

In Review: The 2022 SEFA Laboratory of the Year Competition

Welcome to the SEFA (Scientific Equipment and Furniture Association) Laboratory of the Year (LOY) competition. Like other International Awards that recognize exemplary projects, honoring the best, significant new buildings and planning projects designed and/or built around the world, the *SEFA Lab of the Year* award program brings attention to innovative laboratory design and construction to the greater publics and professionals' attention.

The 2022 Entries

For the SEFA 2022 LOY competition there were very competitive, international project entries, which included projects from the United States (east to west coast), Singapore and Sudan, Khartoum. Most of the entries were new construction while a few were adaptive-reuse projects.

In the 2022 LOY competition, the project size varied from 41,000 to 660,000 GSF: about half of the entries consisted of projects with less than 100,000 GSF, a quarter of the entries were among projects between 100,000 to 200,000 GSF, while the rest included projects of more than 200,000 GSF.

The projects spanned a wide range of client types: a third were corporate, another third were institute/university-corporate partners, and the rest were either universities or government projects. Most housed research and development programs in the biomedical/ biotechnology/ biosciences fields.

Lab of the Year 2022: Joan and Sanford I. Weill Neurosciences Building



Photo © Tim Griffith

The 2022 Laboratory of the Year winner is the *Joan and Sanford I. Weill Neurosciences Building*, a landmark, exciting and transparent edifice at the Mission Bay Campus of the University of California San Francisco (UCSF).



Photo © Kyle Jeffers



Photo © Kyle Jeffers

This new center integrates research, diagnosis and treatment of neurology and psychiatry. Its program challenges the traditional boundaries of research, blurring the lines and fueling connectivity between research, clinical and education to complete the cycle of bench to breakthrough.

This six-storied plus penthouse, 282,900 GSF building provides flexible laboratory spaces that consolidate research typologies with high quality, sensitive, efficient, and flexible clinical spaces. SmithGroup with Mark Cavagnero Associates, San Francisco were the architects and lab planners for the project.

Some of the judge's comments: *"The components of the program were thoughtfully throughout and presented in the submission: public/lab/clinical/experimental."* *"The benchmarking analysis presented in the submission gave merit to the programming of the facility."*

LOY High Honors 2022: 4340 Duncan Multi-tenant Lab and Office Building

High Honors was awarded to the *4340 Duncan Multi-tenant Lab and Office Building* at the Cortex Innovation Community, St. Louis, MO. The owner of the project is the BOBB LLC, an affiliate and development arm of the Washington University, St. Louis.

The project provides state-of-the-art offices, laboratory, and modular spaces for biotechnology companies / business on various stages of development, from start-ups to larger scale organizations. This multi-tenant project facilitates affordable, functional space for these companies on which to grow and thrive.

Consisting of 92,301 GSF, this four-storied plus basement adaptive-reuse project is housed in a 1930's building, listed in the National Register of Historic Places, that originally contained the St. Louis Post-Dispatch printers. HOK St. Louis was the architect and lab planner for the project.



Photo © Sam Fentress



Photo © Sam Fentress



Some of the judge's comments: *"The organization of the building is respectful on several levels: historic preservation requirements, energy use and orientation, collaboration and visual connection."* *"There is abundant natural light, and ample collaborative space within the building to allow members of different tenants to mingle and exchange ideas."*

Entries Characteristics and Trends

This year's LOY entries housed **complex programs** that not only included research and development labs, but also instructional facilities. The projects encompassed a wide range of sciences, including neurology and psychiatry, oncology, food sciences, biotechnology, horticulture, energy science and medical sciences instruction. The research laboratories also spanned a large spectrum of technologies, from basic research to drug discoveries and development of new therapies, to diagnosis and treatment. In addition to the be wet bench laboratories, most projects included specialized areas such as patient clinical areas, instrumentation labs, high-performance instrument labs, clean rooms, cGMP suites, biosafety level suites, cryo-bio depositories, greenhouses, grow rooms, vivarium, etc.



Photo © Andy Caulfield

Predominantly, the projects contained **open-planned laboratories**, fitted with flexible/adaptable table-based lab benches, assigned by science or team hubs that consolidated research typologies. Consisting mostly of four to six lab modules, some of these open-planned labs were designed to meet *NIH's bio-safety level 2 (BSL-2)* requirements. These open-planned labs were complemented with adjacent modular (flexible), **dedicated and shared lab support spaces** (including testing and diagnostic labs) and linear equipment rooms or service corridors. These areas surpassed that of the open-lab square footage!



photo@HOK



Photo@Aker Imaging, Houston, Texas

Based on the entries, wet laboratory spaces seem to be decreasing as a percentage of the total net square feet of the building program. But they are complemented by additional dry and computational labs, desk areas, and collaboration spaces.

