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Making Space for Sung Worship

NEW BUILDINGS, ACOUSTICS, & PASTORAL MUSICIANS First, Make Good Music

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THE NUMBER OF CATHOLIC CHURCH building and renovation projects has grown steadily since the Second Vatican Council, and this trend has continued unabated, even increasing in recent years. There are many reasons for this growth, including the need to respond to directives in postconciliar documents, the growth in population (particularly the growth in church attendance), the shortage of priests, and similar factors. Along with this growth have come some significant changes in the way church building projects are done, in particular the fact that projects are now more committee oriented than in the years before or immediately after the council, drawing on the wisdom of members of the parish staff and community to help in addressing a growing and ever more complex set of design challenges.

It is ever more common for pastoral musicians to be drawn into the building design process, whether by appointment, desire, or the need to assure that the special requirements of the music ministry will be adequately addressed. Of course, one would hope that the architect and acoustician have all the skills and knowledge necessary to design places that accommodate and support music, but it must be appreciated that the physical and acoustical needs for music are complex and evolving. The formal members of the design team (mainly architects and engineers) can benefit greatly from the support and guidance related to the very specialized considerations involved in designing the worship environment to serve the needs of music ministry.

Becoming involved in the architectural and acoustical aspects of a building project may seem daunting and intimidating to a pastoral musician. Your involvement may call for you to help make decisions for a changing, varied, and complex array of music groups and musical styles. You may be called upon to review blueprints, evaluate and offer budgets, and make some judgments or recommendations about acoustical factors. This is not the sort of thing that most pastoral musicians have had experience with, but if we don't do it, it may not get done at all.

Perhaps one of the major concerns of pastoral musicians is that the acoustics be right. But how is a "mere" pastoral musician to deal with this complicated area? Well, it might be encouraging and edifying to know that musicians have been called upon in far more demanding acoustical environments to help architects and engineers deal with the sound aspects of buildings. For example, when Philharmonic Hall (now Avery Fisher Hall) at Lincoln Center was built and found to be an acoustical disaster, the architects and acousticians turned to Juilliard students, serving as ushers in the new building, to help evaluate the problems. This isn't to suggest that one needs a conservatory-trained ear to deal with acoustics; rather, there is a special knowledge that one develops in years of experience in making music, hearing music, and struggling against poor acoustical conditions in other buildings that can and should be brought to bear in the design of a space where music plays a central role.

That knowledge can be a vital part of the building design process, and pastoral musicians have much to offer in helping those who may be less experienced by sharing their knowledge regarding the acoustical aspects involved in other concerns and priorities. For example, carpet and pew cushions may have a certain aesthetic appeal for some architects and building committee members, but their sound-deadening potential must be factored into the decision, and often it is a pastoral musician who is most aware of the deadly influence of such materials.

I hope that these comments make a case for a heightened urgency for pastoral musicians to become involved in the design of acoustical elements in the worship space. Here is a review of the elements of acoustics to show what is needed. First, you have to realize that acoustics for the worship space covers a broader spectrum of the building design process than is often realized. But, for this article, I will focus on three that have the most significant impact on music ministry: natural acoustics, music space planning, and sound reinforcement.

Natural Acoustics

Natural acoustics involves the way a building responds to sound *without* electronic sound reinforcement. While one may question the feasibility of providing good acoustics without a sound system, there are several reasons to suggest that natural acoustics is the most important factor in church building design. In fact, the 1978 document *Environment and Art in Catholic Worship* (EACW), by the NCCB Committee on the Liturgy, speaks directly to this point: “Audibility of all (congregation and ministers) is another primary requirement. A space that does not require voice amplification is ideal” (no. 51).¹

Since the assembly is a vital part of the liturgy and we are certainly not about to arm each member of the assembly with a microphone, it is clearly vital that the natural acoustics of the worship space support this major source of sound without the aid of amplification. However, it must also be appreciated that the size and configuration of modern Catholic church buildings have tended toward design formats that are contrary to good natural acoustical design. For example, with a 1,000-seat worship space and the liturgical imperative to bring the assembly closer to the table, it is now common to find radial seating plans, circular buildings, buildings that don’t possess the traditional shoe-box shape known for excellent projection of unamplified sound. Important as acoustics for worship may be, the shapes of our churches are now determined more by liturgical and non-musical factors.

