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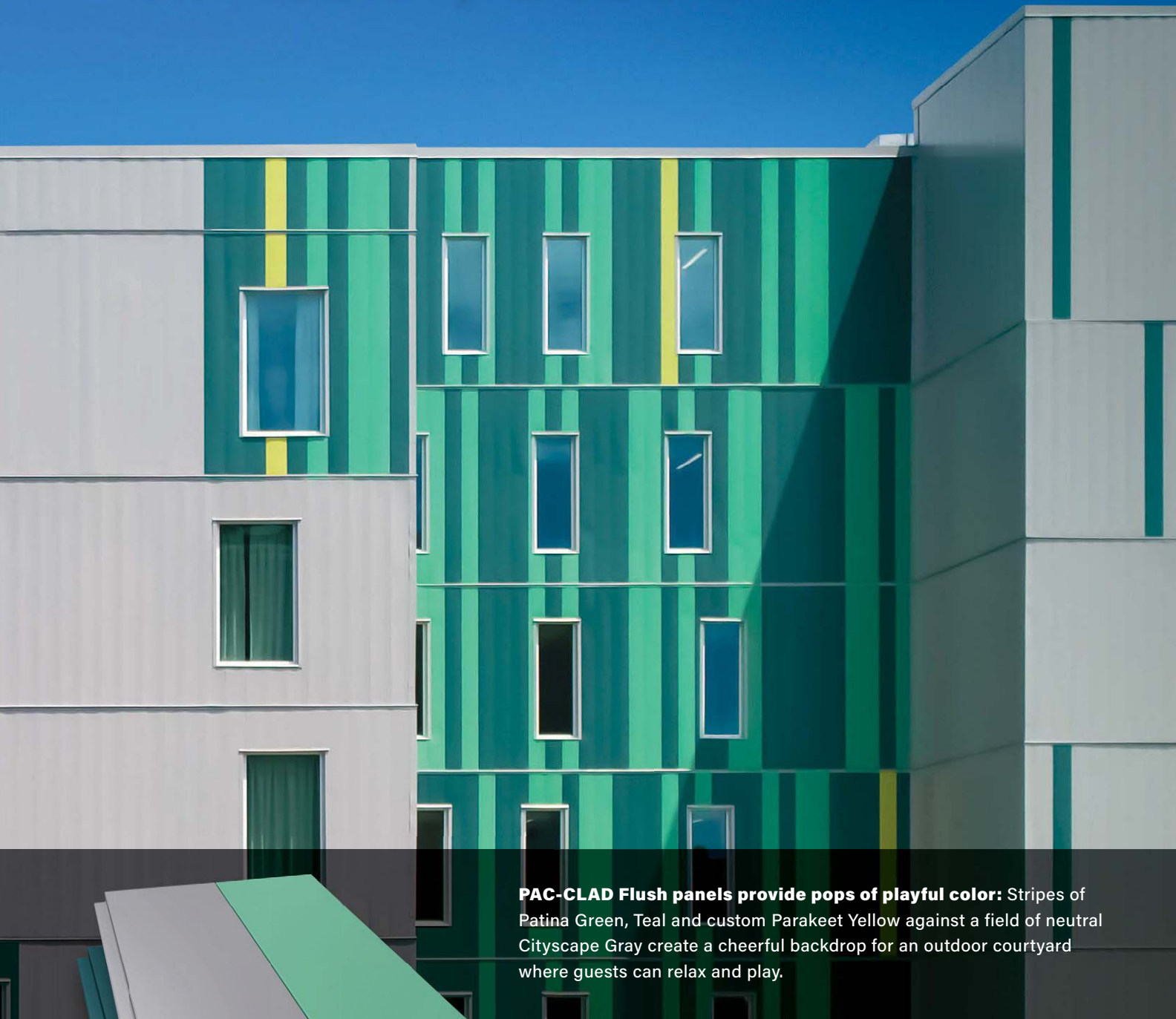
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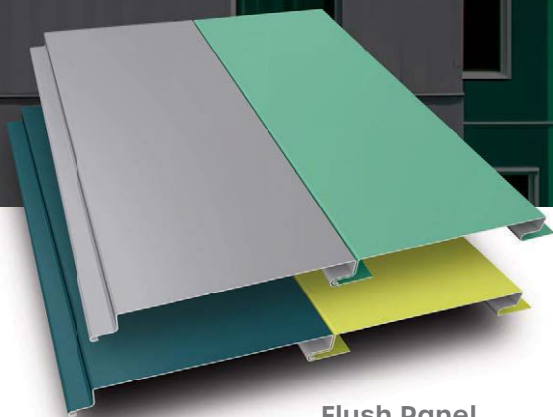
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INSIDE THIS ISSUE

JULY-AUGUST 2022 // VOL 13 // ISSUE 4

feature projects

STUDENT-CENTRIC

Johns Hopkins University School of Nursing opens its building outward to showcase activity and connect to its community



PERUSE HEALTH-CARE PROJECTS FROM ACROSS THE COUNTRY:

28

- Children's Hospital and Medical Center, Omaha, Neb.
- Henry M. Goldman School of Dental Medicine, Boston University
- Women's Wellness and Breast Care, Watertown, N.Y.
- Ronald McDonald House, Cincinnati
- Providence Health Pacific Medical Centers, Renton, Wash.
- Biotech Commons, Philadelphia
- Encompass Health Rehabilitation Hospital, Middletown, Del.
- University Health, San Antonio



cover

COVER PHOTO: ROBERT BENSON PHOTOGRAPHY, COURTESY HORD COPLAN MACHT

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INSIDE THIS ISSUE

JULY-AUGUST 2022 // VOL 13 // ISSUE 4



Guidance

16

DESIGN WITH AUTISM IN MIND

Perceptual and cognitive disability research leads to design solutions that put all people at ease.

Component

44

THE THIN TRIPLE REVOLUTION APPROACHES

Thin triple glazing can meet increasingly stringent codes and efficiency programs and will inevitably expand to the commercial sector.



Energy

48

RESILIENCE, SUSTAINABILITY & HEALTH CARE

Penn State Health Milton S. Hershey Medical Center is focusing on community health through PEER Certification.



Transformation

52

LIFE STAGES

A former hospital now supports a new model for affordable senior living.

Transformation

60

ONCE MORE, WITH FEELING

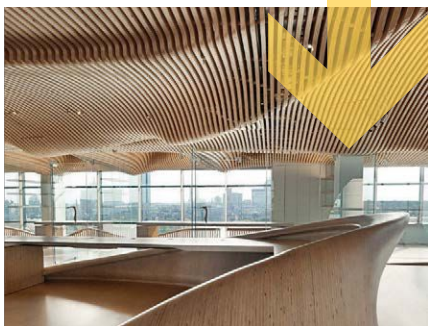
A dated hospital is transformed into a first-of-its-kind clinical research facility for childhood brain development.

Trend Alert

66

WASTE NOT

Rethinking waste is a way to combat climate change.



COLUMN

12 POINT OF VIEW // One person's junk is another person's treasure.

DEPARTMENTS

76 PRODUCTS // View a roundup of the latest materials and systems for the industry.

82 INSPIRATION // Completed in 1911, Woodward Avenue Presbyterian Church, Detroit, was designed in a modern English Gothic style. Today, it's a target for vandals.

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ONE PERSON'S JUNK IS ANOTHER PERSON'S TREASURE

After we put our daughter to bed each night, my husband Bart and I have discovered a show on which we both can agree: “Mysteries of the Abandoned” on the Science Channel. The show visits abandoned building projects throughout the world, explaining what makes them engineering marvels and why they were ultimately abandoned. One particular project, just outside of Buenos Aires, Argentina, caught my attention: Campanopolis, which was built by a supermarket magnate in the 1970s.

Alberto Campana was told he had five years to live when he was diagnosed with throat cancer in 1976, so he purchased about 618 acres of land, which had been a garbage dump, to build a whimsical village out of junk. With no architectural training, Campana’s designs can be compared to a real-life *Alice in Wonderland*. He bought materials from buildings being demolished, discontinued rail lines and antique shops. For example, Campanopolis features doors from a horse-racing venue in Buenos Aires and seats from a defunct movie theater. Many of his designs refute what is typical, such as roofs for floors. Ultimately, Campana created a dream world that is absolutely stunning in its creativity and its testimony that “junk” can be beautiful.

In this issue of **retrofit**, we take a closer look at how we think about waste in the construction and design industry. Jim Schneider, our “Trend Alert” columnist, writes on page 66, that waste diversion not only keeps usable materials from landfills, which are filling up, but also can save money on projects while combating climate change. Schneider brings together a blend of experts who are moving away from our culture of disposability and toward reuse in very unique ways.

For example, Larry Pierce, founder and owner of LCP Group in Vestal, N.Y., has made materials reuse part of his business model. He was inspired out of necessity. “We tore down a 20,000-square-foot furniture store and I was taking out the steel I-beams and they were about \$200 per piece for us to scrap,” Pierce says. “I called a local mill and found that buying new ones would be \$1,800 to \$2,000 per piece. At the same time, we were trying to build a log timber-frame home and the timber-frame trusses were about \$20,000, so we just used the I-beams. The value-add was there. It became a mindset for us: Let’s not throw this stuff out; let’s try to reuse it.”

A lifelong hockey enthusiast, Pierce built a hockey rink on his own farm entirely from scrapped materials. He notes building the rink, in honor of his deceased sister who also was passionate about hockey, would not have been financially possible with new materials. Today, anyone in Pierce’s community is invited to skate at the rink. He hosts groups and individual skaters, as well as hockey tournaments. When speaking to Pierce about the rink—and materials reuse, in general—his passion for the subject is infectious. Materials reuse obviously is more than just a business model to him.

In fact, it’s not a coincidence that we featured materials reuse in our health-care-focused issue. Alberto Campana was so passionate about building Campanopolis that he lived 24 more years after his throat-cancer diagnosis. Perhaps materials reuse is good for more than just the planet.



CAMPANOPOLIS

Christina Koch

CHRISTINA KOCH

Associate Publisher/Editorial Director
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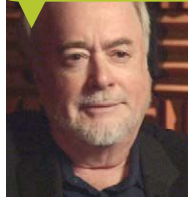
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Steven J. Orfield, founder of Orfield Laboratories Inc., has been involved with architectural and product consulting for more than four decades. He began his career by taking a human-factors approach to architecture with an emphasis on acoustics and lighting in relation to their impact on users' experiences. In "Guidance", page 16, Orfield relates that at least 40 percent of the general population suffers from perceptual and/or cognitive challenges and, therefore, every building should be designed with this in mind for the best predictable user experience.



Paul Lund, AIA, LEED AP BD+C, a principal at Hord Coplan Macht, focuses on the programming, planning, design and management of collegiate facilities, including renovations to accommodate academic programs in existing facilities. In our "Cover Story", page 20, Lund delves into the Johns Hopkins University School of Nursing's redesign. His team sought to strengthen the campus' roots in its East Baltimore neighborhood by breaking down the former fortress-like facilities to foster greater inclusivity, celebrate the educational mission of the School of Nursing and improve the streetscape experience for all passersby.



Bill Lingnell serves as the technical consultant to the Fenestration and Glazing Industry Alliance. He has consulted about many facets of glass and wall systems used on architectural construction projects. In "Component", page 44, Lingnell defines thin triple glazing, its potential to meet increasingly stringent code requirements and efficiency programs, and its inevitable expansion to the commercial sector.



Sumner Byrne, LEED Green Associate, is senior manager of digital marketing at the U.S. Green Building Council and Green Business Certification Inc. She devotes her time to articulating the impacts and importance of green building and business certifications on their communities' health, environment and economies. In "Energy", page 48, Byrne outlines the benefits of the PEER-certified power systems behind Penn State Health Milton S. Hershey Medical Center.



Michael Jerabek, AIA, (left) is a partner at WJW Architects; **Keith Criminger**, AIA, LEED AP, is an associate at WJW Architects; and **Martha Strong** is a registered interior designer and owner of Strong Design Consultants. The trio worked together on transforming an abandoned Chicago hospital into a housing facility that allows low-income seniors to age in place. The new Ravenswood Senior Living, featured in "Transformation", page 52, actually required legislation for it to include independent housing on its upper floors and assisted living on its lower floors.



HGA Principals **Rebecca Kleinbaum Sanders**, AIA, NCARB, (left) and **Meredith Hayes Gordon**, AIA, LEED AP, share the story of the new Masonic Institute for the Developing Brain, which was created inside a former Shriners Children's Hospital in Minneapolis.

The writers demonstrate their team's commitment to learning and innovation for a successful outcome in "Transformation", page 60.

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DESIGN WITH AUTISM IN MIND

Perceptual and Cognitive Disability Research Leads to Design Solutions that Put All People at Ease

WRITTEN BY | **STEVEN J. ORFIELD**

Professionals who design building structures typically do not take into account the perceptual and/or cognitive challenges experienced by individuals with various disabilities. Sometimes these challenges are referred to as the “invisible disabilities” within the inclusiveness community. Moreover, when designers are asked to consider the users’ perceptual and/or cognitive disabilities, they often rely on intuition rather than on an agreed-upon, science-based approach. Consequently, the need for objective standards is paramount, given the increasing number of residential facilities, therapeutic clinics, and employment settings currently being designed for those with autism and other disabilities.

The Americans with Disabilities Act

(ADA) mandates the need for inclusive design for those with disabilities to properly access building structures. Yet, much of ADA is non-specific about perceptual and cognitive disabilities. Therefore, I urge professional designers to bear in mind various populations who suffer from perceptual and/or cognitive challenges. These challenges include aging, dementia, autism, mental illness, ADHD, PTSD, SPD, blindness and deafness. Individuals with these challenges often experience numerous problems, including sensory hypersensitivity, limited sensory sensitivity, cognitive problems and anxiety. Such issues affect at least 40 percent of the general population, according to the 2016 Disability Statistics Annual Report from the Rehabilitation Research and Training Center on Disability Statistics and Demographics.

