

**NEWMAN STUDENT AWARD FUND'S**

**2024**  
**STUDENT DESIGN**  
**COMPETITION**

**PRESENTED BY:**



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

**SPONSORED BY:**



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## INTRODUCTION

The Technical Committee on Architectural Acoustics with support from the Robert Bradford Newman Student Award Fund and The Wenger Corporation is sponsoring a Student Design Competition to be judged in conjunction with the 185<sup>th</sup> meeting of the Acoustical Society of America, held in Ottawa, Ontario, Canada, 13–17 May 2024.

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 2024 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.

### REGISTRATION

Teams must register by e-mail **before 1:00 PM (CST) on 8 April 2024** with the competition chair, Robin Glosemeyer Petrone at [robin@thresholdacoustics.com](mailto:robin@thresholdacoustics.com). In the e-mail, please include the following information (in an editable text file – **please do not attached as a pdf**):

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, their school, and their e-mail address.
3. Please indicated 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 acoustic design professionals.

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 USD\*
- Up to Four Commendation Awards of 900 USD\*

\* Should the judges determine there to be less than 4 entries worthy of Commendation Awards, the total prize award of USD 5000 USD will be subdivided between the First Honor and Commendation winners.

## PRESENTATION FORMAT AND SUBMISSION PROCEDURE

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 186<sup>th</sup> ASA Meeting in Ottawa, Ontario, Canada, 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. If information is not legible in the digital and print submission, if, for instance the text is too small or is pixilated to the point of illegibility, no "credit" is given for the work.

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/>).
- 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's identifying information (names, addresses, etc.) will not be revealed to the competition judges.
- Digital submission shall be received **on or before 1:00 PM (CST) on 29 April 2024**.
- Please use send documents via We Transfer at <https://wetransfer.com/> to **Robin Glosemeyer Petrone at [robin@thresholdacoustics.com](mailto:robin@thresholdacoustics.com)**

Hard Copy Submission:

- Please bring or mail a hard copy of the submission to the 186<sup>th</sup> ASA Meeting in Ottawa, Canada for display during the Student Design Competition Session. The winners will be announced during the TCAA

## 2024 NEWMAN AWARD FUND STUDENT DESIGN COMPETITION

- committee meeting, typically held on Tuesday evenings.
- If you choose to mail your hard copy, please send it to the Shaw Centre/Westin Ottawa Hotel, 11 Colonel By Dr, Ottawa, ON K1N 9H4, Canada. Address the delivery to Atten: Guest Robin Glosemeyer Petrone. Submissions must arrive on or before Monday, 13 May 2024 at 5 PM Eastern Time.
- Submissions 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 distributed after the meeting during the month of May 2024.

### 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
- Concert Halls and Opera Houses: Music, Acoustics, and Architecture, 2nd Edition (2003) by Leo Beranek

## TIMELINE SUMMARY

- 19 January 2024 – Design Competition Announced
- 8 April 2024 – registration to be submitted by 1:00 PM Central Standard Time
- 29 April 2024 – submissions to be posted by 1:00 PM Central Standard Time.
- 13-17 May 2024 - Posting of submissions for open exhibition at the 183<sup>rd</sup> ASA meeting
- 13-17 May 2024 - Announcement of winners in the TCAA meeting session
- 20-31 May 2023 – Distribution of awards

## CONTACT INFORMATION

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

## DESIGN SCENARIO

A college with a very strong music and vocal program intends to construct a new 1,200-seat performance hall primarily for opera. Although the main purpose of the hall is to support their opera program, the hall will also be used for speaking engagements by the school's president and other invited speakers.

### PROGRAM DETAILS

Following is the architectural program statement for the opera performance facility which defines the building (for the purposes of this design competition) desired by the college. Submissions shall address the room acoustic, sound isolation and noise control needs to support the opera house.

#### Opera Theatre:

- Stage: Approximately 6,000 ft<sup>2</sup> (560 m<sup>2</sup>) with depth of approximately 60 ft (18 m). Easy access to truck dock for scenery and other material load 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.
- Variable Acoustics: Since the hall is to be used occasionally for orchestra and choral stage performances, a portable stage enclosure (orchestra shell) is required. Also, consideration shall be given to providing variable sound absorption for the hall and for the orchestra pit.
- Audience Layout:
  - Approximately 1,200 seats.
  - Approximately 40% of the seating is to be distributed in two or three levels of side and rear balconies.
  - Orchestra (main floor) seating arrangement may be traditional or continental.
- Stage:
  - Area: Approximately 6,000 ft<sup>2</sup> (560 m<sup>2</sup>) with depth of approximately 60 ft (18 m<sup>2</sup>)
  - 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.
  - Provide easy access to loading dock for scenery and other material load in and out of stage area.
  - There must be a stage crossover corridor for musicians and technical staff during the performance, especially for use by staff and performers with mobility assistance requirements. You may not assume crossover occurs on the performance platform.
- Orchestra Pit
  - Must accommodate ensembles of 25 to 80 members.
- Opera House program:
  - Opera – Non-amplified classic repertoire and lightly amplified modern opera.
  - Speaking Events – Amplified.
- 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>)

