

# Cost Cutting Measures For Successful Sound Critical Facility Design

By Aditya G. Balani

For a building project of any size, cost is almost always a major factor. Surprisingly or not, the final cost for many projects tends to be higher than those projected at the start, but often we are able to help clients find opportunities to reduce costs while still achieving their design goals. Through the use of a structured approach and process, one can ensure that the following issues are best addressed:

## Programming and Documentation

As early in the design process as possible, facility owners should clearly define the needs of the facility in terms of operations and architecture. Documenting these needs is the best step one can take to clearly aligning the visions and expectations of each member on the design team. Setting up a program as early as possible helps to define and maintain a realistic budget. A few hours spent documenting the needs of the facility during the initial concept design development can save dozens of hours later in the schematic and detail design because potential problems can be flagged before investing a great deal of design time in the project. The earlier the program documentation is started, the greater the likelihood that the design team can neatly integrate the facility requirements into the design and will help in reducing redundant design work, or false starts. The design team will also be able to provide important design coordination guidance at this early stage. For example, mechanical and electrical system noise and vibration concerns can also be brought to light at this time, making it easier for the other consultants to relocate these systems in areas that will not cause noise and vibration problems later.

A space-by-space programming document that describes the wish list for each space will help ensure that the design and construction teams stay focused on the needs of the facility. This document should include details such as the expected functionality of each space, as well as intended occupancies, equipment loads (thermal and electrical), the proximity of sound-critical spaces (i.e. studios, offices, etc.), and any special needs (i.e. theatrical lighting and loudspeaker suspension).

An example: in addition to the square footage of each room, the client / architect should also specify the rooms that need to be isolated, location of mechanical rooms, etc. so that the layout of these spaces can be discussed with the team members and finalized early in the design phase.

Remember, the program document is just a starting point. It is expected to be a work-in-progress. During later design phases, the document is likely to be amended based on factors such as field conditions, updated budget availability, changing markets and technology advances.

## Assembly Of Multi-Discipline Design Team

For a successful program documenting phase, it is critical that the design team is comprised of the appropriate members. Often times, we see owners involve acoustical consultants late in the design stage, long after program, budgets and in some cases even blueprints have been generated. If possible at all, changes late in the design often result in higher costs and unavoidable mistakes. It is almost always easier to make changes on paper than once construction has started. Last-minute modifications often result in expensive change-orders and miscoordination between disciplines. Thus resulting in the additional cost for changing the layout of the space and additional building materials required for the change in design during construction.

An example: if the mechanical engineer proposes equipment on the roof above a sound critical space, it is very important that the roof structure be designed to accommodate this early in the schematic phase. Depending on the noise data of the mechanical equipment, the roof may need added mass to control noise transfer from the equipment into the space below. For this, early coordination between the architect, mechanical engineer, structural engineer, and acoustical consultant is required. Thickening the roof slab to address the issue of isolation, for example, may require structural changes, impacting many other disciplines, accruing additional costs and perhaps even affecting the project timeline if dealt with at a later stage in the design phase.

## Communication and Coordination

Even with a program document and properly-assembled team, the project manager / planning team must make sure that all of its members are communicating on a regular basis and with unified documentation. From the very first programming meeting through to completion of construction punch lists, a structure must exist to ensure that all team members are always working from the most recent documentation. Measures to achieve this could include regularly-scheduled meetings or conference calls, distributed meeting minutes, and a unified drawing set from which all of the disciplines work.

Lack of coordination due to outdated information could lead to costly and unnecessary construction errors.

An example: if additional equipment is proposed in the sound critical rooms, there will be an additional power requirement and accommodation for heat generated by the equipment. This would affect the electrical and mechanical requirements for the room and the appropriate team members should be notified. If additional air conditioning for the room is required, the acoustical consultant should be notified immediately for noise control analysis. Avoiding this during design phase could lead to high costs during construction if the already purchased noisy air conditioning equipment needs to be replaced with a less noisy one.

During the schematic and programming phase, it is critical to think about both the short-term and longer-term hopes for the facility. It is then clear to see what items are required to operate both immediately and in the future. Once the schematic design for the space is laid out along with a programming document, actual costs can begin to be estimated. While it is common to start with a target budget, we urge our clients to define the facility they want, develop a programming document and initial layout, and then develop subsequent budgets. Everyone involved can then work as a team to determine how to best fulfill the program's needs while staying within the needed budget.

### About the writer

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### About SIA Acoustics LLC

SIA Acoustics LLC is an acoustical design firm that specializes in projects where great sound is critical. Serving the architectural, production, performing arts and special event communities, they are experienced consultants offering services in acoustics, technical systems design, facility planning, and special event design. Founded in 1989 and based in New York City and Los Angeles, SIA Acoustics solves difficult acoustical and technical challenges and is also known for developing **SIA-SMAART**, the industry-leading acoustical measurement and sound system optimization software system.

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