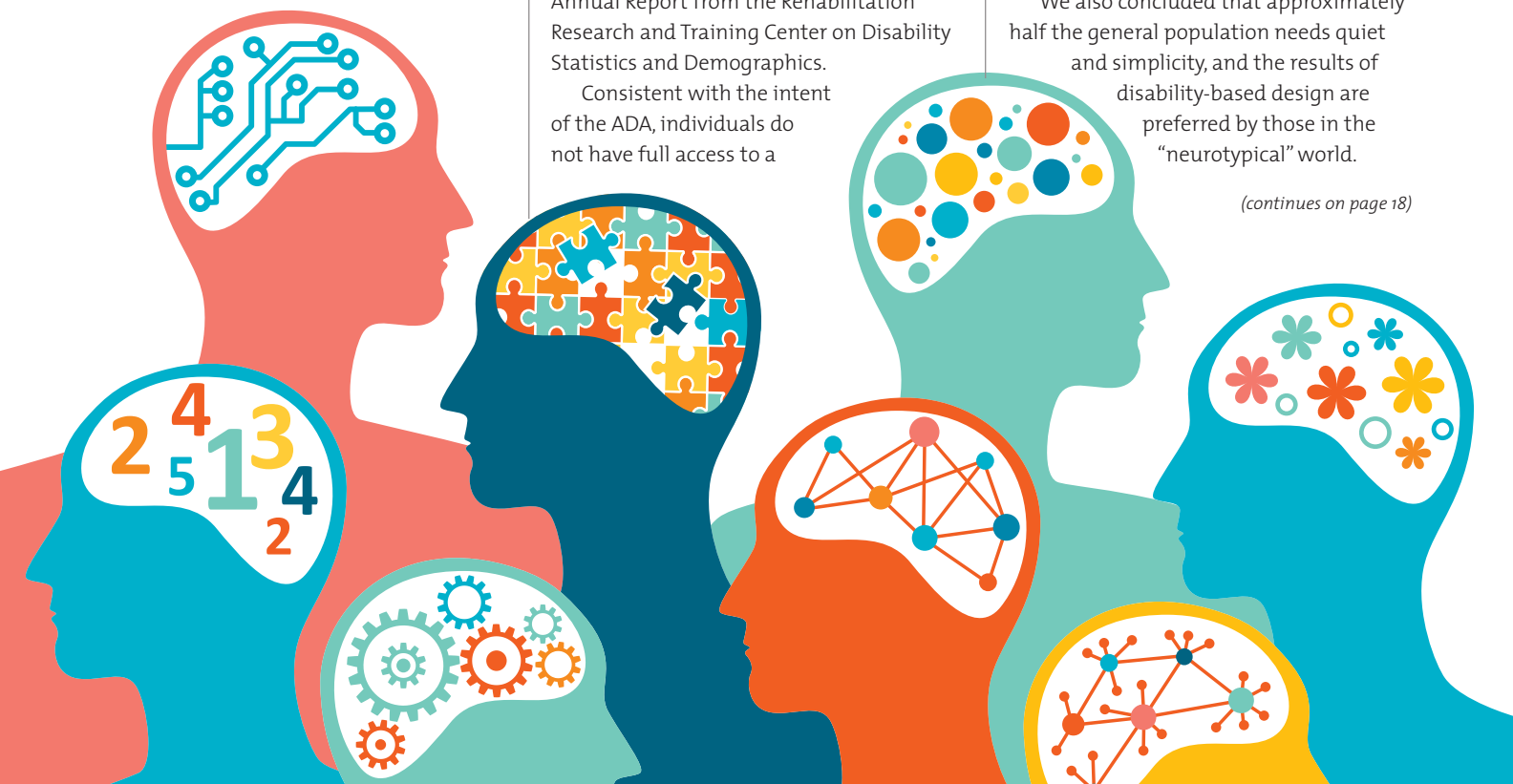
Consistent with the intent of the ADA, individuals do not have full access to a

building’s structure if they cannot adequately process information in their surroundings, which can lead to challenges in navigation, attention, work ability, comfort level and much more.

In 2006, my firm, Orfield Laboratories Inc., began a 10-year journey researching perceptual and cognitive disabilities from a user perspective, starting with aging, dementia and autism. This included thousands of hours of discussions with top academic and research experts associated with each area of sensation, such as vision and hearing, and each of the specialized disabilities, including aging, autism and mental illness. Eventually, we came to the realization that one should not design for a diagnosis, but rather, one should design for the best predictable user experience.

We also concluded that approximately half the general population needs quiet and simplicity, and the results of disability-based design are preferred by those in the “neurotypical” world.

(continues on page 18)



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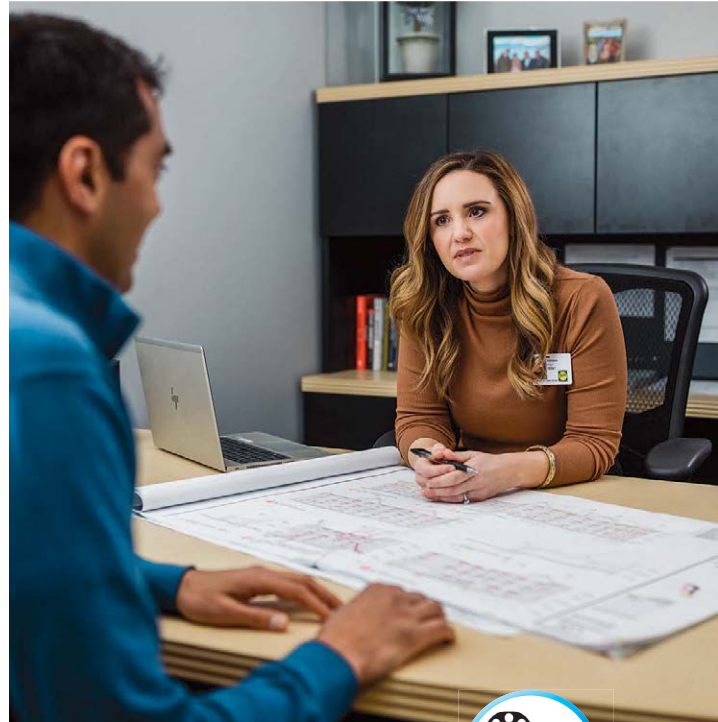
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Building Costs and Design Research: The Good News

Designers and organization administrators often share common assumptions about accessible buildings:

- They are more expensive.
- They are more suitable for those with disabilities.
- They require different solutions for different disabilities.
- They inhibit many design choices.
- They require specializations on the design team.
- They are less likely to have an aesthetic design.

All of these assumptions are incorrect, and they underlie the failure to solve many of the design challenges for those with disabilities.

The Architectural Research Consortium, which is administered by Orfield Laboratories, has stated that any modest or large-scale building can be built with a similar budget for individuals with and without disabilities. For example, a well-designed interior is more important than an expensive façade and an elaborate public entry. Furthermore, aesthetics should be more about a comfortable appearance than expensive finishes.

The Design Research Concept of Autism

During our discussions with many individuals active within the autism community, we came across a common perspective: “When you’ve met one person with autism, you’ve met one person with autism.” Of course, this implies that one should not generalize any aspect of autism to the entire autistic community. With regard to designing a facility to support those on the spectrum, this would imply a nearly impossible task. However, after several years of study, as well as discussions with numerous experts, we formed an alternative view on autism: The variability among human beings, with and without autism, is roughly the same. In other words, “when you’ve met one person, you’ve met one person.”

Fraser Clinic, located in Woodbury, Minn., is the first autism project worldwide that involved quantifiable perceptual performance standards that focused on the sensory sensitivity of children and adults on the spectrum. Prior to working on

this project, we spent much time discussing daily challenges—with an emphasis on sensory sensitivity—with two dozen individuals with Asperger’s syndrome. Their personal experiences were very helpful when forming our approach to designing a user-experience building environment.

As a result of our approach to understanding individuals with autism, as well as designing structures for them, we focused our efforts on those who are hypersensitive to sensory sensations in their environment. We do acknowledge that there are at least two other “sensory” groups in autism, including those who are hyposensitive and often crave sensory stimulation (sensory seeking) and those who do not have any sensory challenges.

Fraser Clinic: The Design Process

Fraser Clinic representatives began working with Pope Associates, an architecture firm, on designing a building that would become a branding statement for Fraser. They also consulted with A. J. Paron-Wildes, who is a designer, the mother of a young man with autism and author of a number of books about design for autism.

Paron-Wildes helped balance the structural design with personal experiences encountered by individuals on the spectrum. Orfield Laboratories was in charge of reducing, or eliminating, potential sources of sensory-related stress and tension within the clinic. This involved user measurements of acoustics, daylighting, thermal comfort and indoor air quality.

Basically, we did not want the clinic building to be perceived as imposing, institutional or noisy. The primary goals were to create a general familiarity and comfort within the clinic and avoid anything that would trigger hypersensitivity. Our first recommendation was to create a building façade that was more reflective of the sensitivity of children on the spectrum because many of them suffer from anxiety and are fearful of unfamiliar settings. Fraser Clinic staff agreed with us, and the design of the new façade was low-key and suggested a welcoming and peaceful building environment.

Furthermore, the design for all spaces within the clinic was nominally similar because many, if not most, individuals on the spectrum have an aversion to change in


their environment. As a result, the building had, in general, a more monolithic design. That is, wherever the individual is located in the building, he or she will perceive the spaces as relatively the same. We also avoided using patterns or complex color schemes, graphics, non-representational pictures and wallcoverings. In many ways, our approach was to design a peaceful and simple, Zen-like environment.

Building Design Standards

Based on research and experience, Orfield Laboratories established a set of building performance standards for those with autism and special needs. In general, the goal of these building standards is to reduce perceptual noise. These standards were formulated based on 10 years of studying perception and cognition; 20 years of collaborating with national groups, such as The Open Plan Working Group and Architectural Research Consortium; and more than 30 years of hosting national design-research conferences. (Learn more about the national groups at www.orfieldlabs.com/working-groups.)

The performance standards were based on visual design research and involved defining, modeling, and measuring building environments with respect to perceptual preference and comfort. The results from these analyses provide recommendations regarding the amount of brightness and visual distraction while optimizing feature daylighting along with a pleasant view of the surrounding.

More specifically, the building’s perceptual performance standards include:

- Visual Reflectance—pattern, gloss, color, appearance, lighting level
- Aural Noise Levels—HVAC noise, privacy, reverberation (liveness), footfall noise, speech
- Thermal Drafts—stagnant air, humidity, thermal asymmetry
- Olfactory Presence—noticeable smells or odors 

The **AUTISM RESEARCH INSTITUTE** has been actively involved in sensory-related research for the past 30 years. This article first appeared on the institute’s website, www.autism.org, and has been reprinted with permission.

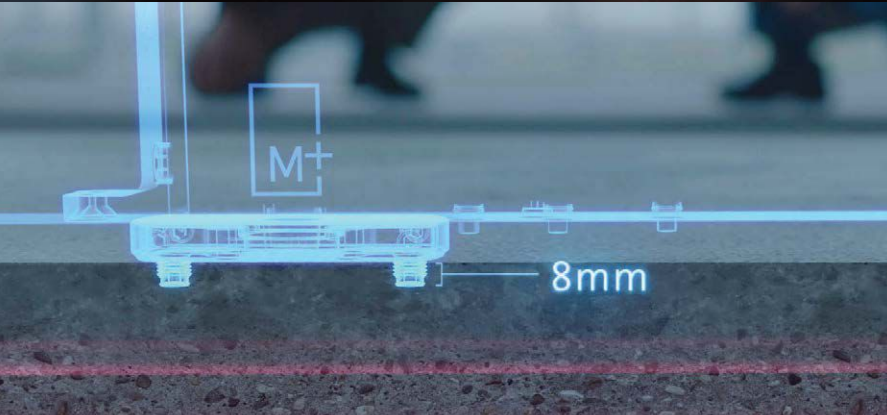


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STUDENT-CENTRIC

Johns Hopkins University School of Nursing Opens Its Building Outward to Showcase Activity, Connect to Community

WRITTEN BY | PAUL LUND, AIA, LEED AP BD+C

The last two years brought about an unprecedented number of across-the-board resignations, retirements and staffing shortages, fundamentally altering our definition of “work” and “the workplace.” But nowhere has the economy buckled more than in health care, specifically nursing. Shifts in pay scales and contract types to balance the current supply and demand are sending ripples across the industry, driving increased attention to nursing school enrollment—in terms of the volume and quality of the graduates. It is a necessity that America’s nursing education programs are equipped to deliver.

PHOTOS: ROBERT BENSON PHOTOGRAPHY, COURTESY HORD COPLAN MACHT



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THE SCHOOL'S HIDDEN GEM HAD ALWAYS BEEN AN OUTDOOR COURTYARD SPACE, BUT IT HAD BEEN HARD TO ACCESS FROM THE INTERIOR. THE NEW HUB OPENS DIRECTLY ONTO THIS COURTYARD. BOTH THE HUB AND COURTYARD ARE NOW VISIBLE ACROSS A DIAGONAL AS ONE ENTERS THE BUILDING.

Johns Hopkins University School of Nursing is one example of a school that has been redesigned to accommodate today's generation of nurses and future nursing leaders. Hord Coplan Macht, in partnership with William Rawn Associates, embraced the university's East Baltimore neighborhood throughout the upgrade and expansion project, seeking to strengthen the campus' roots in the community by breaking down the former fortress-like facilities to foster greater inclusivity, celebrate the educational mission of the School of Nursing and improve the streetscape experience for all passersby.

Built in the early 1990s for a smaller student population and undergraduate-level coursework, the team reimagined the building to create a student-centric learning environment through new and updated programming. The 40,000-square-foot addition to the building replaced the adjacent School of Nursing House building for a more integrated student-faculty-administration experience centered around a new learning hub. The goal of the project was to reinvigorate the existing building through innovative space planning to maximize space utilization, create a student-centric environment, improve learning and research, minimize long-term operating and maintenance expenses, and increase overall efficiency within the school.

