ACOUSTICAL SOCIETY OF AMERICA
STUDENT DESIGN COMPETITION 2019

PRESENTED BY THE TECHNICAL COMMITTEE ON ARCHITECTURAL ACOUSTICS AND THE ROBERT BRADFORD NEWMAN STUDENT AWARD FUND, AND SPONSORED BY THE WENGER FOUNDATION AND THE NATIONAL COUNCIL OF ACOUSTICAL CONSULTANTS

Announcement

The Technical Committee on Architectural Acoustics, with the Robert Bradford Newman Student Award Fund (www.newmanfund.org), The Wenger Foundation, and the National Council of Acoustical Consultants (www.ncac.com), invite you to participate in a student design competition to be displayed and judged at the 177th Meeting of the Acoustical Society of America in Louisville, May 13-17, 2019.

Entry Requirements

Entries may be submitted by individual students or teams of a maximum of three students. Both undergraduate and graduate students are encouraged to participate. Participants must be registered as a student during the spring semester of 2019. Teams comprised of students from different institutions are welcome. Teams comprised of students from different disciplines are encouraged. A faculty sponsor is 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 on or before April 15, 2019**, by email to the competition co-chairs at sdc@newmanfund.org. In the email, indicate (1) your name and school; (2) the name of your teammates (if any), their school(s) and their email 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, or (c) as an extra-curricular; and (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

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.

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

One $1,600 Wenger Prize will be awarded to the first honors entry, as selected by the judges. Four $850 commendation awards will be made to other top entries. At the co-chairs' discretion, the commendation awards may be categorized based on outstanding aspects of the entered designs.

Awards are made possible through a grant from the Newman Fund sponsor the Wenger Foundation.

Presentation Format and Submission Procedure

Entries shall be poster presentations. Entries shall be presented on up to three (3) separate display boards with maximum dimensions of 22 x 28 inches (56 x 71 cm) per board. It is advisable to mount posters to foam core board or other rigid backer. Additional documentation or three-dimensional features may not be attached to the boards; however, this year we will allow the inclusion of a digital code such as a QR code for the inclusion of supplementary material as an option. Keep in mind that the judges will not be obligated to review such information.

In addition to the poster submission, a digital copy of each entry shall be emailed to the competition co-chairs at **sdc@newmanfund.org**. Digital file format must be .pdf or .jpeg. If file size is prohibitive, participants may arrange other methods of file transfer with the co-chairs. Digital copy must be received on or before **Monday, May 13, 2019**. Supplementary materials (i.e. linked to QR code) may be submitted as well but must be received by the same deadline. It is advised that to ensure future viewers of your poster access to the supplementary materials that you maintain the linked supplementary information independent of the SDC.

The competition language is English.

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. 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). Please denote the orientation and arrangement for the presentation boards either on the rear of the boards or on an included sheet.

For entry in the competition, the physical presentation boards must be received no later than **Monday, May 6, 2019** at the following address:

David Woolworth
Roland, Woolworth & Associates
356 CR 102
Oxford, MS 38655

Students attending the meeting may hand-deliver their entries. Entries delivered by students must be available at the ASA meeting registration desk no later than **2 p.m. on Monday, May 13, 2018**. Students opting to deliver entries to the meeting are required to notify the competition co-chairs on or before **Monday, May 6, 2018**.

Affix an opaque envelope to the back of EACH display board. Within each envelope, enclose a loose sheet with the names, addresses, phone numbers, e-mail addresses, school affiliations, and advisor(s) of all participating team members. Please indicate summer e-mail and mailing addresses for all team members. Team member identifying information (names, addresses, etc.) will not be revealed to the competition judges. Entrants may also wish to include a layout diagram for the order in which the posters should be displayed.

Please package display boards securely to prevent damage during shipping.

Competition Brief

A growing media technology company wishes to lease out a floor of an [fictitious] office building in Louisville, and must have a new tenant retrofit design to meet its needs.

Overview of Site and Program

The competition site is the interior fit-out of the 6th floor of a 15 floor office tower. The office tower is centrally located in a re-emerging downtown commercial district, with heavily traveled urban streets bordering the site, with a nearby police station and firehouse. The site building is rectangular in plan, with its longer sides oriented to the north and south. There is a 4-story, municipal building directly across West Jefferson Street, to the north. A new light rail system is proposed, with mid-street tracks and a mid-block station, located on the street between the site building and the municipal building.

The 6th floor of the site building is currently gutted to an exposed concrete floor slab, concrete ceiling deck, building core walls and exterior windows. Most of the 6th floor is wide open. Floors 1-5 of the building are parking garage. The 7th floor is a different tenant, a wealth management company with expectations of a quiet, formal, and serious work environment.

