

**Cascades Park Sound Test Summary**  
**September 8, 2013**  
**4 pm to 8 pm**

**Purpose**

To test the sound levels from two different sound systems: The permanently installed "house" system for non-ticketed events, and a full concert or "touring" array system that would satisfy the sound level requirements of anticipated acts that would be considered for the Park's ticketed events.

For the House system, determine what volume level inside the Park that would satisfy the non-ticketed events that the Park might host. These events might range from a few dozen people attending and listening to a speaker, to a DJ or a small live band, or the possibility of several thousand people for events such as the Tallahassee Symphony or Shakespeare in the Park.

For the touring system, determine what volume level inside the Park that would satisfy an audience of approximately 4,000 ticket buyers, and comply with the requirements of the artist's production.

Once the two appropriate sound levels are determined inside the Park, then monitor the perimeters of the Park facing South, towards Myers Park and Woodland Drives Neighborhoods (along Seaboard Coast Line Railroad Fence), and various locations throughout the Neighborhoods.

The noise ordinance currently being considered by the City is proposing a maximum of 85 dBAs at the property's perimeter of any source in line with the complaining property. The scope was to determine if the Park could operate the non-ticketed events with the house system and the ticketed events with the touring system within those restrictions and if so, what are the corresponding sound levels within the neighborhood.

**House System**

The sound test indicates that the house system, projecting various types of sounds, can meet the needs of the audience and still limit sound levels at or under the 85 dBAs at the Park perimeter. In fact, the sound test indicated that the house system can produce a live band at 89 dBAs at the mix position and yielded a maximum perimeter reading of 73 dBAs, which is well within the proposed City noise ordinance for special entertainment districts.

The house system test indicates that the sound levels required to conduct non-ticketed events will result in no more than 71 dBAs leaving the Park at the perimeters when averaged.

Attachment 1 includes all test meter locations utilized throughout the testing period. Table 1 indicates the sound levels leaving the Park at various measurements. When the sound levels are at their highest (71 dBAs) at the Park perimeter the average sound levels within the neighborhood are 54 dBAs utilizing the four sound meters located closest to the Park (Zone 1).

Zone 1 included four test locations generally located along East Van Buren Street where residential structures are located closest to Park.

**Table 1. House System Review**

Sound Type	Mix	Perimeter Average	Residential Average	Ambient Average
Track	87	70	54	51
Acoustic Live	83	65	52	51
Band Live	89	71	54	51
Spoken Word	83	67	52	51

**Test at Maximum Sound Levels**

Sound Type	Mix	Perimeter	Residential	Ambient
Track, 1C	98	80	60	51

Notes:

1. All sound levels are in dBA
2. On the Acoustics By Design Report to Genesis Group on Jan 10, 2013 two locations, one on Oakland and the other along Myers Park Drive recorded ambient dBA of 62 at 8pm

It is important to note that the 54 dBA average is 3 dBAs over the average ambient noise levels (51dBAs) within Zone 1 during the same time period of the test. As provided in the previous sound study by Acoustics by Design, an increase of 3 dBAs above the ambient sound level is termed “just perceptible” by all acoustic measurements, and therefore should not create noise issues within the neighborhood.

A test was also conducted with the house system that elevated the sound levels at the mixing booth up to 98 dBAs. This sound level (98 dBAs) is the maximum output possible for the house system. Even at the maximum output, the average sound levels at the Park perimeter were 80 dBAs and an average of 60 dBAs within Zone 1 in the neighborhood. The Acoustics by Design report completed on January 10, 2013 shows an 8pm reading at two locations in the Meyers Park Neighborhood of 62 dBA hourly L10. These readings were done at their monitoring locations 4 and 5, one on Oakland St and the other on Meyers Park Drive above the tennis courts. A map indicating the Acoustics by Design monitoring locations is included as Attachment #2.

**Touring System**

Based on observation during the test the volume level necessary to accommodate touring acts requirements and their audiences, would require a dBA level of 95dBAs at the mix position. Utilizing the sound levels generated by the September 8 test, sound levels of 85 dBAs at all test points at the Park perimeter were not achieved. However, when averaged, the Park perimeter sound level was 84 dBAs (see Table 2).

**Table 2. Touring System Review**

Sound Type	Mix	Perimeter Average	Residential Average	Ambient Average
Music Track	95	84	61	51
Acoustic Live	95	83	57	51
Band Live	95	84	61	51
Spoken Word	95	84	52	51

**Test at Maximum Sound Levels**

Sound Type	Mix	Perimeter	Residential	Ambient
Track, 1C dBA	104	93	70	51
Track, 1C dBC	124	106	92	61

Notes:

1. All sound levels are in dBA unless otherwise noted.

In order to reduce the sound levels to 85 dBAs at all points along the perimeter of the Park a smaller speaker array system, aimed much more at the center audience, away from the upper levels, and with less energy from the top speakers would be required. In effect, the application of the sound system is just as important as the limits on the dBA levels. Two different sound systems could provide the same sound levels at the mix position, yet have significant differences in the perimeter readings. All of the application approaches should be considered to further reduce sound levels from leaving the amphitheater and could be quantified in a follow up test.

It should also be noted that Table 2 includes maximum sound levels for dBC weighted frequencies. These lower frequencies are more difficult to attenuate and can cause walls to reverberate. It was noted by a number of survey respondents that they could feel these lower frequencies during portions of the test. The most strategic way of removing these types of impacts is to limit the C weighted sound levels.

**Conclusions**

Based on the sound test results, it appears that the house system can be successfully operated with negligible impacts to the adjoining residential neighborhoods. Care should be taken to compensate sound levels when the source is other than live music or speech. In other words, sound tracts will have a greater impact to the residential areas at the same sound level of live performances. A simple approach is to reduce volume levels for any sound source that is recorded.

Lastly, it is recommended that additional study be performed to further refine the operational parameters for the touring system. Such operational parameters include, but are not limited to; requiring a smaller speaker array system, aim the speaker array towards the center of the audience, ensure that the speaker array system is not directed to the upper levels, provide less energy to the top speaker and consider C weighted sound restrictions. The resulting sound level reduction of the aforementioned approaches cannot be determined unless fully implemented under a live condition.

# Cascade Park Sound Test Survey

September 8, 2013

Sound Test Zones  
and  
GPS points

### Legend

**Zones**

- Mix Position
- Perimeter
- Zone 1
- Zone 2
- Zone 3
- Zone 4



Scale: 0, 250, 500 Feet

PLANNING DEPARTMENT