Still, with the floor plan shaped by the liturgical action, there is some architectural latitude in shaping the other dimensions of the space and providing materials and finishes to support sufficient reverberance for all the sounds occurring in the liturgy. I suspect in this regard that I am preaching to the choir, so to speak, for it is common knowledge among us that a certain amount of liveness, a generous but not excessive reverberation, encourages participation, encourages the untrained voice to join in singing and in spoken responses. First, it is an almost intuitive realization among musicians that dead spaces reveal the flaws in music making. For the assembly, this same acoustical lifelessness imparts a feeling of singing alone, not an ambiance that encourages participation. Again, *Environment and Art* speaks directly to this factor: “A room designed to deaden all sounds is doomed to kill liturgical participation” (no. 51).

Reverberation has at least two qualities that are essential in the worship space. First, it adds warmth, fullness, and richness to all sounds, speech as well as music. This factor is important in making music more beautiful and encouraging those with untrained voices to participate whether they are in the music ministry or in the pews. It also enriches the quality of the speaking voice, again encouraging participation and good proclamation in the spoken parts of the liturgy. Second, reverberation adds loudness to all sounds by preserving sound energy, helping to provide natural (non-electronic) amplification and distribution of sound. This factor is especially important in giving some equality of sound for all gathered in worship. It lifts up the voice of the untrained reader, and it minimizes a sense of aloneness as one sings in the pews, that feeling of unsupported singing which occurs in a space that is too dead.

Another less-known factor in reverberant spaces is that natural sound is an important component of reinforced sound, for it is the natural sound that gives the audible cues about the location of the original sound source. The sound from audio systems comes from the loudspeakers, and this can give an arena-like, non-directional quality to sounds, reducing intimacy. A strong natural (unamplified) sound helps to localize hearing, drawing the ear gently to the real sound source, giving a clear indication that the words and music in liturgy are coming from the ministers and not from some ubiquitous, disembodied PA system.

A question often arises about the amount of reverberance (the reverberation time or period) needed to accomplish all these acoustical requisites. This is a difficult thing to quantify because each church building has unique qualities in terms of size, shape, and other architectural features, and the rever-

beration must be commensurate with the architecture. Still, it would be safe to offer a range of two to three seconds as being appropriate for most liturgical spaces. Less than two seconds would tend to stifle participation and would indicate the presence of excessive sound-absorbing materials that prevent the natural development, enhancement, and even distribution of sound. Much more than three seconds, while often beneficial for music, can tend to reduce speech intelligibility, though this can be overcome with proper sound system design. (There are special considerations for churches with pipe organs, calling for more than three seconds of reverberation, but these must be considered on a case-by-case basis.)

Space Planning for the Music Ministry

Another important element of natural acoustics is the placement of the music ministry within the architectural space. I would offer, as a goal, that the music ministry's sound should be well projected to the rest of the assembly but not be overpowering. Music for liturgy is intended primarily to encourage the participation of the assembly, not chiefly to serve as a musical event to be listened to. "The entire congregation is an active component. There is no audience, no passive element in the liturgical celebration. This fact alone distinguishes it from most other public assemblies" (EACW, no. 30).

The most important factor here is the natural (again, unamplified) parts of the sound of the music ministry. The sound of the music ministry must be projected well enough to encourage the rest of the assembly to join in. And when they do, the natural acoustics of the space should offer enough support for the collective voice of the whole assembly to equal and exceed the sound of the music ministry.

The science of acoustics for a performance space is well developed and we, as musicians and music lovers, have an abundance of experience as listeners in performance spaces to have developed some notion of what is helpful in projecting sound. Many of these same factors are critical in providing good hearing conditions within the music area, for we know how hard it is to make good music if we can't hear ourselves. Hard-surfaced floors, unpadded seats, and similar factors are key components in a good music environment, and these are easily adapted to the worship space; orchestra shells, elevated stages, overhead sound-reflecting clouds are not so easily adapted. But these standard concert hall furnishings, along with some common sense, can at least suggest some possible ways to place the music ministry within the worship space. For example, placing a choir so that it is backed up to a sound reflecting surface and beneath a sloped overhead surface would be extremely beneficial to enhancing the natural sound projection of the choir without introducing theater-like elements.