#### Rehearsal Rooms:

- Opera/Orchestra Rehearsal: To accommodate opera rehearsal, staging or up to 80 orchestra members.

**Dressing Rooms:**

- Two chorus dressing rooms, approximately 600 ft<sup>2</sup> (56 m<sup>2</sup>) each.
- Eight solo dressing rooms, approximately 70 ft<sup>2</sup> (6.5 m<sup>2</sup>) each. Dressing rooms may also be used as music practice rooms.

**Green Room:**

- One multipurpose Green Room, approximately 500 ft<sup>2</sup> (46.5 m<sup>2</sup>). 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 ft<sup>2</sup> (75 m<sup>2</sup>).

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

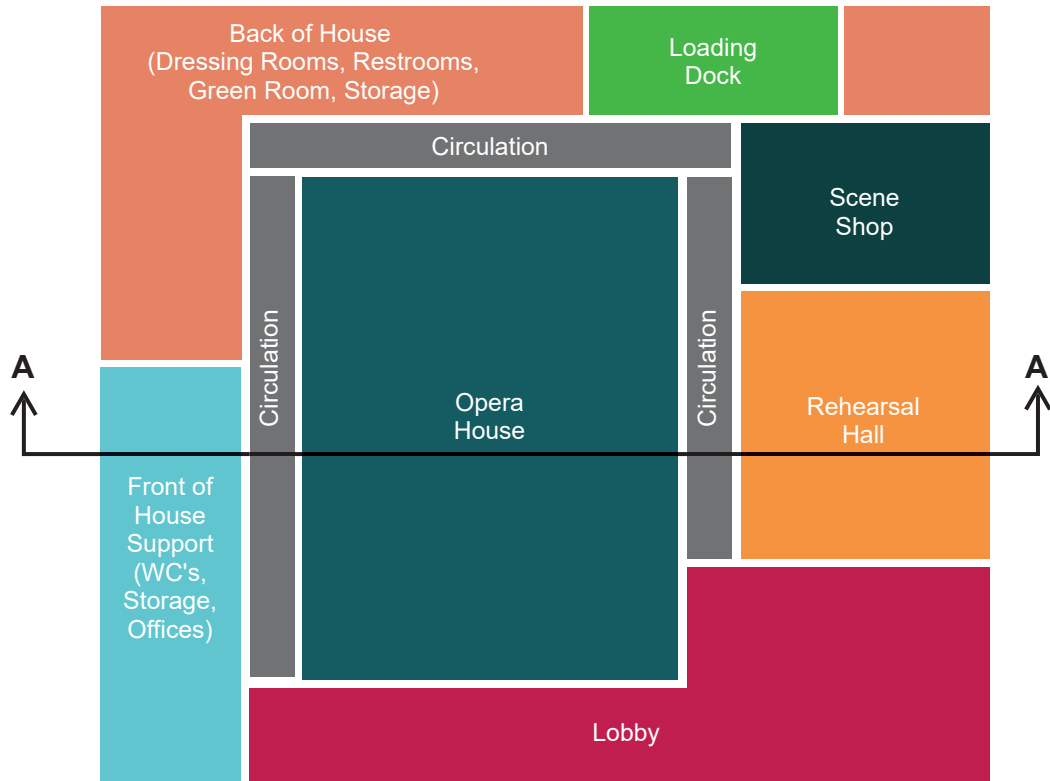
- The MEPFIT Rooms will be located on the second floor of the facility, over the Rehearsal Room and shares a wall with the Concert Hall. See the Plans and Sections.
- The MER will house two air handlers. The casing rated unweighted sound pressure levels, LZeq, for a single unit are as follows. SPLs were gathered in accordance with ARHI 260.

