Tuesday, November 10, 2020

8:00 a.m. to 9:00 a.m. — NETWORKING BREAKFAST

9:00 a.m. to 9:50 a.m. — GENERAL SESSION

G1: High-Performance, World-Class Research Facility Team Collaboration

John Saad, Managing Principal, Vanderweil, Chirag Mistry, Principal, Regional Leader Science & Technology, HOK, and Fred Tull, Preconstruction Services Manager, JE Dunn

Administration prepared a budget for a new 360,000 sf, high-performance research facility with complex ABSL-3 vivarium, imaging, research, a vivarium, and the design process begins. How do you know if the design team is designing to the budget? How do you know if you can afford the materials, program areas, infrastructure, etc.? What about the extra "high performance" criteria that has been mandated for the project? For Emory University, we approached all the issues utilizing a "Design Assist – Target Value Design" strategy. Each step of the design was evaluated and discussed between the design and construction team members to validate each decision to be sure we were on budget. Trade partners were then brought on board to work with the design team to obtain vendor pricing for smart decision making. The process was completed during the entire design period to assume that the project compliance was being followed. We will share this experience with the participants to offer insight on your next project.

10:00 a.m. to 10:50 a.m. — BREAKOUT SESSIONS

B1: Next Generation of Life Science and Physical Science Buildings

Josh Meyer, Managing Principal, JACOBS

In this session we will discuss the trends and issues impacting the design of the next generation of life and physical science research buildings. Examples of recently completed life and physical science buildings will be presented showing how collaboration, workplace strategies, space governance policies, science on display, teaching labs, ratio/proximity of experimentalists to computationalists, innovation space, maker space, core labs/technology platforms, and sustainability have impacted preconceived notions of how these buildings are designed and operated.

B2: Office vs. Lab - Converting Urban Office Space for Laboratory Tenancy

Paul Wilhelms, Senior Associate, Studio Director, Gensler

There is strong demand to have laboratory lease space in urban areas; with few existing purpose-built lab buildings available, life sciences tenants are seeking leases in existing office buildings and converting them to lab uses. While these locations can be very desirable for researcher attraction and retention, and offer good connections to transit, as well as urban amenities, there are significant design and operations impacts to the tenant. Converting building use has an impact on the cost of the tenant buildout, how long it will take, and to the existing tenants in the building. Through hard-won experience in these projects, the presentation will discuss the opportunities and pitfalls of converting office space and how to create a smooth process for the development of these types of conversions.

1:00 a.m. to 12:00 p.m. — BREAKOUT SESSIONS

B3: Extreme Makeover: Radically Re-Thinking Unloved Lab Buildings to Improve Usability, Sustainability, and Resilience

Jeffrey Huang, Associate Principal, Arup, and Z. Smith, Principal and Director of Sustainability and Building Performance, EskewDumezRipple

Many urban research universities face the same challenge: They are running out of space; they have a monster lab building – unloved, inefficient, aging – that's so big that it can't be taken down, but they have neither the land nor the budget to build the same area new somewhere else. An "extreme makeover" retrofit can be the carbon-smart response, but can face challenges in accessibility, resilience, column spacing, floor-to-floor heights, and how to minimize disturbance during phased renovations. This session will provide a deep-dive case study of one campus where the programming exercise for a large new lab building concluded that the least-cost, highest-performance path was a smaller "enabling" building, plus a radical re-think of the workhorse building everyone loved to hate. Themes: cellular vs ballroom labs; deep energy retrofits; stormwater management; embodied carbon accounting; mixing research and active-learning teaching facilities; phased renovation; low floor-to-floor HVAC; deep sustainability; and hot humid climates. Session participants will come away with an appreciation for the potential of the rejuvenation of unloved buildings as part of a larger campus strategy, and see how modern HVAC and envelope strategies can allow buildings that might otherwise be thought of "tear-downs" new life.

