Criterion Acoustics

Architectural Acoustics & Systems Design

Date: July 31, 2025

To: Jill O'Connor – Noble 33

From: David Kotch & Andy Swerdlow – Criterion Acoustics

Re: 1620 Drexel Avenue – Meduza Restaurant, Miami Beach – Environmental Noise Impact Study – V2

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1) Overview

Noble 33 (representing Meduza) has hired Criterion Acoustics (CA) to perform an Environmental Noise Impact Study for the proposed rooftop. The project location is 1620 Drexel Avenue, Miami Beach, FL 33139.

2) Environmental Noise Impact Summary

The key points for the project are as follows:

1. Background, "ambient" level music playback is planned in the rooftop food and beverage area through an installed audio system. No "event" music playback or bands are planned for the rooftop.
2. Sound will be directed away from the closest residential buildings, 1619 Pennsylvania Ave. and 1610 Drexel Ave., to the south. The sound level on the roof will kept sufficiently low to not disturb the peace.
    a. Suggested target rooftop sound level:
        i. 72 dBA (see Table i below)
        ii. As measured with the LASmax setting, which is the "slow maximum" setting on the sound level meter, distributed around the rooftop
    b. The ambient, environmental background sound level in the neighborhood surrounding 1620 Drexel Ave. is 50-55 dBA, as measured by Andy Swerdlow of CA in the late evening on May 8, 2024. See section 4 for more information.
3. Loudspeakers for audio playback shall be distributed to keep individual volumes low, be mounted as close to patron areas as reasonably possible.
4. A digital tamper-resistant sound level input limiter be installed and configured after on-site sound level calibration to ensure that the calibrated level is never exceeded. This limiter and output gain settings will only be accessible by management and will have no local operational access.
5. After limiting, no sound will impact the residences south of 1620 Drexel or other establishments on Lincoln Road if the conditions in this report are met. Sound at 100ft. from the property will not exceed the ambient environmental noise levels.

Table i – Suggested Sound Level Limitation as Measured on Rooftop (LASmax)							
	31.5 [Hz]	63 [Hz]	125 [Hz]	250 [Hz]	500 [Hz]	Overall [dBA]	Overall [dBC]
Sound Level [dBA]	-	74	74	74	74	72	80

