Brooks Acoustics Corporation
49 N. Federal Highway Pompano Beach, Florida 33062 754-229-1450

Ms. Cecilia Torres-Toledo, Esq.
Associate
Akerman LLP
98 Southeast Seventh Street, Suite 1100
Miami, FL 33131

30 June 2022
PJ2022-1388-01

Subject: Acoustical engineering study – Sound analysis for Conditional Use Permit
Oro & Elixir – 818 Lincoln Road, Miami Beach

Dear Ms. Torres-Toledo:

As requested, Brooks Acoustics Corporation (BAC) has conducted a sound analysis for the venue located at 818 Lincoln Road. The proposed venue is to be operated as a restaurant and nightclub known as "Oro & Elixir". This sound study is part of an application for a Conditional Use Permit for the venue.

The objective of this project was to determine the sound levels of the music loudspeakers that may reach two locations outside of the venue. These locations are:

1. Sidewalk on Lincoln Road (Mall) adjacent to venue
2. Apartment building behind the venue (south across Lincoln Lane S)

A sound study was conducted to detemine the expected sound levels at these locations. This sound study was based on the proposed audio design for the venue, submitted by Audio Engineer Jhander Orihuela.

Findings Summary

The sound study confirmed that the music played over the indoor loudspeakers in the proposed restaurant and nightclub is expected to be *below normal conversation sound levels*, and so will not interfere with normal conversation at the sidewalk location adjacent to the venue. The sound level is expected to be lower at the apartments to the south of the venue.

These sound study results for the audio system equipment and loudspeakers on site indicate that the proposed venue at 818 Lincoln Road would be ***in compliance*** with typical Conditional Use Permit requirements.

Conditional Use Permit

The Applicant intends to file an application with the Planning Board of the City of Miami Beach for a Conditional Use Permit (CUP) File Number PB-22-0518 for the Property located at 818 Lincoln Road, for entertainment at a proposed restaurant and nightclub venue, pursuant to Chapter 188, Article IV, and Chapter 142, Article V, Division 6 of the City code.

Typical requirements for an entertainment venue CUP may include the following provisions:

"Entertainment, as defined in City Code Section 114-1, including but not limited to a live show, live performance, or a DJ, shall be strictly prohibited on the outdoor porch and/or the sidewalk café area at the front of the building. All such entertainment shall be located only with the interior of the building.

"Exterior doors/windows may remain open, provided, however, that sound levels along the abutting sidewalks shall not exceed a level that would interfere with normal conversation (i.e. shall not exceed an ambient volume level)."

"A sound field test shall be performed before commencement of business operations, with staff present, to demonstrate that the anticipated sound levels proposed by the applicant, with the doors of the venue open and the music played at the proposed volumes levels, shall not interfere with normal conversation (i.e. shall not exceed and ambient volume level) along the exterior public sidewalks abutting the property."

"The house sound system shall be installed and set in such a manner as to limit the acoustical output of the system and have password protected security on all controls, at all times. The equipment and installation plan for the sound system, including the location of all speakers and sound level control shall be submitted for the review and approval of the Planning Department. 60 days after opening, the sound systems in the facility shall be tested by a qualified acoustic professional, and a report shall be submitted to the Planning Department for review, to verify that it is operating as designed."

"Televisions, and projectors shall not be located anywhere in the exterior areas of the property."

"Exterior speakers may only be permitted for fire or life safety purposes, and/or for background music played at a volume that does not interfere with normal conversation (i.e. at an ambient volume level)."

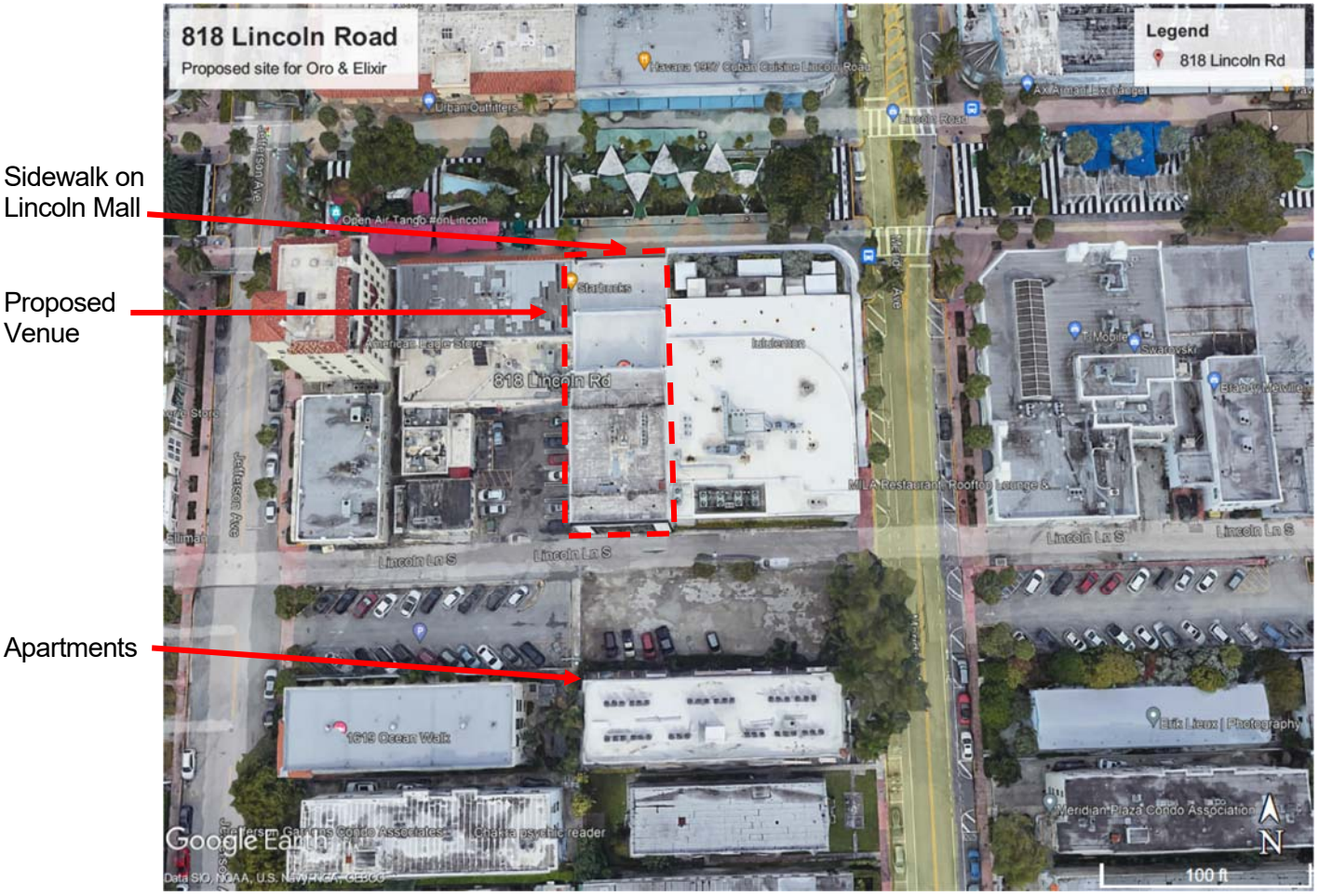
To *summarize*, the following provisions may be imposed on a venue in a Conditional Use Permit:

- The entertainment sound system must have limited output controlled by venue management.

