

**NEWMAN STUDENT AWARD FUND'S**

**2022**  
**STUDENT DESIGN**  
**COMPETITION**

**PRESENTED BY:**



**ROBERT BRADFORD NEWMAN STUDENT AWARD FUND  
THROUGH THE ACOUSTICAL SOCIETY OF AMERICA -  
TECHNICAL COMMITTEE ON ARCHITECTURAL ACOUSTICS**

**SPONSORED BY:**



*Your Performance Partner*

**THE WENGER FOUNDATION**

## INTRODUCTION

The Technical Committee on Architectural Acoustics with support from the Robert Bradford Newman Student Award Fund (<http://www.newmanfund.org/>) and The Wenger Foundation, is sponsoring a student design competition to be judged as part of the 183<sup>rd</sup> meeting of the Acoustical Society of America, 5-9 December 7-11, 2022.

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

## GENERAL INFORMATION

### ENTRY REQUIREMENTS

Entries may be submitted by individual students or teams of a maximum of three students. Each person is restricted to one submission, they may not submit as part of multiple teams. Undergraduate and graduate students are encouraged to participate. Participants must be registered as a student during a portion of the 2022 calendar year. Teams comprised of students from different institutions are welcome. Teams comprised of students from different disciplines (Acoustics, Sound Arts, Architecture, etc.) are encouraged. You may work with a faculty advisor, but it is not a requirement for entry. ASA Meeting attendance is not required to participate in the competition.

### ENTRY LIMITS

To Professors: We are removing the limitations on the number of entries from an institution. Our previous restrictions had stated, *"If the design brief is used as part of a course, entries must be limited to three per institution. Entries submitted by teams with teammates from different colleges within the same university will count as entries from the same institution. Up to three additional entries per institution are allowed if its entrants from your institution are teaming with entrants from a separate institution."*

## REGISTRATION

Teams must register by e-mail **on or before 1:00 PM (CST) on November 1, 2022** to the competition co-chair at [robin@thresholdacoustics.com](mailto:robin@thresholdacoustics.com). In the e-mail, please include the following:

1. The name and contact information of each entrant on the team. For each team member, please include:
  - a. Name
  - b. School affiliation
  - c. Email addresses
2. The name of your faculty advisor, his or her school, and his or her e-mail address.
3. If the project will be completed:
  - a. For credit as part of a design studio
  - b. For credit as part of a non-studio class
  - c. As an extra-curricular project
4. Indicate the student participant who will serve as primary contact for the team. The primary contact will serve as a vital link for receiving information and updates on the competition. This may include answers to frequently asked questions and changes to information presented in this bulletin.

## JUDGING AND AWARDS

Entries will be evaluated on technical merit, design vision, innovation, and effectiveness of presentation.

The submitted designs will be judged by a panel of practicing design professionals and university faculty. The panel may include acoustical consultants, architects, theatrical consultants, and educators in associated fields.

Awards are made possible through a generous donation from the Wenger Foundation to the Newman Student Award Fund and will include:

- One First Honors prize of \$1,400
- Up to Four Commendation Awards of \$900

## PRESENTATION FORMAT AND SUBMISSION PROCEDURE

As of the penning of the brief, the 183<sup>rd</sup> Meeting of the Acoustical Society of America, will take place in December 2022 and will be held in-person in Nashville, Tennessee, USA. Submission requirements will include a digital submission for judging prior to the in-person meeting and a printed copy of the submission for display at the ASA Meeting where the winners will be announced during the Technical Committee on Architectural Acoustics.

Entrants shall submit digital poster as pdfs with maximum dimensions equivalent to 3 poster boards of 22 x 28 inches (56 x 71 cm) per board. Additional documentation beyond that accommodated within the area of the 3 boards may not be included. Text and image size on the display surface shall be legible at a distance of 3 feet (1 meter), as if the boards were to be printed and displayed. Body text may be no smaller than 24-point font; captions may be no smaller than 18-point font. The font size, amount of narrative text, and number of graphs should be appropriate for poster viewing. A thoughtful viewing of the presentation should be possible in about 10 minutes.

