

NEWMAN STUDENT AWARD FUND
**2020 STUDENT DESIGN
COMPETITION**

REVISION 2

PRESENTED BY:



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

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INTRODUCTION

The Technical Committee on Architectural Acoustics with support from the Robert Bradford Newman Student Award Fund (<http://www.newmanfund.org/>), The Wenger Foundation, is sponsoring a student design competition to be judged as part of the 179th meeting of the Acoustical Society of America in Chicago, IL December 7-11, 2020.

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. Undergraduate and graduate students are encouraged to participate. Participants must be registered as a student during the spring or fall semesters of 2020. Teams comprised of students from different institutions are welcome. Teams comprised of students from different disciplines are encouraged. A faculty sponsor is strongly recommended, but not required. Meeting attendance is not required to participate in the competition.

ENTRY LIMITS

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.

REGISTRATION

Teams must register by email on or before November 16, 2020 to the competition co-chairs at robin@thresholdacoustics.com. In the e-mail, please include the following:

1. Your name and school
2. The name of your teammates (if any), their school(s) (if different than your school), and their e-mail addresses,
3. The name of your faculty advisor, his or her school, and his or her e-mail address.
4. 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
5. 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 will include

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

PRESENTATION FORMAT AND SUBMISSION PROCEDURE

As the 179th Meeting of the Acoustical Society of America, 7-11 December 2020 will, be held virtually, the submission requirements will now be digital only. Entrants may submit digital poster as pdfs with maximum dimensions equivalent to 3 poster boards of 22 x 28 inches (56 x 71 cm) per board. Hard copies of the boards are no longer required. Additional documentation beyond that accommodated within the area of the 3 board 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 shall be no smaller than 24 point font; captions may be no smaller than 18 point. 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.

Include a separate pdf with the names, addresses, phone numbers, e-mail addresses, school affiliations, and advisor(s) of all participating team members. Please indicate the e-mail and mailing addresses for all team members. Team member identifying information (names, addresses, etc.) will not be revealed to the competition judges.

Submission shall be received no later than **1:00 PM CST on Monday, November 30, 2020.**

Please use send documents via We Transfer at <https://wetransfer.com/> to Robin Glosemeyer Petrone at robin@thresholdacoustics.com

Additional information may be obtained by contacting Robin Glosemeyer Petrone at Threshold Acoustics: Phone 312 386 1400 Email robin@thresholdacoustics.com

SUGGESTED REFERENCES

- Concert Halls and Opera Houses: Music, Acoustics, and Architecture, 2nd Edition (2003) by Leo Beranek
- Acoustical Design of Theatres For Drama Performance: 1985-2010 (2010), Edited by David Bradley, Erica Ryherd, and Michelle Vigeant. (Available from ASA Books: <https://www.abdi-ecommerce10.com/ASA/c-57-all-products.aspx?pagenum=1>)
- 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

STUDENT DESIGN COMPETITION TIMELINE SUMMARY

- December 31, 2019 – Statement release
- April 4, 2020 – Statement Revision 1 modifying submittal date to align with Fall ASA meeting
- October 4, 2020 – Statement Revision 2 modifying submittal to digital and submittal due date
- November 16, 2020 – registration deadline
- November 30, 2020 – submissions to be posted by 1:00 PM Central Standard Time.
- December 8, 2020 – Announcement of winners and posting of submissions for open exhibition.

STUDENT DESIGN COMPETITION CO-CHAIRS CONTACT INFORMATION

Competition primary contact will be through the e-mail address robin@thresholdacoustics.com

Newman Student Award Fund Co-chairs

Robin Glosemeyer Petrone
Threshold Acoustics

Michelle Vigeant
Penn State University

Ian Hoffman
Peabody Institute

DESIGN SCENARIO

A city orchestra wishes to construct a music pavilion, with covered and lawn seating, to serve as its summer home.

PROGRAM DESCRIPTION

The music pavilion will have a variety of functions. The orchestra will only occupy such a facility for $\frac{1}{4}$ of the useable days during a summer season. As a result, the orchestra has formed an alliance with the local opera, ballet and theater companies who will use the facility for an additional $\frac{1}{2}$ of the usable days. The anticipated number of audience members for the orchestra is 10,000 people, while the ballet, theater and opera each expect 7,000 patrons.