Tuesday, November 10, 2020

1:00 a.m. to 12:00 p.m. — BREAKOUT SESSIONS (cont'd)

B4: Adaptability Santa Monica College Science and Math Center – A Sustainable and Iconic Solution for a Two-Year Community College

Punit K. Jain, AIA, LEED Fellow, Senior Vice President, Cannon Design

In an environment where cost of higher education and student loan debt continues to rise, community colleges are becoming attractive to prospective students for vocational training, as well as a place to learn before transferring to a four-year degree college. However, to attract prospective students who have studied in state-of-the-art high schools and visited cutting edge four-year colleges, the community colleges must improve their infrastructure and facilities. Santa Monica College is one such public two-year community college in Santa Monica, California. Seeking a solution to be competitive within the California market including four-year institutions, the college sought to bring together many of the disparate science and math programs scattered across the campus into one single interdisciplinary building. This project involves construction of a new Interdisciplinary Science and Math Center, connected to the current Science Building, that would consolidate the Mathematics and Science programs including math, anthropology, astronomy, geography, geology, and physical and life sciences. The presentation will focus on the value of sustainable design and planning in bringing a diverse group of stakeholders together in one single building that is flexible and adaptable over its life.

2:00 p.m. to 2:50 p.m. — BREAKOUT SESSIONS

B5: Empowering Research Through Design: The Latest Research

David Miller, BSA Life Structures, National Discovery Market Leader

What makes a laboratory great? How is it that a lab can get a nickname like, "the Invention Factory?" Or consistently be among the top grant-funded? The answer lies in productivity. Whether the lab is for research, testing, or teaching, operating at optimal potential is the goal of any lab. This presentation will start with a brief history of laboratory design, followed by a discussion of productivity metrics which are translatable to various laboratory types. Then, the latest research will be presented to take the mystery of out of how design features and strategies can maximize productivity. Recent laboratory spaces will highlight how the strategies were executed, as well as how these same strategies promote sustainability, safety, and job satisfaction. Finally, a bibliography of the research will be made available to attendees as real-world ROI for defending these transforming design features.

B6: Safety, Wellness and Sustainability – Evaluating Overall Risk from Laboratory Exhausts

Aimee Smith, Technical Director, RWDI

The current state of global climate change and our new climate reality is elevating the importance of sustainability, occupant wellness, and reducing laboratory energy use. To provide healthy and comfortable laboratory spaces, indoor air quality can be optimized through the design process by ensuring that laboratory exhaust emissions do not re-enter the building air supply. This optimization must also be balanced with energy savings strategies such as reducing the speed of the rooftop exhaust fans. A procedure to successfully address the interactive issues of safety, wellness, and fan energy savings for laboratories will be presented. Historical approaches in the industry based on guidance from agencies like U.S. EPA, ASHRAE, and ANSI/AIHA Z9.5 will be reviewed through the lens that following this guidance will not optimize air quality at the building air intakes. A more thorough approach involves dispersion modeling and development of acceptability criteria to assess the modeling results. Development of acceptability criteria is a critical step in the process that involves investigation of the details for the laboratory in question (i.e., chemical use, expected activities, etc.). With development of laboratory specific acceptability criteria, wind tunnel dispersion modeling data can be used to perform a climate analysis, allowing for a rigorous assessment of the potential risk to optimize air quality levels and occupant wellness, while maximizing fan energy savings. Several case studies using this approach for laboratories will be presented and discussed to demonstrate this procedure can minimize energy consumption and enhance occupant wellness.

3:00 p.m. to 3:50 p.m. — BREAKOUT SESSIONS

B7: Next Generation Lab for DOE and Pacific Northwest National Lab

Brian Richard, EVP & Director of Science & Technology Projects; Skye K. Smith, Senior Project Manager; and Brian Lemmon, AIA, Project Architect, Kirksey Architects, Inc.

Connection. Interaction. Collaboration. These cornerstones of innovation will be central to a new facility having just broke ground in early 2020 at the heart of PNNL's Richland, Washington campus. Scheduled for completion in 2021, the Energy Sciences Capability project will serve as a focal point for the synergistic research being conducted among PNNL scientists and partners from around the country. The facility will showcase Washington State's leadership in energy sciences that benefit the state, nation, world, and the Department of Energy's mission, and will offer a collection of state-of-the-art research instrumentation to support fundamental research in chemistry, materials science, and computational science. The project is delivered via a Design/Build method and includes multiple architectural and infrastructure provisions to both "tell a story" and provide robust lab utility distribution – maximizing the available use of science and discovery.