3) Project Images

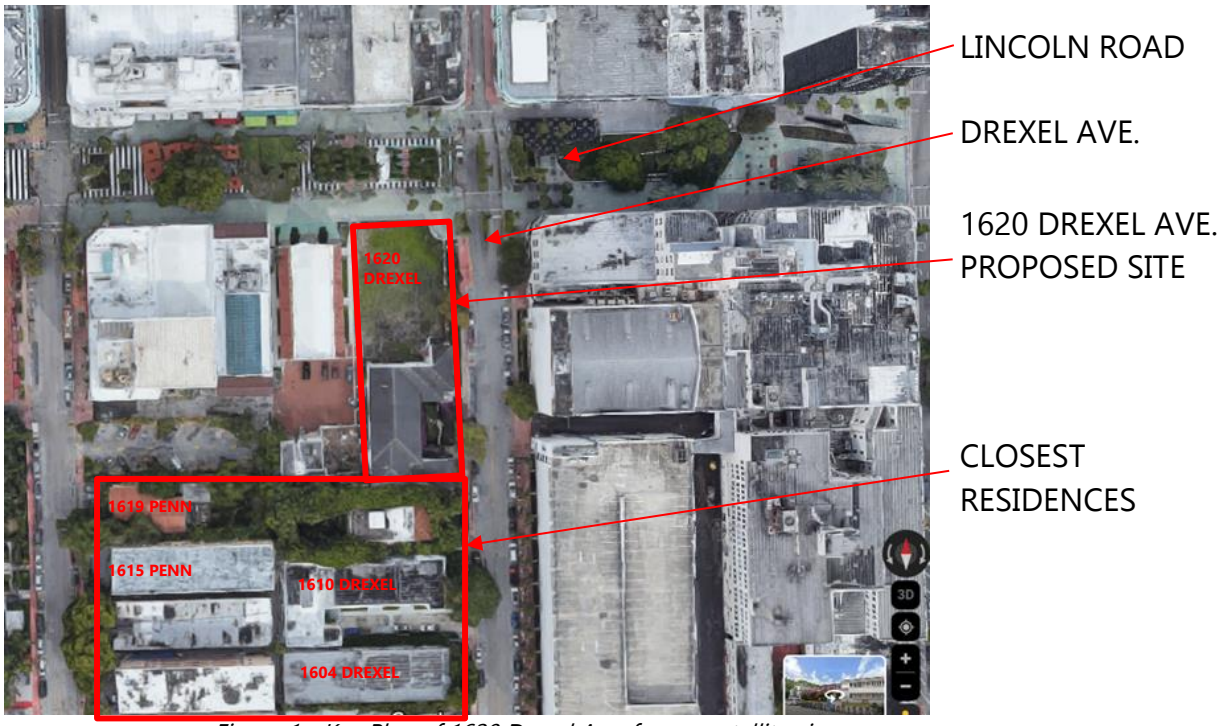

Figure 1 - Key Plan of 1620 Drexel Ave. from a satellite view

Figure 2 - Street View of 1620 Drexel Ave. The proposed building site is demolished.

4) Model Results

1. Methodology
   a. A B&K 2270 handheld analyzer was used for on-site acoustical measurements. The analyzer has the following software packages installed:
      - BZ-7223 - Frequency analyzer software
      - BZ-7224 - Logging software
      - BZ-7225 - Enhanced logging software
      - BZ-7226 - Sound recording option

      The meter was calibrated by B&K in the past year, in addition to daily calibration with a B&K 4231 ½" microphone calibrator. A windscreen was used during the measurement.
      All measured acoustical data was processed using the L90 calculation, removing the loudest 90% of recorded data.
   b. Predicted rooftop sound from loudspeakers and talking patrons was modeled using Noisetools dBMap software.
      Patron sound sources were simulated using line sources with 68 dBA sound power per meter using the spectrum in Table i, derived from ANSI 3.5 "normal" vocal effort. The spectrum was increased by 3dB to allow for two talkers per meter. The 45m line source was drawn for the rooftop seating area, which equates to approximately 90 people talking simultaneously.
   c. Loudspeaker sound sources were modeled as omnidirectional (accurate for bass sounds) and placed 2.5m (8 ft.) above the surface of the roof deck. The assumed sound power is listed below in Table ii; and is a typical value for a small outdoor speaker. A total of (9) speakers were modeled. They are placed in a distributed fashion on the roof throughout the patron area. The proposed roof audio system has not yet been specified; CA has used this to show an average, typical, and unsophisticated loudspeaker deployment suitable for background music.

Table ii – Sound power level for a normal speaking voice

	31.5 [Hz]	63 [Hz]	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]	Overall [dBA]	Overall [dBC]
Sound Level	-	45	55	65	69	63	56	50	45	68	-

Table iii – Modeled sound power level for a single loudspeaker

	31.5 [Hz]	63 [Hz]	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]	Overall [dBA]	Overall [dBC]
Sound Level	-	80	80	80	80	78	77	74	71	83	87

