

STUDENT DESIGN COMPETITION 2013

TCAA
TECHNICAL COMMITTEE ON
ARCHITECTURAL ACOUSTICS



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 21st International Congress on Acoustics and 165th meeting of Acoustical Society of America in Montreal, Quebec, Canada, June 2 – June 7, 2013.

The 2013 design competition involves the design of a college performance hall and related facilities primarily for the school's strong opera program. 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. Each participating school shall be limited to three (3) entries consisting of participants from the same school and one (1) collaborative entry consisting of participants from multiple schools. Students are not allowed to be a participant in more than one entry.

Students intending to enter the competition must register by sending an email to Norman Philipp (nphilipp@pittstate.edu) on or before **April 8, 2013**. In the email, please indicate the name(s) of all team members, 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. **(Note that this requirement has changed since previous competitions. The overall**

dimensional area of presentation has not been significantly altered. The modified size is intended to ease handling and reduce shipping costs.)

Design and layout of the submissions should account for the presentation style. The font size, amount of narrative text, 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 **Tuesday May 21, 2013** at the following address:

Prof. Norman Philipp
School of Construction
Pittsburg State University
1701 South Broadway
Pittsburg, KS 66762

However, students attending the Montreal meeting may deliver their entries assuming that they are available at the convention center (Palais des Congrès de Montréal) in Montreal no later than **8:30 am on Tuesday June 4, 2013.**

An e-mail message must be sent to Norman Philipp (nphilipp@pittstate.edu) by **5:00 pm on May 22, 2013** 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 Hall** and the **Rehearsal Room** are of primary importance, but other programmed building spaces must be included in the overall design and they may be similarly considered in regard to room acoustics and noise control at the discretion of each competition participant(s) and in the interest of design completeness. 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.

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 opera such as stage rigging; side and rear slip stages, stage traps, etc. But, space for these facilities should be included.

At this time, specific design of sound reinforcement systems should not be included. However, geometrical considerations (e.g., space, coverage, sight-lines, etc.) for loudspeakers, in-house mix location, etc. should be provided. Electro acoustic enhancement systems are not to be considered as a solution for achieving variable acoustics.

REFERENCES

Useful references for opera house 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

DESIGN SCENARIO

A college of moderate size with a very strong music program intends to construct on their campus a performance hall primarily for opera. Opera performances are typically from the standard repertory (excluding Wagner) with a 70 member orchestra and a 40 to 50 person chorus with both student performances and performances by professional opera companies. Although the main purpose of the hall is to support the traditional opera program, the hall will also be used for musical theatre, orchestral concerts, chamber music, chorus, dance, and occasional lectures.

Following is the architectural program statement for the opera performance facility which defines the building desired by the college.

BUILDING PROGRAM

Performance Hall

Audience Seating: Approximately 1,200 seats with roughly 40% of the seating in two or three levels of side and rear balconies and/or boxes. The orchestra (main floor) seating arrangement may be traditional with aisles or that which has been commonly called "continental" seating.

Stage: Approximately 6,000 ft² (560 m²) with depth of approximately 60 ft (18m) (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: Minimum 50 ft (15.25 m) wide and 30 ft (9.15 m) high.

Stage House: Fully rigged with conventional counterweight 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 70 musicians (approximately 1800 ft² (170 m²)). 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 to allow for adequate sound projection from the pit to the audience seating area. Variable acoustics may also be considered to allow for different styles of opera.

Variable Acoustics: Since the hall is to be used for orchestra and choral stage performances, a portable stage enclosure (shell) is required. Also, it is recommended that variable acoustics for the hall be considered, given the multipurpose nature of the hall.

Scene Shop

The scene shop shall consist of approximately 6,000 ft² (560 m²) with easy access to the stage and truck loading dock. The door(s) for scenery entrance and exit shall have dimensions of approximately 18 ft (5.5 m) wide and 25 ft (7.6 m) high. It is anticipated that the Scene Shop will be in use during rehearsals in the Performance Hall and occasionally during performances.

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.)

- Three chorus dressing rooms at approximately 500 ft² each. (Max. Occ. 30)
- Five solo dressing rooms at approximately 200 ft² (18.6 m²) each. (Max. Occ. 5)
- Two 4-person dressing rooms at approximately 350 ft² (32.5 m²) each. (Max. Occ. 8)
- Orchestra dressing room at approximately 1050 ft² (98 m²) with easy access to orchestra pit. (Max. Occ. 70)

Costume Shop, Wardrobe Room, and Wig Shop

The total combined footprint of the costume shop, wardrobe room, and wig shop should consist of approximately 1,200 ft² (112 m²).

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.

Rehearsal Room

The Rehearsal Room requires a space with daylighting of approximately 2,800 ft² (250 m²), for dancers, small instrumental ensemble/sectionals and chorus. Additionally, the Rehearsal Room shall have four (4) attached acoustically isolated practice rooms of approximately 100 ft² (9 m²) each. The Rehearsal Room may also be used for pre/post function events including, but not limited to: lectures, meetings, receptions, workshops, and small group ensemble performances.

Green Room

Multipurpose Green Room at approximately 1200 ft² (112 m²). The Green Room shall be used for performer relaxation and pre/post function events (including lectures, meetings, receptions, workshops, and small group ensemble (instrumental and/or choral) performances.

Lobby

The Lobby shall serve as the entrance to the Performance Hall, a box office and house manager's office. In addition to serving as a typical lobby, it will be used on occasion for art exhibits, meetings, luncheons and dinners, receptions, and small ensemble (choral and/or instrumental) performance.

Mechanical Equipment Room (MER)

Due to site constraints, the Mechanical Equipment Room (approximately 1,400 ft² (130 m²)) must be housed within or on the roof of the main structure of the new building. The MER will primarily house air handlers, as chilled water and steam are available from a nearby college building. The noise and vibration from the MER must be considered in relation to adjacent and nearby receivers, including neighboring properties.

Storage

Provide sufficient storage space, approximately 5,000 ft² (470 m²), across multiple spaces within easy access to the stage, pit, green room and rehearsal room to allow for 2 full size grand pianos, small instruments, scenery, and rigging.

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 2012	Release of Announcement and Design Scenario
April 08, 2013	Registration Deadline
May 21, 2013	Deadline for Receipt of Submissions
June 2-7, 2013	21 st International Congress on Acoustics and 165 th Meeting of Acoustical Society of America, Montreal, Quebec, Canada

STUDENT DESIGN COMPETITION CHAIRS

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