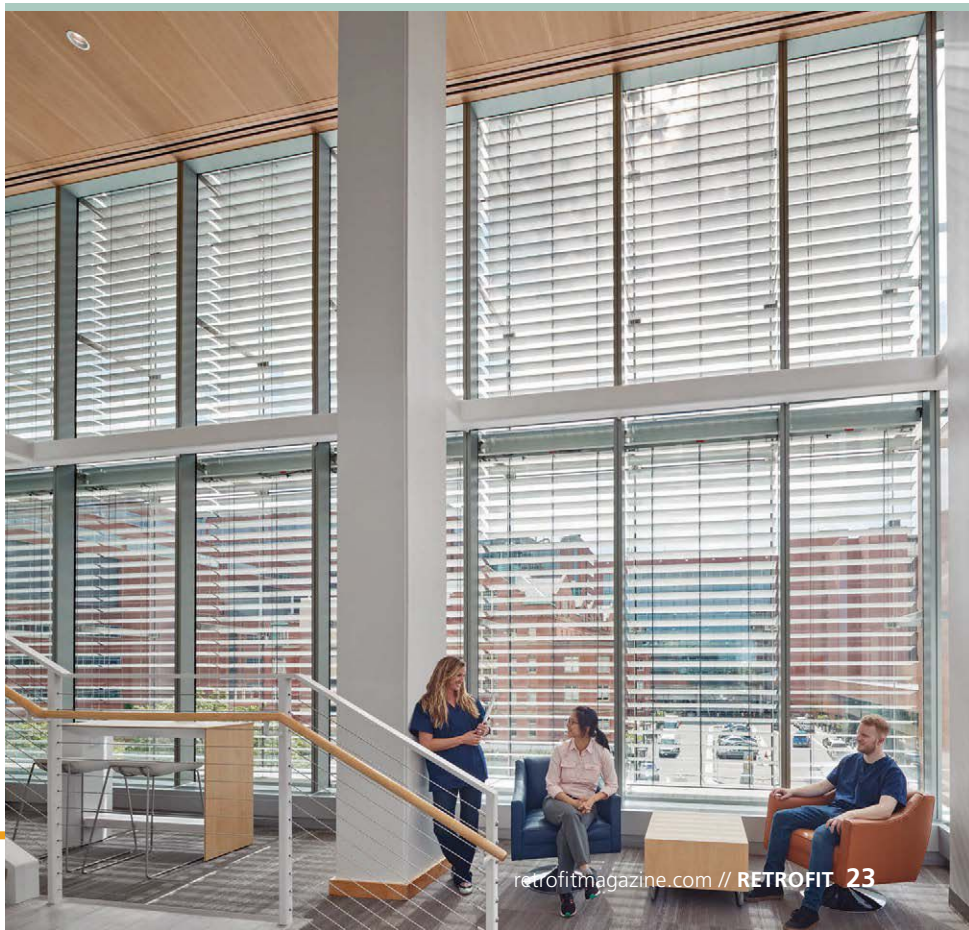
CAMPUS IDENTITY AND SENSE OF PLACE

Giving the School of Nursing a recognizable identity within the broader East Baltimore medical campus was an important aspect of the renovation. The entrance of the building was moved to a more visible location with an outdoor terrace. The café was intentionally located in the prime corner of the building to open up the building to the broader community and to increase the school's connections to the local community. The café serves an important role in East Baltimore; there are limited food-service opportunities in the neighborhood.

A new hub was located adjacent to the beloved existing courtyard that was also redesigned as part of the project. This gives students, faculty and staff a place to gather outdoors, as well as within the abundant interior spaces of the hub. Because Johns Hopkins University School of Nursing is a top-ranked and international leader in nursing education, an important aspect of the project was to expand the conferencing facility within the school. The convening space was doubled in size and

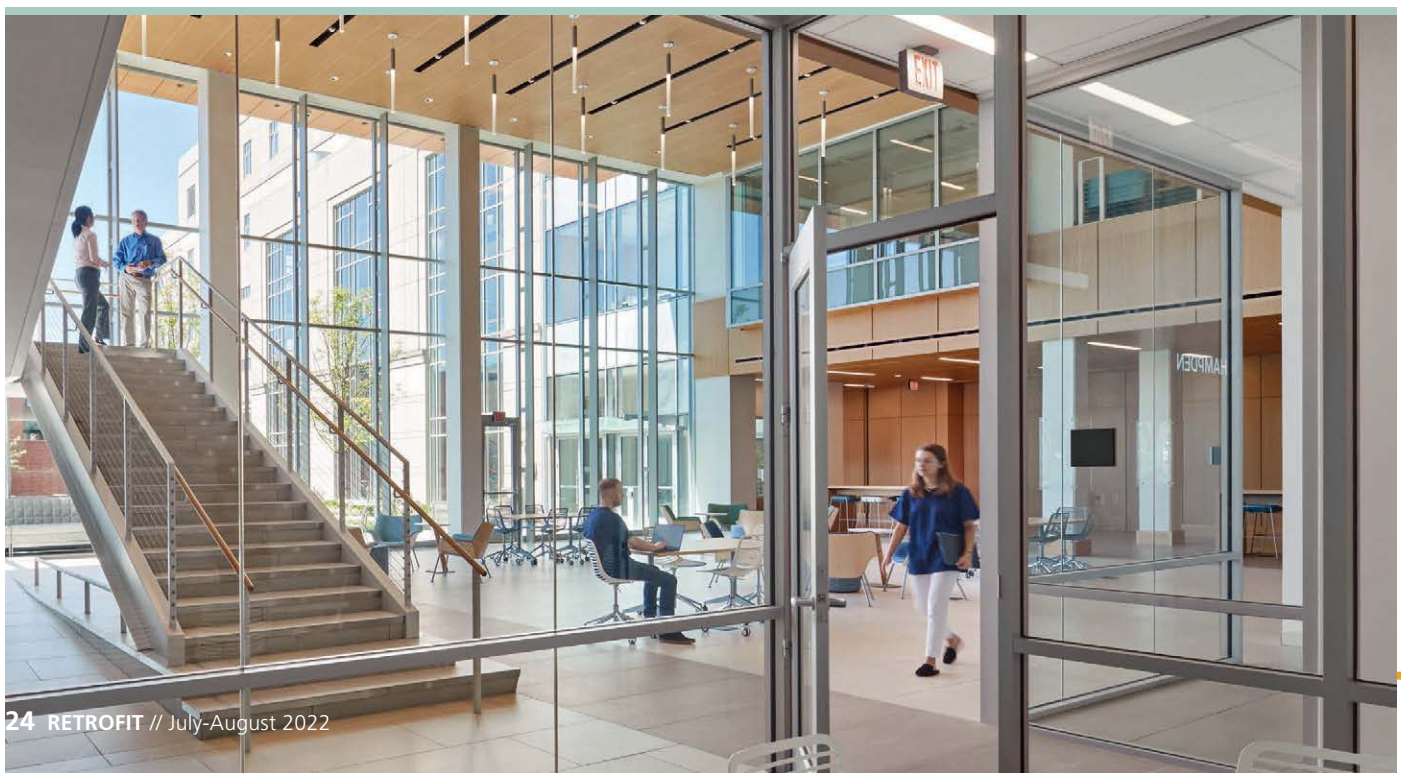


A DOUBLE-SKIN CURTAINWALL SYSTEM AT THE WEST FAÇADE CONTROLS HEAT GAIN, GLARE AND ALLOWS FOR GREATER TRANSPARENCY IN SUPPORT OF THE GOAL OF SHOWCASING ACTIVITY WITHIN THE BUILDING. THIS CURTAINWALL ALLOWS STUDENTS TO GATHER, STUDY AND CONNECT ALONG THE GLASS IN COMFORT.





A SEQUENCE OF OPEN STAIRS CREATES A DELIBERATELY WINDING PATH THROUGH THE BUILDING, LEADING STUDENTS PAST STUDY AREAS WITH VIEWS AND DAYLIGHT. THE SCHOOL HUB'S FOCAL POINT IS A LARGE MURAL WITH THE SCHOOL OF NURSING CREED AND CREST.



connected to the new hub with a barn door. This design allows the School of Nursing to more easily share its leadership and knowledge with improved physical connectivity.

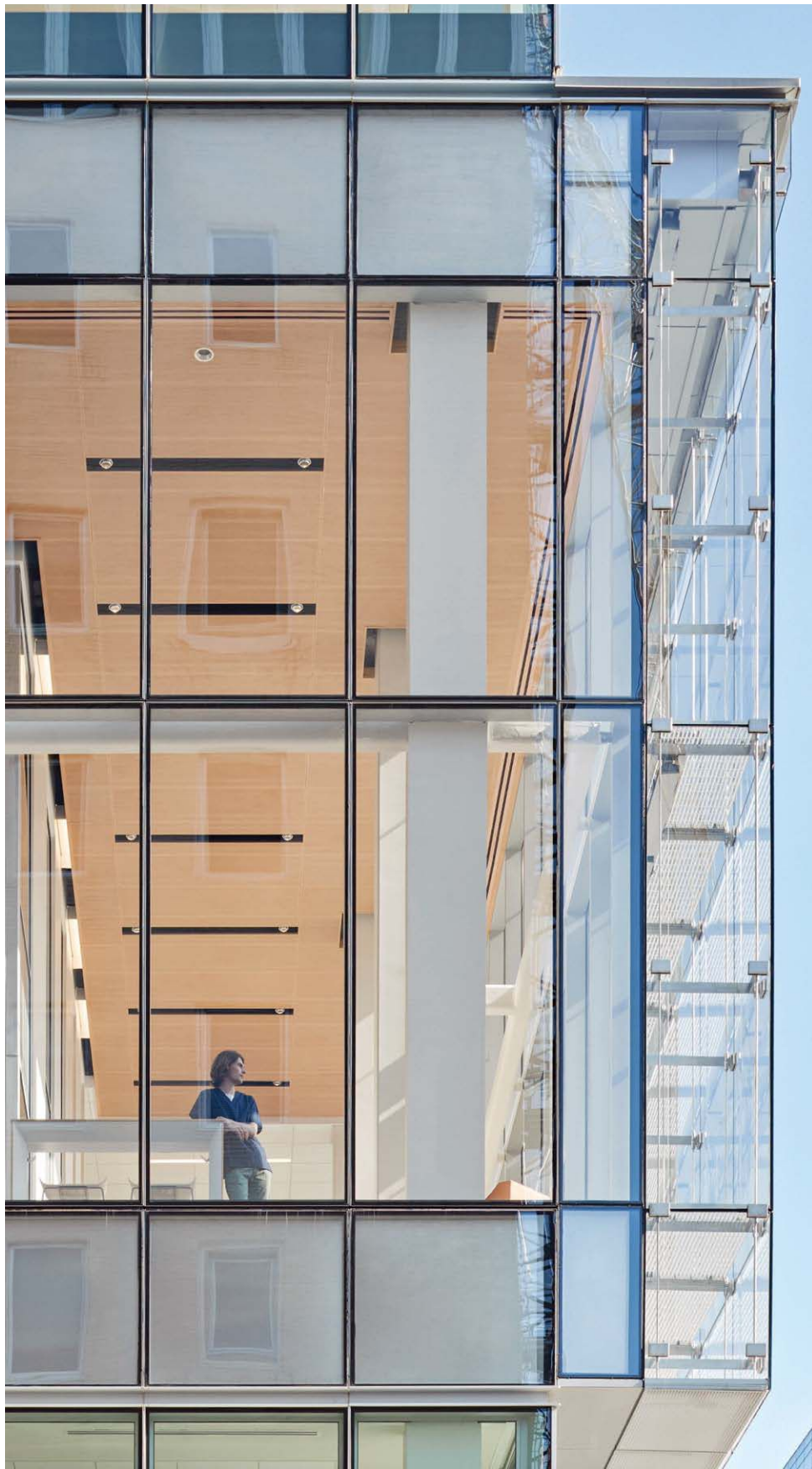
DESIGNING FOR WELLBEING

A major focus of the project was to proactively promote health and wellness for students, faculty and visitors. In particular, the overall design was built to promote mental and cardiovascular health. To promote mental health, the team created a holistic design focused on employing biophilic design strategies that create spaces that are connected to the outdoor courtyard and utilize patterns from nature. To support cardiac health, a decision was made not to incorporate another elevator in the project. A grand new stairway weaves its way from the hub up through the building to encourage the stairs use. The stairway is open, visually interesting and conducive to stopping to talk, encouraging students and faculty to move more and interact with each other. It was designed and located to showcase the life of the school and provide views of East Baltimore. This is in sharp contrast to the existing building layout, which was more inward focused. Better physical and mental health leads to deeper, more meaningful and more engaged learning.

STUDENT-CENTRIC SPACES

A focus on student spaces extends throughout the renovation and addition. A sequence of open stairs creates a deliberately winding path through the building, leading students past study areas with views and daylight. In contrast to the more active hub, the Study Cube located on the third floor supports quiet study. Placed on the main façade, above the new entrance, the Study Cube celebrates the student-centered focus of the school, showcasing activity to the community.

A double-skin curtainwall system at the west façade controls heat gain, glare and allows for greater transparency in support of this goal of showcasing activity. This curtainwall allows students to gather, study and connect along the glass in comfort that would not be possible without this double-skin technology. Numerous collaborative study rooms, study booths and informal seating are strategically located throughout the building. The design team intentionally located these areas to break down the divide between the faculty and student domains that existed within the former





building layout.

On the lower level of the building, a new informal student kitchen and lounge area is incorporated to allow students to gather.

FULFILLING THE MISSION OF THE INSTITUTION

The addition allowed the school to create a true hub of school life for the first time: a place where the whole school could gather to hear guest speakers or where students, who primarily work in groups, can find each other. The school's hidden gem had always been an outdoor courtyard space, but it had been hard to access from the interior. The new hub opens directly onto this courtyard. Both the hub and courtyard are now visible across a diagonal as one enters the building. Student collaboration spaces face onto the hub at both levels.

The hub's focal point is a large mural with the school of nursing creed and crest. It is a colorful physical manifestation of the mission. The hub is designed in layers of transparency and acoustical privacy. The group study rooms located directly on the hub are enclosed in interior storefront and do not have doors. As you move further away from the hub, the collaborative study rooms include doors and eventually a multipurpose enclosed classroom.


