CLAYTON ACOUSTICS GROUP is an acoustics consulting firm specializing in projects for houses of worship, serving congregations across the spectrum of Christian and Jewish denominations. Our projects include new construction, renovations and historic restorations, and we are equally at home in a small parish church, neighborhood synagogue or large city cathedral.

Successful worship spaces share highly-valued qualities such as clarity for intelligible speech, reverberance for liturgical music, responsiveness for congregational participation, and low background noise for enhancement of all sounds. We offer a full scope of architectural acoustics consulting services, including room interior acoustic design, sound isolation, mechanical equipment noise and vibration control, speech- and music-reinforcement sound system design and pipe organ acoustics.

Bringing both music and speech to life in a worship space is an exciting challenge, and our passion.

DESIGN PHILOSOPHY FOR HOUSES OF WORSHIP

Clayton Acoustics Group’s design philosophy and consulting practice are acoustics-centered and engineering-based—the natural room acoustics and sound system must fully be part of the architectural design, and selection of materials and equipment must serve this goal exclusively. We support the theory that **acoustics is architecture**, as well as the equally important corollary **audio is acoustics**, and always look for simple, flexible and elegant solutions which meet our clients’ needs.

Many of our projects are houses of worship, with a clear emphasis on churches and synagogues having traditional liturgies and strong music programs. We most often serve those congregations which wish to retain or even enhance the natural worship-space acoustics and may also require a high quality speech-reinforcement sound system to provide excellent speech intelligibility. We also help our clients with a variety of organ-related acoustics issues.

A reverberant synagogue or church is often a very complex acoustical space which must reconcile a distinct conflict of uses, needing to simultaneously be a music room and a lecture hall. Choral and organ music, as well as congregational singing and responses, are typically well supported by the natural acoustics of a responsive and reverberant worship space. Sermons, prayers and scripture readings are best served by a space with little reverberance which favors clarity of the spoken word. Our preferred design approach is to preserve those qualities of natural acoustics which are already good and enhance those which need improvement, and then specify a high quality speech-reinforcement sound system capable of providing excellent speech intelligibility.

Noise in a worship space—even the background hum of traffic or whir of machinery—can be a potent enemy of speech and music. Any amount of background noise reduces speech intelligibility and music clarity, masking nuance of the spoken word and subtlety of a musical phrase. We advocate strongly for elimination of noise in the worship space, whether from environmental sources outside the building or mechanical systems inside.

Many worship buildings, old and new, can be challenging spaces in which to achieve the right acoustical balance between music and speech requirements. A practical and sensitive design based upon solid acoustics principles, with careful attention to detail and thoroughness of purpose, can achieve excellent results.

CONSULTING PRACTICE

As specialist acoustics consultants Clayton Acoustics Group brings considerable “value-added” services to every project. Our goal is to identify and design the best solution to meet the users’ needs, within the owner’s budget, and then see the project through to proper completion.

Architectural acoustics consulting for houses of worship typically includes room interior acoustics, sound-isolation, mechanical equipment noise and vibration control, and a speech-reinforcement sound system. We view these four disciplines as highly connected parts of a whole, as they are interrelated in complex ways and all are of critical importance to the success of a high-quality worship space project.

For all projects we assemble an appropriate “project team” with just the right mix of specialist consultants to address the particular needs of each client. It is our standard practice to work vigorously for the full integration of all acoustics requirements into the architectural and liturgical fabric of each building design.

A cooperative and professional working style between consultants, engineers and architect during design, and later with the contractors during installation, helps ensure the success of any project.
Clayton Acoustics Group is an independent professional consulting firm which works only for facility owners or other design professionals. We are consultants and designers, not contractors, installers or equipment resellers. We do not have financial or business interests in the product manufacturing companies or contracting firms we may recommend. This independence allows us the necessary freedom to best represent the needs of our clients throughout a project.

For each and every project Clayton Acoustics Group brings its considerable experience and singular expertise in the highly-specialized area of worship-space acoustics fully to bear on the concept, design and implementation.

**DESIGN & CONSULTING SERVICES**

For a house of worship project having critical music and speech requirements, the specialist acoustic consultant should initially take a leading role with the architect, engineers, liturgical consultant and organ builder in design of the worship space to ensure acoustical excellence.

It is essential that strong criteria and guidelines be established for room acoustics, sound isolation, and noise and vibration control from the very beginning of the project. For these disciplines a large share of our value to the client and design team is usually realized in the early phases of design. Once these important goals are set, and the design lead moves to the architectural and engineering teams, concepts are developed into construction details and finally the bid documents are prepared.