	<b>Sound Pressure Levels</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>
AHU Casing Radiated	71	71	63	63	84	75	62

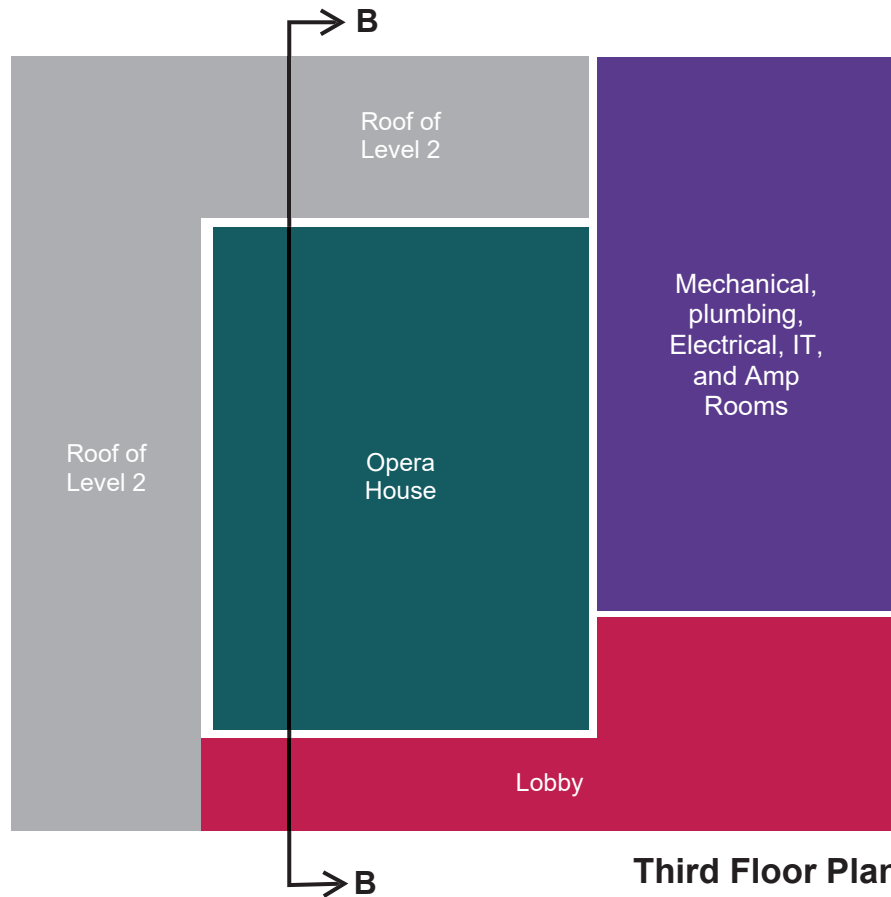
**SITE NOISE CONSIDERATIONS**

The project will be constructed in the city’s downtown on an open city block measuring 300 ft x 360 ft (90 meter x 110 meter.) Highly trafficked streets surround the building site in all four cardinal directions. See the Site Plan. The peak, unweighted, LZeq, noise levels recorded for emergency vehicle traffic events, at a location of the building facade, in octave frequency bands are as follows:

	<b>Sound Pressure Levels</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>
Emergency Vehicular Traffic	71	73	75	80	66	54	40