Tuesday, November 10, 2020

3:00 p.m. to 3:50 p.m. — BREAKOUT SESSIONS (cont'd)

B8: Lab of the Future: A World-Class Campus for Genomics Research

Jennifer DiMambro, Principal, Americas Science & Industry Business Leader, Arup

The Wellcome Genome Campus is part of the Wellcome Trust, which is one of the largest charitable research foundations in the world. It was established in 1936 with the purpose of funding research to improve human and animal health. The Genome Campus is one of the leading research centers for genomics in the world and is currently home to 2,600 researchers. Arup has been involved with campus for the past 7 years and has worked on a wide range of projects including a new, state-of-the-art sequencing facility, an incubator for businesses involved in genomic and bioinformatics, and the upgrade of the on-site datacenter which house high density computing to support the scientific research. This presentation will give insight into each of these projects, including the key design elements and challenges. The presentation will then focus on the masterplanning work we have undertaken for Wellcome who is looking to significantly expand its operations at the site over the next 15 years. The recently approved masterplan includes 1.6msqft of research and translation floor space, 1,500 home for campus workers, and significant education, community, and leisure facilities. We will look at what the challenges are for campuses faced with the rise in urban labs, and how you develop a campus that is also a community and has a sense of place and belonging.

4:00 p.m. to 5:00 p.m. — BREAKOUT SESSIONS

B9: Transformation for the Next Generation - Creating Low Carbon Lab Facilities

Don Kranbuehl AIA, PE, LEED BD+C, Principal, and Julia Janaro, AIA, LEED AP Senior Architect, Clark Nexsen

This presentation will showcase this process using an array of laboratory building types including higher-ed engineering research labs, adaptive-reuse lab renovation projects, and plant-science greenhouse laboratory facilities. While high-performance design has largely focused on operation carbon, the new frontier for design is reducing the embodied carbon in building materials: the carbon associated with structural systems and interior and exterior materials. Embodied carbon is the sunk-cost carbon of these materials baked into the building before it begins to operate. Design teams need to learn how to evaluate Environmental Product Declarations and reduce the carbon emissions related to the manufacturing and transportation of building materials. The IPCC research group has determined that we have 10 years to keep global warming to 1.5 by reducing carbon emissions by 50% and then to net zero by 2050. So, the next 10 years are critical for the building industry and the science and technology market sector is a key catalyst for this challenge. Its scientific users are the ones following climate change research and seeking facilities that meet those challenges. This presentation will look at the tools for selecting low carbon materials and the methods for tracking/reducing the carbon in laboratory building systems and materials.

B10: Research Facilities in the Cone: Resilient Design for Extreme Storm Events

Christopher Patterson, Senior Project Architect, HOK

Design professionals and facilities managers are all familiar with the trends of climate change – major storms are increasing in both frequency and intensity, posing risks to the built environment. In this new age, the strategies for mitigation and design resilience are both being updated and created new, but what are the specific challenges posed in the planning and design of research facilities? Often, the best solution must be assembled bespoke based on the specific type of research program being housed. This presentation will provide an overview of the impact that major storm events have on research facilities. Although hurricane-prone locations will be discussed, the methodology for decision making and many of the mitigation measures can be applied to any rain intensive storm and major flood event. A framework for creating a definition of resilience specific to the building type will be presented. The strengths and weaknesses of common practices for storm mitigation will be discussed as a component of a fully developed extreme storm event plan.

Wednesday, November 11, 2020

8:00 a.m. to 9:00 a.m. — NETWORKING BREAKFAST

9:00 a.m. to 9:50 a.m. — GENERAL SESSION

G2: Next Gen STEM on Academic Campuses

Brian Kowalchuk, Global Design Director and Sally Lee, Architect, HDR Inc.

This presentation will include an overview of current trends across STEM disciplines and how those trends translate to new demands on campus building and infrastructure. These trends include, but are not limited to, the role of industry, the role of donors, project-based learning, inter-disciplinary collaboration, and advanced research priorities. Using the new Brendan Iribe Center as an example, the presentation explores how STEM buildings can transform into a new type of anchor for academic campuses – part institute, part innovation center, part student commons. The demands of science and engineering environments in academia have radically changed over the past decade. Institutions are simultaneously responding to multiple sources of disruption: increased industry engagement, sophisticated demands for advanced research, and evolving curriculums that put more hands-on and project-based learning front and center. They are building virtual space and capacity for their work and developing strategies to tap into and utilize all of the data they have access to in order to innovate.