A NEW CENTER FOR RESEARCH AND SYMPOSIA

For the first time, the School of Nursing can

host research activities and symposia in its building, allowing the broader medical community and city that the school serves to visit. The hub, in conjunction with new conferencing rooms, creates a gathering "ecosystem". Smaller spaces allow community groups to participate in research activities. For the first time, funded research spaces are within the main building, allowing students greater access to prominent researchers and their work.

The research commons is designed around flexibility and efficiency of research teams. The design is based around groupings of three that can expand and contract as research grant fundings ebb and flow. Although the commons is airy and open, it incorporates the required privacy and security requirements for research. This commons concept is new to the school and will allow students to see and participate in research activities.

A FUTURE-BUILT SCHOOL

Redesigned to accommodate a new generation of nursing students, Johns Hopkins University School of Nursing embraces the local neighborhood to create a campus that is open to students and the community alike. This technology-rich, next-generation nursing school carefully considers its students, enlivens its surrounding community and creates an environment where students can prepare to face the many challenges of today's health-care system. 

» [THE DESIGN TEAM SOUGHT] TO STRENGTHEN THE CAMPUS' ROOTS IN THE COMMUNITY BY BREAKING DOWN THE FORMER FORTRESS-LIKE FACILITIES TO FOSTER GREATER INCLUSIVITY, CELEBRATE THE EDUCATIONAL MISSION OF THE SCHOOL OF NURSING AND IMPROVE THE STREETScape EXPERIENCE FOR ALL PASSERSBY. «



Materials

CEILING // Rockfon North America, www.rockfon.com

WOOD WALL & CEILING PANELS // Navy Island, soundply.com

LIGHT FIXTURES // SPI Lighting, www.spilighting.com; 3G Lighting, www.3glighting.com; and Focal Point, www.focalpointlights.com

INTERIOR STOREFRONT // Oldcastle BuildingEnvelope, obe.com

CARPET TILE // Shaw Contract, www.shawcontract.com

FLOOR TILE (HUB) // Architessa, architessa.com

LUXURY VINYL TILE // Armstrong Flooring, www.armstrongflooring.com/commercial

PAINT // Sherwin-Williams, www.sherwin-williams.com

LAMINATE // Formica, www.formica.com

SOLID SURFACING // Dupont Corian Quartz, www.corianquartz.com

UPHOLSTERY // Momentum Textiles & Wallcovering, www.momentumtextilesandwalls.com, and Designtex, www.designtex.com

CUSTOM GRAPHICS // 3M, www.3m.com

LOUNGE FURNITURE // Herman Miller Inc., www.hermanmiller.com; Mitchell Gold + Bob Williams, www.mgbwhome.com; OFS, ofs.com; and Coalesse, www.coalesse.com

STOOLS, BAR-HEIGHT TABLES (STUDY CUBE) // Steelcase Inc., www.steelcase.com

TABLES // KI, www.ki.com, and OFS, ofs.com

ADDITIONAL SEATING // Kimball, www.kimball.com, and Herman Miller, www.hermanmiller.com

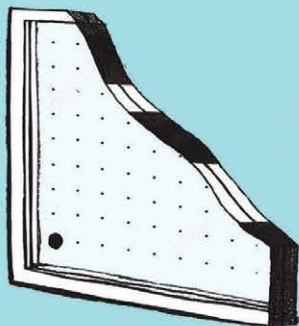
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Archibald Place (left) was able to maintain its existing building appearance while upgrading its monolithic glass to modern IGU performance.



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- Mitigate outside noise by improving acoustic performance



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CHILDREN'S HOSPITAL AND MEDICAL CENTER |

Omaha, Neb.

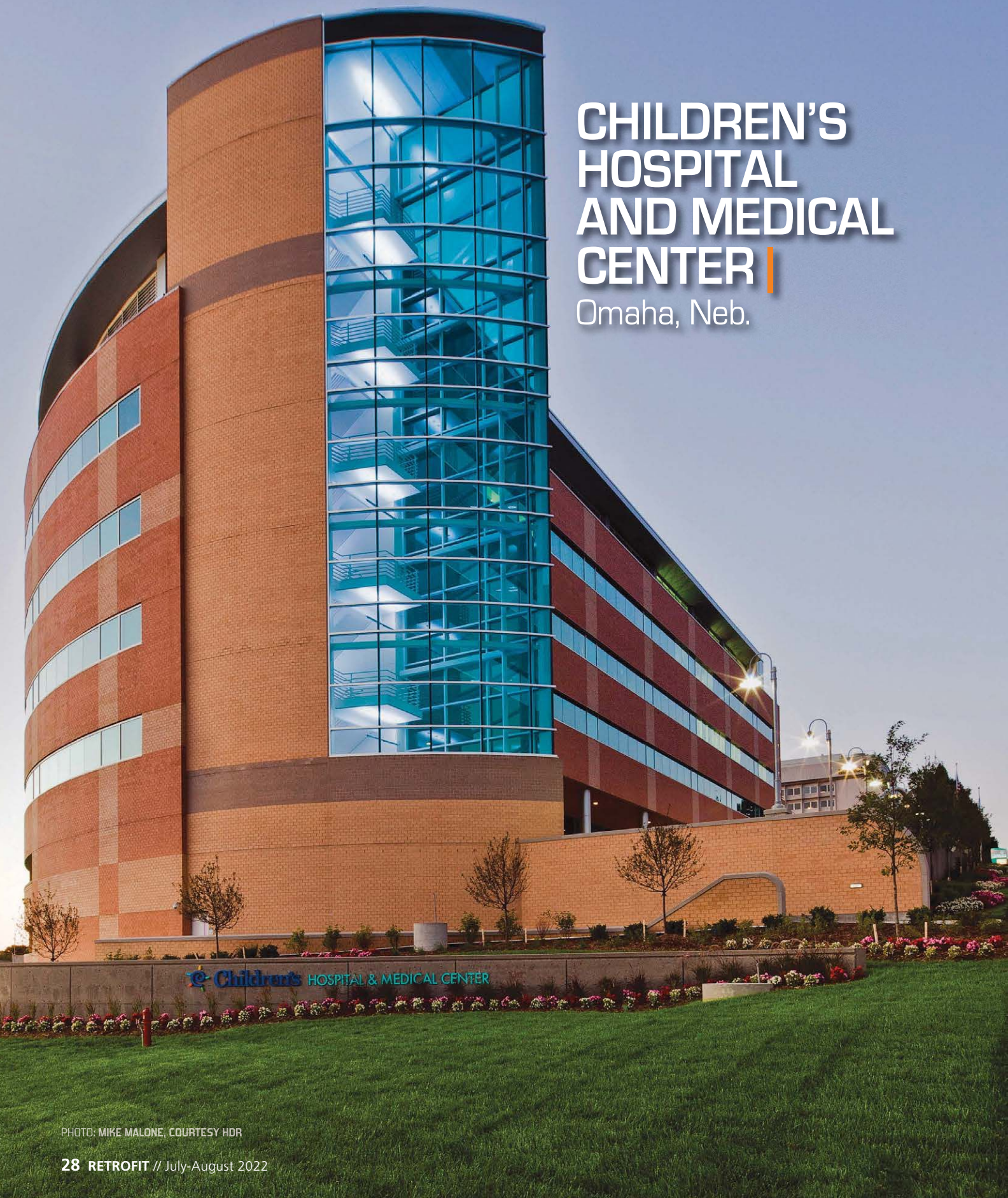


PHOTO: MIKE MALONE, COURTESY HDR

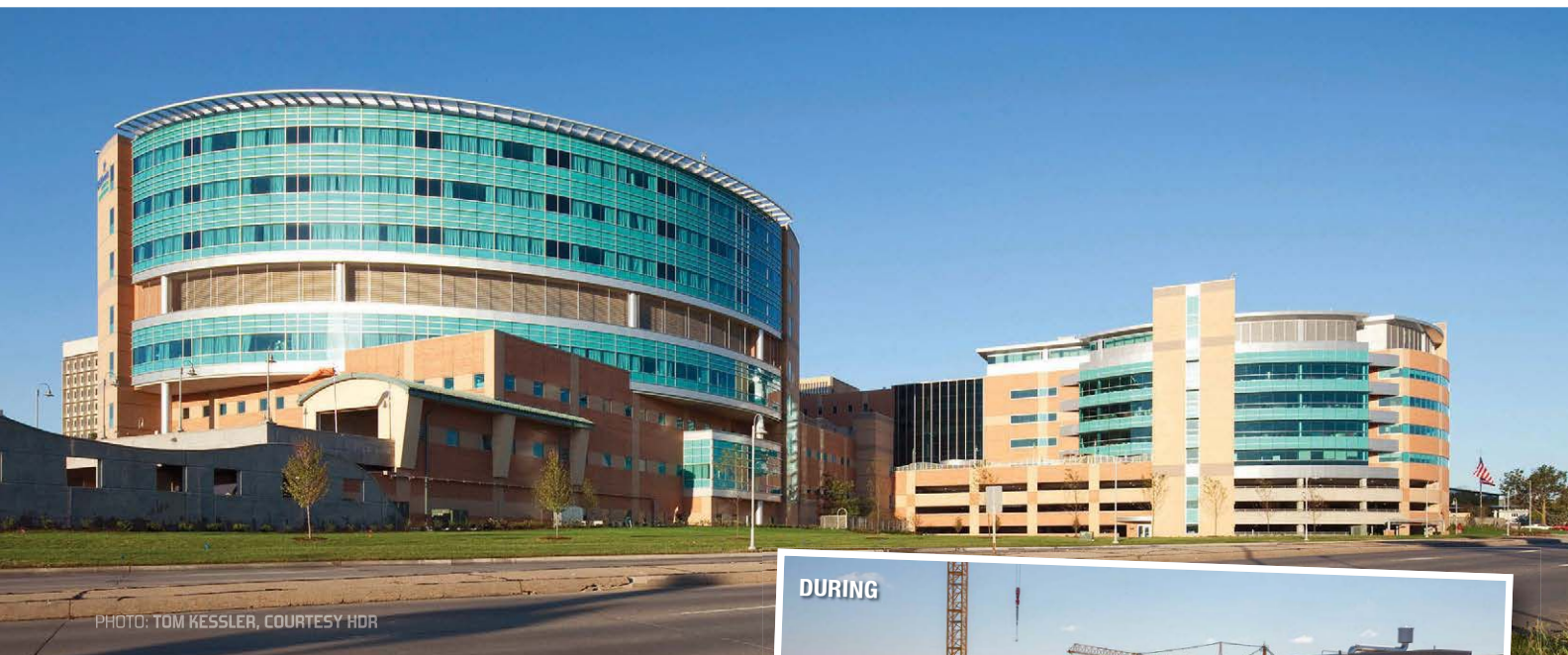


PHOTO: TOM KESSLER, COURTESY HDR

►► RETROFIT TEAM

GENERAL CONTRACTOR: Kiewit, www.kiewit.com

ARCHITECT: HDR, www.hdrinc.com

MECHANICAL, PLUMBING, HVAC ENGINEER: The Waldinger Corp., www.waldinger.com

METAL STUDS AND DRYWALL: E&K, e-kco.com

EXTERIOR CLOSURE: Architectural Wall Systems, www.archwall.com

►► MATERIALS

The hospital received a 450,000-square-foot expansion and 100,000-square-foot renovation. The new facility, known as the Hubbard Center, is the most visible and colorful part of Children's Hospital and Medical Center, fronting Omaha's busiest corridor and integrating architecturally with the existing facilities. It reunites the children's intensive care and cardiac-care units, formerly across the street in another hospital, with the children's hospital and its expansion. A unitized curtainwall envelope seamlessly ties the existing hospital to the expansion.

Adjacent to the new tower is an expanded onsite parking garage that features a large digital media screen, as well as a perforated skin that showcases shifting colors, creating a new face for the campus. The interior complements the colorful exterior, incorporating color schemes and motifs from the existing buildings into the new spaces to unify the architecture and give the Hubbard Center a dynamic and playful appearance.

The design team developed an environment that is friendly and appealing to patients of any age. Common areas feature educational games and engaging diversions that bridge the hospital's patient-age divide. Bright, playful colors and a creative lighting design are incorporated throughout the interiors, like the vivid family amenity spaces that feature adjustable color-changing lighting and the care spaces that utilize soothing starry-sky ceilings complete with constellation lighting. Each patient floor has a dedicated shape and distinct color scheme for enhanced wayfinding and a strong sense of place.

Large ICU-level patient rooms built for flexibility include user-controlled lighting to support patients and their families' routines and comfort. Each inpatient room has an entertainment system through which families can pull up live language interpreters, including sign language.

The following is a sampling of materials used in the project:
DIGITAL MEDIA SCREEN: Daktronics, www.daktronics.com



PHOTO: DAN SCHWALM, COURTESY HDR

DURING

COLOR-CHANGING LIGHTING IN AMENITY SPACES: Lumenpulse, www.lumenpulse.com

USER-CONTROLLED LIGHTING IN PATIENT ROOMS: Visa Lighting, www.visalighting.com; USAI Lighting, www.usailighting.com; Qtran, www.q-tran.com; and Encelium, encelium.com

EXTERIOR COLOR-CHANGING LIGHTING: Traxon Technologies, www.traxontechnologies.com

►► THE RETROFIT

Since its founding in 1948, amid the polio epidemic, Children's Hospital and Medical Center has been on the leading edge of pediatric care across the region as Nebraska's only freestanding children's hospital. This has led to steady, significant growth in the number of patients served and the variety of programs and services provided. During the last decade, the hospital reached capacity in its existing facilities and decided to grow—in scope and space—to continue to meet the needs of children and families in the region.

This ambitious expansion transforms a confined, urban site into a 10-story, state-of-the-art hospital that doubles the size of the existing hospital, adding 100 beds, new services, and new and improved features, including 17 operating rooms, a 20-room emergency department, hematology and oncology unit with its own dedicated floor, rooftop helipad and more.

The Hubbard Center's design aims to provide a sense of normalcy and everyday comforts for patients and their families via an expansive café area, a chapel and meeting space, intuitive patient check-in/check-out, and outdoor viewing gardens. A glass solarium provides space for events, and an indoor garden allows families and patients to gather and relax outside the care space.