Sound system design follows a similar but more involved and concentrated path throughout the project. Our usual work plan begins with concepts and guidelines, followed by a significant engineering and documentation effort, continuing with supervision during installation, and concluding with hands-on consultant tuning of the completed system.

We participate fully in all phases of our projects: programming, design, documentation, bidding, construction administration and on-site commissioning.

**ACOUSTICS TECHNOLOGY**

Clayton Acoustics Group has invested heavily in hardware and software technology in order to give its staff the necessary tools to work on the cutting edge of architectural acoustics. We use 2D and 3D CAD drafting to produce all our drawings, plus we use computer modeling extensively for design and prediction of room acoustics as well as loudspeaker and audio system performance. A portable “acoustics field-measurement lab” supports all our on-site work.

**SELECTED PROJECTS FOR HOUSES OF WORSHIP**

- Church of the Redeemer (Episcopal), Chestnut Hill MA
- Congregation Beth Sholom (Orthodox), Lawrence NY
- St. Paul’s Episcopal Church, Rock Creek Parish, Washington DC
- Church of the Holy Cross (Roman Catholic), New York NY
- The Hampton Synagogue (Orthodox), Westhampton Beach NY
- Cathedral of Christ the King (Roman Catholic), Atlanta GA
- Temple Emanu-El (Reform), New York NY
- St. James-the-Less Episcopal Church, Scarsdale NY
- Congregation Shearith Israel (Orthodox), New York NY
- First Presbyterian Church, New Bern NC
- St. Martin-in-the-Fields Episcopal Church, Philadelphia PA
- Congregation Agudas Achim (Conservative), Austin TX
- Cathedral of St. John the Baptist (Roman Catholic), Savannah GA
- First Church of Christ Scientist, Greenwich CT
- Christ Church Cathedral (Episcopal), Louisville KY
- St. John’s Seminary Chapel (Roman Catholic), Brighton MA
- Presbyterian Church of Chestnut Hill, Philadelphia PA
- West Market Street United Methodist Church, Greensboro NC
- St. James’s Episcopal Church, Richmond VA
- Park Avenue Synagogue (Conservative), New York NY

**CONTACT INFORMATION**

We are always delighted to talk to prospective clients about their acoustics needs and project goals. Please contact:

Dan Clayton, Principal Consultant  
CLAYTON ACOUSTICS GROUP  
73 Croton Avenue, Suite 102  
Ossining, NY 10562-4972  
Tel: 914-762-2162  Fax: 914-762-3498  
Mobile: 914-643-1647  
Email: danclayton@claytonacoustics.com  
Web: claytonacoustics.com
CONGREGATION AGUDAS ACHIM
AUSTIN, TX

This strikingly modern Sephardic-style sanctuary was built in 2001 by a large and growing Conservative congregation. Main floor and balcony levels seat one thousand, and wrap around three sides of the sanctuary which features a central bema for Torah reading. The front bema, with Ark and rabbi’s pulpit, is at the east wall. The sound system provides “hands-free” speech and vocal reinforcement for worship services. Microphone signals from talkers at the front and center bemas are fed through automatic mixers and then a multi-channel digital signal processor configured with an innovative “zoned delay-level-mixing matrix.” A ten-zone system of overhead distributed ceiling and pendant loudspeakers are discretely integrated into the building. This complex system simultaneously maintains “location realism” to talkers at both bemas for listeners throughout the sanctuary.

FREE SYNAGOGUE OF FLUSHING
FLUSHING, NY

Founded in 1917 upon the principals of Rabbi Stephen Wise, the Free Synagogue of Flushing is the oldest Reform Synagogue both on Long Island and in continual existence on its original site in the Borough of Queens. Although the surrounding neighborhood of Flushing has changed remarkably in the last generation (now home to one of the largest “Chinatowns” in the United States), a large and loyal congregation still gathers from across Queens to worship together each Sabbath. The neoclassical sanctuary was constructed in 1926 and features a massive 60-foot diameter dome crowned by a Star-of-David stained glass dome. We were asked to help the congregation solve years of accumulated sound system problems—on a tight budget. Some parts of the system dated from the mid 20th century (such as the loudspeakers shown in this photo). We outlined an all-new, simple, cost-effective system which addressed the needs of clergy, musicians and the congregation, and then turned the project over to a local sound contractor.