- Indoor and outdoor loudspeakers and open doors/windows are permitted, providing that the speakers are played at ambient (i.e. normal conversation) sound level, along exterior public sidewalks.

Venue sound study

A sound study for the proposed venue was conducted to satisfy that requirement for the Conditional Use Permit application. An aerial view of the proposed venue location at 818 Lincoln Road is seen below.



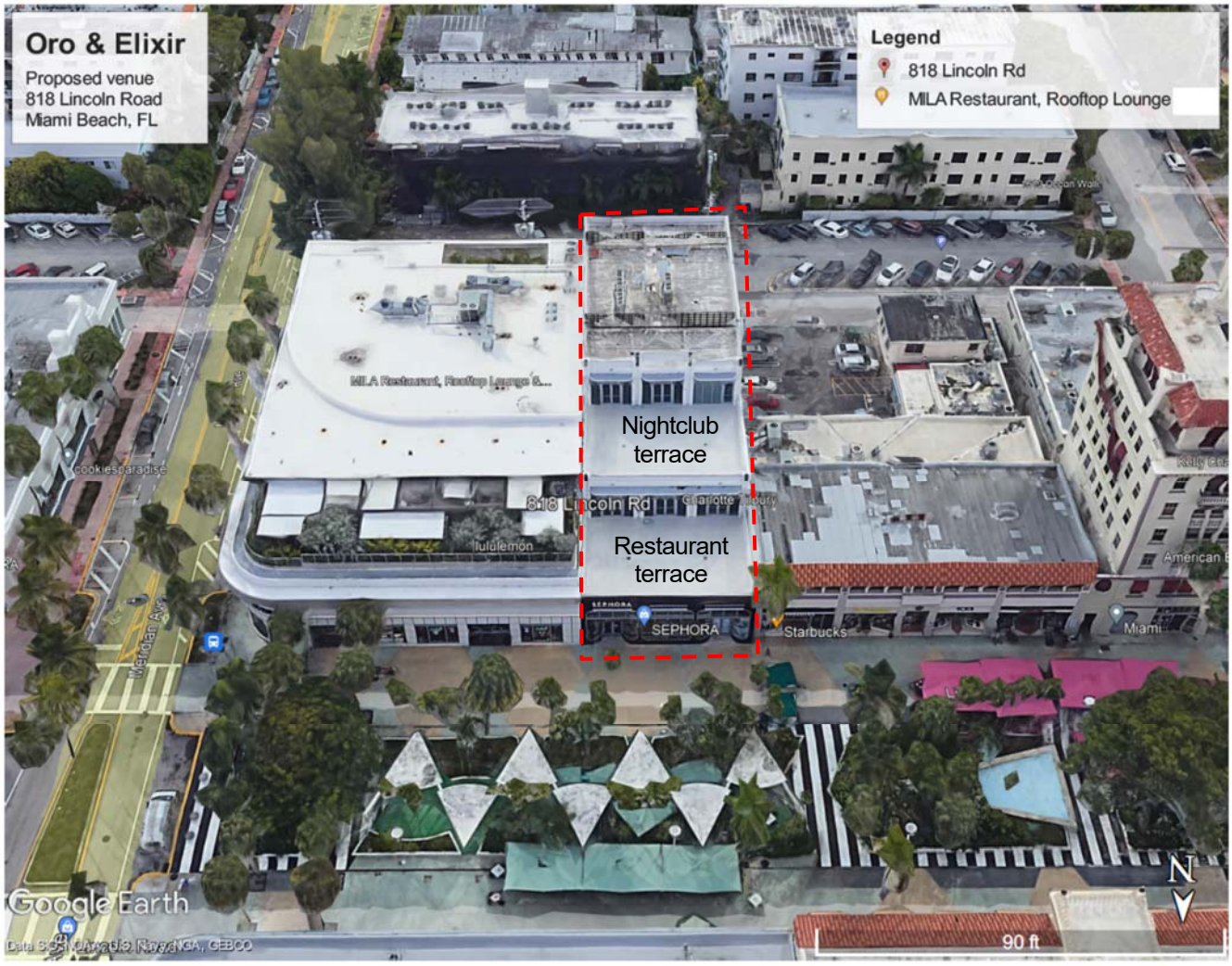
Proposed restaurant and nightclub venue location at 818 Lincoln Road.

The location of the proposed venue at 818 Lincoln Road is in the heart of the Lincoln Mall entertainment district. This site is surrounded by other restaurant and nightclub operations.

The Lincoln Mall is located directly to the north of the proposed venue. The entrance to the proposed venue will be from Lincoln Mall.

To the east is the MILA restaurant and rooftop lounge. Further east is Meridian Avenue. To the south is the service road Lincoln Lane S, across which are a city parking lot and residential apartments. To the west are a variety of retail operations and commercial offices.

The proposed restaurant will occupy the 2nd floor of the building and the nightclub will be on the 3rd floor. A separate retail operation is planned for the 1st floor.



Proposed Oro & Elixir restaurant and nightclub venue (viewing south).

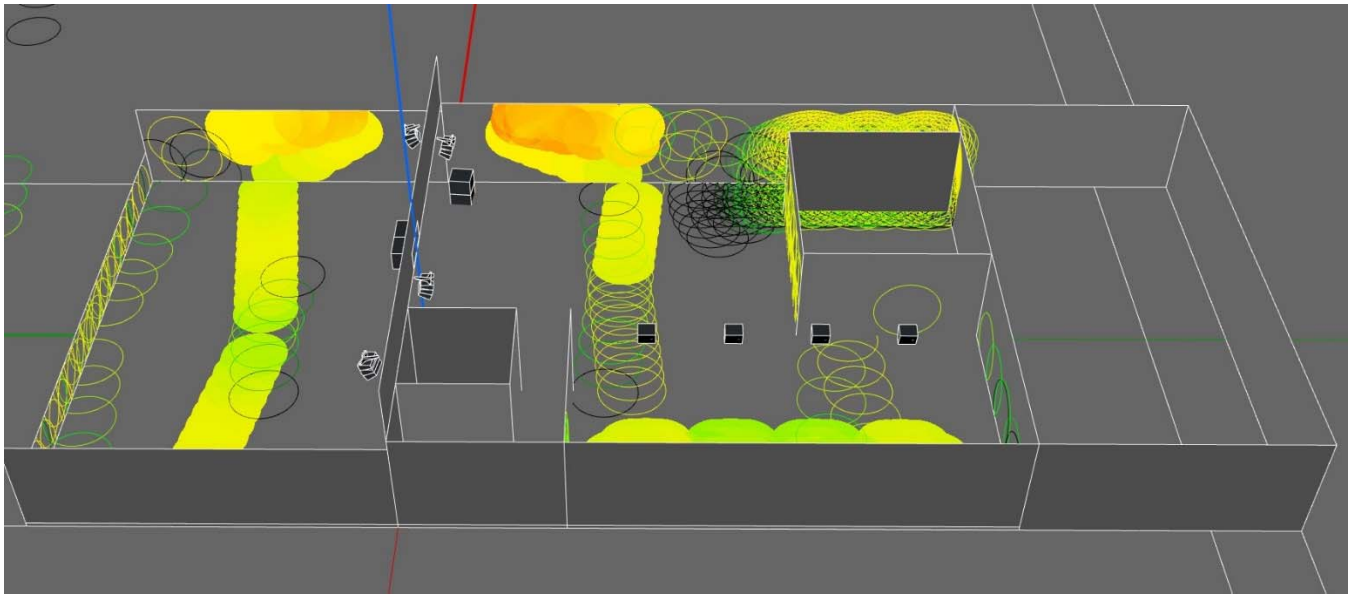
The entertainment sound systems which are proposed to be installed will be the latest technology and designed to operate in a robust and reliable manner. The sound components of the system are to be installed in an equipment rack with a lockable door. None of the sound components in the rack are adjustable at the component. The sound adjustments for the system will be made using various password protected presets for entertainment scenes such as dining background music and nightclub dance entertainment. The higher sound level scene will be for nightclub dance music presented by a DJ.