The competition language is English.

Digital Submission:

- Please submit one version of your digital submission with no identifying team names or school affiliation for judging.
- Submit a second digital copy with all entrants' names and school affiliation included under the submissions project name. The second version will be posted on the Robert Bradford Newman Student Award Fund website for viewing. (<https://www.newmanfund.org/student-design-competitions/2019-sdc-announcement/>). All submissions will be posted on the website.
- Include a separate text file (.doc or similar, please do not send as a .pdf) with the names, addresses, phone numbers, e-mail addresses, school affiliations, and advisor(s) of all participating team members. Team member identifying information (names, addresses, etc.) will not be revealed to the competition judges.
- Digital submission shall be received **on or before 5:00 PM (CST) on 14 November 2022.**
- Please use send documents via We Transfer at <https://wettransfer.com/> to Robin Glosemeyer Petrone at [robin@thresholdacoustics.com](mailto:robin@thresholdacoustics.com)

Hard Copy Submission:

- Please bring or mail a hard copy submissions to the 183<sup>rd</sup> ASA Meeting in Tennessee for display during the meeting. Your submission will remain on display throughout the entire meeting and will be displayed during the TCAA committee meeting (typically on Tuesday) when the winners are announcement and presented awards.
  - If you choose to mail your hard copy, please send the package to Attention: Guest and Acoustical

## 2022 NEWMAN AWARD FUND STUDENT DESIGN COMPETITION

Society of American Meeting Attendee Robin Glosemeyer Petrone. Schedule the package to arrive between 2-4 December 2022, prior to the beginning of the meetings on 5 December 2022.

- Submission are to be mounted on up to three (3) separate display boards with maximum dimensions of 22 x 28 inches (56 x 71 cm) per board. Mount posters to foam core board or another rigid backer for display.

### Awards

- Awards will be mailed to the primary contact after the meeting during the month of December 2022.

### Additional Information

- Additional Information may be obtained by contacting:

Robin Glosemeyer Petrone  
Threshold Acoustics  
P 312.386.1400  
E [robin@thresholdacoustics.com](mailto:robin@thresholdacoustics.com)

## SUGGESTED REFERENCES

- Architectural Acoustics (1988, reprinted in 2007) by M. David Egan
- Architectural Acoustics Illustrated (2015) by Michael Ermann
- Architectural Acoustics, 2nd Edition (2014) by Marshall Long
- Acoustical Design of Theatres for Drama Performance (2010) by David T. Bradley (Editor), Erica E. Ryherd (Editor), Michelle C. Vigeant (Editor)
- Concert Halls and Opera Houses: Music, Acoustics, and Architecture, 2nd Edition (2003) by Leo Beranek

## TIMELINE SUMMARY

- 16 January 2022 – Design Competition Announced
- 1 November 2022– registration to be submitted by 1:00 PM Central Standard Time
- 14 November 2022 – submissions to be posted by 1:00 PM Central Standard Time.
- 5-9 December 2022 - Posting of submissions for open exhibition at the 183<sup>rd</sup> ASA meeting
- December 2022 - Announcement of winners in the TCAA meeting session
- December 2022 – Distribution of awards

## CO-CHAIRS CONTACT INFORMATION

Competition primary contact will be through the e-mail address [robin@thresholdacoustics.com](mailto:robin@thresholdacoustics.com)

## NEWMAN STUDENT AWARD FUND COCHAIRS:

Robin Glosemeyer Petrone  
Threshold Acoustics

Daniel J. Butko  
University of Oklahoma

## DESIGN SCENARIO

A regional drama theatre company intends to construct a new 700-seat, end stage theatre to accommodate dramatic and musical performances. The facility will include a pit for up to 15 musicians for musicals. In addition to the theatre Company's performances, they will also rent their facility on dark days. The rental events may use the lobby and/or the theatre spaces.

The building will include a rehearsal room of the same area as the stage play area. one the size of the stage, and a second smaller room for scene work.

The site for the center is relatively flat and it is located approximately 200 feet from a major 6-lane highway.