HENRY M. GOLDMAN SCHOOL OF DENTAL MEDICINE, BOSTON UNIVERSITY



►► RETROFIT TEAM

MASTER PLANNING, ARCHITECT, INTERIOR ARCHITECT, BUILDING ENCLOSURE CONSULTANT, MEP ENGINEER, STRUCTURAL ENGINEER, LIGHTING DESIGN AND LANDSCAPE ARCHITECT: SmithGroup, www.smithgroup.com
GENERAL CONTRACTOR: Shawmut Design and Construction, www.shawmut.com
OWNER'S PROJECT MANAGER: Compass Project Management Inc., compass.vertexeng.com
CIVIL ENGINEER: Nitsch Engineering, www.nitscheng.com

►► MATERIALS

SmithGroup designed the expansion and renovation of this mid-century building as a phased renovation that allowed the dental school to continue providing cutting-edge education to its students and high-quality oral health care to its patients, who are often among the most underserved populations in Boston.

A 7-story addition on the building's west side and a 2-story addition on the north side expanded the existing building on Albany Street, and 63,000 square feet of interiors were renovated. The building was re-clad with a modern high-performance façade, accented with terra cotta and wood-grain panels and featuring integrated lighting, creating

a strong architectural statement reflecting the innovative vision of the school.

The new facility incorporates the Simulation Learning Center, which has 117 student stations and two instructional/teacher stations outfitted with simulators, intraoral scanners, ultrasonic scalers, electric handpieces, curing units for composite restoration and a high-speed evacuation system.

"Under the leadership of Dean Emeritus Dr. Jeffrey W. Hutter, BU was the first dental school in the U.S. to implement a fully digital vision for providing oral health care to its patients and for educating its students," says Cataldo Leone, dean ad interim. "The new Simulation Learning Center closely aligns with what students will use in the clinical environment, better preparing them for the later phases of their educational experience."

The project added 28 new chairs to the predoctoral Patient Treatment Center, totaling 100 chairs spread over three floors and five distinct spaces in the renewed dental school. The Patient Treatment Center is outfitted with digital radiography with multidimensional imaging capabilities, along with laboratories that house dental 3D printers and robust five-axis milling units.

The project also includes the creation of student-centered collaborative and learning

environments, which did not exist in the original dental school facility. A new academic entrance on East Newton Street leads to student collaborative space for informal learning and social gathering.

A flexible, 140-seat lecture hall provides a venue for the school's larger classes, as well as events and symposia. A mix of flexible and fixed furniture provides agility to convert the room for many purposes. Embedded technologies enable distance learning or course recordings to expand educational modes. Lighting is designed to fully support the flexibility of the space, allowing levels to be adjusted for different teaching styles, technology uses or event types. A backlit writable glass teaching wall is dimmable and color-changing, allowing the atmosphere to vary from quiet study to active learning to events. Immediately outside the lecture hall is a pre-function space for receptions and other events, as well as break-out space for collaborative learning.

The following is a sampling of materials used in the project:

METAL WALL PANELS: IW Series from CENTRIA, www.centria.com
WOOD PANELS: Meteon from Trespa, www.trespa.com
TERRA COTTA: NeaCera from Avenere Cladding,



www.avenerecladding.com
 GLASS CURTAINWALL AND WINDOWS: 1600 Series from Kawneer, www.kawneer.com
 EXTERIOR FAÇADE AND CANOPY ACCENT LIGHTING: Ecosense, www.ecosenselighting.com
 EXTERIOR INTEGRATED HANDRAIL LIGHTING: Cole Lighting, www.colelighting.com
 EXTERIOR CANOPY DOWNLIGHTS: Lucifer Lighting Co., www.luciferlighting.com
 INTERIOR DENTAL CLINICS LIGHTING: Fluxwerx, fluxwerx.com, and Zumtobel, zumtobel.us
 INTERIOR PUBLIC SPACES, PATIENT WAITING LIGHTING: Focal Point, www.focalpointlights.com, and USAI Lighting, www.usailighting.com
 INTERIOR WOOD SLAT INTEGRATED DOWNLIGHTS: Kreon, www.kreon.com
 INTERIOR STUDENT LOUNGE ACCENT LIGHTS: Selux, www.selux.us; Louis Poulson, www.louispoulson.com; and Bocci, bocci.com
 INTERIOR ELEVATOR LOBBIES LIGHTING: Prudential Lighting Co., www.prulite.com
 LARGE CLASSROOM LIGHTING: TLS, tls-led.com, and Fluxwerx, fluxwerx.com
 CARPET: Mannington Commercial, www.manningtoncommercial.com
 RESILIENT SHEET FLOORING: Johnsonite, commercial.tarkett.com
 RESILIENT TILE FLOORING: Armstrong Flooring,

www.armstrongflooring.com
 PORCELAIN TILE: Caesar Ceramics, www.caesar.it/us/caesarusa
 TERRAZZO: Terrazzo & Marble Supply Cos., www.tmsupply.com
 ACOUSTICAL CEILING TILE: Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com
 WOOD CEILING AND WOOD PANELS: Rulon International, rulonco.com
 PAINT: Pittsburgh Paint, www.ppgpaints.com/ppg-pittsburgh-paints
 WALL TILE: American Olean, www.americanolean.com; Anatolia, www.anatoliatile.com; Daltile, www.daltile.com; and Lea Ceramiche, www.leaceramiche.com
 ACOUSTICAL METAL PANELS: Fry Reglet, fryreglet.com
 ACRYLIC PANELS: 3Form, www.3-form.com
 WRITABLE GLASS: Clarus, www.clarus.com, and Forms+Surfaces, www.forms-surfaces.com
 SIGNAGE AND ENVIRONMENTAL GRAPHICS: DCL, www.designcommunicationsltd.com

► THE RETROFIT

Boston University (BU) embarked on an in-depth Applied Strategic Planning (ASP) process to set a new direction for the Henry M. Goldman School of Dental Medicine. It became clear during the

ASP that the BU dental education facilities were not capable of meeting current or future needs of the university. Dental facilities were sprawled out across the university medical campus, and clinical space was insufficient.

BU engaged SmithGroup to participate in a facility master plan process running concurrent to the overall planning course to address the program's spatial needs. The alignment of the facilities master plan to the strategic planning process ultimately allowed the university to think beyond the walls of the existing dental education facilities and re-conceptualize a new paradigm for dental education at BU. Following nearly six years of scenario exploration on the BU medical campus, design moved forward for a project to renovate 63,000 gross square feet and expand the existing GSDM facility by 48,000 gross square feet.

Construction of the project was structured into four phases, allowing the dental school to continue educational and patient-care operations uninterrupted. The phased planning enabled such flexibility that construction activity could be reprioritized in the final phase, when COVID-19 safety protocols were enacted and a construction moratorium was mandated by the city of Boston, allowing the school to still meet its targeted July 2021 completion.

WOMEN'S WELLNESS AND BREAST CARE | Watertown, N.Y.

Samaritan
Health and Wellness Plaza

BEFORE

PHOTO: COURTESY SLAM COLLABORATIVE

PHOTOS: DAVID REVETTE unless otherwise noted

» RETROFIT TEAM

ARCHITECTS: SLAM Collaborative, www.slamcoll.com, and Aubertine and Currier Architects, aubertinecurrier.com
GENERAL CONTRACTOR: Purcell Construction Corp., www.purcellconstruction.com

» MATERIALS

When a big-box store moved out of the community, Samaritan Medical Center purchased the 80,000-square-foot retail space with ample on-grade parking. The location of the property was on a major north-south route into town and near other scattered hospital services.

The open parking leads directly into a glazed public gallery across the front of the building, providing discrete entryways into the individual service pods that are color coded by service. The individually contained service pods streamline staff

movements for improved patient treatment times.

The design team's philosophy was based around a Planetree Person Centered Care model with the focus on the environment supporting the health of a person by providing a calming and welcoming space to ease the level of stress sometimes encountered with medical visits. Biophilic graphic patterns and natural materials, including stone fireplaces in gownned waiting spaces, provide a level of comfort during visits.

The following is a sampling of materials used in the project:

WINDOWS: Tubelite, tubeliteinc.com
INTERIOR GLASS: Skyline Design, skydesign.com
CARPET: Biodiversity Collection from Interface, www.interface.com, and Kinetex from J&J Flooring, www.jjflooringgroup.com
FLOORING: Mannington, www.manningtoncommercial.com; Amtico,

www.amtico.com; and Nora, www.nora.com
LIGHTING: Avalon from Barbican, barbican.ca, and Heracleum from YLighting, www.ylighting.com
WALLCOVERINGS: Glamdecor from Glamora, www.glamora.it/en, and Symphony from WolfGordon, www.wolfgordon.com

» THE RETROFIT

Samaritan Medical Center opened its new Women's Wellness and Breast Care location in November 2019. New York State provided a \$9.8 million Statewide Health Care Facility Transformation Program grant to help make the project possible. Located in the Samaritan Health and Wellness Plaza, the new location combines many women's health services, including internal medicine, breast health, cardiology, dermatology, ear/nose, gastroenterology, neurology, mental health and gynecology services into one convenient location.



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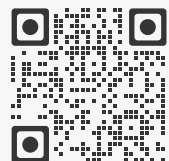


**AIRTIGHTEN
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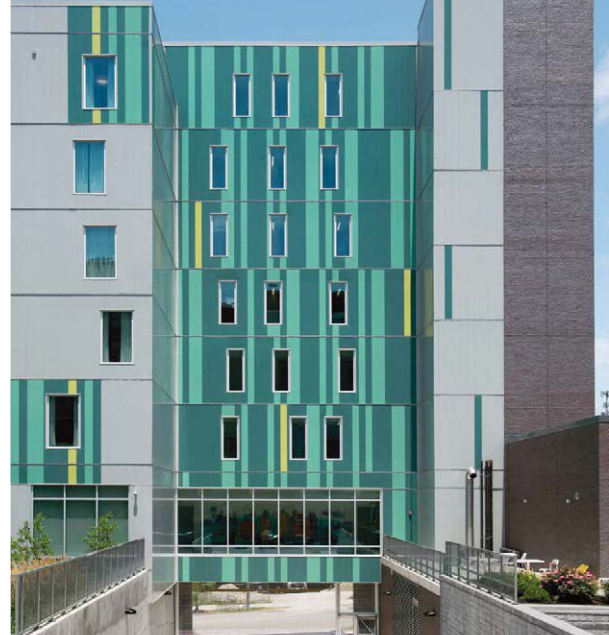


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RONALD MCDONALD HOUSE | Cincinnati

► RETROFIT TEAM

ARCHITECT: GBBN Architects, www.gbbn.com
 WALL PANEL INSTALLER: Neiheisel Steel,
 (513) 367-6000
 GENERAL CONTRACTOR: Messer,
www.messer.com

► MATERIALS

Especially in cities with prominent children's hospitals, Ronald McDonald House Charities have become important resources for families with severely sick children. The organization offers housing and meals to these families at no cost while their children are receiving medical treatment. These facilities often don't have enough room to serve all who need their services, which is why a number now are pursuing expansion. The most prominent of these projects is in Cincinnati, with a \$42 million addition and renovation that more than doubled the space to 177 rooms, making it the largest in the world.

While the exterior of the renovated and expanded structure is primarily masonry to blend in with the surrounding Avondale neighborhood, the courtyard created by the L-shaped design is a study in fun. Here, designers with GBBN Architects clad the walls in metal panels that provide pops of playful color—two shades of green and one of

yellow—around all the window openings and from top to bottom on one inset wall. The panels provide a backdrop for a recreation area and fountain to give guests access to outdoor space.

"GBBN, in collaboration with Ronald McDonald House, sought an approach integrating the existing wide range of urban scales of the immediate context," says Scott Kyle, a GBBN Architects associate and designer on the project. That context included two Cincinnati Children's Hospital Medical Center towers to the west and south of the building, single-family homes to the north, and mid-level office and parking structures to the east. These surroundings had to be considered, along with the existing Ronald McDonald House structure to which this new build would be attached.

A number of factors were considered while developing the panel patterning, Kyle adds. "The large façade surfaces are broken down to smaller, scalable modules to make up the playful whole," he says. "The panelization also considers standard panel lengths, installation methods, and expansion and contraction; the horizontal joints incorporated into the system illustrate this integration."

GBBN Architects' designers specified Petersen's PAC-CLAD products to create the unique exteriors framing the courtyard. These included approximately 22,000 square feet of

the company's Flush wall panels in a mix of Cityscape—a gray tone that creates a neutral background—along with Patina Green, Teal and the custom yellow Parakeet for the striping that surrounds the windows. An additional 860 square feet of Petersen's Snap-Clad roof panels were used to create a canopy for the facility's seventh-story rooftop gathering space.

Neiheisel Steel handled the courtyard wall-panel installation, which was the firm's largest metal panel project. Neiheisel Steel's team had its challenges—notably the need to work from lifts instead of being able to use staging. "There were certain elevations where we had to bring in 135-foot lifts," says Project Manager Scott Neiheisel. "Lifts aren't as efficient as stages; they bounce and move in the wind."

The added effort paid off, though, in the reactions of all involved—a fact Kyle attributes to teamwork. "The final product was truly a collaboration by the owner, architect, engineers and contractors," he says. "It has been extremely well-received by the owner, the neighborhood and, most importantly, the guest families calling RMH Cincinnati home."