Once installed and commissioned, these preset conditions cannot be altered and will be under the control of the venue management. It is noted that no televisions or projectors are planned for outside the building.

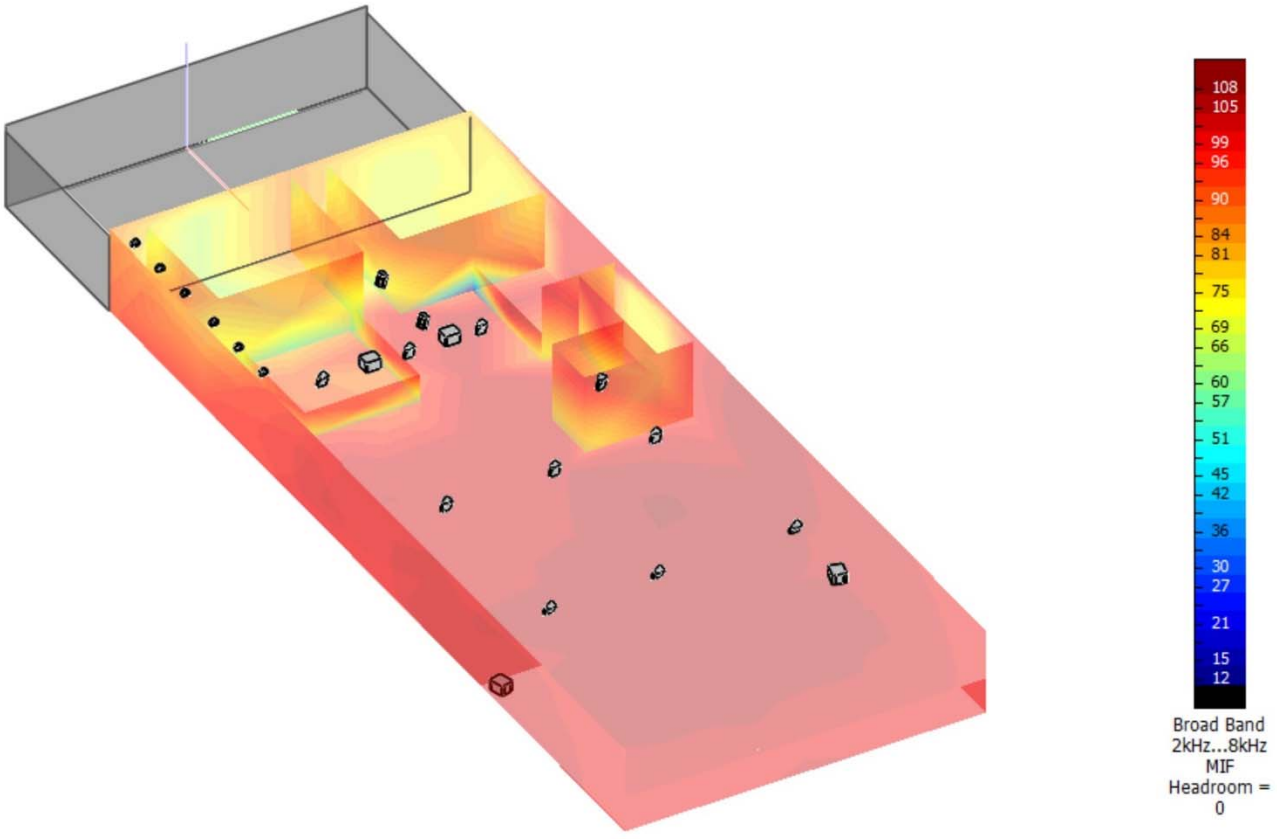
Sound level calculations

A sound level study was made, based on the proposed sound system design as presented by Audio Engineer Jhander Orihuela. Two systems will be combined to provide audio entertainment as called for by the scene presets. These are the NEXO and the L-Acoustic systems which were designed and modeled by Jhander using the manufacturer native software packages.

Views of the audio systems are shown below.



Proposed Oro & Elixir nightclub (3rd floor) sound system (L-Acoustics).



Proposed Oro & Elixir restaurant (2nd floor) sound system (NEXO).

The expected sound level for the dance music preset is 102 dBA on the dance floor. On the 2nd floor patio the expected sound level is about 90 dBA, as seen on the NEXO diagram.

The dance floor sound level was projected to the areas of interest by acoustical engineering analysis using a sound propagation computer model. The calculation sheets are attached.

Sound source data and location data were used as input to a computer modeling procedure which calculated the propagation of that sound through the atmosphere to the receiver positions. The sound propagation calculation procedure accounts for the effects of the sources and facility building, barrier effects, and also distance and atmospheric conditions, in accordance with International Standards on the attenuation of sound during propagation outdoors, ISO 9613-1 and ISO 9613-2.

The calculations are based on sound source spectral data from a large theater electronic dance music (EDM) show in the Brooks Acoustics data base, as seen on the Source Sheet – attached. These large theater sound data were adjusted to the level used in the nightclub audio system design of 102 dBA on the dance floor, located on the 3rd floor of the building. This level is considered typical for this nightclub venue.

The sound barrier effects provided by the 3rd floor and 2 floor terraces were accounted for using the standard barrier calculation procedures. The barrier attenuation data are given in the attached Appendix.

Calculation Results

The sound level calculated at Position 1, the Mall sidewalk to the north, is about **64 dBA** (64 A-weighted decibels), the level of a *normal conversation*.

The sound level calculated at Position 2, the apartments to the south is about **57 dBA**. This is the level of a *quiet conversation*.

Further, exterior walls and windows typically provide at least 25 dBA sound reduction from the outside to the inside. This would reduce the dance music sound inside the apartments to 32 dBA or lower. This would typically be below the sound level of the HVAC unit in the apartment. So, it is *unlikely* that any sound from the venue will be audible indoors at the apartments. It is expected that the operation of the venue with dance music will not disturb the comfort and repose of any person in the vicinity.

Calculation results outside and inside the receiver locations are given in the Table below:

Operating Condition	Receiver Distance	Sound level outside	Sound level inside Apartment
Dance music in proposed venue	Pos 1 – Sidewalk to N – 5 feet	64 dBA (normal conversation)	--
Dance music in proposed venue	Pos 2- Apartments to S – 76 feet	57 dBA (quiet conversation)	32 dBA (very quiet whisper)

For comparison, a typical conversation level / TV level is 65 to 70 dBA.

Sound level criteria

For the purposes of this CUP study, the criteria for maximum sound level limits were set at the level of a normal conversation (70 dBA) at the outside of a receiver position, such as the sidewalk and apartment locations. This recognizes the typical CUP requirement that the music at the venue not exceed the sound level of a normal conversation, and not be disturbing to persons in the vicinity.