With $\frac{1}{4}$ of the schedule still open, and the need to bring in significantly more funds to maintain the facility, the managers of the pavilion will need to schedule popular acts such as rock and jazz to fill the remainder of the schedule. During these popular performances, audiences of up to 25,000 are expected.

The pavilion shall be sized to accommodate 5,000 seated audience members under a roof. An open lawn shall be capable of holding up to 20,000 audience members.

The orchestra, opera and ballet desire a natural acoustic facility for those audience members under the roof. It will, however, be necessary to provide amplification to support of orchestra performances with amplified instruments or singers and voice lift for Broadway and spoken word. Electro-acoustic sound reinforcement system to reach those audience members in the lawn seating and under the roof for popular touring acts. Most touring acts will bring their own sound systems, but some may opt to use the system provided by the facility to cover the open lawn seating areas.

Back of house support space will be required; some will be acoustically sensitive. The orchestra will need a rehearsal room. The ballet, opera and theater will require a room for rehearsal as well. Resident companies and facility staff will need offices. Dressing rooms for the soloist and chorus members are also required.

The site that has been purchased has a natural slope and provides several different location and orientation options. Location and orientation should be considered. The site is surrounded by a river at the north, a state highway on the south and state roads on the east and west. There is a major, 6-lane interstate located 200 feet to the east of the site. Sound levels measured from the interstate have been provided and must be taken into consideration. Please see the attached site plan.

Parking for patron and performers will be required.

PROGRAM DETAILS

The following section is the architectural program statement for the pavilion which defines the building (for the purposes of this design competition) as desired by the orchestra.

Pavilion:

- Audience Seating: Approximately 5000 seats. Orchestra (main floor) seating arrangement may be traditional or continental.
- Stage: Approximately 6,000 ft² (560 m²) with depth of approximately 60 ft (18 m). Easy access to the loading dock for scenery and other materials being transported in and out.
- Stage Proscenium: Minimum dimensions of 50 ft (15 m) wide and 30 ft (9 m) high.
- Stage House: Height from stage floor to gridiron approximately 3 times height of proscenium.

- Orchestra Pit: To accommodate orchestra of approximately 70 members. At least one pit lift with at least three positions...pit level, and stage level.

Rehearsal Rooms:

- Orchestra Rehearsal: To accommodate up to 100 orchestra members.
- Movement Rehearsal: A multipurpose room to accommodate rehearsal as well as a warm up for the ballet, theater, chorus and opera.

Dressing Rooms:

- Two chorus dressing rooms, approximately 600 ft² (56 m²) each.
- Eight solo dressing rooms, approximately 70 ft² (6.5 m²) each. Dressing rooms may also be used as music practice rooms.

Green Room:

- One multipurpose Green Room, approximately 500 ft² (46.5 m²). This room may be used occasionally for meetings and perhaps as a music rehearsal room.

Office Space:

- Three offices for the facility’s technical staff approximately 120 sq.ft.
- Two offices for the resident company’s staff approximately 100 sq.ft.

Mechanical Equipment Room (MER)

- The MER will primarily house air handlers and a scroll type chiller to serve the backstage support and rehearsal spaces. It is estimated that area required by the MER will be a minimum of 800 ft² (75 m²).

SITE NOISE CONSIDERATIONS

Measured highway traffic noise levels at the edge of the site closest to the highway in octave frequency bands are tabulated below:

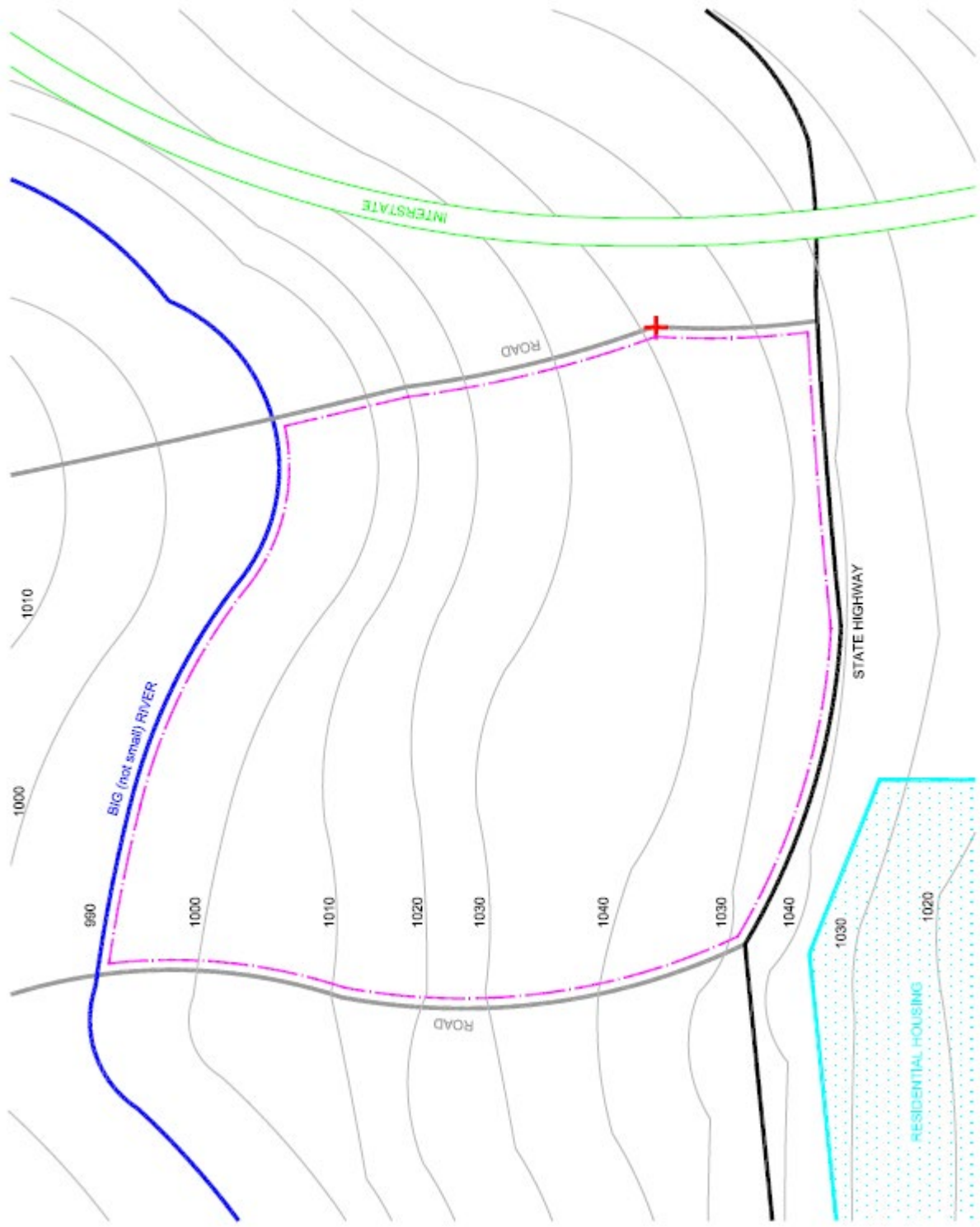
	Octave Band Center Frequency (Hertz)						
	<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	<u>4000</u>
Roadway Vehicular Traffic SPL - dB re 20μ Pa*	65-75	34-76	62-74	63-72	65-70	64-71	60-65

*Each set of levels represents the range of levels observed in each octave frequency band for a 20-minute period during heavy, late afternoon traffic. Levels indicated are believed to represent realistic “worst case” environmental sound levels at the site. Measurements were made at the edge of the site that is closest to the highway.

TECHNICAL REQUIREMENTS

Design competition entries should emphasize the general building acoustics design (room acoustics and noise control) and its interaction with the overall architectural design, with such design included for the facility, support spaces, etc. It is not necessary to prepare architectural exterior building elevations. The drawings should present comprehensive solutions to the acoustical design in schematic design format. In addition to plans and sections, the poster boards may display 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 for this particular design problem 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, and general noise and vibration control procedures relating to air handling, electrical power transformers, theatrical lighting dimmers, etc. 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. As indicated below, the facility will require an electro-acoustic sound reinforcement system for distribution of sound to the main seating and the open lawn seating areas. It is not necessary to design this system as part of the overall design except to identify mounting locations at the stage and that open lawn coverage loudspeaker locations are to be provided and indicated.



ASA Student Design Competition 2020 – Site Plan

