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Review of April 23, 2026 Noise Assessment of Proposed STREAM Data Center, Alabama, NY

Source level definitions

1. The report states that 198 chiller units would be installed (is this correct?) whereas the model assumes 60 would be in continuous operation on each building. The manufacturer and model of the planned chiller should be stated in the body of the report.

   The report lists chiller source level data that we understand is the best available data from modeling or from measurements of an analogous unit. The report needs to clearly state that sound levels of the actual chiller model may differ, and that the sound level data will be included in the report and modeling will be updated when equipment has been built and tested. It should be stated accordingly the systems are being designed to achieve conservative noise criteria and verification sound level testing is planned.

   Separate sound level data were described in the report and used in modeling to characterize daytime chiller operations at 100% load with fan speeds at 70% of maximum and nighttime chiller operations at 100% load at fan speeds of 50% of maximum. The noise report states these performance factors are based on peak 50 year daytime temperatures and peak 20 year nighttime temperatures, and that nighttime operations will never be at full speed. The report should also state whether daytime operations might ever exceed 70% speed. The sound levels are defined for other fan operating speeds as well. It should be stated that the additional sound level data represent reduced operations for potential noise mitigation options.

   The chiller source levels are currently identified at distances of 150 feet. It was requested that a table of source levels of other typical chillers be provided for comparison that were measured at close-in distances. If the provided data are actual measurement data of an analogous unit at 150 feet, the reported levels may include sound attenuation due to air absorption and due to ground absorption or reflection in certain frequency bands, depending on whether the unit was measured on pavement or on grass. The ground and air attenuation factors may be minor, possibly in the range of ½ to 1½ dB in each octave band. However, these factors should be investigated and added to or subtracted from the chiller octave-band source level data as appropriate. The ground factors can be calculated using the formulas given in ISO 9613-2 1996 Table 3. The air absorption factors can be estimated from ISO 9613-2 1996 Table 2 or from formulas and tables in ISO 9613-1 1993.

2. Two emergency generators are planned to be installed at each building at-grade. The manufacturer and models of the planned generator and enclosure should be stated in the body of the report.

   The report states that during emergency generator operations, the chillers would be turned off. The modeled emergency operation represents the six generators, the rooftop condensers and air handling units, and the at-grade transformers.

   For generator testing and maintenance purposes the units were modeled to operate one at each building in the most favorable condition of east at building 2, west at building 3 and north at building 1, combined with the rooftop equipment and transformers. Other generator maintenance mode source combinations were not modeled. Worst case maintenance testing with the alternate generators should also be evaluated, which might most impact the boundaries.

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The generators appear to be defined in the noise model based on manufacturer supplied octave-band sound pressure levels for the engine exhaust with the estimated sound insertion loss of an exhaust silencer. It is not stated whether the source data are modeled or were actually measured. Separate data are not given to describe sound emissions from the enclosure air inlet, radiator exhaust, and cabinet sides and top. The source level data used in the model to represent the generators are slightly higher than the silenced exhaust sound levels alone in certain low frequency bands, which may represent the contributions of these other sources. The other generator enclosure source data should be identified in the report to clarify the modeled source levels.

3. Other sources were added to the updated noise model, consisting of air cooled condensing units, rooftop building air ventilation units, at-grade building transformers, with transformers at the main substation, as requested. These units were included in Table 1 and in the Appendix. Some information on these equipment should be discussed in the report body.
   a. Condensers. The sound levels used to represent the Daikan air-cooled condenser units are assumed to be manufacturer octave-band sound power levels for operations at 100% fan speed. An 8 dB noise reduction was applied to each octave band in the model to represent planned operation at 70% speed. This appears to be a reasonable adjustment factor. The report states that 300 condenser units would be installed with 70% in operation at any time. The source data appear to have been measured in an indoor space in accord with AHRI 360.
   b. Rooftop air handling units. The sound levels used to represent the Daikan rooftop air handling units are taken from Geoclima manufacturer octave-band sound power levels for operations at 50% fan speed. Sound level data for the actual air handling unit model should be included in the noise report when available and used in further assessments. The employed data appear to have been generated from modeling or measurements of sound pressure levels of the represented equipment at a distance of 150 feet. Otherwise, similar to the chillers, correction factors should be applied to account for the 150 foot propagation distance if the data are measurements.
   c. Building electrical transformers. The at-grade building transformers were represented in the noise model using the database included in the modeling program to represent a 3150 KVA (3.15 MVA) unit. The database lists a sound power level of 72.3 dBA for a low-noise transformer without a cooling fan. The manufacturer data listed in the noise report describes the sound level as "NEMA standard". In the modeling program database, the sound power level for a standard transformer without fan of 3150 KVA rating is instead 81.3 dBA or 9 dBA higher than was modeled. This difference may affect the nighttime sound level compliance at location R7 and others. The actual transformer NEMA sound level needs to be verified. We alternately calculated the transformer sound power level using the Electric Power Plant *Environmental Noise Guide*. For a transformer the NEMA sound rating can be calculated from the MVA rating, and is determined to be 61 dBA for a standard unit. The transformer sound power level rating is calculated from the NEMA rating by applying a factor based on the MVA value, which leads to 76.25 dBA. This is 4 dBA higher than the standard database value used in the noise model. The actual NEMA sound rating and sound power level of the building transformers should be supplied by the manufacturer and updated in the noise model.
   d. Substation electrical transformers. The main substation transformers were represented in the model using the sound level database included in the modeling program to represent a 50 MVA low noise unit with a cooling fan with a sound power level of 73.5 dBA. This needs to be verified with a manufacturer data sheet. We alternately calculated the sound power level for the substation transformers. The NEMA rating is calculated at 60.4 dBA for a low noise unit, and the sound power level is calculated at 78.65 dBA. This is slightly higher than the standard database value that was used in the model. The actual NEMA sound rating and sound power level of the substation transformers should be supplied by the manufacturer and updated in the noise model.