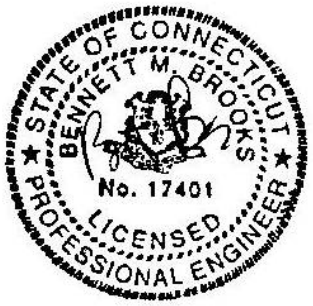
Discussion

Based on the sound study results for the proposed venue at 818 Lincoln Road, it is clear that the audio system in the dance music mode is expected to operate such that it produces a sound level that is at or below the ambient sound level. The music system is not expected to produce a sound level that would interfere with normal conversation.

Please contact me if you have any questions concerning these findings.

Very truly yours,
BROOKS ACOUSTICS CORPORATION

Bennett M. Brooks, PE, FASA, INCE
President



APPENDIX

818 Lincoln Road
CUP Sound Study

1. Sound propagation calculation sheets

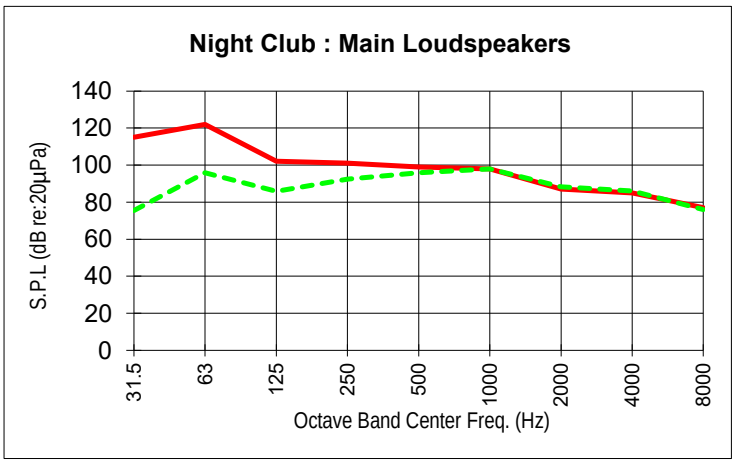
Source Sheet

Source Group: Night Club
Source Name: Main Loudspeakers

Source Data: BAC Unweighted
Source Level: 102 dB(A)
record distance: 5

Source Type: point

Coordinates:	East	North	Elev.
	0	0	36



Frequency	Data		Signature	A-weighted Signature	A-weighting Curve	freq.
31.5 Hz	115		**115**	76	-39.4	31.5
63 Hz	122		**122**	96	-26.2	63
125 Hz	102		**102**	86	-16.1	125
250 Hz	101		**101**	92	-8.6	250
500 Hz	99		**99**	96	-3.2	500
1000 Hz	98		**98**	98	0.0	1000
2000 Hz	87		**87**	88	1.2	2000
4000 Hz	85		**85**	86	1.0	4000
8000 Hz	77		**77**	76	-1.1	8000

Theater test
EDM show
LA01
107 dBA
@ FOH

Adjusted to
102 dBA
on dance floor

BARRIER ATTENUATION CALCULATION
Oro & Elixir
Source: Mains -- Receiver: Sidewalk to S

* Indicates values to be input in feet -- sound from loudspeakers on dance floor over terrace walls
baseline elev. 5 ft

$h_b := 18$ *Height of barrier

$h_s := 5$ *Height of source

$h_r := 5$ *Height of Receiver

$d_{sb} := 49$ *Distance from source to barrier

$d_{br} := 46$ *Distance from barrier to receiver

$c := 344$ Speed of sound (m/s)

$n := 0..8$

$f_n := 31.25 \cdot 2^n$ Frequency of peak (Hz)

$\lambda_n := \frac{c}{f_n}$ Wavelength of peak (meters)

$D_{br} := d_{br} \cdot .3048$ $D_{br} = 14.021$

$D_{sb} := d_{sb} \cdot .3048$ $D_{sb} = 14.935$

$H_{sb} := (h_b - h_s) \cdot .3048$ $H_{sb} = 3.962$

$H_{br} := (h_b - h_r) \cdot .3048$ $H_{br} = 3.962$

The path distances specific to the geometry of the installation -- in meters

$R_{sb} := \sqrt{(D_{sb})^2 + (H_{sb})^2}$ $R_{sb} = 15.452$

$R_{br} := \sqrt{D_{br}^2 + H_{br}^2}$ $R_{br} = 14.57$

Fresnel Number

$N_n := \frac{2 \cdot [(R_{sb} + R_{br}) - (D_{sb} + D_{br})]}{\lambda_n}$

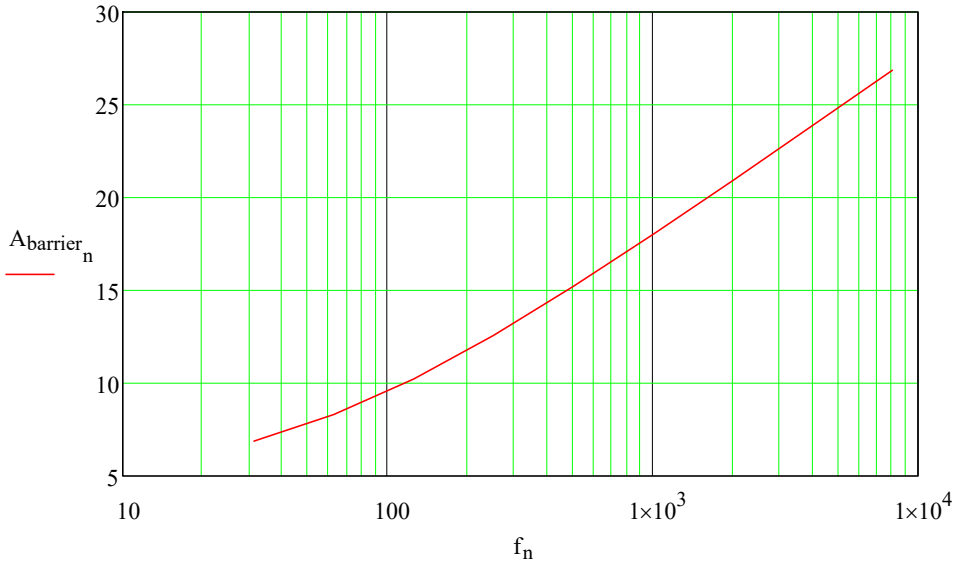
$C := 10$

C=10 for receiver over reflecting plane (close to ground)

$A_{barrier_n} := 10 \cdot \log\left[3 + C \cdot N_n \cdot \exp\left[-\frac{1}{2000} \cdot \sqrt{\frac{R_{sb} \cdot R_{br} \cdot (D_{sb} + D_{br})}{2 \cdot [(R_{sb} + R_{br}) - (D_{sb} + D_{br})]}}\right]\right]$ Barrier Attenuation

$$A_{barrier} = \begin{pmatrix} 6.9 \\ 8.3 \\ 10.2 \\ 12.6 \\ 15.2 \\ 18 \\ 20.9 \\ 23.9 \\ 26.9 \end{pmatrix} \quad \begin{matrix} 31.5 \\ 63 \\ 125 \\ 250 \\ 500 \\ 1000 \\ 2000 \\ 4000 \\ 8000 \end{matrix}$$

Note: Practical limit for barrier attenuation is 20 dB


30
25
20
15
10
5
$A_{barrier_n}$
10
100
1×10^3
1×10^4
f_n

BARRIER ATTENUATION CALCULATION
Oro & Elixir
Source: Mains -- Receiver: Apartment to S

