EDWARD DUGGER + ASSOCIATES, P.A.
Consultants in Architectural Acoustics

Acoustic Study – ED+A 18986

March 19, 2018

Applicant:

Coco Bambu

955 Alton Road
Miami Beach, Florida 33139

Prepared for:
Thomas R. Mooney – Director
City of Miami Beach Planning Department
1700 Convention Center Drive, Second Floor
Miami Beach, Florida 33139

Prepared by:
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Date: 19 March 2018

To: Thomas R. Mooney, Director
City of Miami Beach Planning Department
1700 Convention Center Drive, 2nd Floor
Miami Beach, Florida 33139

From: Sam Shroyer, ASA
Edward Dugger, FAIA ASA NCAC INCE

Re: **Acoustic Study – City of Miami Beach**
Coco Bambu
955 Alton Road
Miami Beach, Florida 33139
ED+A 18986

Mr. Mooney,

The following report has been prepared by Edward Dugger + Associates, P.A. (ED+A) to provide an analysis of noise and potential acoustical impact at 955 Alton Road in conjunction with Coco Bambu's request for an Entertainment License. This study consisted of site visits to the existing restaurant, long-term acoustical measurements, and review of the project's design and operational plan.

Overall, it has been concluded that indoor entertainment at Coco Bambu would not negatively impact its surrounding uses, particularly the nearby residential buildings.

ED+A welcome further discussion with the City of Miami Beach Planning Department and their peer-review acoustical consultant pertaining to this report and application.

Project Information

Introduction

Coco Bambu (the Applicant) is seeking a Conditional Use Permit for an Entertainment License at 955 Alton Road. The property will operate primarily as a restaurant with entertainment such as live music or DJ's. Most of the Applicant's operations occur within the building structure, though there is a dining area on the west side of the building outside of the main entrance.

Project Location

The restaurant is located on the southeast corner of Alton Road and 10th Street. The building is two-stories in height with dining, bar-counters, and back-of-house operations taking place on both floors. The property is zoned as Commercial and the Applicant has been permitted to use the property as a restaurant. There is a vacant Commercial lot to the restaurant's south which is currently used for parking, several Commercial Retail Outlets across Alton Road to its west, northwest, and north. There are Multi-Family residential buildings to the restaurant's northeast and southeast, with two additional Multi-Family residential buildings directly to its east behind the restaurant.

Operations

Coco Bambu is proposing to have Indoor Entertainment beginning anywhere from 10:00 a.m., finishing no later than the current allowance. Both levels are used for dining and each level has its own dedicated bar counter. The Dining Areas account for approximately 60% of the floor area on each level, while the Service Areas occupy the eastern portion of the building on both levels. A portion of the Dining Area on the second level also features an operable wall which is used to separate the spaces for private parties or events.

The restaurant currently has a distributed audio system consisting mostly of ceiling speakers, though there are also surface-mounted speakers at the bar counters on both floors. There are also surface-mounted speakers on the front patio outside of the main entrance on the west side of the building. These speakers are currently utilized to maintain ambience by producing background-level music.

The Applicant plans to continue to use this audio system to provide music at background sound levels, but will supplement this system with additional loudspeakers to provide entertainment music. As the audio system consists of several "zones" which can be controlled independently of one another, sound output may not be constant throughout the entire restaurant and all loudspeakers may not necessarily be utilized for background music and/or entertainment music at any given time. For example, a

majority of the loudspeakers on the second level may be providing music for entertainment, but the loudspeakers in the separate area on the south side of the building may produce music at background levels if there is a private event in that area; or, while entertainment could be provided on the second level, background music could be played on the lower level to provide ambience for dining customers.

Acoustical Measurements and Results

Methodology

Long-term acoustical measurements were performed on a parapet outside of the restaurant, directly between its first and second level. The measurement location was at a similar height as the second level of the residential buildings to the east, which were separated from the equipment only by the eastern alley. This location was chosen as these properties would certainly be considered to be the nearest noise-sensitive receiver in relation to the restaurant.

