

## ***Industrial Noise Study, San Diego County***

Wieland Acoustics spent time working on an interesting environmental noise study for a site in San Diego County. What made this project particularly challenging was its location directly across the street from a large and noisy industrial plant. The use of the project site had also not been established, so we were asked to look at three possibilities: 1) multifamily residential; 2) a school, library, hospital or nursing home; or 3) professional office buildings.

### ***Noise Sources***

The industrial plant across from the site manufactures concrete blocks and bricks. In doing so, a multitude of noises are generated, each of which had to be considered in our study. The noise sources included two large conveyor belts, material pumps, pounding activities, heavy trucks off-loading materials or picking up blocks for delivery, and forklift movements between the plant and the outdoor storage areas. These sources and activities generated maximum noise levels as high as 87 dB(A), and continuous average noise levels as high as 71 dB(A) at the project site.

Considering that the industrial plant operates from 4:00 a.m. to 11:00 p.m. five days a week, the noise-related impact at the project site was significant, with local noise ordinance standards being exceeded by as much as 14 dB (depending on the ultimate use of the site.)

### ***Mitigation Methods***

To mitigate the noise impacts, we looked at five alternative mitigation measures, each with its own advantages and disadvantages:

1. ***Noise Control at the Source.*** This would mean applying noise control measures (such as barriers, enclosures, etc.) to the industrial plant. While this has the greatest potential for reducing noise impacts at the project site, it also requires cooperation from the plant owners, and would do nothing to mitigate noise from heavy trucks using the street.
2. ***Building Orientation and Site.*** This would involve designing the project site so that noise-sensitive areas and buildings are located away from the industrial plant, or so that non-sensitive buildings (such as offices) provide a barrier to the noise-sensitive areas. Buildings could also be oriented so that the noise-sensitive areas such as patios are located on the opposite side of the building from the industrial plant. However, sometimes the impacts of proper site design can render a project economically unfeasible.

3. **Noise Barriers.** This approach would include walls or berms at the property line, and around noise-sensitive areas (such as patios, balconies, common recreational areas, etc.). Barriers can be an effective mitigation measure given the proper geometrical relationship between the noise source, the barrier and the receiver. However in this case, the most effective barrier location would be at the industrial plant, not at the project site. Also, barriers are not very effective when the noise source—like the conveyor system at the industrial plant—is very high.
4. **Landscaping.** This would provide psychological benefits by reducing visual impacts, but would not reduce noise levels. To have any effect on noise, the landscaping would need to include dense shrubbery or trees, at least 100' deep.
5. **Building Construction.** By upgrading the construction of the proposed buildings with sound-rated windows and doors, and with a mechanical ventilation system, the noise level within the interior of the proposed buildings could be reduced substantially.

### **Recommendations**

Based on our review of the available alternatives for mitigating the industrial noise impacts, it was clear that not one of the alternatives, by itself, would provide enough noise reduction. Therefore, it was recommended that the most cost-effective approach would be to include a combination of all the above measures.

### **Conclusion**

The proposed project faces a number of challenges because of its location near a large industrial plant, not the least of which is the economic impact of implementing the required noise-control measures. It will be interesting to see how the issues are resolved, and how they affect the ultimate design of the project.

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