## PROGRAM DETAILS

Following is the architectural program statement for the theatre facility which defines the building (for the purposes of this design competition) desired by the Theatre Company

700-seat Theatre:

- Audience Seating:
  - 700 seats for dramatic events. The number of seats may be less for musical performances (when lifts are set to pit level)
  - Seating may be distributed between orchestra (main floor) level, upper level side and rear tiers
  - Main floor seating arrangement may be traditional or continental.
- Stage:
  - 40 ft (12 m) wide by 40 ft (12 m) deep play area.
  - 15 ft (4.5 m) wide wings to both sides.
  - Easy access to truck dock for scenery and other material load in and out.
  - There must be a stage cross over corridor for actors and technical staff during the performance, especially for use by staff and performance with mobility assistance need. You may not assume crossover can occur on stage, behind scenery.
- Stage Proscenium: Minimum dimensions of 40 ft (12 m) wide and 30 ft (9 m) high.
- Stage House: Height from stage floor to gridiron approximately 2.5 times height of proscenium.
- Orchestra Pit:
  - Provide one pit lift with the highest play position at stage level – the space will also host corporate events, presentations or lectures, downstage of the main curtain.
  - The pit shall accommodate 15 musicians, 13 musicians at 22 sq.ft. per musician plus a drum kit and a grand piano.
  - The pit must be accessible for performers with mobility assistance needs and to bring large instruments to the pit level without raising the pit lift to stage level
- Variable Acoustics:
  - The theatre will be used for both non-amplified and amplified spoken word as well as amplified musicals, corporate events, presentations and lectures. Variable acoustics finishes may be considered to adjust the room acoustic response for amplified and non-amplified events.
  - The theatre will not host orchestra, recitals, or operatic events. An orchestra shell is not required.

Lobby:

- 3500 ft<sup>2</sup> (325 m<sup>2</sup>) Lobby serves as the entrance space to the theatre.
- Please note: In addition to serving as a typical lobby, it will be used on occasion serves as rental spaces for meetings, launch events, luncheons, dinners, and receptions.

Box Office

- 240 ft<sup>2</sup> (22 m<sup>2</sup>)

Front of House Public Restrooms

- Women's to be 50 ft (15 m) x 16 ft (5 m)
- Men's to be 50 ft (15 m) x 12 ft (3.7 m)
- Two Unisex 130 ft<sup>2</sup> (5 m<sup>2</sup>)

Lighting and Stage Manager Control Room

- 300 ft<sup>2</sup> (28 m<sup>2</sup>)

In-house Audio Mix Position

- 9 ft (3 m) wide, two seating rows deep

Follow Spot Both

- 250 ft<sup>2</sup> (22 m<sup>2</sup>)

Scene Shop

- Approximately 3,200 ft<sup>2</sup> (300 m<sup>2</sup>) with easy (straight) access to stage and to truck loading dock.
- One door for scenery entrance and exit with dimensions of approximately 18 ft (5.5 m) wide and 25 ft high.
- Room height 35 ft to be (10.7 m.)
- Please note: It is anticipated that the Scene Shop will be in use during rehearsals in the theatre; both work in the scene shop and rehearsal on stage must be able to occur simultaneously.

Rehearsal and Warm-up Room:

- Provide at least a 40 ft (12 m) wide by 40 ft (12 m) deep play area, same as the stage play area, with room for circulation around the stages action.
  - Height to be determine but submitter.

Dressing Rooms:

- Three chorus 14-person dressing rooms, approximately 840 ft<sup>2</sup> (77 m<sup>2</sup>) each. Including two non-gendered toilets and 1 shower in each room. Chorus dressing rooms may also be used as warm-up rooms.
- Five solo dressing rooms, approximately 260 ft<sup>2</sup> (56 m<sup>2</sup>) each.
  - Please Note: Dressing rooms will also be used as music practice/ warm-up spaces and should accommodate an upright piano.
- Conductors dressing room. 300 ft<sup>2</sup> (27 m<sup>2</sup>) Include a restroom with shower.
  - Please Note: The dressing room will be used as music practice/ warm-up spaces and should accommodate a grand piano.