Desk space for laboratory personnel was found outside of the proper laboratory areas. Desks in university client projects were located just outside the labs, with visual contact into the lab. In the government and corporate client projects desks were located near but away from the open-lab areas.

University projects still housed dedicated, but smaller research/principal investigator (PI) **offices** (some as low as 80 NSF). While corporate clients housed them in open desk environments, the only exception observed was dedicated offices for program directors.



Photo © Chua Ying YI

A large amount and variety of **collaborative and interactive space** was common in most projects, providing for employee working flexibility and mobility environments. Outdoor workspaces, either courtyards or balconies, were observed on various projects. Besides the kitchenette/lunchroom, open lounges, work rooms, and huddle rooms were typical.

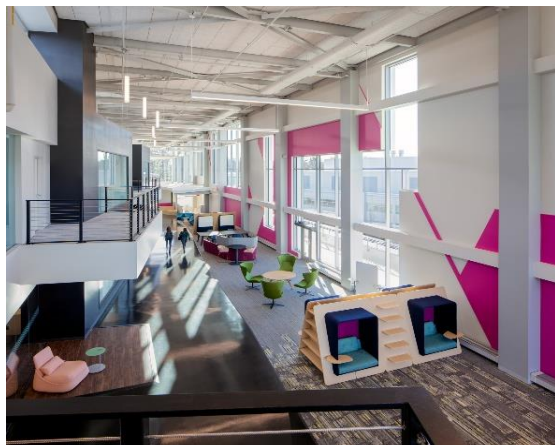


Photo © Andy Caufield

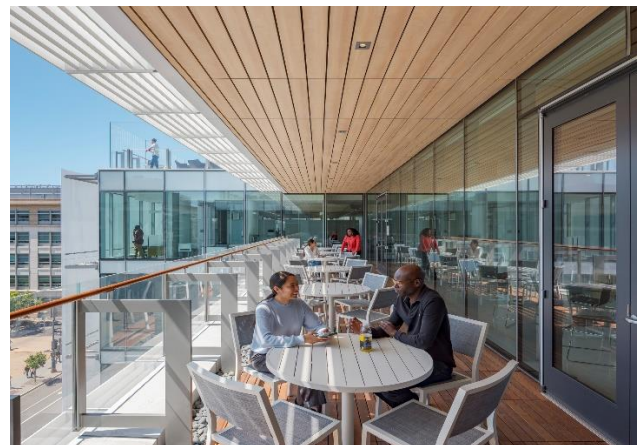


Photo © Kyle Jeffers

Most projects included science on display features, or open interiors to observe and celebrate science. Where appropriate, **transparency** from the lab to the outside as well as visual contact between the lab and desk/office spaces was present. Additionally, all projects, either new construction or adaptive reuse, included ample areas of glass to allow for views and natural light into the laboratory areas.



Photo © Chua Ying Yi

Safety and security were a primary concern of all clients, with separation of circulation paths for patients, personnel, and laboratory logistics distribution. Except for heavy chemical labs, fume hoods were housed in lab support alcoves.



photo@Tim Griffith



photo@Aker Imaging, Houston, Texas

Although a few of the entries pursued and received LEED certification, **sustainable concepts** were present in all entries. Most projects embraced the sustainable principles associated with the *LEED U.S. Green Building Council (USGBC)* to evaluate their environmental performance, and some projects placed emphasis on carbon reduction strategies to improve their performance and measurement towards the

2030 Building Challenge (although technically not part of the 2030 Building Challenge). But by separating the wet lab from the recirculating office/ dry lab environments, some projects cited mechanical systems designs that operate under safe normal conditions as low as 6 ACH, substantially lowering the energy usage intensity (EUI) more than a typical laboratory building when utilizing the *ASHRAE 90.1 standard*. Two of the entries projected their EUI to be 85 KBTU/SF/YR or less.

Among the notions cited to improve personnel **recruitment and retention** were high-quality, light-filled architecture, improved lab capabilities and flexibility and enhanced collaborative environments.