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Model design

4. The buildings were modeled with grade elevations of 677 ft, 676 ft, and 674 ft, respectively for Buildings 1, 2, 3. The report states building heights of 45.23 feet. The modeled building heights are 42.73 feet along the long sides and 45.73 feet along the centerline peak. The values need to be corroborated.

5. The chiller manufacturer specifies the machine height at 9.33 feet. It was determined from the modeling data the source heights were modeled at 17.63 ft above the lowest roof elevations of Buildings 2 and 3. The roof perimeter screens were modeled with heights of 18.65 ft at the building centerline peak and 21.65 ft along the building sides. It is determined from the model the source heights are actually 24.06 ft above the lowest roof elevations of Buildings 1 with roof screen heights of 19.08 ft at the building centerline peak and 22.08 ft along the building sides. Accordingly, the chillers on Building 1 are not fully screened in the model. Heights should be verified and corrected.

6. The generator manufacturer lists the machine true height at 10.83 feet. Enclosures are specified to be 16.1 feet high. The generator source height is modeled at 16.9 feet. These heights seem consistent. The generators are to be installed within twenty foot high barriers. Taller screens would provide additional mitigation if needed.

7. The rooftop air handling units and condensers are represented at source heights of 6.7 and 7.5 feet above the roof lines. Dimension data could not be determined for the Daikan model and the RTU model although the values seem reasonable including bases.

8. The modeling program is configured for *no reflection* from the vertical building surfaces and both sides of the rooftop barriers and generator barriers. With reflections added to these surfaces the continuous mechanical daytime levels at R7 would be 49.8 dBA in the day and at 45.4 dBA at night, compared to 45.1 dBA and 40.4 dBA which is a 5 dBA difference. The vertical surface reflection factors should conservatively be applied to the assessments.

9. Receiver R7 is the closest residence to the site, followed by residences represented by R5, R6, and R20. The locations of the calculation points in the model at R5, R6, and R20 are on the south sides of the buildings, although at location R7 it is on the north side. R7 should be represented on the south building side. This may increase predicted received levels by 0.3 dB.

   Points of reception should also be considered for the south boundaries of the nearest properties to identify outdoor yard sound levels.

10. Assessments of sound transmission from rooftop equipment through the rooftop barrier were performed by us and were found not to significantly change the received sound levels. The barriers were modeled with vertical area sources characterized with a calculated sound level of combined rooftop sources and the sound attenuation of a 4 PSF aluminum wall panel. The report states that sound transmission should not be significant

11. Assessments of sound transmission of indoor sources through the building walls were not performed in the noise assessment, and were not performed by us not knowing the types of indoor sources and final wall construction. There should be some discussion on indoor-outdoor transmission added to the report.

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12. Evaluations of noise of employee vehicle traffic were not included in the noise assessment, and were performed by us. The levels at R7 from the north campus traffic are estimated to increase by 0.1 dBA in the morning and afternoon peak hours which would be insignificant. There should be some discussion on the minimal influences of vehicle noise added to the report.

13. The report states the accuracy of calculations to be ±1 dB. The ISO 9613-2 standards (1996, Table 5 or 2024, Table 4) standards state an accuracy of ±1 dB for propagation over distances up to 100m and ±3 dB for distances over 100m for a mean source-receiver height of 5 to 30m. The distance from the north building sources to location R7 for example is more than 100m. The consequences of the modeling accuracy factor should be discussed, in particular for nighttime compliance that may affect needs for mitigation.

14. The report should state which version of ISO 9613-2 was incorporated in the model (1996 or 2024).

Assessment results

15. Received levels are calculated at heights of five feet, which is reasonable to represent outdoor locations and single-story residences.

16. Calculation configurations are conservative and acceptable for temperature at 50F/10C, 70% relative humidity, three orders of reflection, ground absorption factor of 0.4, and absence of tree foliage attenuation.

17. The chiller tonality assessments using reference one-third octave-band source data for analogous chiller models from the same manufacturer and another appear reasonable and acceptable. The data should be updated with actual measurements when available.

18. Based on reviews of data, the modeled received sound levels from full mechanical equipment operation currently meet the daytime project sound level limit of 65 dBA and the project nighttime sound level limit of 45 dBA.

    With the recommended addition of source level adjustment factors, reflectivity parameters, source level updating, and modifying the location of R7, the received sound levels could change.

19. Based on reviews of data, the modeled received sound levels from testing and maintenance of one generator at each building with operating rooftop equipment meet the daytime project sound level limit of 65 dBA.

    Based on reviews of emergency generator operations, the modeled received sound levels from six generators with rooftop equipment excluding chillers meet the daytime project sound level limit of 65 dBA and the project nighttime sound level limit of 45 dBA.

    With the recommended addition of building and barrier reflectivity parameters and updating the location of R7, the received emergency generator sound levels could change.

20. Should revised modeling determine nighttime sound levels at location R7 and others exceed the project limit of 45 dBA (or the risk limit of 40 dBA), mitigation options should be considered such as Table 6 reduced nighttime operations and be described.

21. Please supply background noise study “STAMP Sound Study12 23 for TB Review”.