The system was deployed on Tuesday, January 23, 2018 but almost immediately lost its internet connection. The equipment experienced an unusual amount of connectivity issues which resulted in the loss of data over several different windows of time. However, ED+A believe that enough data have been collected to offer an accurate representation of the typical ambient sound environment of the area. The system logged equivalent-continuous sound pressure levels (Leq) every one-half second, from which it calculated and exported five-second Leq, one-minute Leq, and one-hour Leq. Percentile-exceeded sound pressure levels (L10, L50, L90) were also logged in these increments. The one-minute data have been graphed and are included in the Appendix and can be provided in numerical form, if requested. Data for full one-hour periods are also included in numerical form.

Daily L_{eq} (L_{avg}) were calculated from the data to represent the measurement period for each day, though the first day did not include a full twenty-four-hour measurement. Day-night average sound pressure levels (DNL or L_{dn}) were also calculated for each day. L_{dn} is also a time-average value, but a 10 dB penalty is applied to sound pressure levels measured during nighttime periods – 10:00 pm to 7:00 am – to account for the general public's increased sensitivity to sound during these hours. Daily percentile-exceeded sound pressure levels have also been calculated by ED+A and are also included.

In addition to these acoustical measurements, ED+A have discussed the project and its operations with the Applicant extensively, have visited its proposed location and its surroundings, and have reviewed architectural drawings to provide this report.

Measurement Results

Sound pressure levels measured on the east side of the property were mostly consistent throughout the varying time periods through which the monitoring system was operational. These sound levels were mostly just below 60 dBA, though levels seemed to fluctuate between 60 dBA and 65 dBA during afternoon and evening hours. ED+A believe these levels to mostly result from traffic on Alton Road and 10th Street nearby. These levels appeared to mostly decrease to below 60 dBA in the hours leading up to midnight before increasing again with higher levels of activity the following morning.

Discussion and Analysis

Audio System

Coco Bambu intend to upgrade their audio system to produce sound levels throughout the restaurant which are consistent with indoor entertainment. There are currently no audio system specifications that could be reviewed, but ED+A will review them in the future as they are made available. Drawings illustrating the existing audio system have been included. To ensure that entertainment levels do not propagate to other properties, ED+A recommend that speakers used for entertainment purposes are only located within the areas labeled as Dining Area on the architectural plans. Sound which could escape through the main entrance during egress and ingress will also be minimized if speakers are not located in the Waiting Area.

Architectural Features

While there are residential uses directly to the east of the restaurant, the restaurant's layout and construction would make it difficult for entertainment sound to reach these properties. On both floors, the eastern half of the restaurant consists of several spaces and corridors for back-of-house operations, including kitchens, offices, and coolers. Essentially, there are a minimum of three sound-insulating barriers between the Dining Areas which would feature entertainment and the alley to the east of the restaurant:

1. Separation walls between Dining Areas and back-of-house spaces
    a. One- and two-hour fire-rated partitions
2. Multiple separation walls between back-of-house spaces and corridors
    a. Various gypsum wall board assemblies
3. Eastern exterior wall (also used on portions of north and south exterior walls)
    a. 8-in. concrete masonry unit with varying interior partitions (gypsum wall board, etc.)

While the specific manufacturer or construction is unclear, ED+A believe that the windows are comprised of 3/8" laminated glazing. Data published by Viracon reveal that this glazing provides a sound transmission class (STC) of 36 and an outdoor-indoor sound transmission class (OITC) of 32 to 33. Table 2 demonstrates sets of sound transmission loss data for two similar constructions.

The restaurant's north and south façades consist of windows assemblies and concrete masonry unit. All of these windows are sealed, non-operable, and impact safety rated. All windows have received Miami-Dade's County's Notice of Acceptance (NOA), and should effectively contain sound within the building. While it is unclear as to what specific glazing was used in these assemblies, at the very least they all contain laminated glass. Depending on the specific glazing assembly, these windows could have a sound transmission class (STC) ranging from the mid-30's up to the high-40's, with outdoor-indoor sound transmission class (OITC) ranging from the low-30's to the mid-40's.