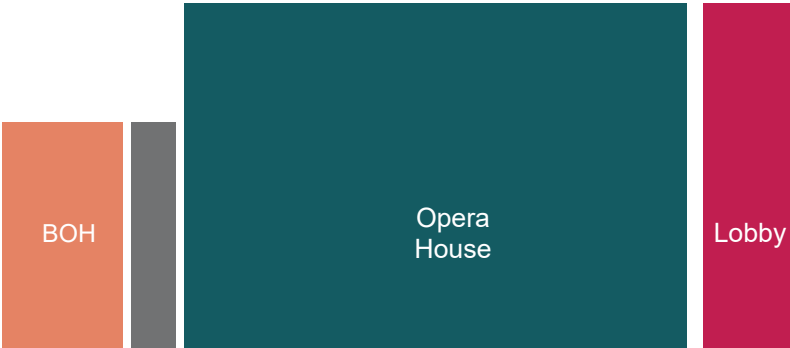
**First and Second Floor Plans**



**Third Floor Plan**

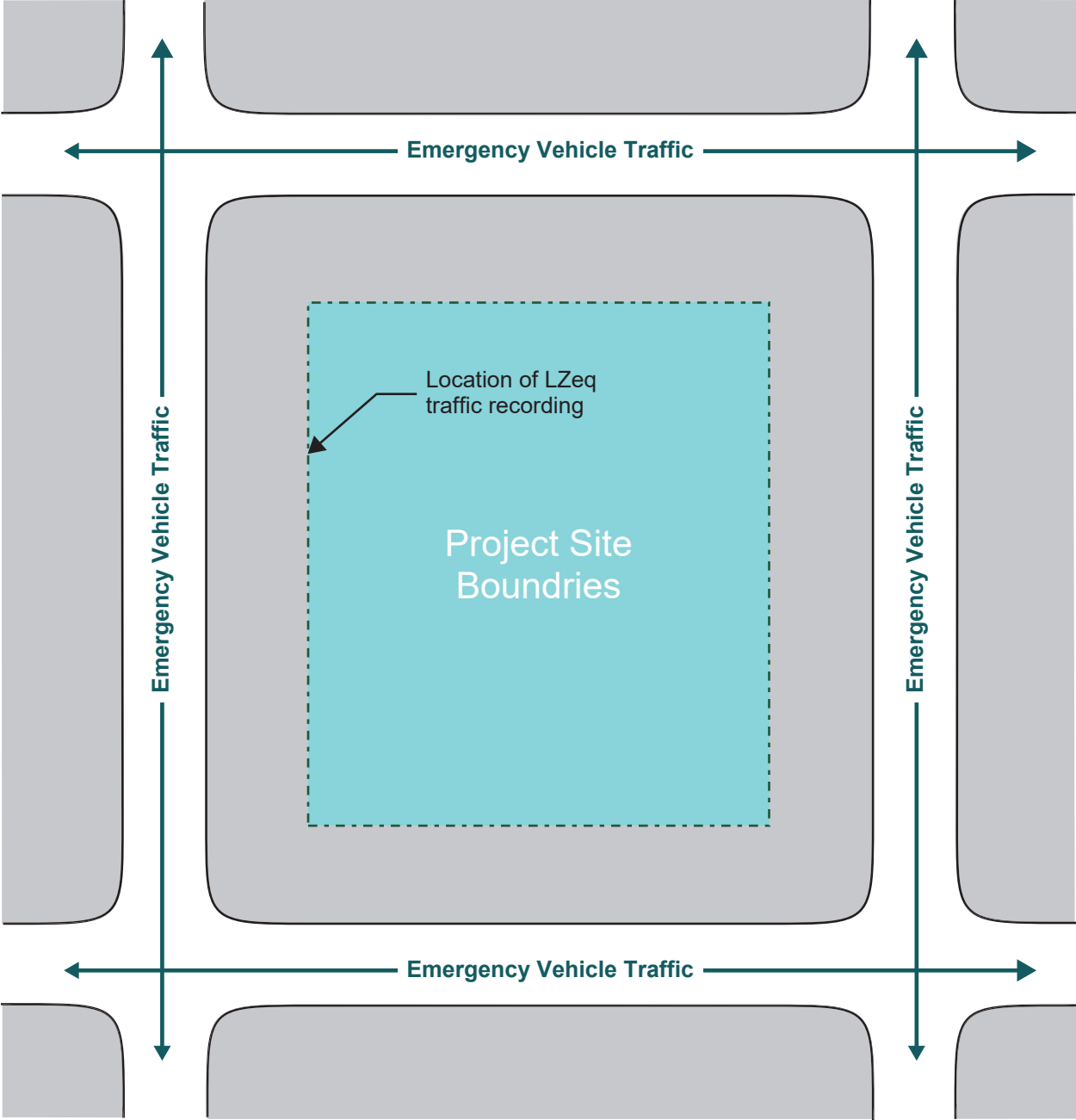


**Section A-A**



**Section B-B**





Site Plan

## TECHNICAL REQUIREMENTS

Design competition entries should emphasize the acoustic design, including the room acoustics, sound isolation and noise & vibration control, and its interaction with the overall architectural design for the Opera Theatre and Rehearsal Room. 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 for the Opera Hall and Rehearsal Room, the poster boards should 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 described. 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 plan and section layout 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 and the loading dock noise interrupting rehearsal on stage or in rehearsal room, to name a few. Note the criteria indicated the MER will have two AHU's and shares common partitions with the concert hall and rehearsal room in plan or section. Judges will be looking for the submissions to include the desired background noise levels for each of the occupied spaces, including the Concert Hall and Rehearsal Room at a minimum along with strategies to control interruptions from noisy spaces including the MEP room, the loading dock, and the exterior.

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.

Designs shall provide an acoustic rooms response capable of supporting the listed range of performance types. Sound amplification, lift, and electro-acoustic 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.