* Indicates values to be input in feet -- sound from loudspeakers on dance floor around building wall to S apts
baseline elev. 5 ft

$h_b := 14$ *Height of barrier

$h_s := 0$ *Height of source

$h_r := 0$ *Height of Receiver

$d_{sb} := 10$ *Distance from source to barrier

$d_{br} := 167$ *Distance from barrier to receiver

$c := 344$ Speed of sound (m/s)

$n := 0..8$

$f_n := 31.25 \cdot 2^n$ Frequency of peak (Hz)

$\lambda_n := \frac{c}{f_n}$ Wavelength of peak (meters)

$D_{br} := d_{br} \cdot .3048$ $D_{br} = 50.902$

$D_{sb} := d_{sb} \cdot .3048$ $D_{sb} = 3.048$

$H_{sb} := (h_b - h_s) \cdot .3048$ $H_{sb} = 4.267$

$H_{br} := (h_b - h_r) \cdot .3048$ $H_{br} = 4.267$

The path distances specific to the geometry of the installation -- in meters

$R_{sb} := \sqrt{(D_{sb})^2 + (H_{sb})^2}$ $R_{sb} = 5.244$

$R_{br} := \sqrt{D_{br}^2 + H_{br}^2}$ $R_{br} = 51.08$

Fresnel Number

$N_n := \frac{2 \cdot [(R_{sb} + R_{br}) - (D_{sb} + D_{br})]}{\lambda_n}$

$C := 10$

C=10 for receiver over reflecting plane (close to ground)

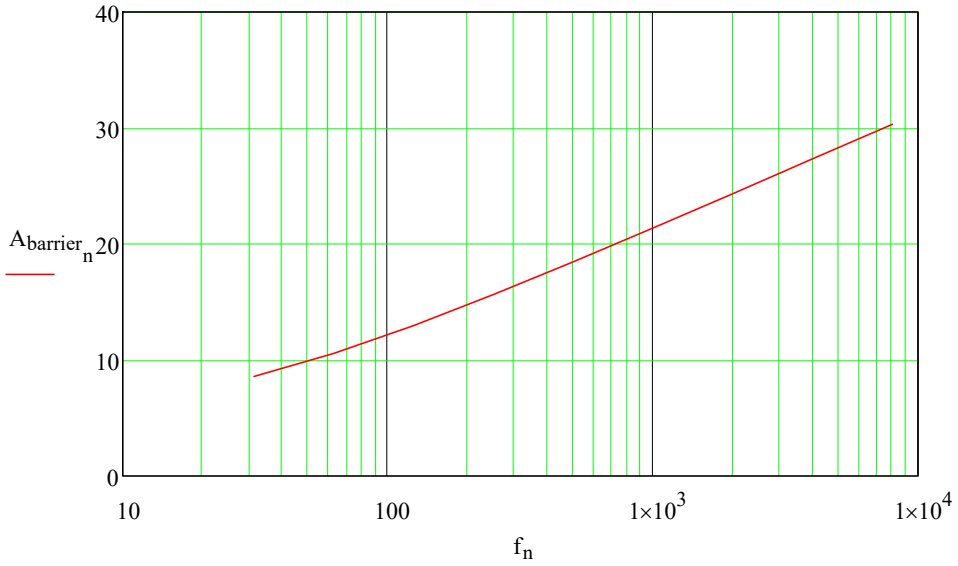
Barrier Attenuation

$$A_{barrier_n} := 10 \cdot \log\left[3 + C \cdot N_n \cdot \exp\left[-\frac{1}{2000} \cdot \sqrt{\frac{R_{sb} \cdot R_{br} \cdot (D_{sb} + D_{br})}{2 \cdot [(R_{sb} + R_{br}) - (D_{sb} + D_{br})]}}\right]\right]$$

$$A_{barrier} = \begin{pmatrix} 8.6 \\ 10.6 \\ 13 \\ 15.6 \\ 18.5 \\ 21.4 \\ 24.3 \\ 27.3 \\ 30.3 \end{pmatrix}$$

31.5
63
125
250
500
1000
2000
4000
8000

Note: Practical limit for barrier attenuation is 20 dB


40
30
20
10
0
$A_{barrier_n}$
10
100
1×10^3
1×10^4
f_n

Akerman

Based on BAC sound data and proposed site plan

Oro & Elixir CUP Sound Study

Sidewalk to North (baseline elev. 5)

Sound Projection: Miami Beach, FL

Dance Floor on venue 3rd floor

PROJECTED FROM: Dance Floor
PROJECTED TO: Pos 1 - Sidewalk to North

Coordinates:

East	North	Elevation
0.0	87.0	5.0

RELATIVE HUMIDITY: 50%
TEMPERATURE: 72 deg. F
ATMOS. PRESS: 760 mm Hg

Criteria Level 70 dBA
Total Sound Level **64 dBA**

Compliance?
YES

FREQ.	AWT SPL
31.5 Hz	43.4
63 Hz	62.2
125 Hz	50.4
250 Hz	54.4
500 Hz	55.2
1000 Hz	54.5
2000 Hz	42.6
4000 Hz	39.9
8000 Hz	27.9
RMS:	64.3

#	SOURCE	CONTRIBUTIONS AWT SPL
1	Night Club Main Loudspeakers	64.3 dBA
2	reserved --	-51.0 dBA
3	reserved --	-32.4 dBA
4	reserved --	-32.4 dBA
5	reserved --	-32.4 dBA
6	reserved --	-32.4 dBA
7	reserved --	-32.4 dBA
8	reserved --	-32.4 dBA

Atmospheric attenuation:	yes
Excess gound attenuation:	no
Source region hard, soft, mixed (h,s,m%):	h
Receiver region hard, soft, mixed (h,s,m%):	h
Middle region hard, soft, mixed (h,s,m%):	h
Barrier shadowing:	yes
Vegetation	no

PATH SHEET

COORDINATES

SOURCE 1: Night Club — East 0.0 — Record Distance
Main Loudspeakers — North 0.0 — 5.0
TYPE: point — Elevation 36.0 — Projection Dist.
92.4

Freq.	Source	Vegetation	Shadowing	Ground Atten	Net Barrier Atten	Atmospheric	Distance Atten	Contribution	Awt Contrib.
31.5 Hz	115.0	0.0	6.9	0.0	6.9	0.0	25.3	82.8	43.4
63 Hz	122.0	0.0	8.3	0.0	8.3	0.0	25.3	88.4	62.2
125 Hz	102.0	0.0	10.2	0.0	10.2	0.0	25.3	66.5	50.4
250 Hz	101.0	0.0	12.6	0.0	12.6	0.0	25.3	63.0	54.4
500 Hz	99.0	0.0	15.2	0.0	15.2	0.1	25.3	58.4	55.2
1000 Hz	98.0	0.0	18.0	0.0	18.0	0.1	25.3	54.5	54.5
2000 Hz	87.0	0.0	20.0	0.0	20.0	0.3	25.3	41.4	42.6
4000 Hz	85.0	0.0	20.0	0.0	20.0	0.8	25.3	38.9	39.9
8000 Hz	77.0	0.0	20.0	0.0	20.0	2.7	25.3	29.0	27.9
								89.5	64.3

PATH SHEET

COORDINATES

SOURCE 2: reserved — East 0.0 — Record Distance
-- — North 0.0 — 1.0
TYPE: point — Elevation 1.0 — Projection Dist.
87.1