The physical and dimensional conditions of the existing building are as follows. The gross floor area of the 6th floor is 21,000ft² [1951m²], with plan dimensions of 210ft x 110ft [64.0m x 33.5m] inboard of the building envelope. The structure, of the 6th floor [and above] is 2-way flat plate reinforced concrete. Floor and ceiling slabs are 8in thick, standard weight concrete [±150lb/ft³ / 2402.5kg/m³]. Reinforced concrete columns, 16in x 16in, occur at regular bay spacings of no more than 23ft in either direction, with a maximum perimeter slab cantilever of 5ft. [NOTE: Each entry must establish and illustrate a plausible column grid for the 6th floor. Building core walls may be load bearing]. The exterior building envelope is a vertically and horizontally continuous glass curtain wall system with aluminum mullions. The concrete floor slabs do not extend through the curtain wall system to the exterior. The vertical clearance, between top of the unfinished 6th floor slab and the bottom of the deck overhead, is 14ft [4.3m].

The program of spaces that needs to be accommodated [detailed descriptions below] includes a music recording and production suite, a video production studio, a largely open office space with a few enclosed offices, conference and meeting rooms, an adaptable assembly space, a fitness studio, a kitchen and staff lounge, medical consultation rooms, storage rooms, core building services and appropriate circulation space.

In addition to a high level of attention to noise control, acoustic isolation and room acoustics, the client has expressed an interest in the incorporation of at least one of the following sustainable building practices, as appropriate in the various spaces: (1) The use of passive daylighting strategies in the office, fitness and break lounge spaces, (2) the incorporation of local materials, including brick, limestone, shale sandstone, and industrial hemp, (3) passive, or shared-air, ventilation strategies, and/or (4) heat gain and solar glare mitigation on the east, south and west exposures.

Detailed Building Program

[All areas are NET and approximate].

Arrival Foyer / Front Desk [±250ft^2 / 23.2m^2]. Provide a small arrival foyer and company front door, as a first space from the elevator lobby. This space should include a receptionist desk. It does not need to be acoustically enclosed.

Music Recording and Production Suite [900ft^2 / 83.6m^2]. This space includes both a live room and a control room, for composing music and audio recording for company promotional materials. The live room will function for employee recreational music activities when not in use for production.

Video Production Studio [650ft² / 60.4m^2]. This space will be used to capture video and voice for company promotion. This will include green screen, simple sets, variable configurations and lighting.

Near or direct adjacency between the Music Production and Recording Suite and the Video Production Studio is desirable.

Office Spaces [total ±7500ft² / 696.7m²]. The office spaces in the fit-out should include the following specific program pieces, described below:

- Open Office Area: Sufficient open office space for 40 open office workstations and circulation between stations. The client prefers an exposed ceiling deck in the open office space, with a preference for discontinuous, suspended or floated planes or absorptive elements, not a continuous ACT grid ceiling.

- Private Offices: Four private offices are needed, with high levels of speech privacy for normal to raised voices. These offices must include some degree of visual transparency.

- Quiet Conversation Spaces: As is typical in open plan office spaces, two small quiet conversation spaces [or phone call booths] are needed, which will be shared by employees. These spaces

should accommodate space for two people, in conversation, and they should achieve a moderate level of speech privacy for normal to raised speaking voices. These spaces must include some visual transparency.

- Conference and Meeting Rooms: Four conference rooms are needed for meetings, teleconference and shared work space. One room should accommodate 20 people, one 14 people, and two 8-10 people. These spaces should achieve a moderate level of speech privacy for normal to raised speaking voices, and they must include some visual transparency.

- Flexible/Adaptable Assembly Space: In the open office area, design a flexible open working space that can accommodate or be adapted to serve as an assembly or gathering space for up to 60 people, for lecture presentation, company meeting, events or announcements [not more than 1000ft²]. Consider the room acoustic design and configuration of this area, to serve as both an assembly space, at times, and as a casual, circulation, lobby or alternate space at other times.

Fitness Area [±1800ft² / 167.2m^2]. Provide a fitness area consisting of a studio with weight machines, an exercise/yoga class space, showers, and lockers. Portable amplification systems will be used, up to 80 dBA. Space plan, design and detail this space so that structure-borne and airborne noise egress does not disturb office work, adjacent nor above. Fitness areas typically have a higher heat load than other spaces in office buildings. Provide an appropriate amount and appropriately located visual transparency to the fitness area, to the adjacent corridor, but NOT common to the general office space.

Kitchen + Break Lounge [700ft^2 / 65.0m^2]. Provide a kitchen area with a small food preparation area, refrigerator/freezer, a coffee station, and possible vending. Within or attached, provide a small lounge for eating lunch or hosting a catered meeting.

Medical Consultation Suite [900ft² / 83.6m^2]. Provide a private area which includes a waiting area for 4-5 people, a nurse/medic's office, 3 aurally and visually private patient care rooms, a small and secure storage room and a unisex restroom.

