Criterion Acoustics

Architectural Acoustics & Systems Design

Date: August 29, 2022

To: Jason Jones – Kimpton Surfcomber

From: David Kotch & Andy Swerdlow – Criterion Acoustics

Re: The Kimpton Surfcomber Hotel, Miami Beach – Acoustic Study and Report

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1) Overview

The Kimpton Surfcomber Hotel (KS) hired Criterion Acoustics (CA) to perform an acoustical analysis of event sound in the High Tide venue area ("Venue"), located at 1717 Collins Avenue in Miami South Beach. The Venue is situated to the east of the pool deck between the Hotel and the beach to the east.

Figure 1 - Key Plan of 1717 Collins Ave. from a satellite view

Events held in the Venue include a DJ in a predetermined location and music played through a permanently installed sound system.

On July 23, 2022, Criterion Acoustics performed a series of acoustical measurements and a physical site inspection at the location.

2) Summary

In summary the key points are:

1. Sound level of an event at the Venue was measured to be 90 dBA at a location 10' from the DJ booth and 75-78 dBA at the property line. Due to the relatively high environmental, ambient noise level of the surrounding area, the venue adds 4-5 dB sound level to the ambient noise level at the property line.
2. The Venue sound level must be reduced by 3dB to 87dBA. A sound level limiter needs to be installed and maintained on the sound system.
3. The high environmental ambient noise level is caused by the neighboring hotels' pool deck event spaces to the north and south, which have similar uses to the Venue and produce music subjectively as loud or louder.
4. Music from the neighbors to the north was clearly audible and dominant (at the property line) during the sound measurements for the Venue.
5. Suggested Sound Level Limit for the Venue:
   87 dBA measured @ 10' from the main speakers

3) Testing Methods and Procedure

A) Measurement Equipment:

Two (2) B&K 2270 handheld analyzers were used for the acoustical measurements. Both analyzers have the following software packages installed:

- BZ-7223 - Frequency analyzer software
- BZ-7224 - Logging software
- BZ-7225 - Enhanced logging software
- BZ-7226 - Sound recording option

Both meters were calibrated by B&K in the past year, in addition to daily calibration with a B&K 4231 ½" microphone calibrator. All B&K meters are equipped with a 4189 pre-polarized microphone and microphone preamplifier ZC-0032.

B) Measurement data is analyzed using the following parameters:

1. A "maximum sustained sound level" is represented with the $L_{AS}5.0$ metric.
2. A "minimum sustained sound level" is represented using the $L_{AS}95.0$ metric.
3. Because there are competing sound sources from multiple properties in many measurements, this is an effective method for gathering the loudest and quietest data points from a measurement.
4. All measurement results are A-weighted.

C) Measurement Conditions and Environmental Factors

1. Venue Daytime Event
    - Measurements were made using the installed sound system in the Venue area east of the Kimpton Surfcomber Hotel pool deck.
    - A DJ set up in the DJ Booth Area, and a "Source" sound level measurement was logged from 1:53 PM to 4:12 PM.
    - A stationary sound level meter was placed 10' from the DJ booth.

D) Venue Event Measurement Setup

Figure 2 - Key Plan of Venue Measurements

Figure 3 - Venue: R5 (Property Line – Beach North) and Source

Figure 4 – Venue Source Measurement

Figure 5 - R6, Property Line – Beach South

Figure 6 - R7, Property Line North

Figure 7 - R8, Property Line South

4) Measurement Results and Analysis

Measurement	Description	Date Time Period	Maximum Sustained Sound Level		Minimum Sustained Ambient Level	Receiver Level Over Ambient	Notes
			Source $L_{AS}5.0$ (dB)	Receiver $L_{AS}5.0$ (dB)	$L_{AS}95.0$ (dB)	(dB)	
Venue							
Source	Venue DJ Booth	7/23/2022 1:53 - 4:12 PM	90.4		81.2		The meter is 10' from the main speakers.
R5	Property Line - Beach N	7/23/2022 1:56 - 2:29 PM	89.3	75.8	70.9	4.9	
R6	Property Line - Beach S	7/23/2022 2:30 - 3:05 PM	90.2	76.8	72	4.8	
R7	Property Line N	7/23/2022 3:09 - 3:42 PM	91.1	77.0	73.0	4	
R8	Property Line S	7/23/2022 3:50 - 4:12 PM	89.8	78.5	73.5	5	Music from the SLS Pool Party clearly audible.

Figure 8 - Measurement Results

Measurement Notes and Analysis:

1. The Venue receiver measurements R5-R8 show 4dB-5dB sound level over ambient.
2. R8 is impacted by music from the SLS Hotel pool deck, which was audible on site and in the measured audio recording. CA measured 6' from the property line (inside the fence) to reduce the impact of the music from the SLS property. This is a conservative approach.

5) Noise Code

The applicable section of the Miami Beach noise code is excerpted below in italics. Unfortunately, the Miami Beach noise code does not utilize explicit sound levels in decibels or specific measurement procedures. Therefore, the interpretation of the code is subjective.

Sec. 46-152. - Noises; unnecessary and excessive prohibited.

It shall be unlawful for any person to make, continue or cause to be made or continued any unreasonably loud, excessive, unnecessary or unusual noise. The following acts, among others, are declared to be unreasonably loud, excessive, unnecessary or unusual noises in violation of this section, but this enumeration shall not be deemed to be exclusive, namely:

(b) Radios, televisions, phonographs, etc. The using, operating, or permitting to be played, used or operated any radio receiving set, television set, musical instrument, phonograph, or other machine or device for the producing or reproducing of sound in such manner as to disturb the peace, quiet and comfort of the neighboring inhabitants, or at any time with louder volume than is necessary for convenient hearing for the person or persons who are in the room, vehicle or chamber in which such machine or device is operated and who are voluntary listeners thereto. The operation of any such set, instrument, phonograph, machine or device between the hours of 11:00 p.m. and 7:00 a.m. in such manner as to be plainly audible at a distance of 100 feet from the building, structure or vehicle in which it is located shall be prima facie evidence of a violation of this section.