Freq.	Source	Vegetation	Shadowing	Ground Atten	Net Barrier Atten	Atmospheric	Distance Atten	Contribution	Awt Contrib.
31.5 Hz	0.0	0.0	7.3	0.0	7.3	0.0	38.8	-46.1	-85.5
63 Hz	0.0	0.0	8.8	0.0	8.8	0.0	38.8	-47.6	-73.8
125 Hz	0.0	0.0	10.9	0.0	10.9	0.0	38.8	-49.7	-65.8
250 Hz	0.0	0.0	13.3	0.0	13.3	0.0	38.8	-52.1	-60.7
500 Hz	0.0	0.0	16.0	0.0	16.0	0.1	38.8	-54.9	-58.1
1000 Hz	0.0	0.0	18.9	0.0	18.9	0.1	38.8	-57.8	-57.8
2000 Hz	0.0	0.0	20.0	0.0	20.0	0.3	38.8	-59.1	-57.9
4000 Hz	0.0	0.0	20.0	0.0	20.0	0.7	38.8	-59.5	-58.5
8000 Hz	0.0	0.0	20.0	0.0	20.0	2.6	38.8	-61.4	-62.5
								-41.8	-51.0

Akerman

Oro & Elixir CUP Sound Study

Miami Beach, FL

Sound Source Contribution Plot

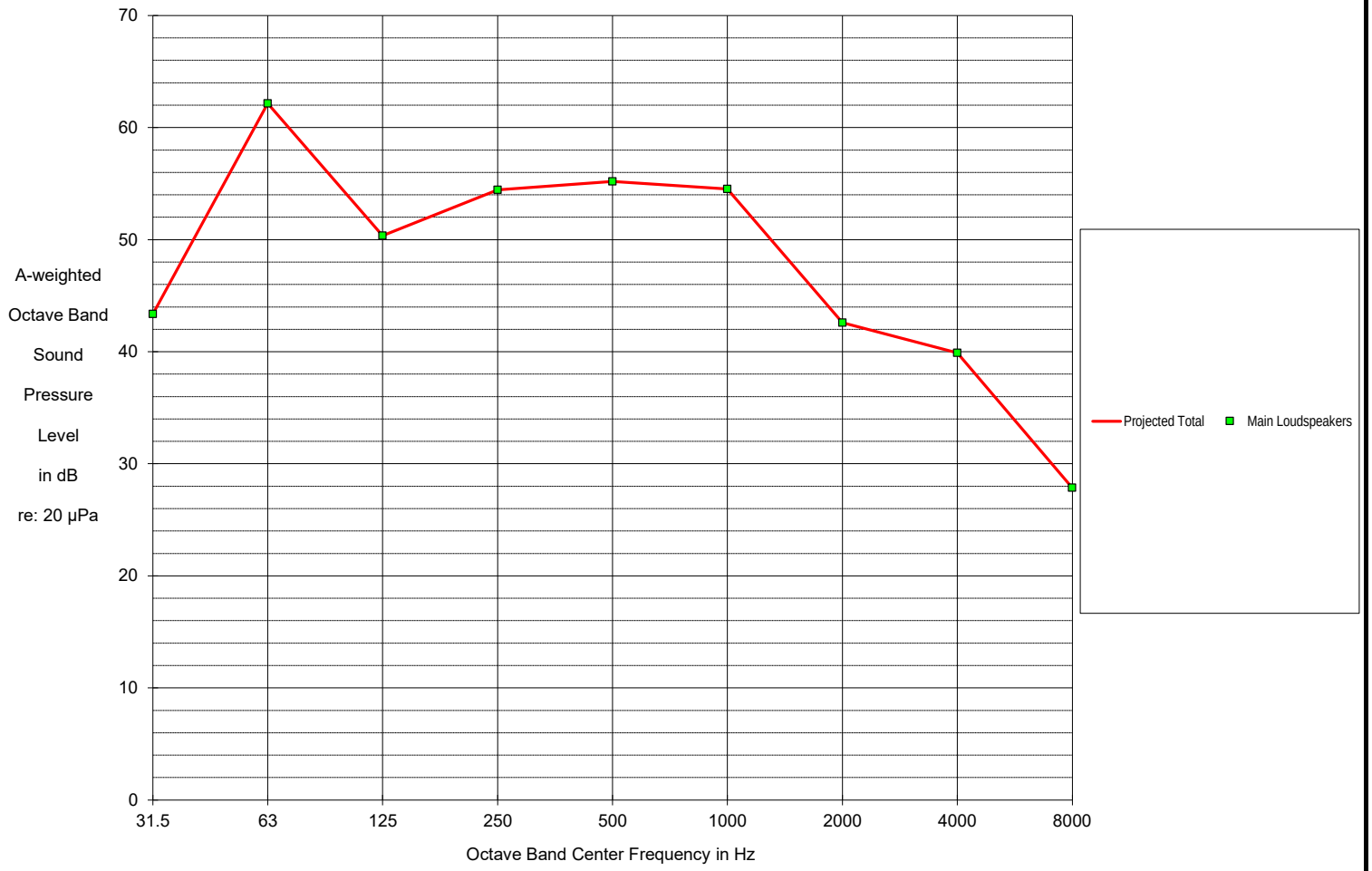
Pos 1 - Sidewalk to North

Based on BAC sound data and proposed site plan

Sidewalk to North (baseline elev. 5)

Dance Floor on venue 3rd floor

RMS: 64 dBA



BAC Sound Projection Design Calculation 1.

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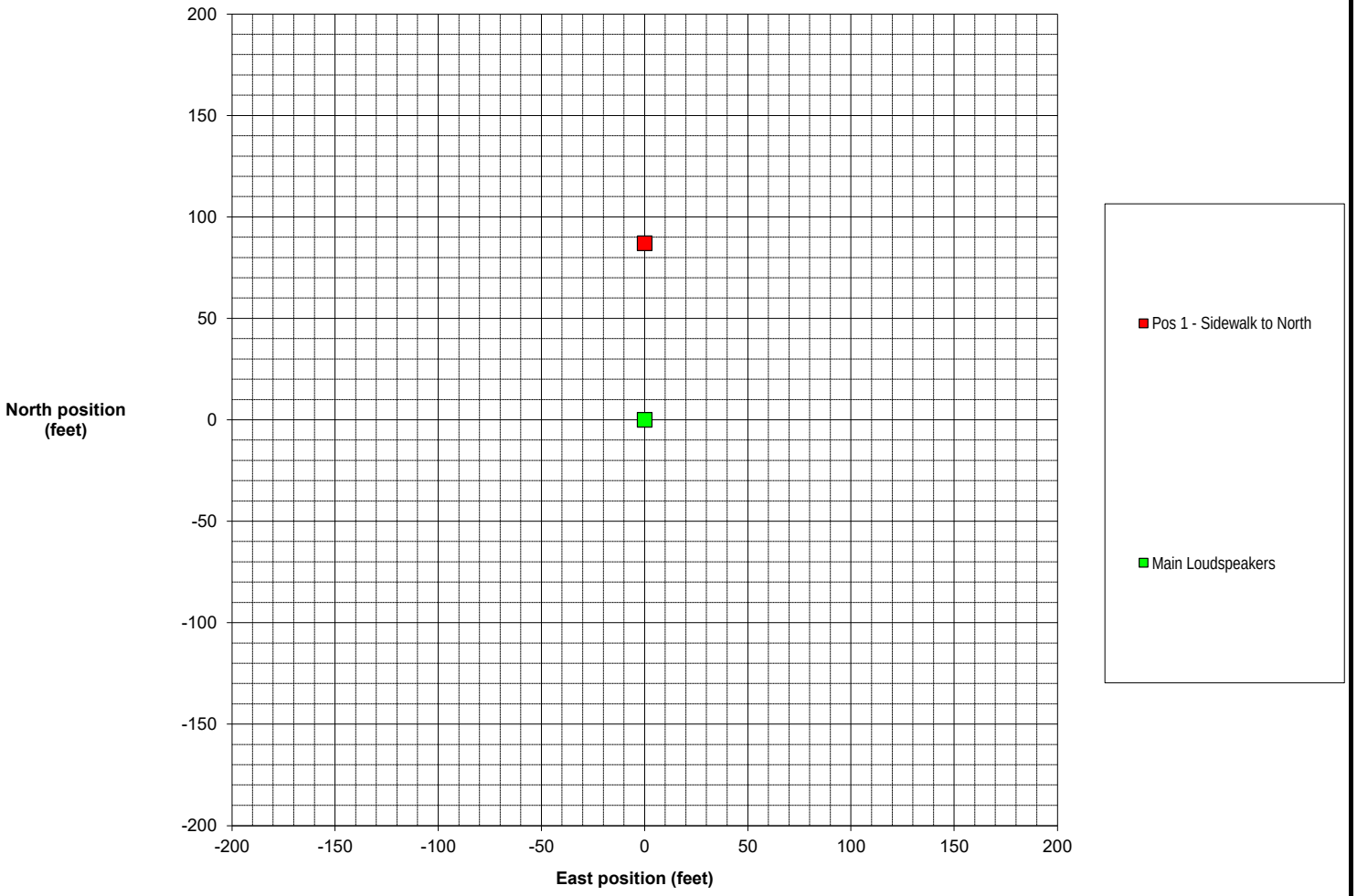
Oro & Elixir CUP Sound Study

