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Experiences with community noise litigation and legal proceedings

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While it is common for architectural acoustics and mechanical noise to be the subject of litigation, community noise is finding its way into legal proceedings such as public meetings, civil lawsuits, and planning commission hearings. The objective of this paper is to summarize our experiences with some atypical legal proceedings related to environmental noise and building acoustics. Various topics include television noise and the cranky neighbor, sleep deprivation due to noisy birds, gentleman estates vs. the community center, and using caution when tapping on specialty tile floors.

1 INTRODUCTION

Noise is becoming a highly litigated issue in the building construction industry. Along with mold and waterproofing, acoustics and noise control lawsuits can be very expensive to the losing party. In addition to architectural acoustics related litigation, community noise issues are also finding their way into the courtroom. The purpose of this paper is not to highlight large projects, or to discuss how to reduce the risk of litigation. Instead this paper overviews several case studies of lawsuits that are somewhat unusual, and describes the process and “lessons learned” from these atypical cases.

2 CASE STUDY 1: KAUFMAN RESIDENCE TV NOISE

Mr. Kaufman’s neighbor had complained many times about the noise radiating from Mr. Kaufman’s TV. In fact, Mr. Kaufman’s neighbor was so disturbed by the noise that he contacted the Hawaii Department of Health to file a complaint. However, the Department of Health refused to take the claim after hearing the source of the noise and told Mr. Kaufman’s neighbor that the Hawaii Department of Health does not regulate noise from TVs or any audio equipment¹, and further clarified that the noise limit is specific only to “stationary mechanical equipment”. As a next step, the frustrated neighbor called the local police to file a noise complaint under the Nuisance Law². The police eventually issued Mr. Kaufman a citation for excessive noise but had no authority to mandate a fix for the noise problem.

Reaching no satisfactory resolution, the neighbor sued Mr. Kaufman for excessive noise. Mr. Kaufman hired D.L. Adams Associates to conduct noise measurements and to testify in court on his behalf. Noise measurements were taken at two locations along the shared property line, shown in Fig. 1, with TV turned on, and also with the TV turned off. The noise

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measurements were taken using two TV station types, one with constant music and one with a loud talk show. The measurements were also taken using two volume settings, “25” and “100” where 100 is full volume. The ambient noise was measured at 39 dBA and noise from the TV ranged from 42 dBA to 57 dBA at the property line.

2.1 Testimony at the District Court

The case was tried in the Honolulu District Court and Mr. Todd Beiler took the witness stand to testify on the noise measurement procedure and results. The case seemed relatively innocuous, so there was only limited preparation prior to the testimony. After a short introduction, the prosecuting attorney immediately fired with surprisingly aggressive questions, challenging Mr. Beiler’s testimony as an expert witness. The attorney cited lack of experience and lack of knowledge in the subject matter in an attempt to disqualify him. The prosecuting attorney purported that the noise measurements were not conducted in accordance with industry standards by suggesting that C-weighted decibels (dBC) was the correct metric to use. The attorney also suggested Mr. Beiler be disqualified because he lacked insufficient knowledge of the State’s noise regulation¹ when he testified that the noise limit did not apply to TV noise or other audio system noises. Fortunately, the judge did not agree and after 45 minutes of grueling questions by the prosecuting attorney and a brief cross examination by the defense attorney the case rested.

The case was eventually dismissed without prejudice by the District Court. Not happy with the results, the neighbor continued his complaints with the Police until Mr. Kaufman requested an injunction against harassment from the court for his neighbor. Mr. Kaufman also petitioned for a temporary restraining order against his neighbor which lasted for several months.

2.2 Lessons Learned

Although this case ended with favorable results for Mr. Kaufman, there were valuable lessons learned on how to prepare for expert witness testimony. In particular, it is important to dedicate sufficient time to thoroughly prepare for every case, even if the case seems simple or elementary. Staying calm and remaining unemotional is also critical to a successful testimony. The opposing attorney may attempt to make these tasks as difficult as possible. There are other witness testimony preparation suggestions summarized in the Conclusions section of this paper.

