



November 23, 2011

Richard Naab, AIA  
Little  
4245 North Fairfax Drive, Suite 650  
Arlington, Virginia 22203

**RE: AMERICAN UNIVERSITY REEVES FIELD  
Bleacher Relocation Noise Assessment**

Dear Mr. Naab:

Miller, Beam & Paganelli, Inc. has performed an acoustical analysis of the anticipated noise from people on the proposed bleacher seats of Reeves Field at American University. We understand the plan is to remove the existing bleachers and install new bleachers, which will seat approximately 250 spectators, on the opposite side of the field of the residential property line. This analysis is performed to assess the likelihood the 250 people will produce "objectionable noise" at the residential property line. This assessment is of unamplified crowd noise. We understand a method is already in place to monitor and regulate loudspeaker noise levels.

One basis for determining if a noise is objectionable is by comparing the measurable level to predefined noise criteria, such as the DC noise code. According to the noise code, the allowable day time loudness level is 60 dBA. In many municipalities, the unamplified voice is not subjected to noise code restrictions. The DC code is somewhat contradictory in that it says, "the unamplified voice shall be exempt at all times," however, it also includes the unamplified voice as a source to be regulated from businesses. For use here, the noise code is a guideline for a normally acceptable sound volume. In reality, many factors including a noise's character, frequency, duration, loudness compared to other background noises, and sensitivity of the listener all contribute to a sound's relative annoyance.

An analysis was conducted of both anticipated noise levels resulting from spectators on the bleachers speaking at normal conversational levels and at elevated levels that might occur at specific moments in the game, such as if a goal is scored. Normal conversation level is typically 60 dBA at a distance of 3 feet from the talker. At the distance from the property line to the bleachers, the bleacher can be considered as a point source. Using basic acoustical theory, the sound pressure (noise level) from a point source diminishes 6 dB with each doubling of distance. As noted above

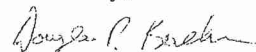
the proposed bleachers can seat 250 people. Assuming half of them are speaking simultaneously, using the logarithmic scale on which the decibel scale is based, the combined level of 125 people would result in a level of 81 dBA at three feet. At a distance of approximately 375 feet between the bleachers and the property line, this level would be reduced to 39 dBA.

Assuming relatively quiet background levels in the 45-50 dBA range, then the calculated level of bleacher conversations at the property line would be approaching half as loud (10 dBA less) than the background noise level. Thus, the noise would possibly be audible, but very subdued, and well below the 60 dBA daytime noise code level. If background levels are higher, such as closer to traffic areas or due to birds and/or insects, air traffic, residential HVAC systems, or other sources, then the noise likely would be inaudible.

It is anticipated that during a game there will be brief periods of highly elevated talking or cheering. Assuming all 250 people are vocalizing at roughly three times (15 dBA) above normal conversation level, this could simplistically be represented as a point source of 99 dBA at 3 feet. With the same diminishing of level with distance to the property line, then this elevated level is calculated to be 57 dBA at the property line. This elevated level would be audible in a relatively quiet background environment. However, for reference, it would still be technically less than the level allowed by the noise code (though noise code is likely not applicable, as noted above) and it would be slightly quieter than typical speech of 60 dBA at three feet. Therefore, assuming these elevated levels are only occasional events, then it is reasonable to conclude that a person of reasonable sensitivity to noise would not find it objectionable.

In summary, an assessment was performed of the potential noise from spectators on the proposed bleachers of Reeves field. The location of the proposed bleacher is on the opposite side of the playing field than the closest residential property line. At this distance, with the bleachers full and half of the people speaking at normal conversation levels, this noise would be either inaudible or barely audible, depending on the background noise levels. During periods of elevated cheering, which we understand to be brief periods occurring occasionally during the overall events, this noise likely would be audible above quiet background noise levels. However, it would not exceed noise code levels, nor should it be objectionable to a person of reasonable sensitivity.

Sincerely,



Douglas P. Koehn, M.S.  
Senior Consultant