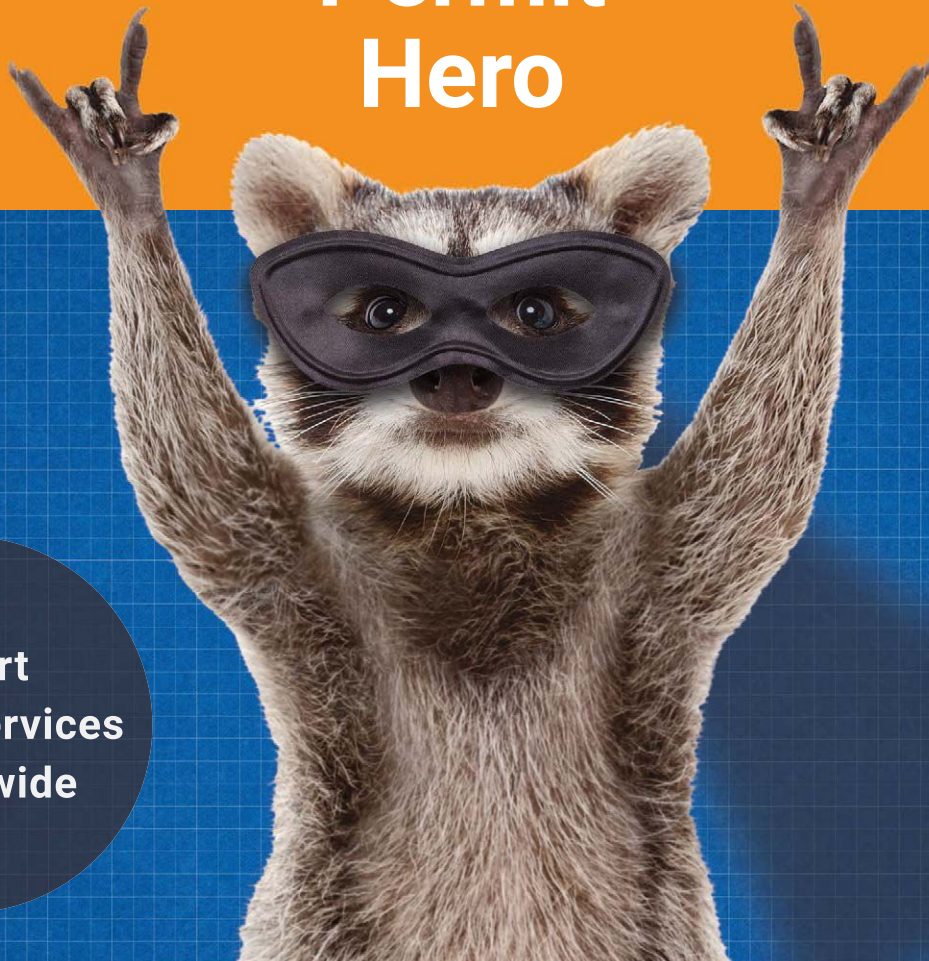
WALL PANEL MANUFACTURER: Petersen,
www.pac-clad.com





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PHOTOS: AD SYSTEMS



►► RETROFIT TEAM

ARCHITECT: JRJ Architects LLC, www.jrjarch.com

►► MATERIALS

The building's ease-of-use and efficiency goals extend from its layout to its design features, starting with one of the most frequently traversed thoroughfares—the doors. Often overlooked, doors can provide a key element to optimizing a space while supporting occupant comfort. Providence Health and JRJ Architects specified AD Systems' ExamSlide sliding door system because it is designed to meet the needs of today's health-care facilities. The flush wood doors' precision-engineered and impact-resistant framing slides along a top-hung roller system for a smooth operation.

Because sliding doors eliminate a door's swing path, they inherently maximize square footage. This, in turn, helped JRJ Architects create exam rooms that maximize usable space and are more accessible to align with PacMed's patient-focused health-care philosophy.

"Providence Health uses a lot of doors in our clinic applications. We learned these barn doors save 10 square feet per exam room because they require no swing clearance, so we standardized on their use," says Erin Couch, the director of

Architectural Standards and Design at Providence Health.

"Clients often want more exam rooms," adds Jason Mullavey from JRJ Architects. "ExamSlide's space-saving design effectively gave us an extra exam room for every 11 we had planned by eliminating the traditional door swing into the room."

From an administrative perspective, more rooms facilitate easier appointment scheduling for staff. It also reduces time spent in the waiting area, both of which create an environment focused on occupant comfort. In addition, the added space in each room allows for exam rooms to hold more essential items. Lastly, the sliding doors do not require an approach clearance. From a patient's perspective, this makes self-rooming easier.

The interior sliding door system features standardized hardware, which simplifies the design process. As Couch states, "Hardware can be difficult and challenging to specify for health-care projects. There are many operational and opening-width requirements to juggle. A clean and easy-to-use standard removes the guesswork from specifying a door." This unified approach helps ensure the door fits all building-code requirements, including the Americans with Disabilities Act, and lowers the possibility of

having to redo door specification.

It also simplifies facility care. All door handles, closing devices and wrap-around frames are built with long-lasting, commercial-grade components. In the unlikely event that a door should need adjustment, the standardized hardware ensures any maintenance will be straightforward.

The 52 doors used at Pacific Medical Centers are certified by the Forest Stewardship Council, ensuring the doors' materials come from responsibly managed forests.

SLIDING DOORS MANUFACTURER: AD Systems, www.specadsystems.com

►► THE RETROFIT

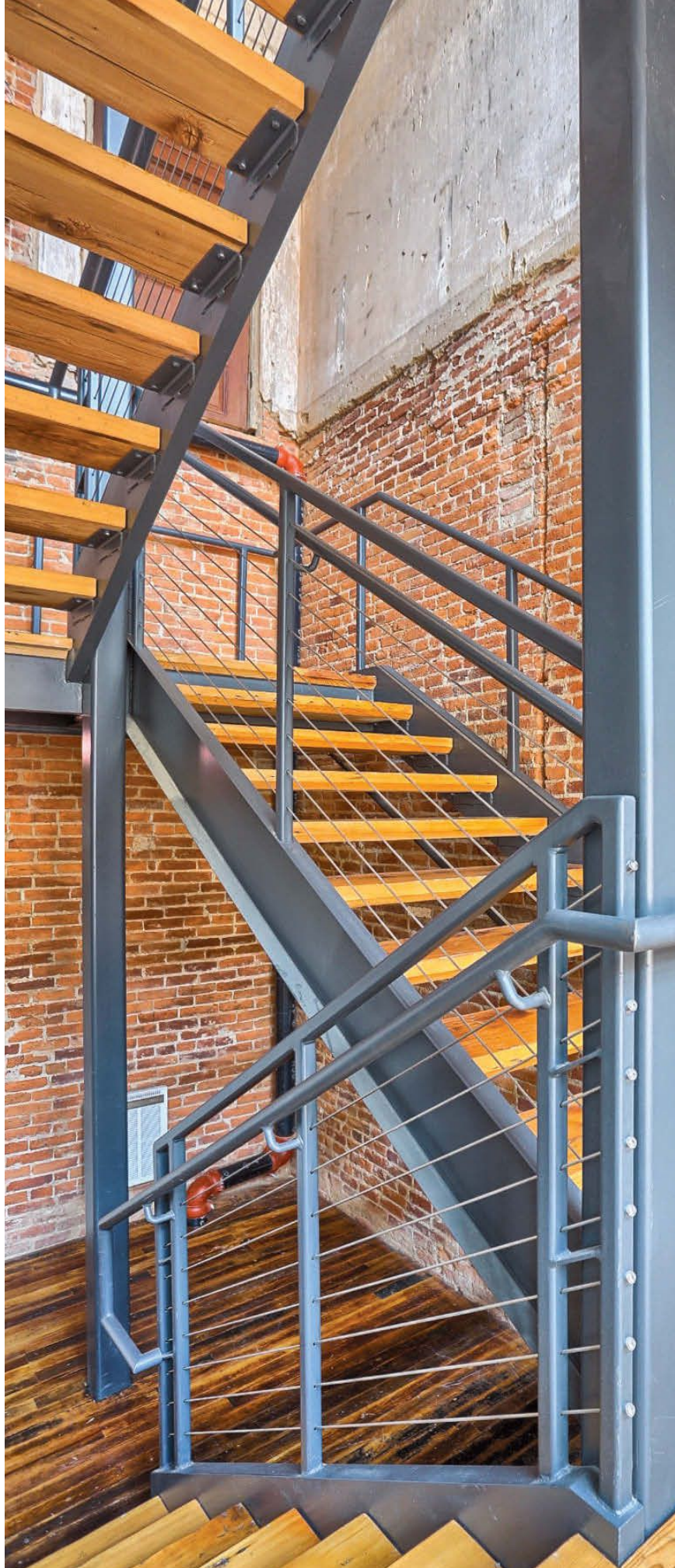
In 2022, Pacific Medical Centers moved into Providence Health's Gately-Ryan Building. The new location is closer to downtown Renton and provides greater accessibility to PacMed's world-class health care. Outside, patients can easily enter the three large, free parking lots from multiple streets. Inside, the all-first-floor clinic provides a modern self-check-in system and expanded access to physical therapy services and a cardiovascular lab. These amenities provide a more positive patient experience by making medical center visits easier and more efficient.



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BIOTECH COMMONS, UNIVERSITY OF PENNSYLVANIA

Philadelphia

PHOTOS: JEFFREY TOTARO



► RETROFIT TEAM

ARCHITECT: Voith & Mactavish Architects LLP,
voithandmactavish.com

► MATERIALS

Housed in a brick structure from the late 1960s, the library had been unassuming with dark interiors that felt cut-off from Hamilton Walk. The renovation replaces the brick façade with floor-to-ceiling windows at ground level. The new windows open the building to the campus, allowing passersby on Hamilton Walk to see inside and bringing natural light

to the once-gloomy interiors. Reading areas and lounges for informal group work line the windows, offering daylit spaces with views out to campus.

The renovation was planned around the sensitive laboratory environments above and below Biotech Commons. The basement hosts a morgue and a Zebrafish laboratory—a space of floor-to-ceiling aquariums vulnerable to even minor sound vibrations. Above Biotech Commons are biomedical laboratories with specialized equipment served by glass pipes running through the building. Voith & Mactavish Architects' renovation

took a surgical approach, reconfiguring the floor in the least invasive way possible and integrating new MEP systems without disturbing the sensitive surroundings.

Throughout, finishes were selected for durability, environmental friendliness and ease-of-maintenance, lowering Biotech Commons' life-cycle carbon footprint and operating costs. The building also hosts one of the first gender-neutral bathrooms on campus, advancing this university initiative.

Other elements—like wirelessly automatic door operators—foster health and safety in the



post-COVID-19 world.

► THE RETROFIT

Voith & Mactavish Architects transformed an outdated biomedical library into an open center for cross-disciplinary learning, prototyping and collaboration. The redesigned space opened its doors to the public on Sept. 20, 2021.

The renovation rethinks what a university library can be in an era when book reference and individual research have given way to digital learning, hands-on making and transdisciplinary

exploration. Gone are the carrels and the stacks, replaced with tech-integrated conference spaces, collaboration classrooms with movable furniture and boards, and a digital fabrication lab equipped with modeling tools and 3D printers.

Biotech Commons supports new modes of research by offering a range of spaces and services that better support how people learn and work. Every facility—from conference centers and study rooms to fabrication shops—is free to be scheduled by any student. Unlike typical university libraries, Biotech Commons does not require a

Penn ID for access, making it a barrier-free place that drives innovation by inviting professionals, students and community members to collaborate.

At the heart of the space are clusters of adaptable group workspaces. Accommodating anywhere from four to 12 people, these allow students to have impromptu breakout sessions and meetings. Various seating options encourage different formats of collaboration, and 20 group study rooms accommodate eight people each. The group studies are acoustically treated, allowing students to work together freely without disrupting others.

ENCOMPASS HEALTH REHABILITATION HOSPITAL

Middletown, Del.

► RETROFIT TEAM

AIR SYSTEMS BALANCING: Eastern Air Balance Corp., www.easternairbalance.com

► MATERIALS

Encompass Health Rehabilitation Hospital is a provider of inpatient rehabilitation following a stroke, hip fracture, and other complex neurological and orthopedic conditions. It contains 40 beds and includes one patient room that functions as a negative-pressure infection isolation room. The room is 19 by 19 feet and conditioned using one constant-volume supply box and one dedicated exhaust fan.

The room was designed to operate at a minimum differential pressure of 0.020-inch w.c. in relation to the adjacent corridor. However, the exhaust fan for the space could not always achieve the required pressure, which caused nuisance alarms and, in some instances, a reversal of the room pressure when room doors opened. The actual exhaust air from the space was increased to the maximum extent possible for the exhaust fan.

Instead of replacing the exhaust fan to achieve the required room differential pressure and to help eliminate the pressure variability, the facility replaced the existing ceiling panels with Calla Health Zone AirAssure ceiling panels from Armstrong Ceiling & Wall Solutions. When placed in a standard ceiling suspension system, AirAssure acoustical ceiling panels form a tight seal and reduce airflow leakage through the ceiling plane up to four times more than panels without AirAssure performance.

According to Tim Roaten, president of Eastern Air Balance Corp., which conducted tests before and after installation of the new panels, the target was to maintain the minimum 0.020-inch w.c. under all conditions. By changing the ceiling panels, room pressure increased to 0.0368-inch w.c., providing an 84 percent buffer above the design minimum. There were no measurable changes to the supply and exhaust airflow in the space; the only change was the replacement of the existing ceiling.

The increase eliminated nuisance room pressure alarms and the need to replace the exhaust

fan. It also brought the room into compliance without any other costly upgrades to the HVAC system. In addition, replacement of the ceiling only took a day, so extended downtime for the room was eliminated. Also eliminated were labor costs involved in caulking ceiling panel edges, an action some facilities are forced to undertake to achieve desired pressure.

"We knew the ceiling would make a difference but didn't know how much," Roaten states. "It performed much better than we imagined, nearly doubling the pressure differential in the room. We simply weren't expecting that much of an increase."

Kevin McNeil, director of Plant Operations for the hospital, agrees. "It was a significant improvement," he says. "We are now able to maintain the required pressure throughout the day, which is especially important today because of the pandemic. If we need another room that requires negative pressure, I would highly recommend this system."