3 CASE STUDY 2: BIRD NOISE AND SLEEP DISTURBANCE

Mr. Schrock’s home sits on a beautiful piece property along the coast. Other inhabitants of this coastline include a colony of seabirds that are a federally protected migratory species. The vacant lot adjacent to Mr. Schrock was donated to a local environmental group to restore and preserve this fragile ecosystem. Fortunately for the birds, this preserve provides additional protection for the colony that uses the rocky and heavily vegetated coastline to burrow and lay eggs. Unfortunately for Mr. Schrock and his neighbors, the seabirds feed their young at night and create a lot of noise in the process. Between the months of March and November, the cacophony of bird noise is loud enough to be disruptive to sleep. From Mr. Schrock’s perspective, the birds are a nuisance which could negatively affect his property value. In addition, the establishment of this preserve is in violation of zoning laws and would require a Conditional Use Permit from the Planning Department.

D.L. Adams Associates was hired to assess bird noise levels and compare these levels to everyday sounds to determine if the birds could be categorized as a nuisance. A sound level

meter was set up on the Schrock's property which collected equivalent (L_{eq}) and 90% exceedance (L_{90}) sound level data in 5-minute intervals. In addition to collecting sound data, the meter was programmed to trigger an audio recording for 15-seconds if an exceedance level was reached.

The measurement results were very unusual. After sunset, ambient sound levels typically drop off due to the decrease in sound events caused by the natural and man-made environment (e.g., birds chirping, traffic noise, etc.). At the Schrock residence, ambient sound levels actually increased significantly during the nighttime hours. Based on the data and audio recordings, it is clear that the nocturnal seabirds were the dominant noise source after 10:00 pm. Figure 2 shows rising L_{90} sound levels which signify that bird noise increases gradually between 1:00 am and 5:00 am. Although the measurements were conducted in a quiet suburban residential setting, the nighttime ambient noise environment is comparable to sound levels experienced in highly populated urban cities.

To establish the bird noise as a nuisance, the sound data was compared to several regulations and guidelines. First, the State Department of Health¹ limits stationary mechanical equipment noise at night to 45 dBA for single family homes, but cannot be enforced for bird noise. However, the data showed that noise from the birds continuously exceeded this limit from 1:00 am to 5:50 am by as much as 15 dB. Second, the sound data was compared to World Health Organizations "Guidelines for Community Noise"³ and "Night Noise Guidelines"⁴. According to these guidelines, populations should not be exposed to yearly average nighttime noise levels greater than 30 dB. While this guideline is also not related to natural noise sources such as birds, the metric gives a good relation for most effects of exterior noises such as traffic, aircraft, and trains. The equivalent nighttime sound level was calculated from the measurement data to be 53 dBA which means that it is not unreasonable to report that the birds may cause adverse health effects associated with sleep disturbance. Legal action is still pending on this case.

4 CASE STUDY 3: COMMUNITY CENTER AMPHITHEATER ENVIRONMENTAL NOISE

D.L. Adams Associates was initially approached almost four years ago by the developer of the Rolling Meadows Community Center to provide design services for the center's auditorium and outdoor amphitheater. However, the property on which the community center is planned is currently in the State Agriculture District/County Open Zoning. The center is a non-conforming use of the land and would require a Special Use Permit. Special Use Permits can be granted in State Agriculture Districts for uses determined to be "unusual but reasonable" and which support community uses and businesses. All Special Permits undergo review by the County's Planning Commission on a case-by-case basis.

As the design moved forward, it became clear that opposition to the project had developed from the neighboring Valley View Estates subdivision. Of the many issues the interveners raised with the project, one of the chief concerns was, of course, noise. D.L. Adams Associates was asked to conduct a noise assessment to study the impact of the amphitheater noise on the neighboring properties. Ultimately, Mr. Todd Beiler was asked to testify at the County's Planning Commission hearings in support of the project. The following paragraphs summarize our involvement pertaining to the noise study and the hearings.

4.1 Environmental Noise Assessment Study

The first challenge was to determine the criteria by which an impact would be determined. Although Hawaii has State and County noise regulations^{1,5}, they do not specifically apply to outdoor music. The only applicable local guideline was drawn from an amphitheater built in urban Waikiki where an ordinance was developed for this specific venue. A summary of these guidelines can be seen in Table 1. Initially, the goal of the developer was to comply with the Department of Health daytime maximum permissible noise limit for businesses or commercial areas, i.e., 60 dBA at the property line.

A sound propagation model was developed using the CadnaA software to predict noise levels from the outdoor amphitheater to the property line. The outdoor amphitheater is designed to seat 250 patrons, but the hillside lawn area has the potential to seat many more. The planned uses for the amphitheater are open air concerts, weddings, and private events. The sound propagation model included two types of sound sources: one representing amplified music and the other representing crowd noise. Noise contour maps were produced as a means of illustrating the expected sound levels in the areas surrounding the project site, including the homes in the Valley View Estates subdivision. The nearest home was approximately 700 feet from the property line and approximately 900 from the Amphitheater.