Now, all of this should suggest that finding a suitable place for the music ministry ought to occur fairly early in the design process. In fact, one prominent and highly regarded liturgical consultant has recommended that planning for the music ministry should occur at the very beginning of the design process: "What are the best locations for the music ministry? I recommend to you that, if you are renovating or building a new church, you answer this question first. Therefore, brought to the table are the people of the music ministry."²

In this area in particular, pastoral musicians have a vitally important role in the design process. At a very early point in the process it is essential for the architect and acoustical consultant to have complete and detailed

information about the nature, variety, sizes, and musical styles included in the music ministry, and it would be helpful for the pastoral musician to prepare a complete summary of the music ministries. In preparing this summary, there are often at least two specific factors that emerge: the variety in sizes and musical styles of music groups and the difficulty in developing one single music ministry space to serve everything from a solo music minister (a singing guitarist, perhaps) to combined choirs of fifty or more including an adult choir, children's choir, bell choir, instrumentalists, and other options.

To be an effective and supportive collaborator with the music ministers, the architect needs to know the maximum size of music groups involved in special liturgies for the high holy days as well as the normal size for those groups serving the typical liturgies. This includes singers, instrumentalists, and instruments. It might be discovered in this process that the aspirations for large musical groups are unrealistically large, that the notion of having the ministers of music be simultaneously "part of the assembly" and "ministers to the assembly" will be a monumental challenge, or that more than one space will be needed for music ministry. It may be that there is one place for a music ministry of twenty or more, while the solo or duo music group could set up in an entirely different location, perhaps on the altar platform. And it may be appropriate to have the larger space adaptable to serve as assembly seating during those times when the music groups are small.

Realize, however, that such adaptability is not the sort of thing that can be easily tacked onto a design that has gone too far without considering music. It is essential that ministers of music take a proactive role in

the early design phases (known in the architectural profession as Programming and Schematic Design). Besides having enough area (square footage) for musicians, it is critical that the area be configured to allow musicians to see and hear each other. Some of this may seem to be common sense, but in one recent project I saw an architectural scheme for a thirty-voice choir shown as two rows, fifteen singers deep!

Sound Reinforcement

Churches existed for years before the advent of electronic sound systems. It is likely that the first use of sound reinforcement systems in worship was for speech, while the use of sound systems for music amplification was a later development. But the ubiquitous use of sound reinforcement in virtually all situations where music is made today (with the exception of concert and opera halls, and even these sanctums have been violated by electronic enhancements) has fostered the mistaken notion that sound reinforcement is a necessary part of music making. Certainly some instruments need electronics for amplification and even for the basic production of sound (electronic organs, synthesizers, electric guitars, and the like). But the majority of conventional instruments used in pastoral music can, if well played, provide sufficient sound to obviate the need for amplification.

Now, this is not to suggest that we abandon the use of sound amplification altogether, for (as stated earlier) the state of church architecture and attention to liturgical priorities are resulting in church buildings that virtually cannot possess good natural acoustics and/or must call for some amplification to overcome unpreventable acoustical difficulties. In fact, the appropriate use of audio (and video) technology is supported and encouraged in Environment and Art, but with some

pertinent qualifications: “Such media, of course should never be used to replace essential congregational action . . . [and] . . . may be used to assist in the communication of appropriate content, a use which requires great delicacy and a careful, balanced integration into the liturgy taken as a whole” (no. 106).

Even this recent (1978) document probably did not adequately anticipate the extent to which sound reinforcement is currently being used in pastoral music. As with any new technology, there is somewhat of a learning curve and a necessary period of development for subtle acclimation and adaptation, but I would like to suggest that sound reinforcement be used only where it is essential and appropriate, not as a substitute for good natural acoustics and not as a substitute for rehearsal. In most regards, if the natural acoustics of a worship space are correctly addressed, the need for sound reinforcement can be minimized, allowing electronics to be used for subtle and unobtrusive enhancement and not to overcome poor acoustics and poor musical execution.