2. On-Site Ambient Sound Level Measurement Results

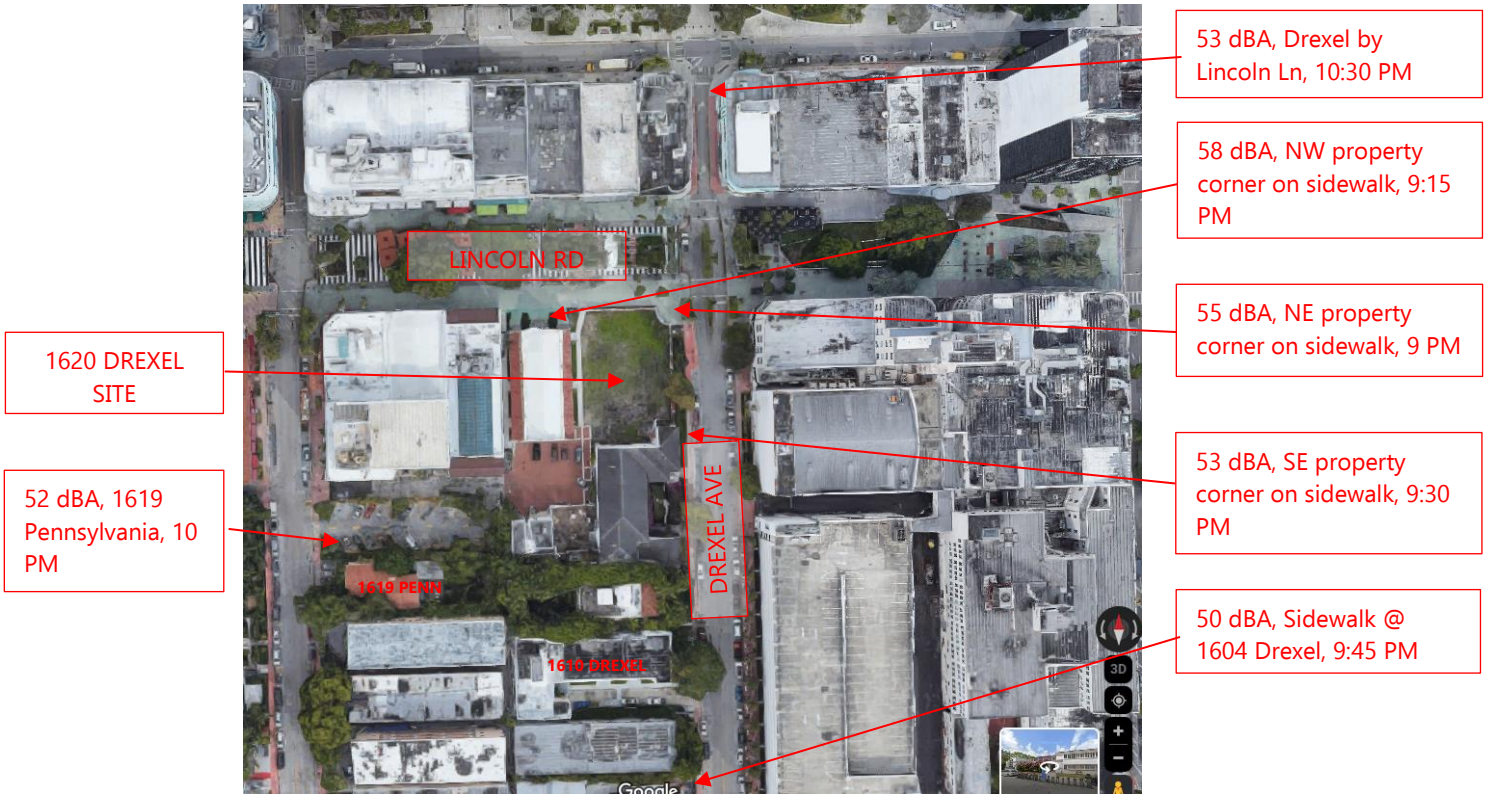

Figure 3 - Map of Ambient Noise Measurement Results

Sound was measured between 9 and 11 PM on Wednesday May 8, 2024. The traffic was light and music and sound from other establishments was low. There are significant periods in the measurements without cars nearby.

Figure 4 - Photos taken during on-site testing. Left: on NE corner of 1620 Drexel on Lincoln, facing north; Right: Sidewalk in front of the 1604 Drexel residences, facing north

3. Environmental Noise Impact Model Results

Figure 6 - dBMap View showing sound projected 5 ft. above the ground. The receiver points are Lsmax dBA sound pressure level.