The results of the sound propagation model showed that it was indeed possible to limit noise from the amplified sound system at the stage such that the 60 dBA criteria at the Rolling Meadows property line would be satisfied, as long as the sound system audio volume was kept to a moderate level (95 dBA at the mix position).

While the developer was relieved to hear that noise from the amphitheater would satisfy the only available local noise standard (even though it was not applicable to this type of noise), industry guidelines revealed that the neighboring Valley View Estates community may still find the noise objectionable. The ISO's 'community response scale'⁶, was provided as a way to estimate the neighboring community's response to changes in sound level. It was suggested that proposing a new criterion that directly addresses the community's concern about intrusive noise may be viewed by the Planning Commission as a pro-active resolution.

4.2 County Planning Commission Hearings

The Valley View Estates was granted intervener status for the special use permit application by the developer. Therefore, a public hearing before the County Planning Commission was held to determine if the project should be granted a Special Use Permit. Mr. Todd Beiler was qualified as an expert witness to testify on the behalf of the community center. The testimony included an overview of the noise modeling approach and a discussion of the noise modeling results. The output of the CadnaA software, a color-coded noise contour map, proved to be an extremely effective tool for illustrating how the noise from the amphitheater would propagate into the surrounding area. With approval from the developer, Mr. Beiler's testimony included three noise mitigation options: (1) Build an earth berm around the amphitheater, (2) partially enclose the stage area, and (3) implement a permanent noise monitoring system for the amphitheater.

Ultimately, the County Planning Commission approved the Special Use under the following conditions:

- Hours of operation for the Amphitheater were limited to Thursdays through Saturdays and on holidays until 10 p.m., plus Sunday until 6 p.m.
- The property line noise limit would be enforced at 55 dBA for all noises.

- A permanent sound monitoring system would be installed to show continued compliance with the 55 dBA noise limit.

5 CASE STUDY 4: APPLE CREEK CONDOMINIUM AOA VS. THE BONTRAGERS

The Bontragers (the upstairs unit owner) have owned their luxury vacation condominium in Hawaii since the building was built in the early 1990s. Much of the hard surface floor has remained in place for the past 20 years. However, the Bontragers have made some floor plan changes to their unit. The Yoders (the downstairs unit owner) bought their unit five years ago and recently submitted a complaint to the Apple Creek Condominium AOA board regarding footfall and other impact noises from the Bontrager's unit above.

The Apple Creek Condominium house rules have very strict requirements for the Impact Insulation Class (IIC) rating of the floor/ceiling assembly. The Apple Creek Bylaws state that modifications to the floor finish must be done in a manner that meets the HUD 1967 Publication "A Guide to Airborne Impact and Structure-Borne Noise Control in Multifamily Dwellings"⁷, Table 10-3 acoustical ratings for Grade I (luxury) housing. Since the residential units are not identically stacked with the same floor plan, the IIC criteria varies depending on the specific room adjacency, ranging from IIC 55 to IIC 65. The subfloor is 6" thick post tensioned concrete with minimal drop ceilings in the downstairs unit. Much of the ceiling was a skim coat layer of plaster on the underside of the concrete slab.

5.1 Field Impact Insulation Class Test

The Yoders retained an acoustical consultant to conduct an FIIC of the floor ceiling assembly, and D.L. Adams Associates was retained by the Bontragers to oversee the test and provide consultation services. Although the Bontragers had installed large area rugs to cover a majority of the floor area, they were not permanent. Therefore, the rugs were rolled back to expose the tile floor finish for the FIIC test. The tile flooring had the appearance of natural stone tile, but it was later revealed that the tiles were hand shaped concrete tiles.

The test began with the tapping machine in Position 1 in accordance with ASTM E 1007-04. However, before the tapping machine could be moved to Position 2, it was apparent that the tapping machine was causing severe damage to the floor tiles, and more than a slight dusting of the finish. The concrete tile was crumbling from the impact of the hammers; creating shallow divots in the tile (see Fig. 3). The impact testing was immediately stopped by the Bontragers. The Yoder's acoustical consultant measured the reverberation time in the downstairs unit, but was not able to complete the remaining tapping machine positions 2 through 4 or the checks for sound flanking.