Wall assembly details and a window schedule have been included with this report, along with floor plans demonstrating the location of the varying wall and window types. NOA's for the various windows have also been included.

Potential for Impact

After walking through the various sections in the restaurant, it became clear to ED+A that the Service Areas serve as a "buffer" on the east side of the restaurant which should effectively prevent any significant level of sound from escaping the building through its eastern façade. On the first floor, the distance from the Dining Area to the eastern façade ranges from 24-ft. to 48-ft. and on the second floor these distances range from 27-ft. to 59-ft. These measurements represent the distance from the Dining Area side of the demising walls which separate the Dining Area and the Service Areas and the Service Area side of the exterior eastern walls.

More concerning is what impact entertainment could have at 1000 Lennox Avenue to the northeast of the restaurant, as there is a direct line-of-sight between the windows on the restaurant's north façade and the residential building. So long as sound levels are controlled so to not impact this address, the properties to the east should not be affected due to the service areas in the eastern portion of the restaurant.

The distance between Coco Bambu's easternmost window on its north façade and 1000 Lennox Avenue is approximately 100-ft. The north façade of the building is 28-ft. from the center of the Dining Areas. The average LA90 measured near the restaurant was 54 dBA. ED+A believe that this value would also be representative of levels experienced at 1000 Lennox Avenue just across 10th Street. 100-ft. nearer to the

theoretical source of sound (the center of Coco Bambu's Dining Area), this sound level would increase by 2 dBA. Adding the window transmission loss to this sound level yields the sound level that would be measured just inside of the restaurant on the opposite side of the façade – 92 dBA. Therefore, it is recommended that sound levels resulting from entertainment within the venue be limited to 92 dBA when measured inside near the north windows. If both the upstairs and downstairs Dining Areas are providing entertainment at equal sound levels at one time, this limit would need to be reduced to 89 dBA on each floor.

Conclusion

ED+A have concluded that the construction features and layout of the Coco Bambu restaurant and its relative location to nearby residential buildings make it an appropriate venue for indoor entertainment. As sound could potentially propagate out of the windows on the restaurant's north façade to 1000 Lennox Avenue, a sound level limit has been established which will allow for indoor entertainment but will not negatively impact the residential properties.

Tables and FIgures

Table 1. ED+A Measurement Equipment			
Manufacturer	**Model**	**Serial No.**	**Laboratory Calibration Date**
Brüel and Kjær	Type 2250-Light Hand-Held Analyzer	3008039	3/1/2017
Brüel and Kjær	Type 4952A Outdoor Microphone	2788753	12/22/2017
Brüel and Kjær	Type 4231 Sound Calibrator	2394124	8/2/2017

Table 2. Window Transmission Loss		
Laminated Glass Construction	**Window TL 1** **3/8" overall – 3/16" glass, 0.15" PVB, 3/16" glass**	**Window TL 2** **3/8" overall – 3/16" glass, 0.30 PVB, 3/16" glass**
STC	36	36
OITC	32	33
100 Hz	27	27
125 Hz	25	27
160 Hz	26	27
200 Hz	30	30
250 Hz	31	31
315 Hz	31	31
400 Hz	33	33
500 Hz	35	34
630 Hz	35	35
800 Hz	35	36
1000 Hz	35	36
1250 Hz	33	35
1600 Hz	33	34
2000 Hz	37	37
2500 Hz	41	41
3150 Hz	44	45
4000 Hz	48	49
5000 Hz	51	52

