Student Design Competition 2015

TCAA
Technical Committee on Architectural Acoustics

Acoustical Society of America

NCAC
National Council of Acoustical Consultants

Announcement

The Acoustical Society of America's Technical Committee on Architectural Acoustics and the National Council of Acoustical Consultants is sponsoring a student design competition to be judged and displayed at the 169th meeting of Acoustical Society of America in Pittsburgh, Pennsylvania, May 18 – May 22, 2015.

The 2015 design competition involves the design of a performance venue addition to a casino and hotel facility in downtown Pittsburgh, Pennsylvania. Refer to the Design Scenario that follows in this information.

The Student Design Competition is open to students in the disciplines of Architecture, Engineering, Physics and other curricula that involve building design and/or acoustics. This competition is intended to encourage students to express their knowledge of architectural acoustics and noise control in the design of a facility in which acoustical considerations are of significant importance.

Participation and Registration

Entries may be submitted by individual students or teams of a maximum of three students. Undergraduate and graduate students are encouraged to participate, and the participants must be registered as a student during the spring semester of the competition. Entries must be limited by each institution to three. Entries submitted by teams with teammates from different colleges within the same university will count as entries from the same institution. Up to two additional entries per institution are allowed if its entrants from the institution team with entrants from a separate institution. Note that only a maximum of two awards (First Honors and Commendation) will be awarded per university.

Students intending to enter the competition must register by sending an email to sdc@newmanfund.org by **April 10, 2015**. In the email, please indicate your name(s), school, and faculty advisor. Provide the email addresses of the faculty advisor and one team member to serve as contact for the entire team.

Presentation Format and Submission Procedure

Entries are to be poster presentations. Submissions shall be presented on up to three (3) separate display boards with maximum dimensions of 22x28 in. (56x71 cm) per board.

Design and layout of the submissions should account for the presentation style. The font size, amount of narrative next, and number of graphs should be appropriate for poster viewing. A thoughtful viewing and analysis of the presentation should be possible in 5 to 8 minutes.

Separate design details, calculations or other documentation may not be attached to the boards. The judges will not review such information. However, such information may be displayed on the boards.

Presentation boards should be suitable for wall or easel display. Means of attachment to the wall or easel will be provided by the competition, (submissions need not include Velcro or pins).

In an opaque envelope affixed to the back of EACH display board, provide the name, address, phone, email addresses, school affiliation and advisor/sponsor of all participating team members. And, please indicate summer e-mail and mailing addresses for all team members. Team member names, school affiliation, etc. will not be revealed to the competition judges. In addition, include a layout reference for the order in which the boards should be displayed.

Presentations should be wrapped in opaque paper for submission to the competition. Wrapping will not be removed until the submissions are displayed for the competition. Please package display boards securely to prevent damage during shipping.

For entry in the competition, presentation boards must be received no later than **Thursday May 14, 2015** at the following address:

SDC c/o Babich Acoustics
7507 W. Hutchison Ave
Pittsburgh, PA 15218
412-228-0917

However, students attending the Pittsburgh meeting may deliver their entries assuming that they are available at the hotel meeting room no later than **8:30 am on Tuesday May 19, 2015**.

An e-mail message must be sent to sdc@newmanfund.org by **5:00 pm on May 7, 2015** indicating that presentation boards have been sent to the above address or that they will be delivered at the meeting.

Technical Requirements

Design competition entries should emphasize the general building acoustics design (room acoustics, noise control, and acoustic isolation). Acoustical design for the Performance Space is of primary importance, but other programmed building spaces must be included in the overall design and considered in regard to room acoustics and noise control relating to the performance hall and neighboring spaces. Presentations may include plan and section drawings, renderings, acoustical calculations, acoustical criteria, and details of construction relating to acoustics and noise control as necessary to describe and support the design. If computer programs are used in the design, graphics and data from the programs may be displayed but are not considered with the same weight as design fundamentals.

While the design of the building mechanical and electrical systems is very important to the acoustical success of a project, it is not necessary to indicate in detail the mechanical and electrical system noise control procedures that are required. However, the presenter(s) may wish to indicate noise criteria, along with general noise and vibration control procedures relating to air handling, electrical transformers, theatrical lighting dimmers, etc. And, for this particular design problem, it is not necessary to indicate special stage facilities for performances such as stage rigging, side and rear slip stages, stage traps, etc. However, space for these facilities should be included.

At this time, specific design of sound reinforcement systems should not be included. However, physical locations for loudspeakers and a location for an in-house mix locations should be indicated.