Miami Beach, FL

Sound Source - Receiver Location Plot

Pos 1 - Sidewalk to North

RMS: 64.3 dBA



BAC Sound Projection Graph Design Calculation 1.

Akerman

Based on BAC sound data and proposed site plan

Oro & Elixir CUP Sound Study

Apts to South (baseline elev. 5)

Sound Projection: Miami Beach, FL

Dance Floor on venue 3rd floor

PROJECTED FROM: Dance Floor
PROJECTED TO: Pos 2 - Apartments to S

Coordinates: East	North	Elevation
-5.0	-153.0	5.0

RELATIVE HUMIDITY: 50%
TEMPERATURE: 72 deg. F
ATMOS. PRESS: 760 mm Hg

Criteria Level 70 dBA
Total Sound Level **57 dBA**

Compliance?
YES

FREQ.	AWT SPL
31.5 Hz	37.1
63 Hz	55.3
125 Hz	43.0
250 Hz	46.8
500 Hz	47.3
1000 Hz	47.9
2000 Hz	37.8
4000 Hz	34.8
8000 Hz	21.4
RMS:	57.3

#	SOURCE	CONTRIBUTIONS AWT SPL
1	Night Club Main Loudspeakers	57.3 dBA
2	reserved --	-56.2 dBA
3	reserved --	-37.7 dBA
4	reserved --	-37.7 dBA
5	reserved --	-37.7 dBA
6	reserved --	-37.7 dBA
7	reserved --	-37.7 dBA
8	reserved --	-37.7 dBA

Atmospheric attenuation:	yes
Excess gound attenuation:	no
Source region hard, soft, mixed (h,s,m%):	h
Receiver region hard, soft, mixed (h,s,m%):	h
Middle region hard, soft, mixed (h,s,m%):	h
Barrier shadowing:	yes
Vegetation	no

PATH SHEET

SOURCE 1: Night Club
Main Loudspeakers
TYPE: point

COORDINATES
East 0.0
North 0.0
Elevation 36.0

Record Distance
5.0
Projection Dist.
156.2

Freq.	Source	Vegetation	Shadowing	Ground Atten	Net Barrier Atten	Atmospheric	Distance Atten	Contribution	Awt Contrib.
31.5 Hz	115.0	0.0	8.6	0.0	8.6	0.0	29.9	76.5	37.1
63 Hz	122.0	0.0	10.6	0.0	10.6	0.0	29.9	81.5	55.3
125 Hz	102.0	0.0	13.0	0.0	13.0	0.0	29.9	59.1	43.0
250 Hz	101.0	0.0	15.6	0.0	15.6	0.1	29.9	55.4	46.8
500 Hz	99.0	0.0	18.5	0.0	18.5	0.1	29.9	50.5	47.3
1000 Hz	98.0	0.0	20.0	0.0	20.0	0.2	29.9	47.9	47.9
2000 Hz	87.0	0.0	20.0	0.0	20.0	0.5	29.9	36.6	37.8
4000 Hz	85.0	0.0	20.0	0.0	20.0	1.3	29.9	33.8	34.8
8000 Hz	77.0	0.0	20.0	0.0	20.0	4.6	29.9	22.5	21.4
								82.7	57.3

PATH SHEET

SOURCE 2: reserved
--
TYPE: point

COORDINATES
East 0.0
North 0.0
Elevation 1.0

Record Distance
1.0
Projection Dist.
153.1

Freq.	Source	Vegetation	Shadowing	Ground Atten	Net Barrier Atten	Atmospheric	Distance Atten	Contribution	Awt Contrib.
31.5 Hz	0.0	0.0	7.3	0.0	7.3	0.0	43.7	-51.0	-90.4
63 Hz	0.0	0.0	8.8	0.0	8.8	0.0	43.7	-52.5	-78.7
125 Hz	0.0	0.0	10.9	0.0	10.9	0.0	43.7	-54.6	-70.7
250 Hz	0.0	0.0	13.3	0.0	13.3	0.1	43.7	-57.1	-65.7
500 Hz	0.0	0.0	16.0	0.0	16.0	0.1	43.7	-59.8	-63.0
1000 Hz	0.0	0.0	18.9	0.0	18.9	0.2	43.7	-62.8	-62.8
2000 Hz	0.0	0.0	20.0	0.0	20.0	0.5	43.7	-64.2	-63.0
4000 Hz	0.0	0.0	20.0	0.0	20.0	1.3	43.7	-65.0	-64.0
8000 Hz	0.0	0.0	20.0	0.0	20.0	4.5	43.7	-68.2	-69.3
								-46.7	-56.2