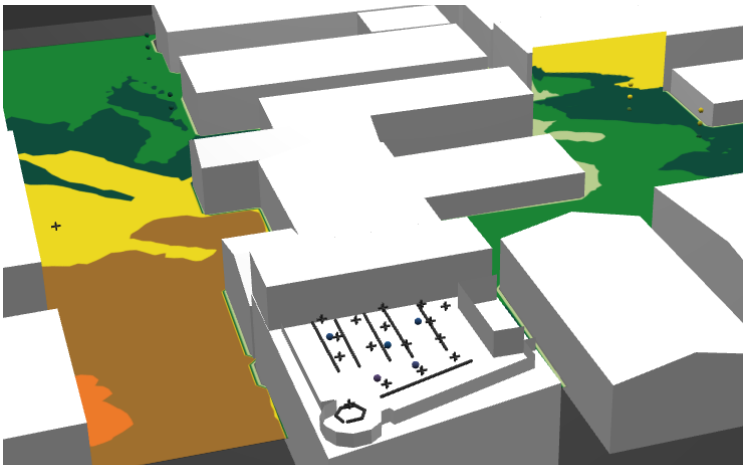

Figure 5 – dBMap 3D View facing south. Sound is projected vertically on 1615 Pennsylvania Ave.

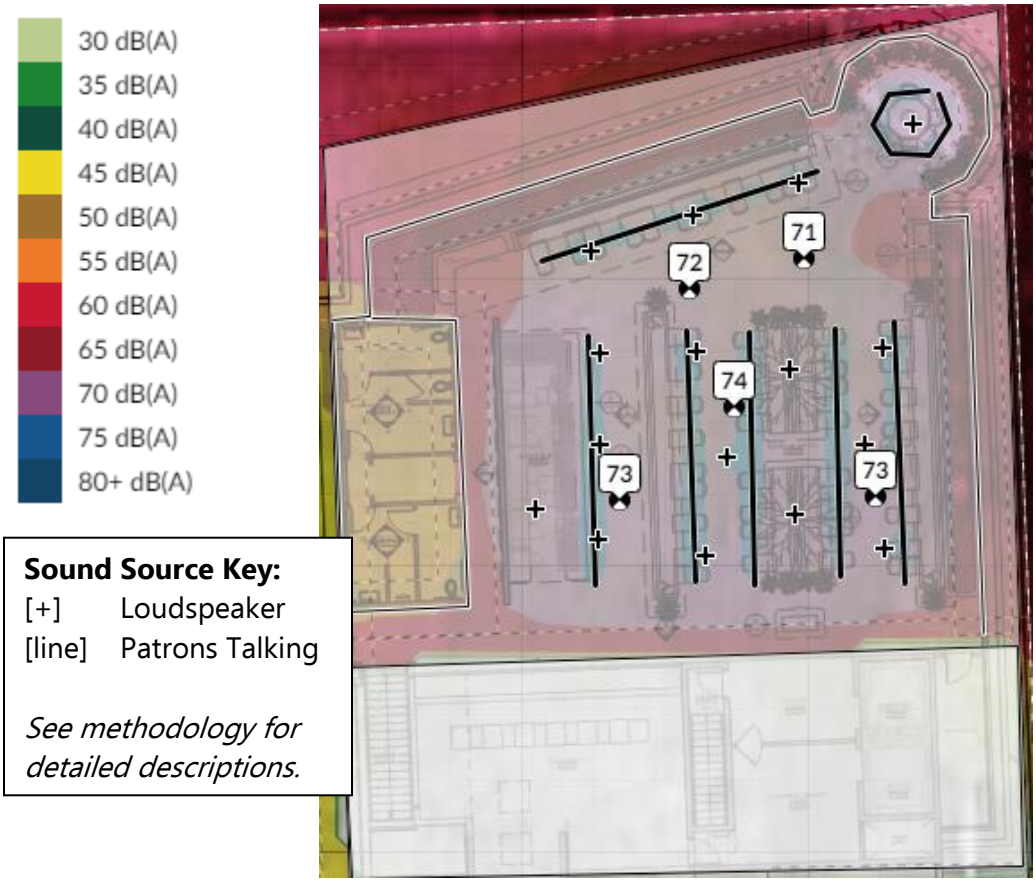

Figure 7 - dBmap view of the 1620 Drexel Rooftop. This is the zoomed in view of the overall plan shown in Figure 5. The sound system is using assumed positions for distributed sound coverage.