The Yoder's presented the test results to the AOA board to argue their case that the Bontrager's floor only achieved FIIC rating of 42, a rating which is much lower than the IIC 55 to 65 required by the Bylaws. However, the Bontragers argued that the test was invalid because only a small portion of the necessary test data was collected. They also argued that, although the area rugs were not permanent, they covered a large majority of the floor area and are semi-permanent since they do not move the rugs. Therefore, their argument stated that the area rugs should be included in the test for achieving the IIC rating.

5.2 Lawsuit: AOA vs. the Bontragers

Since neither side could agree on a resolution or strategy, the AOA was forced to file a lawsuit against the Bontragers for non-compliance with the Bylaws. It is difficult to determine if a judge will side with the Bontragers given the age of the floor finish and the consideration of the floor finish being original to the unit for a majority of the floor area, or side with the Yoders requiring that the Bontragers upgrade the flooring to meet the AOA Bylaws. The lawsuit is still pending.

In this case, one of the more unexpected results was the damaged floor tile caused by the tapping machine, especially considering the extent of the damage. Damage to floor tiles caused by the tapping machine is relatively rare, but can happen. The risk of damage is increased significantly when natural stone is used, depending on the type of stone. The concrete tiles used in this example offer very little resistance to impact damage. The author recommends that future FIIC testing on concrete floor tiles only be conducted with the Owner's permission and a disclaimer that the tapping machine may cause tile damage. FIIC testing on natural stone tile floors should also be carefully considered or evaluated for potential damage.

6 SUMMARY AND CONCLUSIONS

Expert witness work can be a significant portion of a consultant's engagements. An expert is someone who, by reason of special knowledge, skill or training, is able to assist the judge to understand the evidence or to determine a fact. Acoustical engineers are often hired to provide noise studies or testing in support of a case or to provide an expert opinion on another acoustical engineer's work. In either case, it is important to know what is required of an "expert" so as to maintain credibility before taking the stand.

6.1 Rule of Evidence – Expert Witness Qualification

The Daubert standard⁸ is a rule of evidence regarding the admissibility of expert witnesses' testimony in legal proceedings. Essentially, it states that an expert must be able to demonstrate the following:

- The testimony is based upon sufficient facts or data
- The testimony is the product of reliable principles and methods (i.e., industry standards, published or peer reviewed methodologies, or principles taught in an engineering school)
- The witness has applied the principles and methods reliably to the facts of the case.

To pass the Daubert standard, the expert must be able to document the steps he took in his investigation, analysis and conclusions. In other words, the expert should keep a detailed record of his work, while completing the work. Engineers generally conform to this standard as a common practice; however, the conformance should be well documented in order to maintain credibility as an expert witness. The Daubert standard is the rule of law in federal courts and over half of the state court systems. However, many jurisdictions, including state courts, are adopting their own standards and it would be wise to discuss qualifications with an attorney.

6.2 Tips for the Witness Stand

Taking the witness stand can be nerve-wracking and challenging, especially in a highly contested case. However, the following tips⁹ can aid in the preparation for expert witness testimony:

- *Only answer the question that was asked.* Ordinarily, after you have answered the specific question that you were asked, you will not want to volunteer any additional information. Even if opposing counsel sits silently and seems to expect you to say more, don't fall into that trap. If opposing counsel wants more information, he will ask a follow-up question.
- *Get used to silence even if it makes you uncomfortable.* It is your job to answer questions, not to fill silence. It is okay to answer, "I don't know."
- *When it is possible to be definite, be definite.* If you always start an answer with "I believe" or "In my opinion," the effect may be to suggest that your opinions are imprecise and that it is perfectly reasonable for people to disagree with you.
- *Think. Then Answer.* Always think before you speak, whether under direct examination or cross examination. It is always better to pause before you answer a question than give a bad or incorrect answer.
- *Do not overstate your client's position.* An overstatement can devastate your credibility.

7 REFERENCES

1. Chapter 46, *Community Noise Control*, Department of Health, State of Hawaii, Administrative Rules, Title 11, September 23, 1996.
2. Section 41-31, *Noise Control*, Revised Ordinances of Honolulu, City and County of Honolulu, Oahu, (1993).
3. Chapter 3, *Adverse Health Effects of Noise*, World Health Organization Guidelines for Community Noise, (2000).
4. *Night Noise Guidelines for Europe*, World Health Organization, (2007).
5. *Rules & Regulations of the Liquor Control Commission of the County of Kauai*, Department of Liquor Control, County of Kauai, (2006).
6. International Standards Organization ISO/TC 43, *Noise Assessment with Respect to Community Responses*, (1969).
7. *A Guide to Airborne Impact and Structure-Borne Noise Control in Multifamily Dwellings*, Department of Housing and Urban Development, (1967).
8. Daubert standard. 22 April 2011. In *Wikipedia: The Free Encyclopedia*. Wikimedia Foundation Inc. Encyclopedia on-line. Available from http://en.wikipedia.org/wiki/Daubert_standard
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Table 1 - State noise guidelines.