Table 3. Modeled Interior Sound Levels (TL 1)				
	Avg LA90	Avg LA90 at North Façade	Window TL 1	Interior Sound Level
Sum	54.3	56.4		91.9
20 Hz	4.7	6.8		6.8
25 Hz	15.1	17.2		17.2
31.5 Hz	19.8	22		22
40 Hz	23.1	25.3		25.3
50 Hz	27	29.1		29.1
63 Hz	31.5	33.6		33.6
80 Hz	34.2	36.3		36.3
100 Hz	37.3	39.4	27	66.4
125 Hz	39.4	41.5	25	66.5
160 Hz	39.7	41.8	26	67.8
200 Hz	41.7	43.8	30	73.8
250 Hz	42.4	44.5	31	75.5
315 Hz	43	45.2	31	76.2
400 Hz	43.2	45.4	33	78.4
500 Hz	43.4	45.6	35	80.6
630 Hz	44.3	46.5	35	81.5
800 Hz	44.6	46.8	35	81.8
1000 Hz	44.3	46.4	35	81.4
1250 Hz	43.5	45.7	33	78.7
1600 Hz	42.2	44.3	33	77.3
2000 Hz	40.3	42.4	37	79.4
2500 Hz	38	40.1	41	81.1
3150 Hz	35.3	37.5	44	81.5
4000 Hz	32.4	34.5	48	82.5
5000 Hz	28.8	30.9	51	81.9
6300 Hz	25.1	27.3		27.3
8000 Hz	21.1	23.3		23.3
10000 Hz	17.2	19.3		19.3
12500 Hz	12.9	15		15
16000 Hz	11.3	13.4		13.4
20000 Hz	8.7	10.8		10.8

Table 4. Modeled Interior Sound Levels (TL 2)				
	Avg LA90	Avg LA90 at North Façade	Window TL 2	Interior Sound Level
Sum	54.3	56.4		92.5
20 Hz	4.7	6.8		6.8
25 Hz	15.1	17.2		17.2
31.5 Hz	19.8	22		22
40 Hz	23.1	25.3		25.3
50 Hz	27	29.1		29.1
63 Hz	31.5	33.6		33.6
80 Hz	34.2	36.3		36.3
100 Hz	37.3	39.4	27	66.4
125 Hz	39.4	41.5	25	68.5
160 Hz	39.7	41.8	26	68.8
200 Hz	41.7	43.8	30	73.8
250 Hz	42.4	44.5	31	75.5
315 Hz	43	45.2	31	76.2
400 Hz	43.2	45.4	33	78.4
500 Hz	43.4	45.6	35	79.6
630 Hz	44.3	46.5	35	81.5
800 Hz	44.6	46.8	35	82.8
1000 Hz	44.3	46.4	35	82.4
1250 Hz	43.5	45.7	33	80.7
1600 Hz	42.2	44.3	33	78.3
2000 Hz	40.3	42.4	37	79.4
2500 Hz	38	40.1	41	81.1
3150 Hz	35.3	37.5	44	82.5
4000 Hz	32.4	34.5	48	83.5
5000 Hz	28.8	30.9	51	82.9
6300 Hz	25.1	27.3		27.3
8000 Hz	21.1	23.3		23.3
10000 Hz	17.2	19.3		19.3
12500 Hz	12.9	15		15
16000 Hz	11.3	13.4		13.4
20000 Hz	8.7	10.8		10.8

Table 5. Measured L_{Aeq}				
Day	Tuesday	Wednesday	Thursday	Friday
Date	23-Jan	24-Jan	25-Jan	26-Jan
$L_{0000-0100}$				57.2
$L_{0100-0200}$				55.6
$L_{0200-0300}$				54.6
$L_{0300-0400}$				54.2
$L_{0400-0500}$				54.4
$L_{0500-0600}$	61.9			55.0
$L_{0600-0700}$				56.1
$L_{0700-0800}$				59.1
$L_{0800-0900}$				58.2
$L_{0900-1000}$				62.5
$L_{1000-1100}$				61.4
$L_{1100-1200}$				93.7
$L_{1200-1300}$				
$L_{1300-1400}$		59.0		
$L_{1400-1500}$		63.2		
$L_{1500-1600}$		59.9		
$L_{1600-1700}$		68.2	61.7	
$L_{1700-1800}$		59.6	60.5	
$L_{1800-1900}$		59.4	60.3	
$L_{1900-2000}$		57.4	60.1	
$L_{2000-2100}$		58.6	61.0	
$L_{2100-2200}$		56.6	58.8	
$L_{2200-2300}$		56.6	76.0	
$L_{2300-2400}$		56.6	59.1	