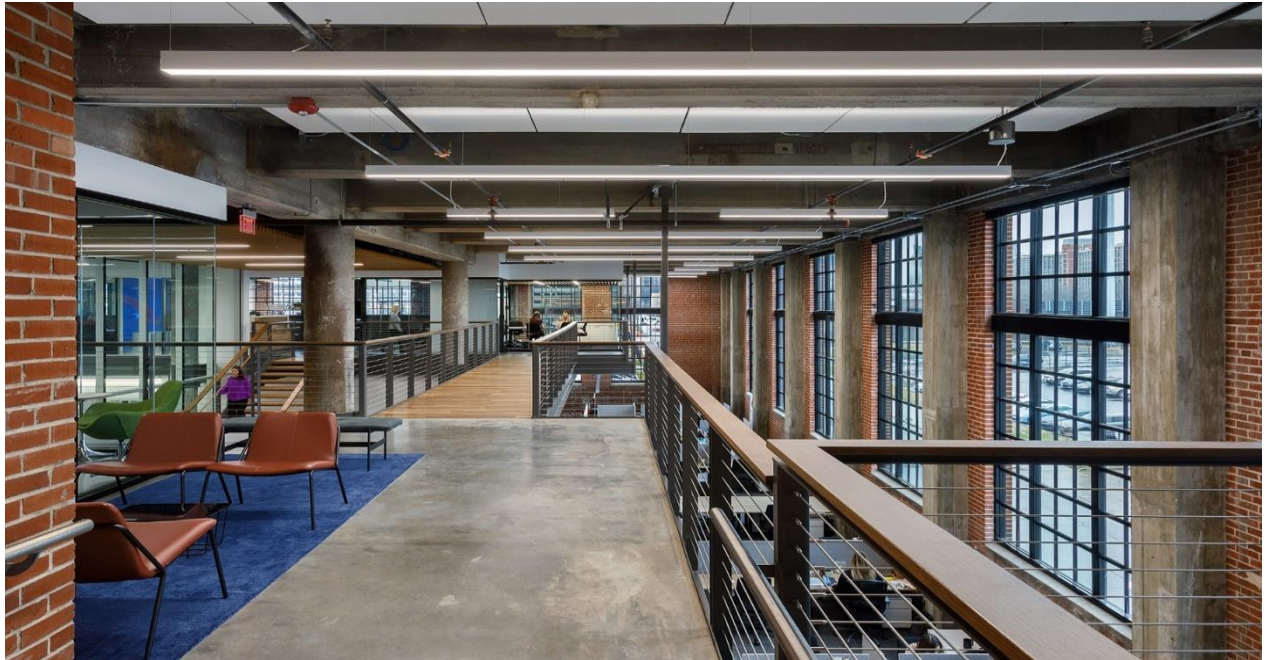


Photo © HOK

Most projects promoted the incorporation of **wellness strategies** within the building design, with areas for employee engagement and well-being. Designs included visible, interconnecting stairs to promote walking up and not utilizing elevators, bicycle parking areas adjacent to locker rooms and showers, lactation rooms, meditation rooms and exterior lounge areas. Gender inclusive restrooms in addition to separate gender restrooms were also mentioned. *Biophilic Design*, the connection with nature to lower stress levels and reduce absenteeism due to illness, was present in some entries. Some projects achieved the *WELL Building Standard accreditation*.



Photo © Kyle Jeffers



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Most projects were conscious of their **community impact**, both during the life of the project and their construction. Some projects sought to improve community engagement, their collaboration between university and industry partners, and/or the connectivity between the research community. During construction, diverse workforce participation (MBE and WBE), including workforce training, became important.

Lastly, most entries cited that the **project delivery** method was extremely important to the success of the project. Stakeholder involvement was key during the programming and design process. A few projects used the *Lean Delivery Process* that engaged the stakeholders (users-architects-engineers-contractors-suppliers) to work as an integrated, lean project delivery team.

The Competition

Winning projects must be places where the instruction and/or research performed is enhanced by the surroundings, where the tenants work in a safe and productive environment, where walking into the facility is an uplifting experience, and where the facility enhances the client's ability to recruit top students, researchers and/or staff.

A laboratory is defined as a building used primarily for scientific or engineering research and analysis or the teaching of science or engineering. Given at the jury's discretion, the award categories are: **Laboratory of the Year** (the top award for new buildings; new multi-building campuses), **High Honors** (projects of excellent quality that just miss LOY status, which could fall under New, renovated, or adaptive reuse construction categories, or **Special Mention** (projects deserving recognition for some specific quality or feature).

About the author

Victor J. Cardona is a retired architect and laboratory designer based in Michigan and Florida. He served as a senior planner, vice-president, and Director Laboratory Planning Group for SmithGroup. A past member of SEFA's Advisory Board, he has been a past judge in the LOY competition. He has published many laboratory-planning articles and presented them at national and international forums. His projects have been recognized by multiple entities, including four LOY projects. He now spends most of his time sailing Lake Michigan.