References

Useful references for performing arts venue design include:

- *Concert Halls and Opera Houses: Music, Acoustics, and Architecture,* Leo Beranek, 2nd Edition, 2002, Springer-Verlag
- *Halls for Music Performance: Two Decades of Experience, 1962-1982,* Acoustical Society of America
- *Halls for Music Performance: Another Two Decades of Experience, 1982-2002,* Acoustical Society of America
- *Performing Arts Spaces,* Paul Scarbrough and Robert Campbell, Time-Saver Standards for Building Types
- *Rock and Pop Venues : Acoustic and Architectural Design*, Niels Werner Adelman-Larsen, Springer-Verlag

Design Scenario

A prospering casino and hotel facility in downtown Pittsburgh, Pennsylvania is looking to expand their market by embarking on a performing arts venue expansion project. The multipurpose performance hall will present national and international performances, including pop and country entertainers, Broadway-style productions, comedy shows, dance reviews, and more. The 2,100 seat venue should retain an intimate experience for both audiences and performers, and should be capable of hosting lectures.

Following is the architectural program statement for the performance facility addition which defines the building desired by the casino and hotel owner.

Building Program

Performance Hall

Audience Seating: Approximately 2,100 seats Between a floor and a bsalcony; seating and exits should adhere to standards in the International building code.

Stage: Approximately 5,000 ft^2 (560 m^2) with depth of approximately 40 ft (from proscenium wall to upstage wall) including side stage wings for rigging control, storage, and preparation. This area does not include the pit in its highest raised position (level with the stage floor).

Stage Proscenium: 60 ft (18.29 m) wide and 30 ft (9.15 m) high.

Stage House: Minimum 75 foot tall fly tower with rigging system and with stage to gridiron height of 2.5 to 3.0 times the proscenium height.

Orchestra Pit: To accommodate an orchestra of approximately 25-30 musicians (approximately 25 ft^2 per musician). At least one pit lift with highest position at stage level. The pit opening shall not be included in the stage floor area. Pit acoustics should be considered with respect to a typical amplified touring system.

Variable Acoustics: Variable acoustics may be included if the entrants determine that it would serve the programming, and should provide an appropriate description of the approach, reasoning, and related criteria. Electro-acoustic enhancement systems (active acoustic systems) are not to be considered as a solution for achieving variable acoustics.

Backstage Area:

A backstage area shall consist of approximately 4,000 ft^2 with easy access to the stage and truck loading dock. The door(s) for scenery entrance and exit shall have minimum dimensions of approximately 18 ft wide and 25 ft high.

Dressing Rooms:

Dressing rooms should have adequate sound isolation from neighboring spaces to all musicians and vocalists to warm-up prior to performance. All dressing rooms shall have attached restrooms with adequate facilities to handle the maximum occupancy for each space. (The restrooms do not need to be designed, but adequate space should be provided.)

- Two chorus dressing rooms at approximately 500 ft^2 each. *(Max. Occ. 30)*
- Four solo dressing rooms at approximately 200 ft^2 (18.6 m^2) each. *(Max. Occ. 5)*
- Two 4-person dressing rooms at approximately 350 ft^2 (32.5 m^2) each. *(Max. Occ. 8)*
- Orchestra dressing room at approximately 850 ft^2 with easy access to orchestra pit. *(Max. Occ. 40)*

Tractor Trailer Loading Dock

The truck loading dock should have easy access to the stage and scene shop for scenery and other materials. Acoustical considerations should be applied to the tractor trailer loading dock in regards to noise transmitted into the building and to the neighboring properties.

Green Room

Multipurpose Green Room at approximately 1000 ft^2.

Lobby

The Lobby shall serve as the entrance to the Performance Hall, a box office and house manager's office. Additionally the lobby should have direct access to both the hotel lobby and main casino floor.

Mechanical Equipment Room (MER)

Due to site constraints, the Mechanical Equipment Room (approximately 1,200 ft^2) must be housed on the roof of the main structure of the new building addition. The MER will primarily house air handlers, as chilled water and steam are available from the main casino MER. The noise and vibration from the MER must be considered in relation to adjacent and nearby receivers, including the performance hall, the nearby hotel towers, and neighboring properties.

Storage

Provide sufficient storage space, approximately 5,000 ft^2 (470 m^2), across multiple spaces within easy access to the stage, pit, and green room to allow for equipment including 2 full size grand pianos, small instruments, scenery, and rigging.