Table 6. Measured L_{A90}				
Day	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Date	**23-Jan**	**24-Jan**	**25-Jan**	**26-Jan**
$L_{0000-0100}$				55.1
$L_{0100-0200}$				52.6
$L_{0200-0300}$				52.2
$L_{0300-0400}$				52.0
$L_{0400-0500}$				51.8
$L_{0500-0600}$				52.1
$L_{0600-0700}$	55.1			53.0
$L_{0700-0800}$				55.8
$L_{0800-0900}$				55.5
$L_{0900-1000}$				57.8
$L_{1000-1100}$				57.0
$L_{1100-1200}$				
$L_{1200-1300}$				
$L_{1300-1400}$		55.0		
$L_{1400-1500}$		56.0		
$L_{1500-1600}$		55.3		
$L_{1600-1700}$		54.9	55.9	
$L_{1700-1800}$		54.6	55.8	
$L_{1800-1900}$		54.8	55.7	
$L_{1900-2000}$		54.2	55.2	
$L_{2000-2100}$		53.9	55.4	
$L_{2100-2200}$		53.3	54.9	
$L_{2200-2300}$		53.0	56.2	
$L_{2300-2400}$		51.0	55.9	

Figure 1
Measurement Period 1

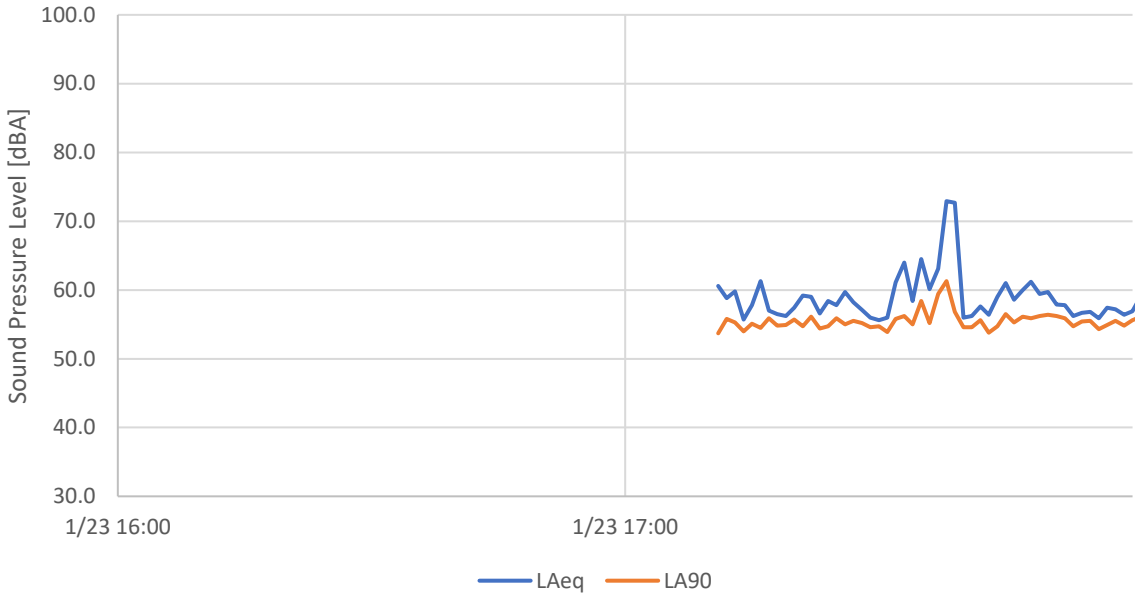

Figure 2
Measurement Period 2

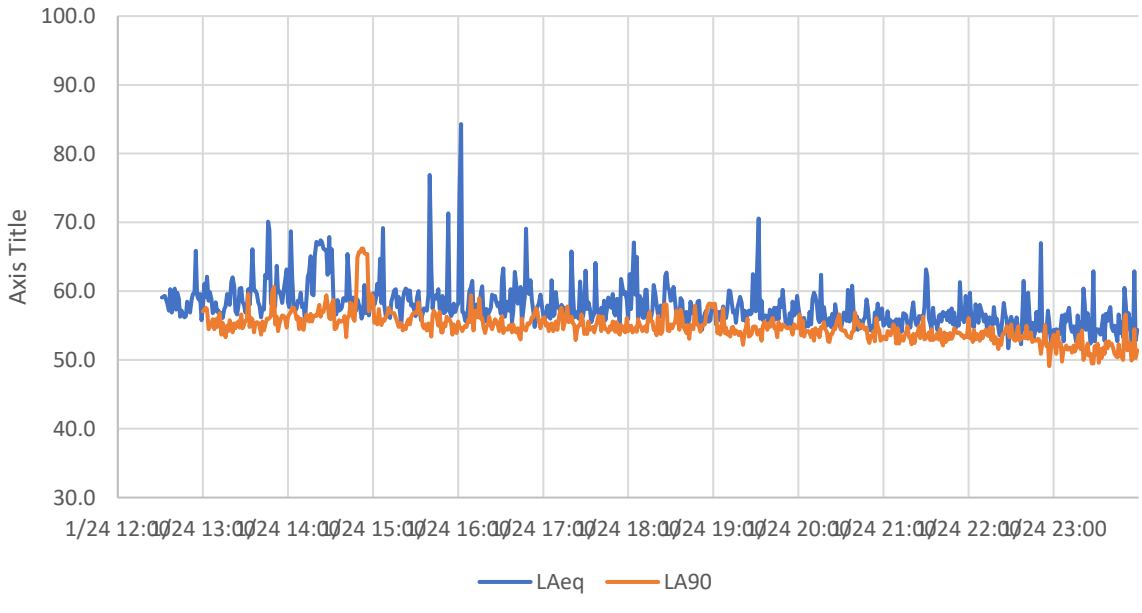

Figure 3
Measurement Period 3

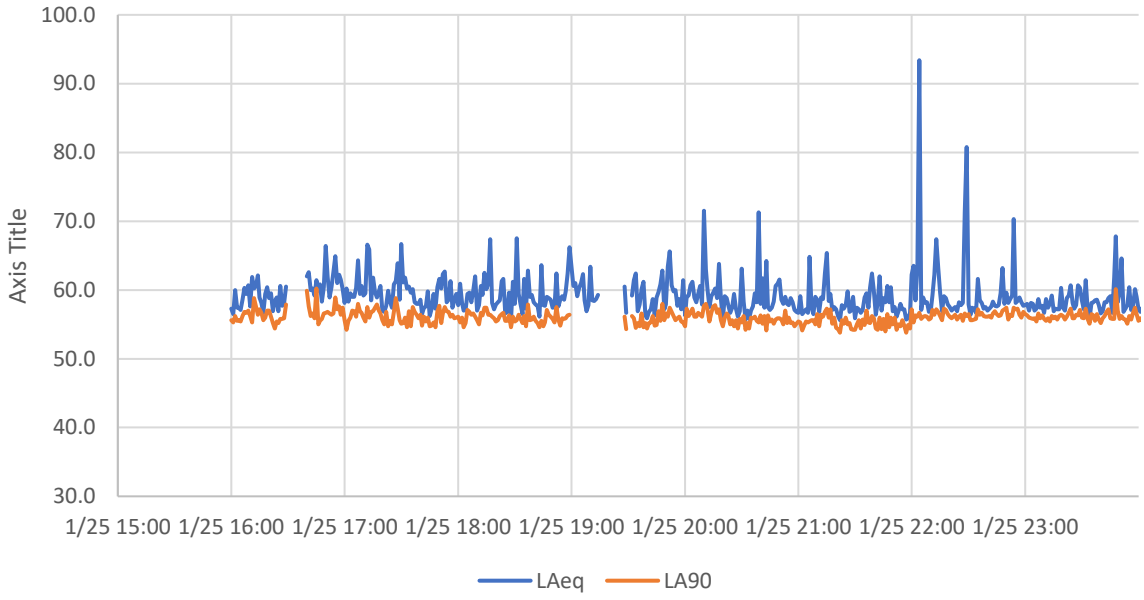

Figure 4
Measurement Period 4