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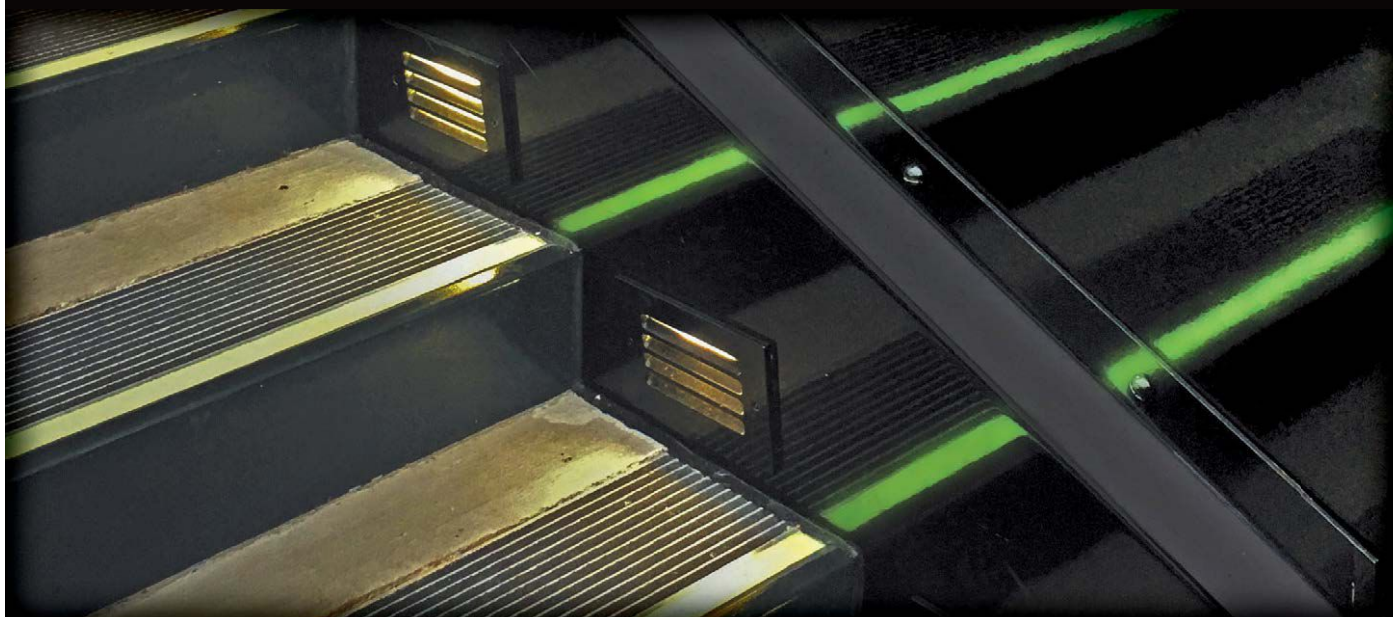




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UNIVERSITY HEALTH | San Antonio

► RETROFIT TEAM

WORKSPACE DESIGNERS: University Health, www.universityhealthsystem.com, and Vari, www.vari.com

► MATERIALS

After purchasing two properties with more than 80,000 square feet each in late 2020, University Health and Vari got started on designing a safe, connected campus. The first phase was to design a custom floorplan with 488 workstations in the first building that could be installed in weeks. University Health Chief Operating Officer Ed Banos says configuration, speed and flexibility were critical to the project's success.

"What we like about the flexibility of the spaces is that we know some of our departments are going to grow. We also don't need to bring in movers and people to put the furniture together," Banos says.

This will be the first time many nonclinical employees with the San Antonio health-care system are united under one roof. The new campus is designed to foster collaboration across different teams, which had previously worked in multiple office locations across the city.

Although the new campus is designed to encourage collaboration, the space also needed to account for the level of privacy required in the health-care industry. Rows of Vari movable walls created offices for privacy and help employees stay safe during the coronavirus pandemic.

As employees begin moving into Phase I of their new Vari-designed office spaces, work is already under way for the second building—an agile design for the technology team.

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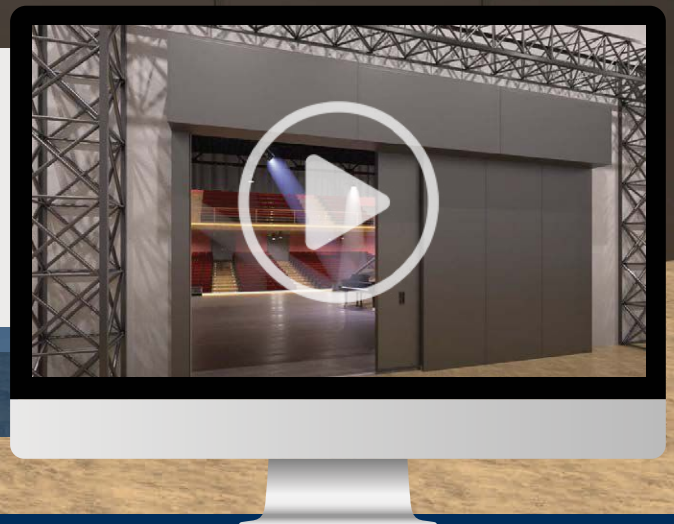
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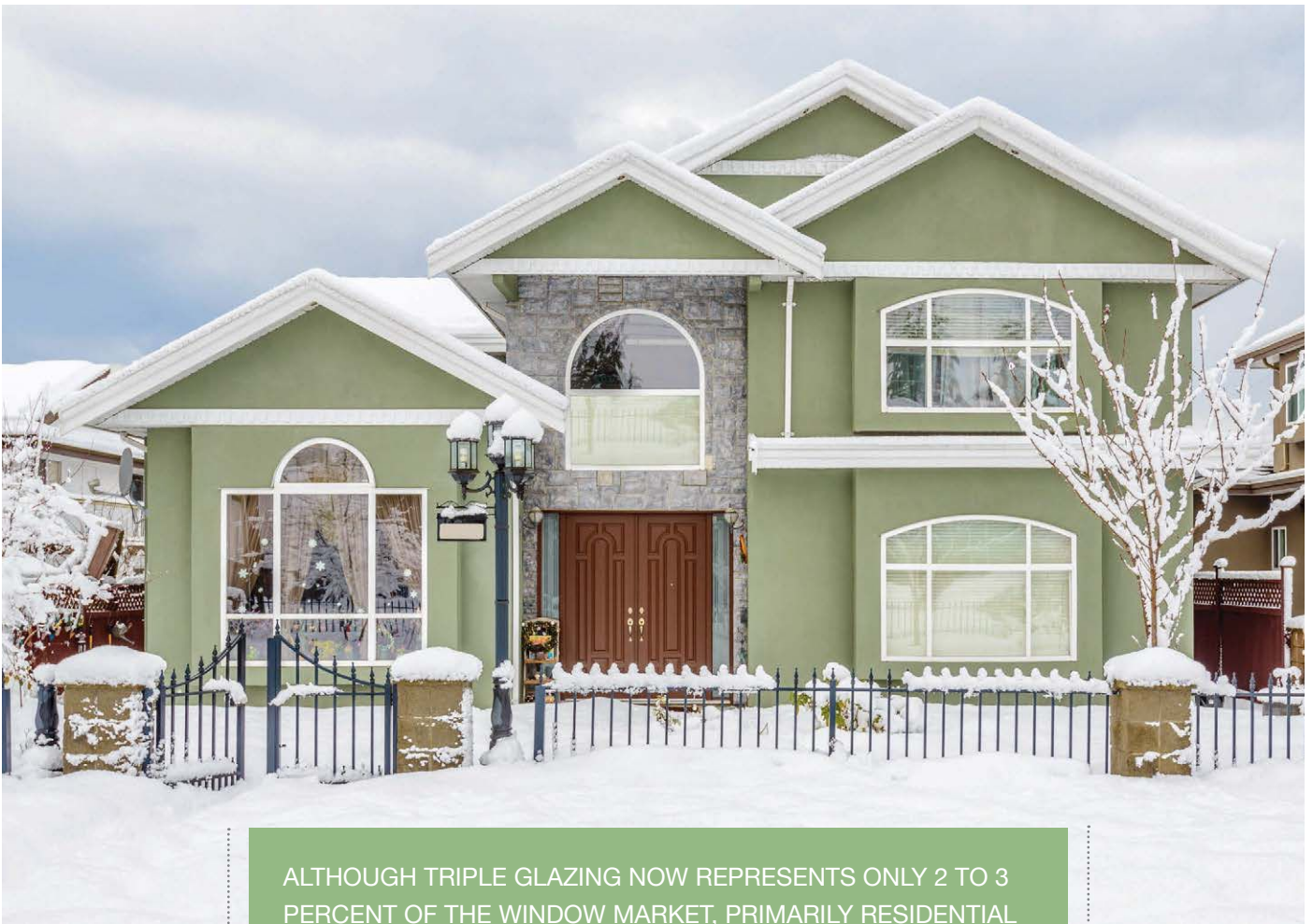
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The Thin Triple Revolution Approaches

WRITTEN BY | **BILL LINGNELL**



ALTHOUGH TRIPLE GLAZING NOW REPRESENTS ONLY 2 TO 3 PERCENT OF THE WINDOW MARKET, PRIMARILY RESIDENTIAL IN COLD NORTHERN REGIONS, THERE IS PRESSURE TO GROW THIS SHARE TO MEET INCREASINGLY STRINGENT U-FACTOR REQUIREMENTS IN CODES AND EFFICIENCY PROGRAMS.

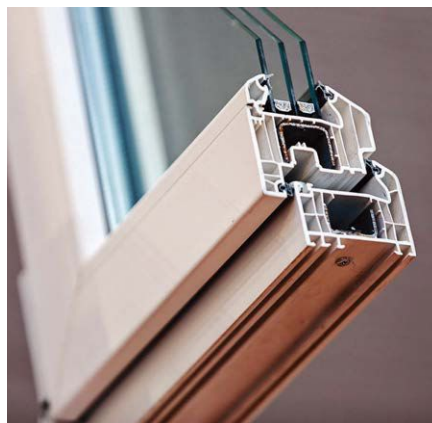
Thin Triple Glazing Can Meet Increasingly Stringent Codes and Efficiency Programs and Will Inevitably Expand to the Commercial Sector

Beginning with the 1970s energy crisis, approaches to achieving energy conservation by minimizing heat loss through building envelopes focused on what amounts to brute-force methods in pursuit of ever-lower U-factor. These efforts included attempts at severely reducing glazed areas, thicker wall insulation and double-glazed windows, evolving in the late 1980s to triple-glazed.

More recently, such efforts have shown a bit more technical finesse. A prime example is the advent of thin triple glazing. Today's cutting-edge thin triple design sandwiches a third layer of very thin glass (on the order of 0.7- to 1.2-millimeters thick) between the two outer lites of glass (up to 3.2-mm thick), adds a second low-E coating (applied to glass surfaces two and five, counting from the outermost face as surface one), and replaces argon gas filling with the more highly insulating krypton. These designs are replacing an earlier interim approach in which the center "lite" was a thin film.

A LOOK AT TODAY

Currently, most builders end up choosing triple-glazed windows with a U-factor, ranging from 0.19 to 0.26 (1.08 to 1.48 in SI [metric] units)—a great improvement over the U-factor of about 0.50 (2.84 in SI units), common for early double glazing without a



APPROACHES TO ACHIEVING ENERGY CONSERVATION BY MINIMIZING HEAT LOSS THROUGH BUILDING ENVELOPES FOCUSED ON WHAT AMOUNTS TO BRUTE-FORCE METHODS IN PURSUIT OF EVER-LOWER U-FACTOR. THESE EFFORTS INCLUDED ATTEMPTS AT SEVERELY REDUCING GLAZED AREAS, THICKER WALL INSULATION AND DOUBLE-GLAZED WINDOWS, EVOLVING IN THE LATE 1980S TO TRIPLE-GLAZED.

low-E coating and insulating inert gas.

Although triple glazing now represents only 2 to 3 percent of the window market, primarily residential in cold northern regions, there is pressure to grow this share to meet increasingly stringent U-factor requirements in codes and efficiency programs, such as ENERGY STAR.

Specifically, energy performance criteria as set forth in the new proposed U.S. ENERGY STAR 7.0 specification would offer two options for the U.S. Northern Zone: a prescriptive value of no more than 0.22 U-factor (a significant reduction from the current 0.27 value) or a range of 0.23 to 0.26 under the equivalent energy-performance options (compared to current values of 0.27 to 0.30). In Canada, a maximum U-factor of 0.21 (1.19 in SI units) is called for and/or an Energy Rating of at least 0.34. The International Energy Conservation Code of 2021 imposes similarly strict criteria, as do various state codes (notably California).

Also, because solar gain helps heat a house during the winter, many cold-climate homeowners and builders seek windows with a high Solar Heat Gain Coefficient (SHGC), in addition to low U-factor. The proposed maximum permitted SHGC for ENERGY STAR 7.0 in the Northern Zone is reduced to no more than 0.17 prescriptive or either 0.35 or 0.40 under the equivalent performance option. By comparison,

GIVEN ENERGY STAR MANDATES AND CODE DEVELOPMENT TRENDS, THERE IS GREAT POTENTIAL FOR GROWTH IN THIN TRIPLE DEMAND.

current first-generation triple-glazed units have a SHGC, ranging from 0.39 to 0.47, while some thin triples can offer lower SHGC values with many low-E coatings available today.

Thin triple glazing with krypton gas infill, rather than the currently common argon, can meet the most stringent of these requirements. Such a unit would in fact be necessary to obtain ENERGY STAR “Most Efficient” designation for use in the Northern Climate Zone. Current leading-edge thin triple designs turn in U-factors of 0.15 or less (0.85 in SI units)—and all at a total insulating glass thickness and overall weight similar to that of double-glazed units.

The engineering infrastructure for widespread thin triple application is being prepared to keep up with product development. For example, a key code reference is ASTM E1300 (2016), Standard Practice for Determining Load Resistance of Glass in Buildings, an update of which is in development and will consider the inclusion for thin triple insulating glass in future updates.

A LOOK AT THE FUTURE

Given ENERGY STAR mandates and code development trends, there is great potential for growth in thin triple demand. Although earlier triple-glazed units have typically been too heavy, too thick and too expensive (resulting in too long a payback period), especially for replacement applications, thin triple technology has the potential to cure these shortcomings.

Regarding cost, as the volume of thin triple products increases, the price premium is expected to come down. Also, if better windows allow HVAC to be downsized, the savings opportunity can help offset the higher initial cost.

