 square feet, six (6) associated equipment yards, and a large substation site. At full build-out, the development is expected to include 252 rooftop chillers, 432 battery energy storage system (BESS) units located within the equipment yards, and eight (8) large transformer units within the substation area.

While these major equipment categories are identified, the report does not document other noise sources that were identified in the site drawings and are typically associated with facilities of this type. Examples include pumps associated with the chiller systems; inverters, power conditioning equipment, and transformers associated with the BESS units; building transformers; emergency backup power generators; and site operational activities such as refuse collection, delivery truck movements and loading dock operations serving the data center buildings. These sources can contribute to the overall sound levels generated by the facility and should be identified and quantified in a comprehensive noise assessment.

The noise study lacks several elements typically included in a comprehensive community noise assessment. It does not document existing ambient sound levels in the surrounding community acquired from measurements taken over an extended period to establish baseline conditions. Establishing these baseline levels is standard engineering practice and essential to evaluate the potential changes to the community sound environment due to operations of the proposed facility.

Additionally, the report does not provide sufficient detail regarding the acoustic modeling used to predict sound levels. Key information that is typically documented includes the calculation methodology and standards employed, modeling assumptions, octave-band sound power levels assigned to each equipment type, documentation of noise controls, and a clear description of the receptor locations used for evaluating compliance. Without this

information, it is difficult to independently evaluate the accuracy or completeness of the predicted noise impacts.

Furthermore, several statements in the report rely on generalized expectations rather than clearly quantified predictions. For example, the report states that “typical mechanical operations are anticipated to remain near or below approximately 50 dB(A)” and that “typical mechanical operational noise levels are anticipated to remain near or below the established maximum permissible daytime and nighttime noise level limits.” These statements do not provide a clear demonstration that the proposed development will comply with the ordinance limits at nearby receptors under worse-case operating conditions.

The interpretation of the Lyon Township noise ordinance presented in the Kimly Horn report appears incomplete. While the report identifies the applicable numerical noise limits, it does not address the 5 dB tonal penalty contained in the ordinance. Tonal noise is commonly associated with electrical and mechanical equipment such as power transformers, cooling fans, and other rotating machinery. If tonal characteristics are present, the ordinance requires the allowable noise limit to be reduced by 5 dB.

Based on the equipment described for the proposed development, tonal components would reasonably be expected from the large transformers within the substation area and may also be present in rooftop chillers and BESS cooling or electrical equipment. In the absence of a detailed tonal evaluation demonstrating otherwise, the potential for tonal noise should be considered in the compliance analysis.

The report also attributes noise reduction from the rooftop chiller units to the presence of 10-foot-tall parapet walls and 14-foot-tall screening walls. Based on the architectural drawings provided, the screening walls consist of louvered panels. Unless the louvers are specifically designed and documented as acoustical barriers with verified noise reduction characteristics, they typically provide limited noise attenuation. Without documentation demonstrating the acoustic performance of these elements, it is not appropriate to assign a noise reduction value to them in predictive modeling.  Furthermore, the report does not provide the modeling parameters or assumptions associated with the barriers, which are necessary to support the predicted results and to guide the construction design.

In addition, the sound level data presented in the Kimly Horn report appears inconsistent between the graphical sound level contour plots and the tabulated receptor data. For example, along the southern property line near the southeast corner of the site, Figure 3 of the application report indicates sound levels of approximately 53 dB(A), while Table A-1 lists receptor “R2” as having a predicted sound level of 47.4 dB(A). The contour plot suggests sound levels exceeding 50 dB(A) at nearby residential properties along the southern boundary, while the tabulated results indicate levels below 50 dB(A). This discrepancy raises questions regarding the consistency of the modeling results.

Furthermore, the predicted sound levels do not appear to account for the 5 dB tonal penalty described in the ordinance. If tonal noise is present from sources such as the transformers in the substation area, the effective allowable limit would be reduced accordingly. Under those

conditions, the Kimly Horn predicted sound levels shown at the southern property boundary exceed the applicable ordinance limit by 5 dB or more.

## Conclusion

Based on our review, the sound study submitted by Kimly Horn does not provide a sufficient technical basis to demonstrate compliance with the Lyon Township noise ordinance. The study lacks a comprehensive accounting of all relevant noise sources, does not document key modeling inputs and assumptions, and does not include baseline ambient sound measurements necessary to evaluate changes to the community sound environment. In addition, the analysis does not address the ordinance 5 dB tone penalty and relies on unsupported assumptions regarding the acoustic performance of proposed screening elements. Apparent inconsistencies between the graphical and tabulated results further limit confidence in the accuracy of the predicted sound levels. As a result, the study does not provide a reliable or verifiable assessment of potential noise impacts and should not be relied upon for approval of the proposed development without a revised and fully documented analysis.

## Recommended Requirements

The proposed Project Flex data center is a large-scale industrial development with the potential to significantly impact the surrounding community. A comprehensive noise assessment is required to demonstrate, with a high degree of technical certainty, that the development will comply with the Lyon Township noise ordinance and to document how predicted sound levels will compare to existing community conditions.

At a minimum, the noise study should include the following information:

1. Detailed description of the modeling methodology, including calculation standards, modeling software used, and other applicable standards or engineering practices.
2. Clear explanation of all assumptions used in the modeling calculations, data center operational assumptions, and any simplifications applied.
3. Comprehensive inventory and information of all noise sources associated with the development, including:
    a. Manufacturer and model identification of equipment
    b. Manufacturer-provided octave-band sound power data representing maximum noise output
    c. Assumptions applied to each noise source
    d. Identification and justification for any noise sources excluded from the analysis
4. Documentation of all proposed noise control measures, including:
    a. Description of materials and construction methods
    b. Acoustic performance data or manufacturer specifications

   c. Construction details sufficient to define and evaluate expected sound attenuation
5. Details of community receptor locations and assumptions.
6. Documentation of conservative assumptions applied in the modeling analysis that helps ensure protection of the adjacent community.
7. Detailed presentation of modeling results, including enlarged sound level contour plots in areas where noise levels approach residential properties, schools, or other sensitive receptors, and in addition to tabular results with clearly documented receptor locations.
8. Modeling results with and without proposed noise control measures, allowing evaluation of the effectiveness of the mitigation strategies.
9. Ambient sound level measurements documenting current baseline sound conditions at representative locations near properties expected to be affected by the development.
10. Comparison of predicted operational sound levels with existing ambient sound levels to evaluate the expected change in the community sound environment.
11. Evaluation of the anticipated change in the local soundscape, including identification of any significant increases in sound levels and potential mitigation measures where necessary.