Wednesday, November 11, 2020

10:00 a.m. to 10:50 a.m. — BREAKOUT SESSIONS

B11: Transforming Boehringer Ingelheim's R&D Enterprise

John M. Finlay, PE Project Manager Boehringer Ingelheim Pharmaceuticals, Inc.; Robert DeGenova, Senior Science Planner, and Sara Wolf Workplace Strategist, Flad Architects

Boehringer Ingelheim Pharmaceuticals, Inc. currently occupies a 300-acre site in Ridgefield, Connecticut, with numerous buildings totaling over 1.3 million square feet. This campus has successfully supported the discovery of pharmaceutical therapies for over 40 years; however, technological changes in the ways research is conducted, as well as the interdependence upon sophisticated equipment, has led to new work paradigms. This transformation within both the laboratory and office workspace has taken place as researchers embraced the combination wet-bench research with sophisticated data analysis. This combination has spawned new research methodologies. As a result, Boehringer Ingelheim has embarked on an exciting and visionary master plan to create a responsive and highly productive Research and Development organization that is reflected in their new vision. Attendees will come to understand several important, key approaches to Boehringer Ingelheim's visionary transformation: Attendees will be exposed to new ways of working within current R&D laboratories that promote efficiency and intellectual discovery through collaborative initiatives; they will view contemporary laboratory design solutions and furnishings that respond to highly dependent equipment integration; and they will also understand how the research enterprise has expanded to include a wide range of collaborators that work outside of the lab, as well as with national and international partners.

B12: SEFA' s Global Market Survey Results

David J. Sutton, CAE, JD, Executive Director and General Counsel, Scientific Equipment & Furniture Association (SEFA)

The 2020 SEFA Global market survey presentation will feature an in depth estimate of the size of the global market for lab furniture and fume hoods. This survey also breaks down the size of the major markets in the world such as the U.S, China, Europe, Japan, and India. The survey also highlights the size of these global markets by the types of labs and the projected growth rates for these market segments. Anyone who wants to know where they should focus their budgets and resources will want to know.

11:00 a.m. to 12:00 p.m. — BREAKOUT SESSIONS

B13: Enabling an Applications Engineering Laboratory to be Comprehensive Capability & Rapid Turnaround

Kaitlyn Doolittle, Laboratory Supervisor, DuPont Electronics & Imaging, and Erik Koepf, Ph.D., DuPont, Laboratory Leader

Speed of response to requests from OEMs – turnaround time for applications development and sampling for example – is critical in the fast-paced technology environment of Silicon Valley, where DuPont's Silicon Valley Technology Center (SVTC) is located. The consumer electronics applications engineering laboratory at SVTC has utilized digital solutions to improve efficiency and data quality. An example of this is the deployment and development of a flexible Laboratory Information Management System (LIMS). The LIMS software enables collection of data in a SQL database for expedited result lookup, direct connection to instrumentation for automated data transfer, and specification checks to ensure data quality. Tablets are used in the laboratory for easy, fast, and direct data entry into the LIMS. QR code labels are generated by the LIMS and used for direct sample and inventory tracking with handheld scanners. The use of robotic arms is being explored to address instances of repetitive testing, opening the possibility to save significant hours of technician time, and enable automatic data import to the LIMS that was previously not possible. The combination of these solutions with LIMS enables the application engineers to perform prototyping and testing faster to meet customer requests sooner. Additionally, the LIMS provides a quick method for querying the results of previous testing, in order to identify the optimal material(s) or preparation conditions for a new customer application. In the near future, the site's data analytics experts will be able to use the results from the database to perform machine learning and predictive analyses. These are just a few examples of how DuPont SVTC is building a modern and efficiency applications engineering laboratory.

B14: The Sustainable Design Lifecycle

David Pinto, Managing Principal, and Steve Karl, Associate/Senior Project Manager, Vanderweil, and Dwayne Rush, The Pennsylvania State University

This session will outline the Sustainable Design Lifecycle of a project from conceptual design to occupancy, highlighting key moments and best practices that have the greatest impact for cost effectively maximizing the sustainability of a project. We will also highlight how to best ensure that project teams include this scope in their proposals. Presenters will share their early dynamic modeling process and tools, and show how this can be used not just for large, technically complex projects, but for any project trying to achieve aggressive energy or water goals with site area, floor height, budget, operational or other constraints. Presenters representing Penn State University and Vanderweil Engineers will share how they applied these best practices to the design and construction of two laboratory projects on the University Park Campus: the recently completed $117M, 193,000gsf Chemical and Biomedical Engineering Building and the new 100,000gsf replacement of the Henning Building, home to PSU's Departments of Animal Science and Veterinary & Biomedical Sciences.