Green Room:

- One multipurpose Green Room, approximately 500 ft<sup>2</sup> (46.5 m<sup>2</sup>).

Off-stage Quick Toilet

- 60 ft<sup>2</sup> (5.5 m<sup>2</sup>)

Costume Shop

- 800 ft<sup>2</sup> (70 m<sup>2</sup>)

Wig and Make Up

- 300 ft<sup>2</sup> (27 m<sup>2</sup>)

Prop Pantry

- 100 ft<sup>2</sup> (10 m<sup>2</sup>)

Lighting and Audio Storage and Repair Rooms

- 300 ft<sup>2</sup> (27 m<sup>2</sup>) each.

Dimmer and Audio Rack Rooms

- 250 ft<sup>2</sup> (22 m<sup>2</sup>) each.

MEPFIT (mechanical, electrical, plumbing, fire protection, IT) Rooms

- The MER (mechanical equipment room) will primarily house air handlers. It is estimated that there will be two MER will be a minimum of 1,500 ft<sup>2</sup> (140 m<sup>2</sup>).
- Assume a chiller is required and will be located in a mechanical yard outdoors, within 15' (4.6 m) of one of the building's facades.
  - Please note: Address noise control the chiller as it relates to the theatre and to neighbors, 60' (18 m) away in plan.

	<b>Octave Band Center Frequency (Hertz)</b>							
	<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	<u>4000</u>	<u>8000</u>
Sound Power	64	65	77	82	94	39	87	72
Sound Pressure @ 30' (9m)	36	37	49	54	66	65	59	44

Circulation, Stairs, Elevators, Janitorial

- Include the spaces noted above in the plan layouts.

## SITE NOISE CONSIDERATIONS

Peak levels highway traffic noise levels (on the future site of the building is approximately approximately 200 feet from a major 6-lane highway, prior to construction) in octave frequency bands:

	<b><u>Sound Pressure Levels - dB re 20μ Pa</u></b>							
	<b>Octave Band Center Frequency (Hertz)</b>							
	<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	<u>4000</u>	<u>8000</u>
Roadway Vehicular Traffic	68	70	61	61	63	57	44	38

## TECHNICAL REQUIREMENTS

Design competition entries should emphasize the general building's acoustic design (room acoustics, sound isolation and noise & vibration control) and its interaction with the overall architectural design, with such design included for the facility, support spaces, etc.

The drawings should present comprehensive solutions to the acoustical design in schematic design format. It is not necessary to prepare architectural exterior building elevations.

In addition to plans and sections, the poster boards may display acoustical calculations, acoustical criteria, and details of construction relating to acoustics, sound isolation 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.

Front and back of house support spaces, such as restrooms, costume storage, and equipment rooms, are to be included in the layout of the building. Submission must include the listed spaces in the plans/sections of the building. The submission does not need to address the interior room requirements of each space. If the spaces are likely to have the potential to produce noise either due to the equipment they hold or the intended use, the sound isolation of said rooms should be considered. Examples include noise generated by equipment in MEPFIT rooms, construction in scene shop interrupting rehearsal on stage or in rehearsal room, or rental events in the Lobby while rehearsals occur on stage, to name a few.

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 for this particular design problem. However, the presenter(s) should address noise criteria, and general noise and vibration control procedures relating to air handling, electrical power transformers, theatrical lighting dimmers, etc.

Sound amplification, lift and electroacoustic enhancement system design is outside of the scope of this competition. It is, however, necessary to address the presence of amplification loudspeakers as sound sources. Electroacoustic sound systems are not to be used to produce the change in room acoustic response between amplified and non-amplified performance types.

It is also not necessary, for this particular design problem, to indicate special stage equipment such as stage rigging, side and rear slip stages, traps, etc. The facility will require a sound reinforcement system for distribution of sound to the main seating and tiers seating levels for announcements and speaking engagements. While it is not necessary to design (select specific equipment) for this amplification system as part of the overall design, it is necessary to identify location of loudspeakers to support spoken word, Broadway musical singing and pit band amplification from stage.