

# THE NOISE CONSULTANCY, LLC

309 VAN NESTE ROAD  
FLEMINGTON, NEW JERSEY 08822



(908) 237-0298

NOISECONSULTANCY@AOL.COM

WWW.NOISECONSULTANCY.COM

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SENT VIA EMAIL

March 12, 2019

John Gunn, Chair  
City of Beacon Planning Board

Re: 554 Main Street Amended Site Plan

In the preparation of this review I have reviewed the following documents:

- Site Plan for 554 Main Street prepared by Burns Engineering Services
- Sound Control Plan, Melzingah Tap House, prepared by Audio Video Forensics Lab
- Bose L1 Compact System Product Literature
- 244 Bass Trap Product Literature
- Police reports filed with the Beacon Police Department
- Beacon Chapter 149 Noise
- Beacon Section 223-29 (Zoning, Performance Standards)

On March 11, 2019 I conducted two site visits, one at noon and another at approximately 5 PM. During those site visits, I conducted observations and sound level measurements of the ambient sound levels at the following locations: Melzingah's fence line, next to the smoker; Verplanck Avenue sidewalk at the same elevation as the rear of the Davis Street homes, facing Melzingah's; and, the sidewalk in front of 10 Ackerman Street.

## Regulatory Framework

Currently, there are two applicable standards that apply to this application, although they are actively undergoing the amendment process.

In the Noise Code (Chapter 149 of the City Code), the applicable limit for a source such as this is 70 dBA at the property line during the day and 55 dBA indoors. It is my opinion that these limits are unreasonably high, however they are the current standard.

The Zoning Performance Standards (Section 223-29 of the City Code) are much more strict, but they specify measurement with equipment and methods that are outdated. Nonetheless, if the limits in 223-29 are converted<sup>1</sup> into dBA (for the sake of comparison), the limits would be approximately 40-45 dBA, and a penalty of 6 dBA applies if the source property is within 200 feet of a residential district, thus the equivalent levels would be approximately 35-40 dBA as a limit. In my opinion, this limit is unreasonable

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<sup>1</sup> I have attached a conversion table from Octave Bands to A-weighted sound levels. In Section 223-29, for example, the limit for 150-299 Hz is 55, the conversion factor is approximately -10 dB, for an equivalent of approximately 45 dBA)

low, however, it is the current standard. It may be considered as a point of guidance but is unenforceable from a practical standpoint due to the outdated equipment issue.

### **Ambient Sound Levels**

The residences on Davis and Ackerman Streets are in relatively quiet residential neighborhoods (this data set is 4:45 -5:15 PM, Monday March 11, 2019):

- Verplanck, at the elevation of Davis houses – 51-53 dBA<sup>2</sup> (traffic on Main, Fishkill Creek waterfall)
- Melzingah's fenceline at smoker (adjacent to Davis Street residence property line) 50-51 dBA no traffic on Main, 53-55 dBA with traffic
- Ackerman (sidewalk in front of #10) 44-48 dBA no traffic on Main , 48-53 dBA with traffic on Main

There were children playing on Davis Street, and a school-aged child was visible through the window in one of the houses that backs up to 554 Main. Written comments received by one of the residents noted health concerns, presumably requiring the opportunity to recuperate.

### **Site Use**

The Site Control Plan states that the planned activities at 554 Main Street during the week is for “those who wish to enjoy a quiet outdoor setting”, and on the weekends “soft entertainment is provided consisting of a singer with acoustic guitar and/or keyboard accompaniment. Pre-recorded background music comes on during musician breaks.”

If this is the plan going forward, it appears to be a departure from the activities described in the Police Reports, and written comments received from the public.

### **Sound Control Plan**

The Sound Control Plan essentially states that the applicant will control the volume of the sound through adjusting the volume in response to testing they conduct. Of course, the volume control on a sound system can be reduced to any level desired or required. Ultimately, regardless of any testing that may be conducted by the applicant or their expert, the facility will have to comply with the noise limitations set forth in the Beacon City Code, as may be amended from time to time. The approval of an amended site plan, should that be the decision of the Board, does not absolve the facility of any requirement going forward to comply with the noise limitations in the City Code, current or amended.

The Sound Control Plan implies that setting the sound levels on the system initially will be sufficient to limit the levels going forward. In my experience that is often not the case. First of all, some musicians will request that they use their own sound amplification equipment, which must be prohibited. The

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<sup>2</sup> Intermittent traffic on Verplanck Rd. is not reported here, because the sound level measurements were conducted on the Verplanck sidewalk much closer to the cars than the residences on Davis, thus the data would be unrepresentative. The steady ambient sound levels are reported.

speakers are not the only component with a volume control. Mixing boards (if one is used in this set up) and many instruments can have independent volume controls separate from the speakers themselves. Further, it is my experience that if the volume control on a sound system is not physically locked or password protected it is often bypassed. If the amended site plan were approved, the facility would be very well served to actively self-police their property line nightly with a sound level meter (many facilities do), to prevent the ramifications of having the Beacon Police Department do it for them.