Summarized analyses of the prediction model results are as follows:

a. The modeled sound level on the 1620 Drexel rooftop ranges from 71 dBA to 74 dBA (Lsmax). This includes reproduced music and talking voices from approximately 126 people.
b. The roof mezzanine is approximately 15 ft. higher than the rooftop deck. This effectively reduces the amount of sound travelling south.
c. The highest level of environmental egress noise is 55 dBA, predicted across Drexel Ave. The ambient sound level measured in this location is 55 dBA (minimum, L90). This sound level may be detectable under certain conditions but will usually be inaudible.
d. The highest level of sound predicted at a residential property is 39 dBA (1615 Pennsylvania Ave.). The ambient sound measured in this location was 52 dBA (minimum, L90); 39 dBA Lsmax sound level will have no impact.

5) Noise Code

The applicable section of the Miami Beach noise code is excerpted below in italics.

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.

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.

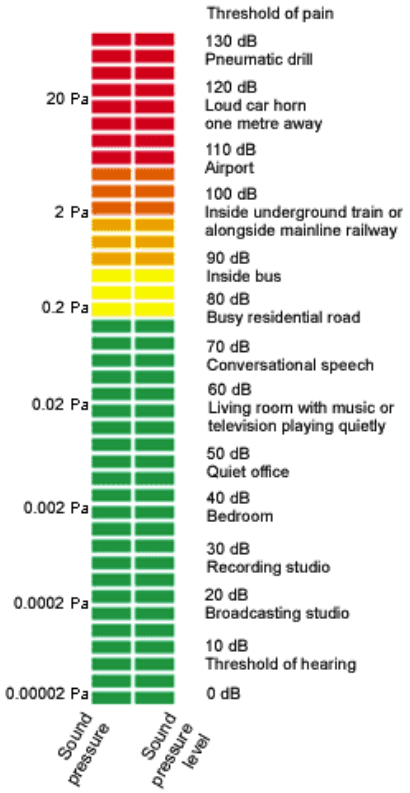

Figure A – Chart illustrating comparative dB & SPL values.

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.

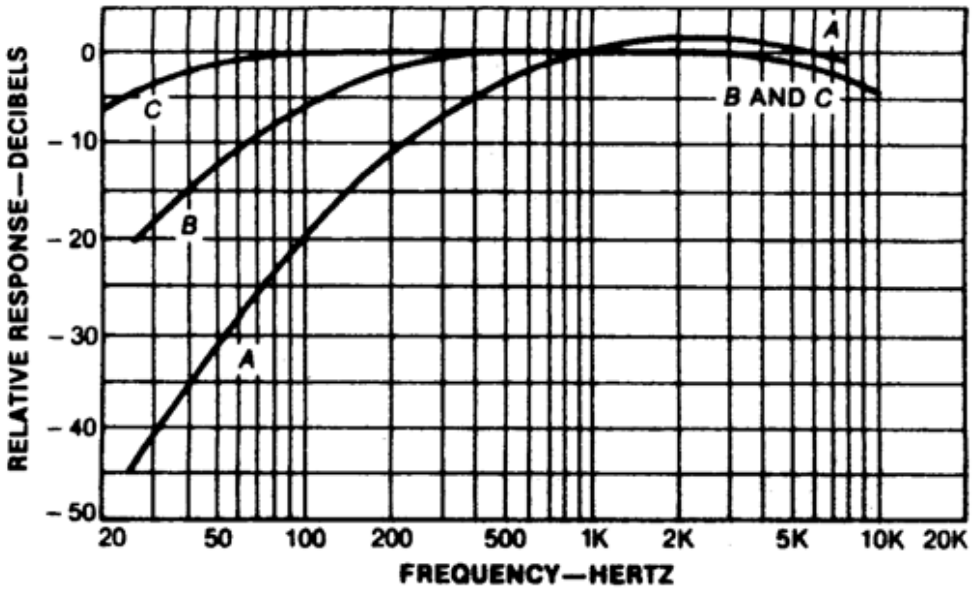

Figure B – A visual comparison of weighting curves.

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.