

Perry Estate Environmental Noise Study

The Perry Estate Special Committee is providing the following report on the environmental noise study conducted at the request of Clark Lyda by Chad Himmel with JEAcoustics.

Input from the HNA membership has indicated serious concern with outdoor amplified music and that City of Austin sound regulations would not provide adequate protection against unacceptable levels. With the results of the environmental noise study the discussion between the Committee and the developer has broadened to include amplified and non-amplified noise, as well as a more stringent decibel level standard.

A simulation of the proposed electronic sound limiting system will be conducted to confirm the feasibility of this approach to regulate sound levels. JEAcoustics will set a date based on weather conditions providing the greatest impact for sound levels. The date will be announced shortly.

Below please find a brief summary requested by the Committee of Chad Himmel and the Committee's December 18th meeting notes. The Committee invites your comments and input.

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Summary

At our meeting, the Perry Committee requested some general information about the electronic sound limiting system we are proposing for implementation on outdoor sound systems at the Perry Property. The concept is to only allow amplified outdoor sound that is electronically limited to a specific volume, achieving the dBA/dBC criteria established for the project to prevent disturbances. These systems go by a variety of names: sound logger-limiters, sound management systems, noise limiters, sound limiters, etc. We have also called it a "governor" a "self-regulating" sound system, or something that "keeps a cap" on noise. A couple of examples:

www.grozier.com/AutomaticSPLcontrol.shtml

<http://www.scantekinc.com/sound-level-logger-limiter/lrf-04-frequency-filter-sound-level-limiter-recorder>

It would consist of one or more microphones set at a specified distance from the outdoor loudspeakers. The optimum distance for that would need to be determined, but probably 10 to 30 feet from the loudspeakers so that the microphones are not too far away, picking up noise from irrelevant or off-site sources. If the sound produced by the amplified system is louder than our design criteria, the central module limits the volume coming out. The system could also be set up to do some of the following things:

- display the sound level on a lighted readout
- send email alerts
- write measured sound level data to memory (logging)
- stream data to the internet for real-time viewing
- record sound files (.wav files) that could be used later for identifying an offending noise source

My recommendation is to use this type of system for monitoring and controlling all types of outdoor amplified sound—music performance, voice, announcements, and pre-recorded music. Any visiting performer or DJ would need to plug into the "house" system to be controlled by it. It could not be used effectively for limiting non-amplified sound in real time, obviously, but could probably be used to monitor non-amplified sounds, and to indicate whether non-amplified levels are too loud, or approaching too loud.

If outdoor conditions (noises coming from off-site, problems with wind, etc.) seem to interfere with microphones' accuracy, it should be possible to install a lightweight stage shell or other

outdoor structure to protect the system, if that is necessary, and focus the sound to improve accuracy for readings and electronic limiting. If outdoor structures like that fit with the owner's plan for the property, they could also be used to direct sound away from residential areas, while directing it more towards the monitoring microphones. I intended to discuss this concept of stage shell/outdoor structure at the meeting and ran short on time.

Thanks,

Chad Himmel, PE

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Perry Estate Committee notes from Chad's presentation at the meeting held with the developer on December 18th:

- Chad took measurements of ambient noise at 18 different locations on the Perry Property (were any measurement taken at locations off of the Perry Property?) There were 5 locations off the Perry site, 9 locations along Perry Property boundaries, 4 locations at central areas of the property.
- Chad used two different standard forms of criteria along with the ambient measurement results when coming up with his suggestions for acceptable decibel levels for high and low frequency noise. He reviewed other criteria as well, but these two standards formed the primary basis.
 - o Chad used the World Health Organization's Standard Criteria for acceptable noise levels. This criterion was used with reference to dBA.
 - o Chad used another set of German Criteria, which provides a more detailed analysis of the low frequency noise (e.g. bass). This criterion was used with reference to dBC.
- Chad's ultimate suggestion for a maximum decibel level for outdoor amplified and non-amplified music is about 25 decibels less than what the City of Austin's Code allows, or 45 dBA / 57 dBC at night, and 50 dBA / 60 dBC during the day.
 - o Please describe again exactly where this 45 db measurement is to occur?
 - § At the property line, or the source?
 - At a residential dwelling (for Perry Property living units and for neighbors' upper floors) or a residential property boundary (for ground floor at neighboring properties). In many cases, measurements at distant residential locations would not be practical; therefore, we also developed parallel criteria for noise limits at locations close to the source, to be measured and monitored on the Perry Property.
- On the type of modeling that you used (e.g. 3-D modeling using the topography of the site), please provide a synopsis of your modeling technique?
 - o We used SoundPLAN 3D noise modeling software, and modeled the topography, on-site reflective walls and pavement, existing buildings on- and off-site, except for those Perry Property structures that we expect to be removed, and we added various representative Perry Estate event noise sources to the mansion patio and sunken garden to predict results at residential receiver locations. Noise levels that we modeled on the patio and in the garden were set to levels at the source that would achieve the criteria recommended at receiver locations. Images shared at the meeting showed noise contour maps with dBC results received at the 2nd floor level.

- Amplified music needs to have the same cap as non-amplified music
- One of Chad's suggestions was to install a self-governing device into the sound system for the property which would automatically restrict the decibel level of amplified instruments, voice, announcements, and pre-recorded music
- o This self-governing device cannot, however, put a cap on the decibel level of non-amplified music
- o Chad therefore suggests for certain non-amplified instruments be allowed or disallowed based on the typical noise level each instrument generates. and/or that the size of performing ensemble be limited to a maximum number of performers playing at the same time.
- o Chad also noted that though he has suggested one of these self-governing sound devices to multiple businesses around the US, he has not had any personal experience with them as they are a relatively new technology and he is not a sound system designer. He has implemented similar sound logging instruments and methods for industrial noise monitoring in the field, but not for entertainment music noise limiting purposes.