Wednesday, November 11, 2020

1:30 p.m. to 2:20 p.m. — BREAKOUT SESSIONS

B15: Good Bones (or Not): Renovating Yesterday's Labs and Building New Science Facilities for the Future

Mary Jo Spector, Director of Research Facilities, Design, Construction & Maintenance, Florida State University, and Tyler Dykes, Senior Project Engineer, Affiliated Engineers, Inc.

This presentation will examine specific challenges that face lab facility owners, whether they realize it or not, including but not limited to aging building infrastructure, limited funding, changing programs, new research requirements, and competition within the industry. These obstacles will be examined in the context of several case studies that illustrate examples and lessons learned that can be applied by both owners and design consultants. Case studies highlight several buildings on the Florida State University campus including chemistry, biology, and teaching labs. The case studies will show solutions from the perspective of the building owner, as well as the consultant, that can be adapted for use in the future on both renovation and new construction projects. The discussion will talk to the limitations of cost, schedule, and logistical considerations specific to individual projects. The experiences described in this presentation will give owners and designers strategies, tools, and philosophies to overcome the challenges associated with renovating aging lab facilities.

B16: High Hazard Common Mistakes

Todd Oliver Senior Consulting Engineer Jensen Hughes

In the last few years, there has been a significant increase in the construction of new STEM facilities on higher education campuses. Within those buildings, many include contain high-hazard contents. Typically, these spaces are not properly designed to accommodate the program space needs and are often under-protected or improperly protected from fire. This presentation will provide an overview of common misconceptions or mistakes that we've assembled from years of working through code compliance on these challenging projects. Do you know if the high-hazard storage spaces you design are properly protected from fire? There is not a one-size-fits-all solution for every high hazard space. Let us help you ask the right questions to know the answer.

2:30 p.m. to 3:20 p.m. — BREAKOUT SESSIONS

B17: Using Lean Design to Improve Turnaround Times in a Hospital Lab

Mike Antochow, Operational Excellence and Innovation Leader, and Andrew Rearick, Lab Technician, Akron Children's Hospital

Akron Children's Hospital's Centralized Core Lab required renovation of not only space, but of process, and hence, Lean design process was employed. Staff were engaged and empowered through a number of Lean principles, including conducting multiple simulations in a full-scale cardboard mock-up to come up with a new layout. The new layout improves patient care, promotes employee satisfaction, reduces distances travelled for specimens, and reduces overall costs. This workshop will take the participant through the entire process of design to final punch card. Participants will learn: - Work required prior to the start of Lean Lab Design; - Lean Lab Design from 2-dimensional paper doll exercises to 3-dimensional cardboard mock-ups; - Simulation within the mock-up; - Scoping out phasing of construction using the mock-up; - Preparation for construction; - How to lead lab techs through construction from communication methods to change engagement techniques; - And much more.

B18: Designing a Lab for Now While Flexible for Future Robotics and Automation

Chris Small, Principal, Hanbury

In today's lab programming process, Robotics and Automation are becoming more prevalent. The high cost and unproven results prevent implementation on day 1 more times than not, but designers are being challenged to plan for the future while keeping current operations efficient and functional until that day arrives. Chris Small will explore strategies to create lab designs that satisfy both the current and future state. Lab Designers will learn communication strategies, flexible design modules, and how to approach the future unknown. Small will explore current case studies where labs have been programmed and designed with Robotics and Automation in mind. These case studies will demonstrate how the modules and infrastructure are setup to accommodate the future equipment and process. He will also explore the benefits clients have seen from having this flexibility and successes of installation of Robotics and Automation post project completion.

3:30 p.m. to 4:30 p.m. — PANEL DISCUSSION

P1: The Future Workforce in Lab Design

Rebekah Gandy, Gensler; Elliott Ruzicka, MWA Architects; Brian Richard, Kirksey, John Saad, Vanderweil, and; Tom Sonk, Dow

Back by popular demand... the discussion continues. Where are the next generation of laboratory architects, designers, and planners coming from? Is your company addressing this need today? Are you personally involved in the process? Over the past three years this important topic has been lively debated - ranging from mentoring programs to institutional knowledge transfer to women in positions of leadership. A panel of subject matter experts will engage with fellow panelists, field questions from the audience as well as other question submitted online prior to the conference. What can we as industry professionals do to fill the gaps, develop tomorrow's leaders, and ensure that the Laboratory Design community continues to attract the best and brightest.

4:30 p.m. — CONFERENCE ADJOURNS