6) Conclusions

In summary, the High Tide Venue currently has minimal sound impact to the surrounding areas. The Venue sound needs to be reduced by 3dB from 90dBA to 87dBA to be within 3dB of ambient at the property line. A sound level limiter needs to be installed and maintained on the sound system.

Please call to further discuss.

Sincerely,

David Kotch.

APPENDIX OF ACOUSTIC TERMS AND DEFINITIONS

Ambient:

Ambient noise includes all sounds present in an environment. The ambient noise level may be measured at any moment, but it will vary widely with time, e.g., with the coming and going of trucks, cars, aircraft, sirens, etc.

Decibel (dB):

A unit of the intensity of sound. The decibel (abbreviated dB) is a relational measure, expressing the relative intensity of the described sound to a reference sound. The decibel is a logarithmic measure, specifically 10 times the logarithm of the ratio of two voltages, currents, or sound pressures. Decibels are a logarithmic scale, so every 3dB increase is a doubling of sound pressure and subjectively it requires 10dB for a perceived doubling of loudness. See Figure A for a chart illustrating comparative dB & SPL values.

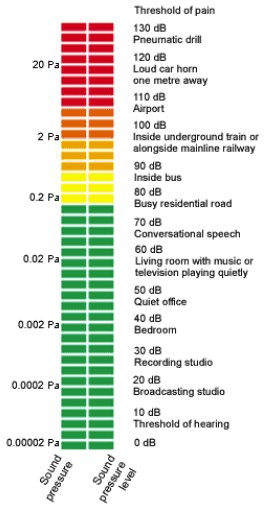

Figure A – Chart illustrating comparative dB & SPL values.

A-Weighting:

The A-contour filters out a significant amount of the bass in order to approximate the way humans hear at the 40 phon level. It is useful for eliminating inaudible low frequencies and is commonly used at SPLs below 70 dB. Sound pressure level values obtained using this weighting are referred to as A-weighted sound pressure levels and are signified by the identifier dBA. See Figure B for a visual comparison of weighting curves.

C-Weighting:

The C-contour is nearly flat, with only a slight reduction at the high and low frequencies. It approximates the way humans hear at very high sound levels and is commonly used for SPLs above 70 dB. Sound pressure level values obtained using this weighting are referred to as C-weighted sound pressure levels and are signified by the identifier dBC. See Figure B for a visual comparison of weighting curves.

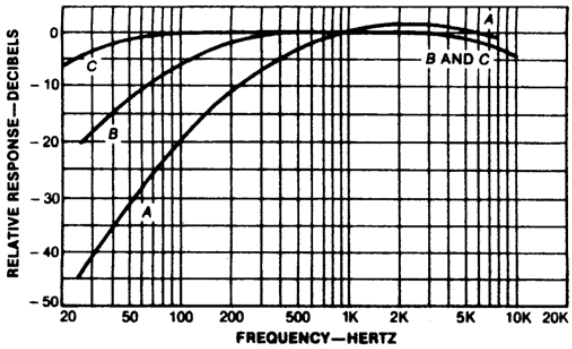

Figure B – A visual comparison of weighting curves.

L_{EQ}:

Equivalent continuous sound level. The steady level which would produce the same sound energy over the test period as the specified time-varying sound. This figure is useful for studying long-term trends in environmental noise.

L_{MAX}:

Highest, or loudest, Sound Pressure Level (in dBA, dBC, or dBZ) measured during the test period.

L_{MIN}:

Lowest, or quietest, Sound Pressure Level (in dBA, dBC, or dBZ) measured during the test period.

L_n:

L_n values are statistical noise levels (sometimes called percentiles) used to assess noise levels (sound pressure levels) from fluctuating noise sources over time. Any statistical value between 0.01% and 99.99% may be calculated where 'n' is the percent exceeded noise level over a timed measurement period (T).

$L_{5.0}$:

$L_{5.0}$ is the level exceeded for 5% of the time. For 5% of the time, the sound or noise has a sound pressure level above $L_{5.0}$. For the rest of the time, the sound or noise has a sound pressure level at or below $L_{5.0}$. These higher sound pressure levels are due to sporadic or intermittent events. $L_{5.0}$ is often used when assessing environmental noise and in planning applications.

L_{95}:

L_{95} is the level exceeded 95% of the time. For 95% of the time, the noise level is above this level. It is generally considered to be representing the background or ambient level of an environment. L_{95} is often used to quantify the background noise levels in assessments of noise pollution and nuisance noise from industrial sources.

Perception of Sound:

The threshold of perception of the human ear is approximately three decibels and a five-decibel change is considered to be clearly noticeable to the ear. This is

primarily due to the logarithmic measuring metric typically associated with decibels. See Chart 1 for perceived change in decibel levels.

Perceived Change in Decibel Levels	
Change in sound level	**Perceived change to the human ear**
± 1dB	Not perceptible
± 3dB	Threshold of perception
± 5dB	Clearly noticeable
±10dB	Twice (or half) as Loud
± 20dB	Fourfold (4x) change

Chart 1 - Perceived change in decibel levels.

Subtracting Sound Levels:

Sometimes it is necessary to subtract the background noise from the total SPL. The correction for background noise can be done by subtracting background noise from the total noise level using logarithmic subtraction.

If change is less than 3 dB(A), the background noise is too high for an accurate measurement and the correct noise level cannot be found until the background noise has been reduced. If the difference is more than 10 dB(A), the background noise can be ignored.