The Sound Control Plan proposes to create a musician's nook in the eastern corner of the pavilion flanked by sound absorbing panels. The premise is that the panels will "soak up the sound so that the musicians can hear themselves consistently no matter how much interference sound the patrons make without turning up the volume." The premise is fallacious, as these panels, which will be behind the musicians are designed to minimize reflected sound, and vast majority of the crowd sound will be coming from in front of the musicians. Were this nook not constructed, there would be no reflective surface behind the musicians.

The product they are proposing to use, GK Acoustics' 244 Bass Trap, is not it intended to block transmission of sound through the panel, it is designed to be used inside a room to reduce reverberant or reflected sound. It is not waterproof and is not intended for outdoor use. (Personal communication, March 12, 2019, with Technical Support). There are panels that can perform all of these tasks. The Sound Control Plan also contends that these panels will result in "damping sound from the musicians themselves". As the panels will be behind both the musicians and the speakers, this is highly unlikely.

## Considerations

The residences on Davis and Ackerman Streets currently enjoy a relatively quiet residential acoustic environment. They are however, immediately adjacent to a commercial zone.

Approval of the site plan may significantly alter that acoustic environment, when there is outdoor amplified music, if the facility operates to the limits of Beacon's Noise Code, current or amended.

The hours of such operation should be carefully considered, noting school-aged children (Thursday is a school night) and people seeking recuperative time.

## Options

- In the event the Planning Board is inclined to approve application, the following conditions should be considered:
  - Limit days of the week and hours for outdoor amplification. Use of amplified equipment outside of these days/hours is a prima facie violation. No measurements required.
  - Prohibit outdoor gaming (e.g., "cornhole" with attendant screams of competitive excitement)
  - Require "quiet" days or weekends where there is no outdoor amplified music so the adjacent residents can plan their own outdoor family gatherings, or simple relaxation.

Adequate notice must be provided of such dates (e.g., 6 weeks). Provide for a number of these throughout the season, possibly every other weekend.

- Some protection for the residences on Davis Street could be provided if the musician's nook were constructed in a manner that prevented transmission through the nook's walls (e.g., solid walls, at least 2 lbs/ft<sup>2</sup>, no air gaps), with the musicians and speakers all within that nook, and the northern wall extending to the roof of the pavilion and possibly 20 feet beyond the speakers (towards Ackerman), which would be installed at ground level near the walls. Absorptive treatment on the interior of those walls would improve the acoustics for the musicians and patrons. It would however, not reduce the sound levels received at the Ackerman Street residences, as the speakers will still be oriented at them.
- It would be better if the musicians moved to the eastern side of the Covered Pavilion area, positioned with their backs to the outdoor service bar and the speakers directed towards Verplanck Street. In that case a similar wall could be built from the northwest corner of the service bar to a distance of 20 feet beyond the speakers in the direction of Verplanck Street. This configuration could provide meaningful protection for residents in both Davis and Ackerman. This configuration, however, could interfere with the operation of the outdoor service area.

Sincerely,



Eric M. Zwierling, M.S., INCE, ASA  
President

**Conversion of Sound Levels from Unweighted Sound Pressure (flat or Z-scale response)  
to A- and C-scale Weighting**

**1/3 and 1/1 Octave Bands**

Frequency (Hz)	A Weighting (dB)	C Weighting (dB)
10	-70.4	-14.3
12.5	-63.4	-11.2
<b>16*</b>	<b>-56.7</b>	<b>-8.5</b>
20	-50.5	-6.2
25	-44.7	-4.4
<b>31.5</b>	<b>-39.4</b>	<b>-3.0</b>
40	-34.6	-2.0
50	-30.2	-1.3
<b>63</b>	<b>-26.2</b>	<b>-0.8</b>
80	-22.5	-0.5
100	-19.1	-0.3
<b>125</b>	<b>-16.1</b>	<b>-0.2</b>
160	-13.4	-0.1
200	-10.9	0
<b>250</b>	<b>-8.6</b>	<b>0</b>
315	-6.6	0
400	-4.8	0
<b>500</b>	<b>-3.2</b>	<b>0</b>
630	-1.9	0
800	-0.8	0
<b>1,000</b>	<b>0</b>	<b>0</b>
1,250	+ 0.6	0
1,600	+ 1.0	-0.1
<b>2,000</b>	<b>+ 1.2</b>	<b>-0.2</b>
2,500	+ 1.3	-0.3
3,150	+ 1.2	-0.5
<b>4,000</b>	<b>+ 1.0</b>	<b>-0.8</b>
5,000	+ 0.5	-1.3
6,300	-0.1	-2.0
<b>8,000</b>	<b>-1.1</b>	<b>-3.0</b>
10,000	-2.5	-4.4
12,500	-4.3	-6.3
<b>16,000</b>	<b>-6.6</b>	<b>-8.5</b>
20,000	-9.3	-11.2

\*Note: Center frequencies of 1/1 octave bands appear in bold.

After: The Science and Applications of Acoustics. Daniel R Rachel. Springer. 2000.