

# THE ACOUSTICS CONSULTING PROCESS

**A**RCHITECTS ROUTINELY COLLABORATE WITH CONSULTANTS, BUT IT SEEMS THAT EVERY specialty consultant has different priorities, needs, and work styles. Acoustics Consultants are no exception. The collaboration and exchange of information between the Architect and Acoustics Consultant are critically important to the successful utilization of the consultant's talent and experience by the Architect and to the successful implementation of the consultant's design input. This summary of **MuSONICS'** scope of work, objectives, and communication needs should help the Architect and Owner make the most productive and effective use of the project Acoustics Consultant.

**MuSONICS** will be involved in five distinct and essential areas of sound and acoustics:

1. **Natural/Architectural Acoustics:** The response of an architectural space to sound (speech, music, and/or noise) without amplification. Natural acoustics involves the shape, dimensions, proportions, surface finishes, etc., of a space.
2. **Music Space Planning:** The location and configuration of the area for music ministry as integral parts of the architectural and acoustical design enabling musicians to see and hear each other as well as project their sound to the congregation.
3. **Acoustic Isolation:** The sound-insulating properties that prevent the intrusion of unwanted sound from the exterior or from other rooms within the building.
4. **Mechanical System Noise and Vibration Control:** Modifications or refinements of the mechanical system design to control or minimize any building system noise that could interfere with optimum room use. This includes noise from HVAC, plumbing, electrical devices, etc.
5. **Sound Reinforcement Systems:** A complete design and Equipment Specification for sound reinforcement systems to provide excellent speech intelligibility and to support music. This will include a collaborative effort involving liturgical and musical needs.

To provide the Architect and other design team members with the needed design input throughout the entire building project, the following items are typically involved:

## PROGRAMMING AND SCHEMATIC DESIGN PHASES

The Acoustics Consultant needs the following items and involvement with the Owner and other design team members:

1. A Project Directory listing the firms, addresses, and other contact information for all design team members and Owner's Representatives. A design team kick-off meeting is often an ideal way to initiate the professional and personal relationships that will be needed throughout the project.
2. A Program Manual or formal program statement outlining the uses and priorities for the building including specialized needs and functions.
3. Preliminary Schematic Design sketches and progress drawings as they are developed. It is strongly recommended that the Acoustics Consultant be involved in formulating SD concepts and evaluating basic design factors before any drawings are submitted to the Owner.
4. Meetings, site visits, and interviews with the Architect, Owner's Representatives, other design team members, etc., to clarify needs, expectations, and priorities. This may include a tour of the existing church, attendance at worship services, visits to representative or comparable churches in the area, design charettes, etc.

The Acoustics Consultant will provide the following:

1. Preliminary recommendations and acoustical design criteria for rooms and major spaces including room dimensions, proportions, reverberation criteria, etc.
2. Preliminary recommendations for sound isolation to prevent the intrusion of noise from outdoors, and to prevent sound interference between rooms within the building.
3. Preliminary recommendations and Guidelines for noise criteria and basic design approaches for the control of noise and vibration from HVAC systems.
4. Development of preliminary design requirements and cost opinions for sound reinforcement systems including:
  - Speech reinforcement
  - Music, choral, and instrumental reinforcement
  - Recording and playback
  - System for the hearing impaired.
5. Preliminary recommendations and guidance for music ministries. This will include a preliminary evaluation of music programs, space planning, and initial design assessments for some or all of the following:
  - Traditional and contemporary vocal and instrumental groups
  - Major musical instruments such as an organ, piano, synthesizers, etc.
  - Storage of music, instruments, robes, etc.
  - Music rehearsal spaces and sound control locations.

## DESIGN DEVELOPMENT AND CONSTRUCTION DOCUMENTS PHASES

The Acoustics Consultant needs the following items from the Architect, Owner, and other design team members:

1. Updated and revised Programming information and the final set of Schematic Design Drawings as approved by the Owner. These are usually provided at the end of the SD phase.
2. Outline Specifications and/or Preliminary Project Manual.
3. Complete drawings and specifications at 50% and 90% of Design Development and at 75% and 100% of Construction Documents. Note: All drawing sets provided to the Acoustics Consultant must include the complete architectural, mechanical, electrical, and plumbing (MEP) drawings. Progress drawings should also be provided as needed.
4. Complete information for mechanical systems at 50% and 90% of Design Development and at 75% and 100% of Construction Documents. The information required is the same as typically shown on Mechanical Equipment Schedules: brake and motor horsepower, CFM, rpm, total static pressure, etc. Manufacturers' noise data should be provided if it is available and forwarded directly to the Acoustical Consultant.
5. Response and review from the Owner and Owner's Representatives of the Preliminary Sound System Specification and Music Master Planning review.

The Acoustics Consultant will continue the development of all the work initiated in the Programming and SD phases and will provide:

1. A review of revised Programming information and approved Schematic Design drawings.
2. Guideline Specifications to assist the Architect in the development of the Project Specification and/or Project Manual.
3. A review of drawings and specifications at 50% and 90% of Design Development and at 75% and 100% of Construction Documents. Reviews will include a written report and/or mark-ups of the submitted documents.
4. A complete noise analysis for building mechanical systems at 50% and 90% of Design Development and at 75% and 90% of Construction Documents. Recommendations for noise control treatments will be provided to the Mechanical Engineer as needed.
5. A written Functional Description of Sound Reinforcement Systems developed through collaboration with Owner's Representatives. This Functional Description will serve as the basis for a Sound System Equipment Specification. The Sound System Specification will be offered for bid to qualified sound contractors.
6. Continued development and a final revision of the Music Master Plan. The Music Master Plan will be used to identify specific items that should be included in the Project Specifications or assist the Owner in specifying items needed that are not included in the Architect's scope of work. This might include items such as: choral risers, seating for music groups, major musical instruments and associated provisions (blower rooms, organ speakers, midi capabilities, etc.)

All of the above work will include the preparation of drawings, sketches, and reports as needed to convey recommendations for architectural acoustics, sound isolation, mechanical system noise and vibration control, etc.

## CONSTRUCTION AND FINAL PERFORMANCE VERIFICATION

The Acoustics Consultant needs the following items from the Architect, Owner, and other design team members:

1. The final set of Construction Documents (drawings and specifications) as approved by the Owner.
2. Submittals, cutsheets, shop drawings, and other documents related to the construction process including alternates, value engineering proposals, change orders, etc., that involve any and all aspect of the Acoustics Consultants' work.

The Acoustics Consultant will provide the following:

1. Review of pertinent bid and shop drawings.
2. Site visits during construction to verify the construction and/or installation of critical acoustical elements.
3. Post-completion checkout of the facilities and acceptance testing of installed systems and equipment for which the Acoustics Consultant has developed performance specifications. Specific checkout items and measurements will include room acoustics (reverberation, echoes, etc.), sound isolation, mechanical system noise levels, sound reinforcement systems.
4. Final punch list and recommendations for fine tuning as needed.