Let’s look briefly at some common assumptions about sound reinforcement applied to the music ministry (omitting electronic instruments). One commonly repeated observation is that the words of all the vocal music done by the music ministry must be understood throughout the whole assembly. This assumption might be worth some critical review. Aidan Kavanagh has provided some clear insight into questions of audibility and intelligibility in liturgy: “Not every liturgical word must be heard by all, but words that need to be heard should be clearly audible.”³ He elaborates this comment with specific directives about the “words that need to be heard, and the persons responsible for making them clearly

audible.” For the cantor/choir, for example, Kavanagh offers this list: “Psalm verses of entry, Alleluia, preparation, and communion antiphons, meditation chants.”⁴

To extend this deliberately limited list to include all the words sung by the music ministry might be a mistake. In fact, many a presider draws on the concept that, in eliciting assembly response and participation, less is more. For example, I have observed several presiders who show an awareness that if, for example, they recite the profession of faith clearly, strongly, and audibly, the rest of the assembly is apt to take a passive roll and just listen. By initiating the creed strongly and then backing off after the first sentence or two, however, a presider can encourage most assemblies to respond by taking a stronger and more active role in the recitation.

Do You Hear . . .

Another area where sound reinforcement might be a vital element of good liturgy would be in the monitoring function, i.e., in providing those in the various ministries with a clear, audible, and immediate representation of their own sounds and an indication of how the sounds they are making are being perceived by the rest of the assembly. Of all the sound-related aspects of good liturgy, this monitoring function is among the most vital, and its value applies to all ministers, whether their contribution to the liturgy is spoken or sung. Implementing such electronic monitoring with “quality and appropriateness,” however, is not the sort of thing that can be done without some careful design and planning.

I would suggest that with good natural acoustics, the hearing conditions in the sanctuary and music ministry areas should be such that electronic monitoring is not necessary. But I will quickly admit that this

is a naïve suggestion, for good natural acoustics, especially audibility in the liturgical centers, has been the poor stepchild of church architecture. So what are we to do? Our role models (if we can call them that) have been (or so it would appear, based on the examples I have seen in many worship spaces) the sort of monitoring equipment used at performing arts centers and on TV talk show entertainment segments: those unsightly black floor wedges pointed back toward the musicians. Stand-mounted “hotspot” speakers are smaller, but visually they are not much better than floor monitors.

Good monitoring can be included as a part of the total sound system design. It is critically important to do this in the design phase for three reasons: 1) Audible monitoring (without excessive loudness) calls for proper placement of small, specialty loudspeakers; 2) visual integration calls for selecting suitable locations where these speakers project their sounds to limited areas without being too conspicuous; 3) concealing these speakers may call for some strategies that are most effectively done as part of an integrated design effort involving acoustician and architect. (Trust me on this: The architect doesn’t want these things to show up in the publicity photos.)

First Things First

Finally, regarding all sound reinforcement issues, I would like to suggest a more music- and liturgy-oriented perspective: Make good music first—independent of any and all mikes and mixers. Then take this beautiful, liturgically appropriate musical blend and, only if absolutely necessary, lift it (amplify it) just enough to serve liturgical needs. Take great care as you evaluate the extent to which your musical leadership needs to be amplified. It is all too easy to overstep the bounds of good liturgy and prayerful music

ministry. If you attend properly to good music making and to the careful and limited use of electronic amplification, your assemblies will thank you by participating more strongly in the very important and spiritually uplifting musical parts of liturgy.

Notes

1. National Conference of Catholic Bishops, Committee on the Liturgy, Environment and Art in Catholic Worship (Washington, DC: USCC, 1978).
2. Quoted from a talk entitled “Environmental Factors of the Music Ministry” by Fr. Richard Vosko at the Form/Reform Conference, Indianapolis, IN, 1996.
3. Aidan Kavanagh, OSB, *Elements of Rite: A Handbook of Liturgical Style* (Collegeville, MN: The Liturgical Press, 1982), 15.
4. Ibid.

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