Akerman

Oro & Elixir CUP Sound Study

Miami Beach, FL

Sound Source Contribution Plot

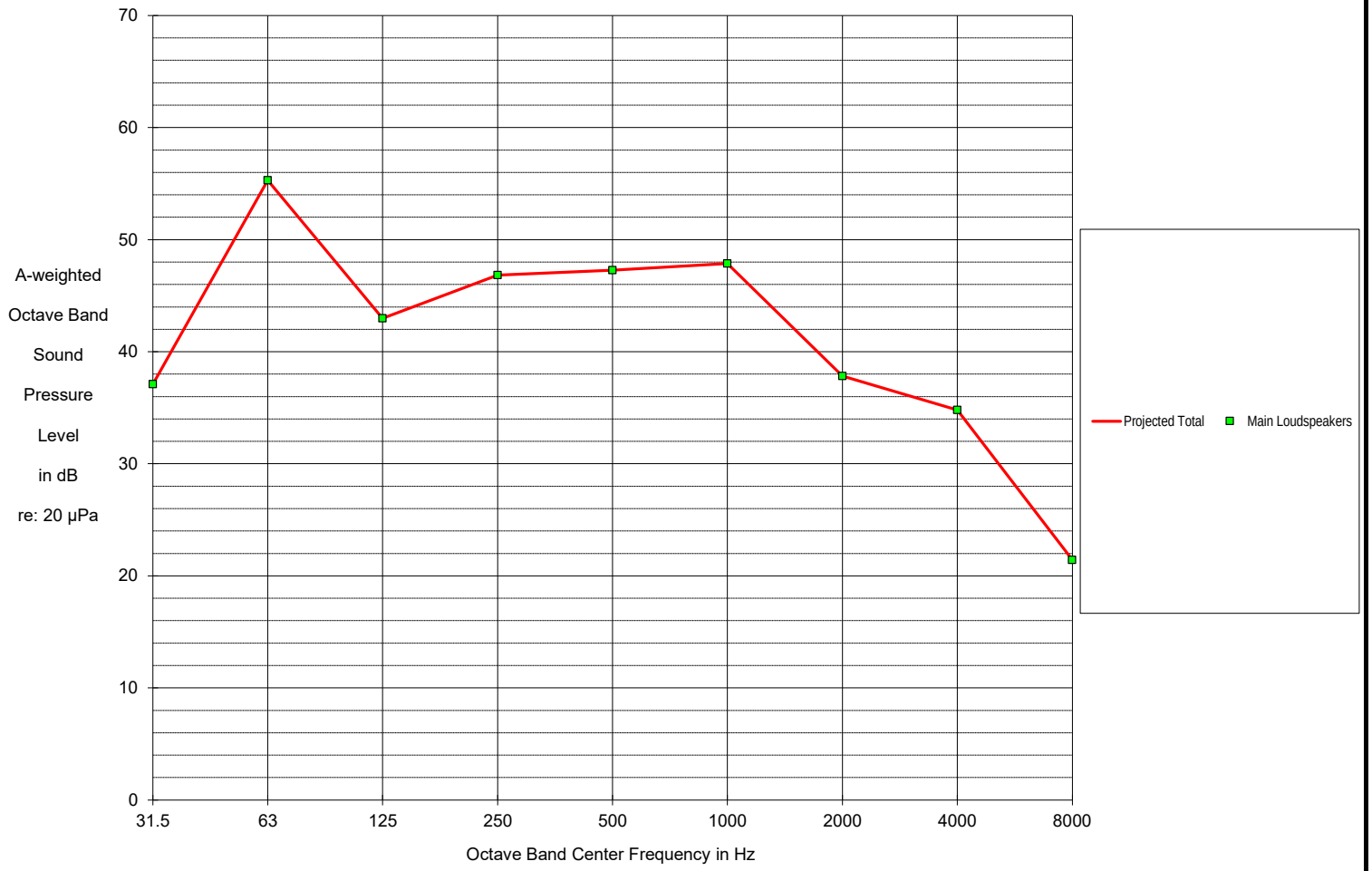
Pos 2 - Apartments to S

Based on BAC sound data and proposed site plan

Apts to South (baseline elev. 5)

Dance Floor on venue 3rd floor

RMS: 57 dBA



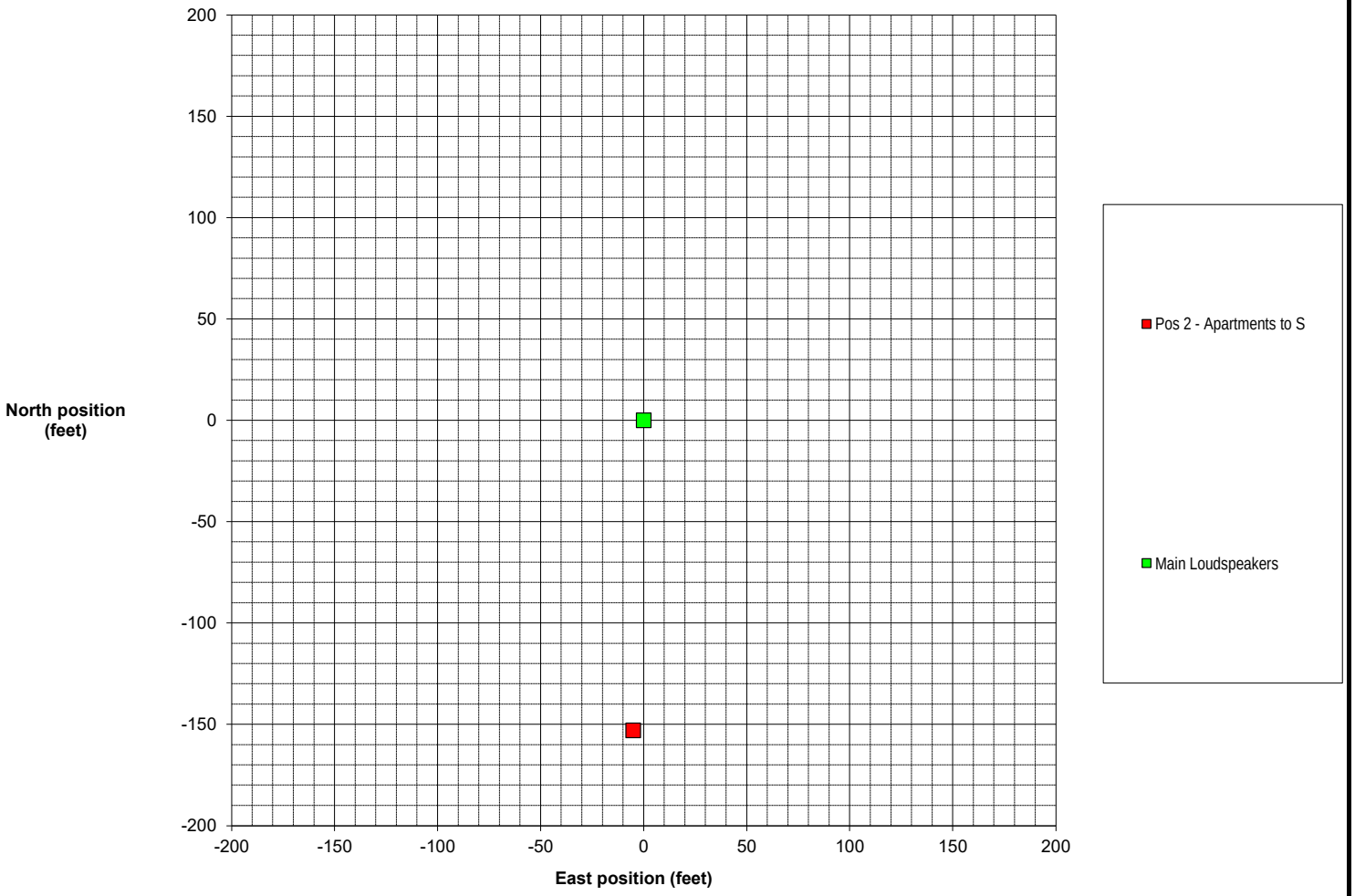
BAC Sound Projection Design Calculation 2.

Akerman
Oro & Elixir CUP Sound Study
Miami Beach, FL

Sound Source - Receiver Location Plot

Pos 2 - Apartments to S

RMS: 57.3 dBA



BAC Sound Projection Graph Design Calculation 2.