Building Site

The site for the performance hall is relatively flat and is situated in the North Shore District of Pittsburgh, Pennsylvania (40°26'52.72"N and 80°1'27.19"W). It is bounded on the south by the Ohio River, on the West by the West End Bridge (US Interstate 19 - 4 lanes), on the north by 65th Infantry Memorial Highway (Pennsylvania State Highway 65 – 6 lanes), and the existing casino facility to the east. It is located approximately 1800 feet from Heinz Field to the east, 1700 feet (from a 2 track railroad to the southwest, and 1500 ft directly under the flight-path from the Pittsburgh International Airport (located 10 miles to the west-northwest).

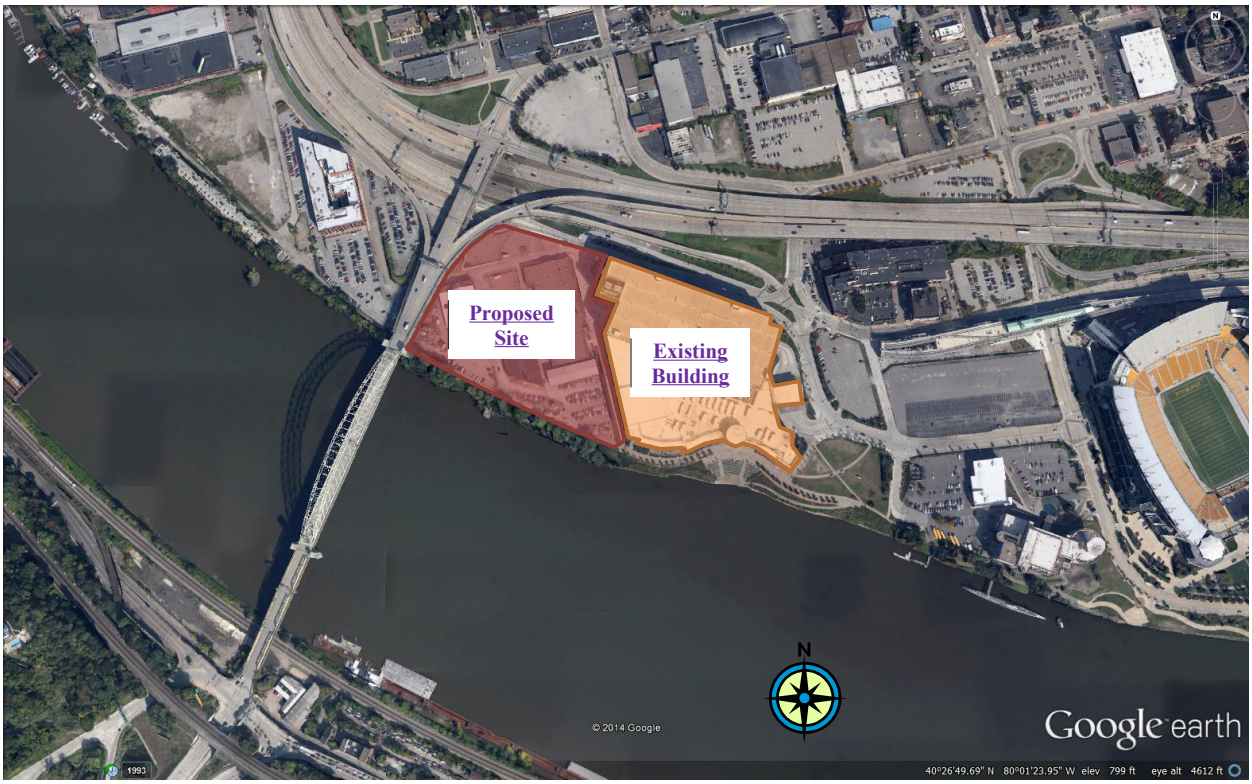

Figure 1 Image courtesy of Google Earth.

Judging and Awards

The submitted designs will be judged by a panel of practicing design professionals. The panel will include acoustical consultants and architect(s), and perhaps a theatrical consultant.

Entries will be evaluated on technical merit, design vision, effectiveness of presentation, and adherence to the design scenario and program requirements.

An award of $1,250 will be made to the individual or team whose entry is chosen as "First Honors". "Commendation" awards of $700 will be made for four other outstanding entries.

Questions and Clarifications

Questions regarding the competition requirements or clarifications about the design scenario may be directed to the design competition chairs via email (see contact information at end of document). Questions and answers deemed to affect all entries will be copied to all participants and advisors who have registered. Questions relating to procedural matters (shipping of posters, etc.) may be directed to any of the design competition chairs as noted below.

Competition Timeline

December 2014	Release of Announcement and Design Scenario
April 10, 2015	Registration Deadline
May 14, 2015	Deadline for Receipt of Submissions
May 18-22, 2015	169th meeting of Acoustical Society of America in Pittsburgh, PA

Student Design Competition Chairs
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