<i>State Department of Health and County Liquor Commission Maximum Permissible Noise Limits</i>		
Zoning Districts:	Daytime (7:00 am to 10:00 pm)	Nighttime (10:00 pm to 7:00 am)
Residential, Conservation, Preservation, Public/Open Space	55 dBA	45 dBA
Multi-Family Dwellings, Apartments, Business, Commercial, Hotel, Resort	60 dBA	50 dBA
Agriculture, Country, Industrial	70 dBA	70 dBA
<i>County Land Use Commission Special Ordinance for Outdoor Amphitheater</i>		
Nearest Apartment/Hotel/Business (approximately 2000 feet away)	68 dBA	Prohibited



Fig 1 - Location of “TV noise” measurements (client’s home on left, fenced property line on right).

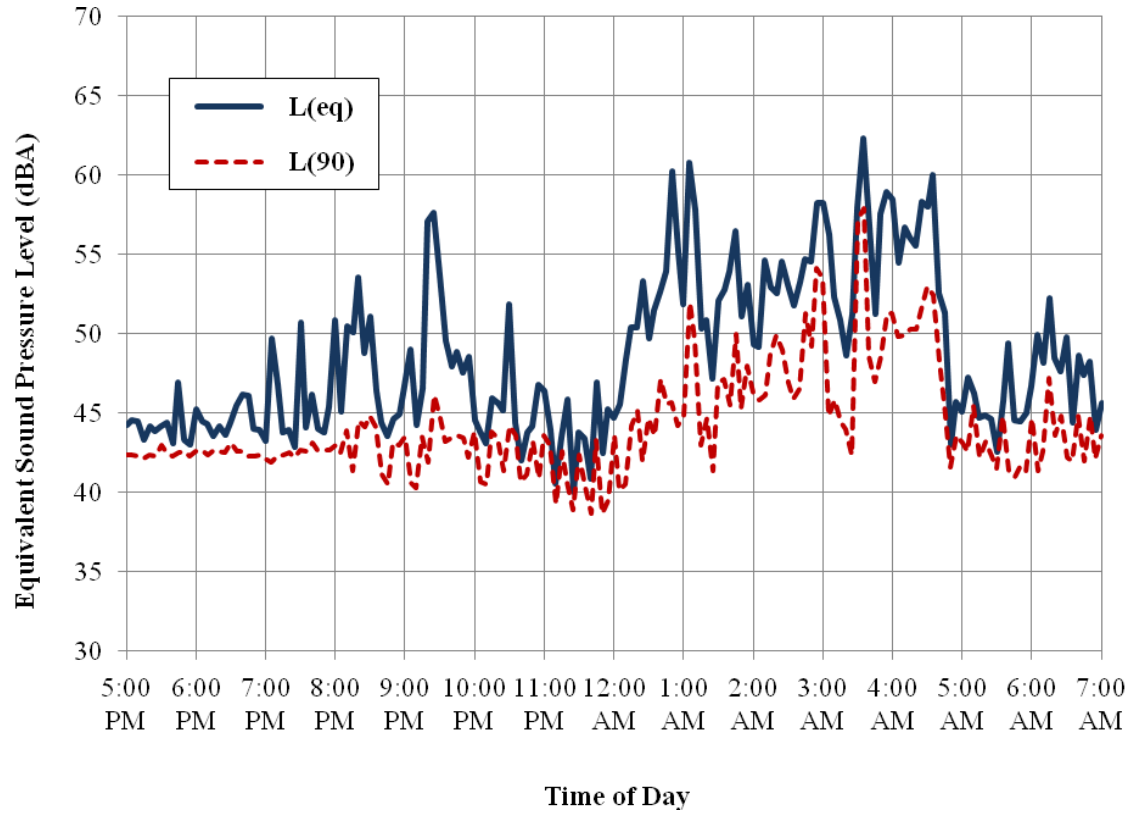


Fig 2 - Measurement results for bird noise study.



Fig 3 - Field Impact Insulation Test (FIIC) photographs: before (l), after (R).