Acentech Incorporated
33 Moulton Street
Cambridge, MA 02138

Telephone: 617-499-8000
Facsimile: 617-499-8074
E-mail: postbox@acentech.com

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MEMO

To: Chris Kelly (for Wellesley Country Club)
From: Carl Rosenberg – Acentech
cc. Rob Bramhall – Rob Bramhall Architects
Subject: Community noise impact related to Wellesley Country Club
Acentech Project No. 618844
Date: June 13, 2006
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At your request, we have made a series of acoustical measurements and related analyses regarding potential community noise impact pertinent to the proposed new Wellesley Country Club clubhouse. We conclude that, if the new country club continues to operate in a mode similar to the existing facility, and with operational restrictions as noted below, noise in the community will not be any more noticeable than it is today, and will not be more audible than existing ambient conditions.

1. Ambient Sound Levels in the Community. I made measurements of background sound levels on Lincoln Road and Lincoln Circle on Thursday evening, May 18, 2006, between 7:30 and 8:30 pm. The area is characteristic of a quiet, residential neighborhood. There is no through traffic. The main contributors to the noise are distant traffic on Wellesley Avenue, Abbott Road, and on other more distant roadways, and flyovers from light aircraft (propeller planes). An occasional train whistle is audible. The measurements went smoothly and neighbors were forthcoming and helpful to me in these efforts.

I used a Bruel & Kjael Model 2225 Integrating Sound Level Meter (serial number 796935). This meter measures the average sound energy over a 60 second interval to quantify the "60 sec LEQ." (The LEQ is the average sound level energy over a given time period, using an A-weighted filter that filters the sound in the same manner as the human ear.) LEQ in dBA (A-weighted decibels) is one of the most appropriate and accepted measures of environmental noise.

Note: Another frequently used environmental noise metric is the L90, which is the sound level that is exceeded 90% of the measurement time period. Because the LEQ is relatively constant where I was measuring, its value will be close to the L90 value. These measurements made in May were a chance to check the overall general range of ambient sound levels.

Lincoln Circle is on a knoll that is more exposed than the adjacent neighborhood to traffic noise from areas such as Wellesley Avenue. The ambient LEQ levels on Lincoln Circle were in the range of 43 to 48 dBA. Houses on Lincoln Road, particularly the houses at #42 and #46, are behind the knoll of Lincoln Circle, and the LEQ levels were quieter, in the range of 40 to 45 dBA. I did not include sounds from any car passbys or particularly loud aircraft or even very loud (but pleasant) birds. These sound levels are typical of a quiet suburban area.

The temperature was around 65° F, humidity was about 50%, and there was no appreciable wind.

2. Attenuation with distance. As one would expect, sound diminishes over distance, and we made measurements of the sound attenuation that might be expected over the distance from the proposed new clubhouse to the neighborhood. For these measurements we generated a loud broad-band noise at an arbitrary sound level of over 90 dBA at the site of the proposed new clubhouse. We then measured the resulting sound level at locations in neighboring areas. These measurements were made on June 6 and 8, 2006. On June 6, the temperature was 72° F, humidity was 57%, the wind was easterly at about 6 mph; on June 8, the temperature was 58° F, humidity was 94%, and wind was from the northwest at about 7 mph.

Sound levels decrease over distance due to spherical radiation. From a distance of 25 feet from our source (or what would be 25 feet from activity at the new building) to three near residential property line locations (a distances of about 500 feet from the source), the drop-off or attenuation outdoors was always at least 25 dBA. To locations farther back in the community on Lincoln Circle and on Lincoln Road, the attenuation was greater. However, we were not able to measure it because the signal from our sound source was at or below the ambient – that is to say, the signal from the noise we generated had become indistinguishable from the ordinary background noise level. I believe that the attenuation will vary to a small degree based on wind and temperature conditions, but a minimum of 25 decibels of reduction is in the right order of magnitude.

Measurement locations are shown on attached Figure 1.

3. Outdoor dining. I also measured the sound level at 25 feet from outdoor dining on the existing clubhouse terrace. I did this on May 28, 2006, between 6:00 and 7:00 pm. The LEQ from normal conversation on the patio was about 50 dBA. Therefore, at the property line and at the nearest neighbors, we extrapolate that the sound level from the sound of outdoor dining will be around 25 dBA, which is well below ambient neighborhood noise and would be inaudible, even to someone standing outside in the neighborhood. Locations on Lincoln Road are further protected by the knoll of Lincoln Circle, and are a greater distance from the source, so sound levels here will be even quieter.