Storage Rooms [±2300 / 213.6m² total, for three rooms]. Provide three (3) storage rooms, at varying sizes and locations. One is for music/video production storage. A second is for general office and supplies storage. The third is for secure file and company business storage.

The above program list indicates approximate NET areas for each space or space type. Net area is the actual usable floor area, within the finished walls of each space. After all of the above NET program areas are aggregated, the NET program area is 15,000ft² / 1393.5m². In building fit-out designs, all NET programs areas are assigned a grossing factor, to scale up the amount of space actually needed to accommodate the program needs. In the case of semi-specialty office space, like this, a grossing factor of 1.40 might be used. The NET area of 15,000ft² x 1.40 = 21,000ft² / 1951.0m² which is equal to the gross available area of the 6th floor [the usable area inside the enclosed building envelope].

Included within the grossing factor is the accommodation of Core Building Spaces and Services. This includes the area needed for hard circulation space and access to egress routes, elevators and machine rooms, restrooms, IT spaces, mechanical rooms, electrical rooms, stairwells, *and* the area required for all the aggregate wall thickness in the plan. In the case of higher level acoustic isolation design, wall thickness becomes non-trivial, when taken as a whole.

NOTE: Each competition proposal must accommodate and locate two enclosed egress stairwells, no less than 100ft apart, and two elevator shafts. The walls of the elevators and stairs can be load-bearing concrete, and they may participate in the general structural grid laid out for the building.

Technical Expectations

Aside from the format, size, and submission procedures described above, contestants should feel they have wide latitude about how to develop and communicate the design proposal and competition entry. Past winning and honored competition entries can be found at www.newmandfund.org.

Design competition entries should emphasize the general building acoustics strategies, criteria and design approaches, as well as specific design and details, as applicable. This includes room acoustics, noise control, and the control of sound transmission. Quantitative acoustic design criteria are not prescribed. Based on the descriptions in the brief, each entry should establish appropriate criteria and goals for the various spaces, using known metrics, and also demonstrate designs that can reasonably achieve the selected criteria. Both setting the criteria, based on the brief, AND demonstrating the design competency to achieve them, are important and should be communicated in the competition proposal.

The *Music Recording and Production Suite, Video Production Room,* various *Office Spaces* and *Fitness Studio* are of primary importance and must be emphasized on the posters. Other programmed building spaces must be thoughtfully included in the overall design, and they may be similarly considered at the discretion of each team in the interest of design completeness. Presentations may include plan, reflected ceiling 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. Text should be used, as needed, to communicate the rationale for the design approach[es] and to the describe designs, as necessary.

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 the details of the mechanical and electrical system noise control. However, teams should indicate noise criteria, along with general noise and vibration control procedures relating to air handling equipment, electrical transformers, etc. Thoughtful space planning will be considered by the judges, as it relates to noise control.

References

Useful design references include:

Noise Control in Buildings, Harris, McGraw-Hill 1994.

Architectural Acoustics Illustrated, Ermann, Wiley and Sons, 2014.

Architectural Acoustics, Egan, J Ross Publishing, 2007, McGraw Hill, 1988.

Architectural Acoustics, Principles and Practice, Cavanaugh, Tocci, Wilkes, J Wiley and Sons, 1st Ed.1999, 2nd Ed 2010.

Architectural Acoustics, Principles and Design, Mehta, Jonson, Rogafort, Prentice Hall, 1999.

Architectural Acoustics, Marshall Long, Academic Press, 2006.

Acoustics of Small Rooms, Mendel Kleiner and Jiri Tichy, CRC Press, 2014.

Acoustical Designing in Architecture, Vern O. Knudsen and Cyril M. Harris, Acoustical Society of America, 1980 (originally published in 1950)

Collected Papers on Acoustics, Wallace Clement Sabine, Acoustical Society of America, 1993 (originally published in 1921)
Deaf Architects and Blind Acousticians? Robert E. Apfel, Acoustical Society of America, 1998

Requests for Information

Please direct questions to sdc@newmanfund.org. Note that general questions and requests for more information about the design scenario or competition will be met with follow-up to all registered teams by the co-chairs.

Competition Timeline Summary

Wednesday, January 23 – Statement release

Friday, April 15 – Registration deadline

Monday, May 6 – Presentation boards must be received by the individual listed in the competition announcement.

Monday, May 6 – (For participants delivering presentation boards to the meeting) notice must be emailed to sdc@newmanfund.org that entry will be delivered to the ASA registration desk.

Monday, May 13 – first day of Louisville meeting; digital submission deadline; 2 p.m. CST deadline for receipt of hand-delivered presentation boards at ASA registration desk

Tuesday, May 14 – Judging and open exhibition

Student Design Competition Co-Chairs Contact Information

Competition primary contact will be through the e-mail address **sdc@newmanfund.org**.

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