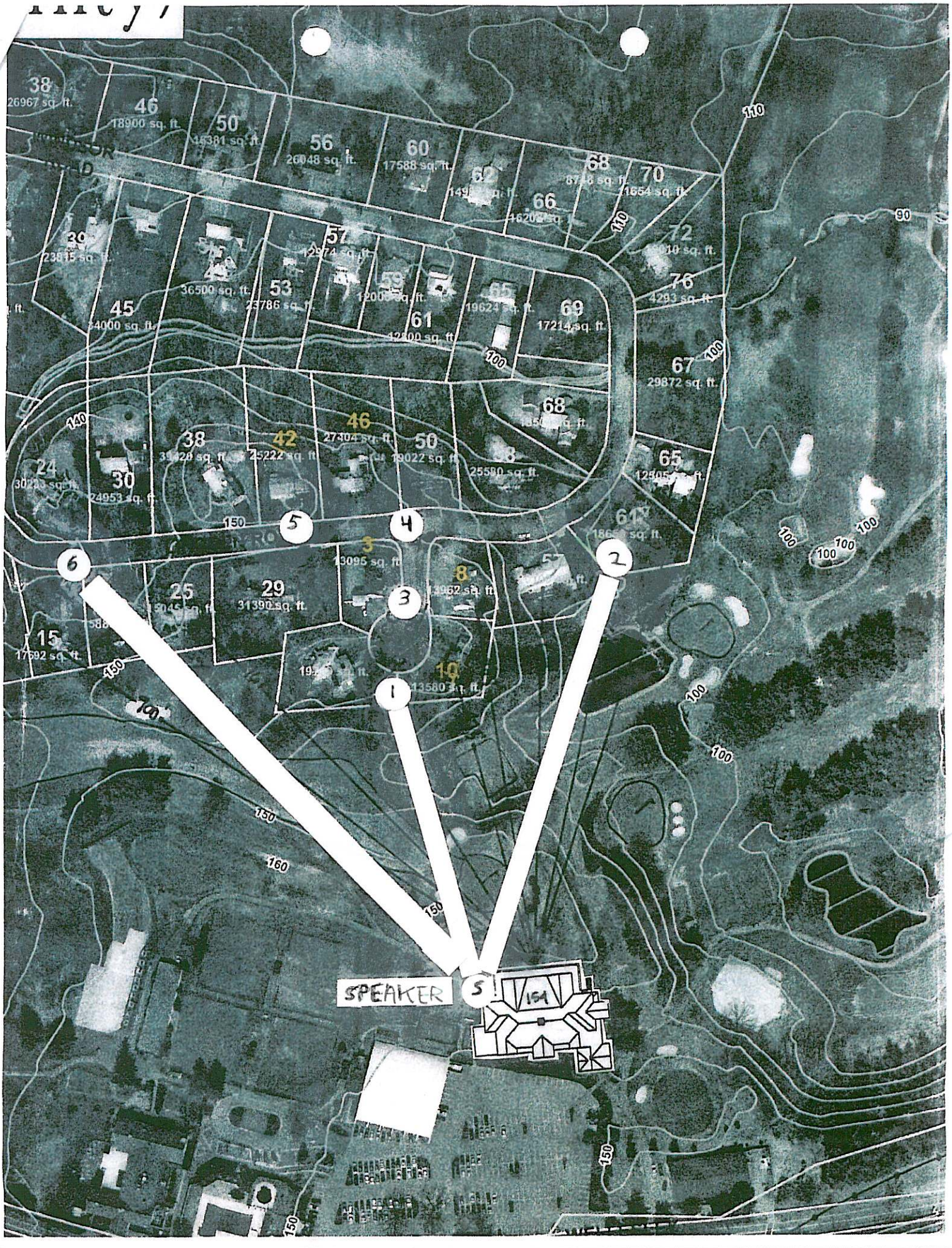
4. Outdoor music. I expect that at a distance of about 25 feet from acoustic music on an outdoor terrace or patio, the LEQ will be around 75 dBA. For amplified music it could, of course, be louder. In any case, at the nearest house, sound levels from acoustic music will be around 50 dBA, and may occasionally be audible to a neighbor standing outside their home, given that it would be slightly above the ambient levels of 43 – 48 dBA. Locations on Lincoln Road are further protected by the knoll of Lincoln Circle, and are a greater distance from the source, so sound levels there would be even quieter.

5. Music indoors to the community. Averaged (LEQ) sound levels inside the Ballroom from amplified music could be as loud as 95 dBA or more. The building envelope will be designed to aggressively contain the sound and reduce transmission to the exterior by at least 30 dBA. There should be a further reduction of 25 decibels to the nearest neighbor, which would mean that the LEQ at Lincoln Circle would be around 40 dBA. This is equivalent to or lower than the ambient sound level of the existing condition for someone standing outside the houses closest to the proposed clubhouse location. Locations on Lincoln Road are further protected by the knoll of Lincoln Circle, and are a greater distance from the source, so sound levels here will be even quieter.

6. Noise levels inside a house. Typical wood frame house construction can be expected to provide an additional 20 decibels (minimum) of sound reduction when doors and windows are closed. Therefore, exterior LEQ sound levels of as much as 50 dBA would be reduced to interior LEQ sound levels of about 30 dBA, which is the typical level in a carefully designed concert hall. Any air conditioning sound will usually be louder than this, and would make the such sound inaudible.

7. Other mitigating factors. The Country Club has identified other mitigating operational measures that will be implemented by the Club to reduce potential noise impact to the community. These include limiting the time of use for the terrace/patio, re-routing access to the Ballroom balcony after 9 pm, and terminating sound generation from club activities at certain times. You can speak to the specifics of these proposals, but certainly they will effectively reduce the potential noise exposures to the community.

Attach. Figure 1. Map of community measurement locations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