As to size and weight, the latest thin triple design is essentially the same width and weight of a double-glazed window—an improvement on the triple-glazed windows that are currently available because it avoids having to redesign the window sash and frame.

However, the advent of thin triple technology poses certain challenges for manufacturers and installers alike.

■ Manufacturing

Manufacturers will have to exercise extra care in glass cutting. Edge quality is critical because edge condition and strength affect the ability of the glass to cope with thermal stress. Because a chip as a percentage of glass thickness is much larger with thin glass, it can easily span the entire thickness of the lite. Extra care in handling and inspection is therefore indicated.

Producers of thin glazing are also challenged to limit deflection during processing and handling—whenever the glass is moved. Stiffer, better-supported cutting tables with more rollers to reduce unsupported spans and suction lifts with adjustable pressure are needed.

Also, post-fabrication quality-control

inspection is not straightforward; once assembled, it can be nearly impossible to visually verify all product edge details. Quality-control efforts need to be focused on the center lite.

In addition, supply chain issues could interfere with thin triple production. For example, krypton pricing has been volatile for the last three years and it is currently quite expensive.

■ Installation


For installers, thin triples with their dimensions similar to those of double-glazed units, can offer the cost-saving advantage of “drop-in” installation versus having to reconfigure the entire opening.

Basic glazing guidelines are the same for triple glazing versus double glazing. Refer to IGMA TM-1300-13, Design Considerations for Multiple Cavity Insulating Glass Units, a document of the Fenestration and Glazing Industry Alliance (FGIA), for details. However, installers of thin triples should be extra careful regarding:

■ Use and placement of setting blocks

Blocks that are too small can focus weight on the center lite by pushing the spacer up into the glass.

■ **Handling** Care in handling is especially important as larger size thin triple insulating glass units, increasingly preferred by architects, become more common. As noted, thin triples need better support.

Thin triple technology continues to be refined at a rapid pace with 0.5-millimeter-thick center panes now becoming available, as are seamless spacers that span all three lites instead of using two separate spacers on either side of the center lite. Aspects, such as safety glazing, high-altitude performance, and in-cavity blinds and grids are undergoing focused research and development efforts. As demand for advanced thin triples increases and inevitably spreads to the commercial sector, the industry will need to heed the modified demands that increased use of thin triples will impose on their production systems in terms of quality control, handling and installation. 



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In 2020, a record number of billion-dollar disasters struck the U.S., damaging aging power infrastructure across the country. (Read about these disasters at www.noaa.gov/stories/record-number-of-billion-dollar-disasters-struck-us-in-2020.) In 2021, extreme weather events continued to wreak havoc on the nation's grids, from the Texas snowstorms that knocked out power for more than 4 million people, to Hurricane Ida's sweep through Louisiana that left millions in the dark.

This rise in climate-related extreme weather events is particularly alarming for health-care providers, where a functioning facility can mean the difference between life and death for patients. A power outage or interruption affecting an intensive care

unit, surgical theater, procedure room, vaccine storage area, electronically locked drug-dispensing unit or long-term care facility can do more than disrupt care and workflows; it can cause harm and cost lives.

In Hershey, Pa., Penn State Health Milton S. Hershey Medical Center isn't taking chances. For years, the medical center has thoughtfully integrated resilient and sustainably focused features into its campus to prepare for the unexpected. Through a U.S. Department of Energy grant run through the Pennsylvania Department of Environmental Protection, Hershey Medical Center achieved PEER Platinum certification for its efforts to boost power reliability and sustainability and seek new pathways for improvement.



Penn State Health Milton S. Hershey Medical Center Is Focusing on Community Health through PEER Certification

PHOTOS: PENN STATE HEALTH

PEER Certification for Resilient Power Infrastructure

PEER certification is administered by Green Business Certification Inc., which also administers LEED, a worldwide green building rating system. Modeled after LEED, PEER is the first rating system that measures and improves power system performance and electricity infrastructure. PEER encourages the adoption of reliable, resilient and sustainable practices and helps power providers solve aging infrastructure, find cost savings, share best practices, build for resiliency, and enhance tracking to identify deficiencies and prevent failures.

Across the world, PEER-certified projects currently provide reliable power to 7.9 million people, mitigate 21 million metric

tons of CO₂ emissions and have saved \$62 million in maintenance costs per year—numbers that continue to increase with each new project.

These projects range across all types of infrastructure—from campuses and utilities to transportation systems. PEER-certified projects include rural cooperatives, city-owned utilities, airports, microgrids, universities and health-care campuses, like Hershey Medical Center.

Penn State Health Milton S. Hershey Medical Center

The PEER Platinum-certified Penn State Health Milton S. Hershey Medical Center is a teaching and research hospital, serving central Pennsylvania. It's the region's only

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Performance Excellence in Electricity Renewal (PEER), peer.gbci.org

Penn State Health Milton S. Hershey Medical Center's PEER Certification, peer.gbci.org/milton-s-hershey-medical-center

Hershey Medical Center's Energy Optimization Platform: Optimum Energy, optimumenergyco.com



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academic medical center and the only medical facility in Pennsylvania to be accredited as a Level 1 trauma center for children and adults. The medical center houses 610 beds and annually admits 29,000 patients, receives 73,000 emergency room patients and performs 33,000 surgical procedures.

With this much activity, the Hershey team has long acknowledged that energy efficiency and resilience are pivotal not only for the center's success, but also for its impact on the local community's power grid. That's why there are multiple LEED-certified buildings across the 4.6-million-square-foot campus operating off of its PEER-certified energy system. The center's work has made it a finalist for the 2022 Greater Good Award for a Pennsylvania Microgrid, which celebrates "microgrids that fulfill a clear societal need and show how microgrids improve the human condition." (Learn more about the awards at microgridknowledge.com/microgrid-greater

good-awards.)

"We are committed to a holistic framework that addresses the efficiency and effectiveness of our electrical system," notes Marvin W. Smith, P.E., CHFM assistant vice president, Facilities. "Through PEER certification, we demonstrate dedication to reliability, resiliency and the environment."

The campus features a 7.5-megawatt combustion turbine, which generates 50 percent of the campus annual electrical power and gives the campus the ability to island part of the facility from the grid in the case of a major outage. The cogeneration plant, also known as combined heat and power, produces multiple sources of energy from the same system, rather than letting extra energy go to waste. It can be 50 to 70 percent more efficient than a typical power source. This system can produce approximately 7.9 MW of electricity onsite, and the accompanying chilled-water system and steam system satisfy around 80 percent of the cooling and heating load requirements of the campus.

This onsite district energy system has allowed the campus to save about 53 million kWh of energy, mitigate 17 kilotons of CO₂ emissions and achieve cost savings of nearly \$4 million annually.

To achieve permanent reductions in its energy demand and consumption, the campus also implemented energy optimization programs with an automation platform across its HVAC, chiller plant and other key energy consumers. As an addition to its portfolio of efficiency measures, this permanent conservation effort helped achieve energy savings of 6 million kWh and cost savings of about \$500,000 while mitigating 3.8 kilotons of CO₂ emissions annually.

Through these combined savings, Hershey Medical Center has been able to reinvest in infrastructure to provide a higher level of patient care while reducing strain on the local grid.

IF THE GLOBAL HEALTH-CARE SECTOR WERE A COUNTRY, IT WOULD BE THE FIFTH-LARGEST **GREENHOUSE-GAS EMITTER** ON THE PLANET, ACCORDING TO A REPORT FROM HEALTH CARE WITHOUT HARM.

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A New Lens: Sustainability as Health Care

"The PEER certification helped us acknowledge that we are a major regional energy user and what kind of impact that much resource use has on our community's health in a holistic sense," says Kevin Kanoff, campus energy engineer.

"Health care doesn't just start and stop at our doors; it's our impact on the environment, as well," agrees Mark Heisey, facilities compliance program manager. Heisey and Kanoff were key facilitators of PEER certification across the Hershey campus.

Heisey and Kanoff's perspective is shared with a growing number in the health-care field, though Hershey is at the forefront of its implementation. If the


global health-care sector were a country, it would be the fifth-largest greenhouse-gas emitter on the planet, according to a report from Health Care Without Harm. (Read the report at noharm-global.org/documents/health-care-climate-footprint-report.) Health-care facilities have a significant carbon footprint because of their need for constant, high energy usage.

"The PEER certification process allowed us to look at our own carbon footprint, the good and the bad," Heisey explains. "We needed to pull data together for our application in a way we normally wouldn't, and it really broadened our horizon. It showed us just how important energy conservation can be when attempting to reduce that carbon footprint."

Hershey Medical Center joins a growing number of projects that are modernizing their power systems through PEER. From the higher-education sector, like the University of Texas at Austin, to transportation hubs, like the Bangalore International Airport and Delhi Metro Rail Company, to municipal utility companies, such as EPB of Chattanooga and beyond, projects are pursuing bolstered resilience, cost savings and a clearer view of their environmental impact.

Through the PEER process, the Hershey Medical Center facilities and engineering teams discovered the symbiosis between their shared goals.

To prepare for the future, resilience and efficiency must go hand in hand. [F](#)



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LIFE STAGES

WRITTEN BY | MICHAEL JERABEK, AIA; KEITH CRIMINGER, AIA, LEED AP; AND MARTHA STRONG

A Former Hospital
Now Supports a New
Model for Affordable
Senior Living

PHOTOS: ANDREW BRUAH PHOTOGRAPHER



Rising nine stories above Ravenswood, a vibrant northside neighborhood in Chicago, the former Ravenswood Hospital building represented a challenge and an opportunity for an innovative new kind of affordable senior housing. The building was part of a larger medical-care campus that has been redeveloped in recent years, including two buildings that were converted to apartments and medical offices and the new construction of a private school.

The hospital officially closed in 2002 and had begun to deteriorate. It also was heavily vandalized, raising concerns among residents in the neighborhood. WJW Architects worked with Evergreen Real Estate Group and the Chicago Housing Authority to revitalize the structure and give the building new life as Ravenswood Senior Living, creating badly needed affordable housing in a desirable neighborhood that is largely out of reach for low-income seniors, including many who have lived most of their lives in the area.

Project Instigates Legislation

The Chicago Housing Authority has more than 10,000 senior housing units. The residents often remain in Chicago Housing Authority housing or other affordable housing beyond when they are able to fully take care of themselves. Because of this, the development team sought to find a solution that allowed low-income seniors to age in place. However, a major hurdle was related to the Supportive Living Facility (SLF) license that was needed from the state of Illinois to provide the assisted living units. Existing legislation did not allow an SLF to be shared with another use in the same building. In this case, an independent senior facility would be housed on the upper floors.

The developer worked diligently with local and state officials to find a way to make the project feasible. Ultimately, legislation was passed that permitted supportive-living senior housing to share a building with other kinds of housing. WJW Architects was then able to create a design that incorporated both affordable assisted and independent senior living in a vertical arrangement within one building.

New separate entrances met a key design requirement of the legislation, and intelligent division of space places supportive living on lower floors while independent living spaces occupy upper levels. As residents age and need more assistance with daily tasks, they will be able to easily transition between the two models—all while remaining in a familiar home.

Exterior Renovation, New Addition

The existing early 1970s concrete and masonry structure was foreboding in its original design with large expanses of windowless brick. This was partly due to an entire upper floor housing large mechanical equipment, as well as a separate surgical floor that did not need windows.

In the adaptive-reuse design process, all the existing windows were removed, and large residential-style windows were installed. In

Two main intersecting circulation corridors were designed on each level to help with wayfinding for residents and guests within the large interior spaces on each floor. One of these corridors connects directly with the main elevator bank, which also includes linear LED lighting that helps to identify the vertical circulation.



BEFORE



The existing early 1970s concrete and masonry structure was foreboding in its original design with large expanses of windowless brick. In the adaptive-reuse design process, all the existing windows were removed, and large residential-style windows were installed. A narrow addition on the north side now sits on top of an existing 1-story structure. The addition was clad in aluminum metal panels to integrate with the metal-clad school it faces.

addition, new masonry openings were created on every floor of the building to open up the façade and provide light and ventilation to the new residential apartments. The large, glazed openings offer residents far-reaching views over their neighborhood's streetscapes, and many units have an unobstructed view of the downtown skyline and Lake Michigan. The result is a building that—though is still taller than most of its neighbors—now feels much lighter and of a more residential character than it ever had in its prior institutional history.

The existing building's floorplate was basically a 140- by 140-foot square, which is great for a hospital but not conducive to the proposed uses. Further complicating matters, the floor outline changed a number of times vertically through the building. In general, an approach was taken to centralize various resident common spaces on the floors (most are larger and there are more of them than in any comparable senior living community) and ring the perimeter with loft-style dwelling units, typically deep and narrow and some with

remote bedrooms with partial-height walls. Because the new windows are so large, light travels deep into any of these units.

Coupled with the floorplate dilemma, the program for the two uses required additional units that would not fit within the existing building. Again, this was caused by the limitations of the existing structure and the need for natural light and ventilation for all of the dwelling units. Furthermore, the existing property is a very tight, urban site that didn't have much space for an addition without demolishing portions of the existing building. Various solutions were considered, including adding vertically to the wings of existing upper floors that were set back. The eventual solution was a narrow addition on the north side, which would sit on top of the existing 1-story structure that had contained electrical equipment in the basement and offices and exam rooms for the hospital. Today, the 1-story structure maintains electrical equipment in the basement and part of the SLF's commercial kitchen and dining room, as well as a loading dock. It was clad in aluminum metal panels to integrate

» RETROFIT TEAM

ARCHITECT // WJW Architects, wjwarchitects.com

- Michael Jerabek, AIA, partner-in-charge
- Keith Criminger, AIA, LEED AP, project manager
- Albert Wang, AIA, project architect
- Lauren Eckberg, AIA, project architect
- David Zielinski, AIA, project architect
- John Schoonmaker, architectural designer

INTERIOR DESIGN // Strong Design Consultants LLC, www.strongdesigninteriors.com

STRUCTURAL ENGINEER // Simpson Gumpertz & Heger, www.sgh.com

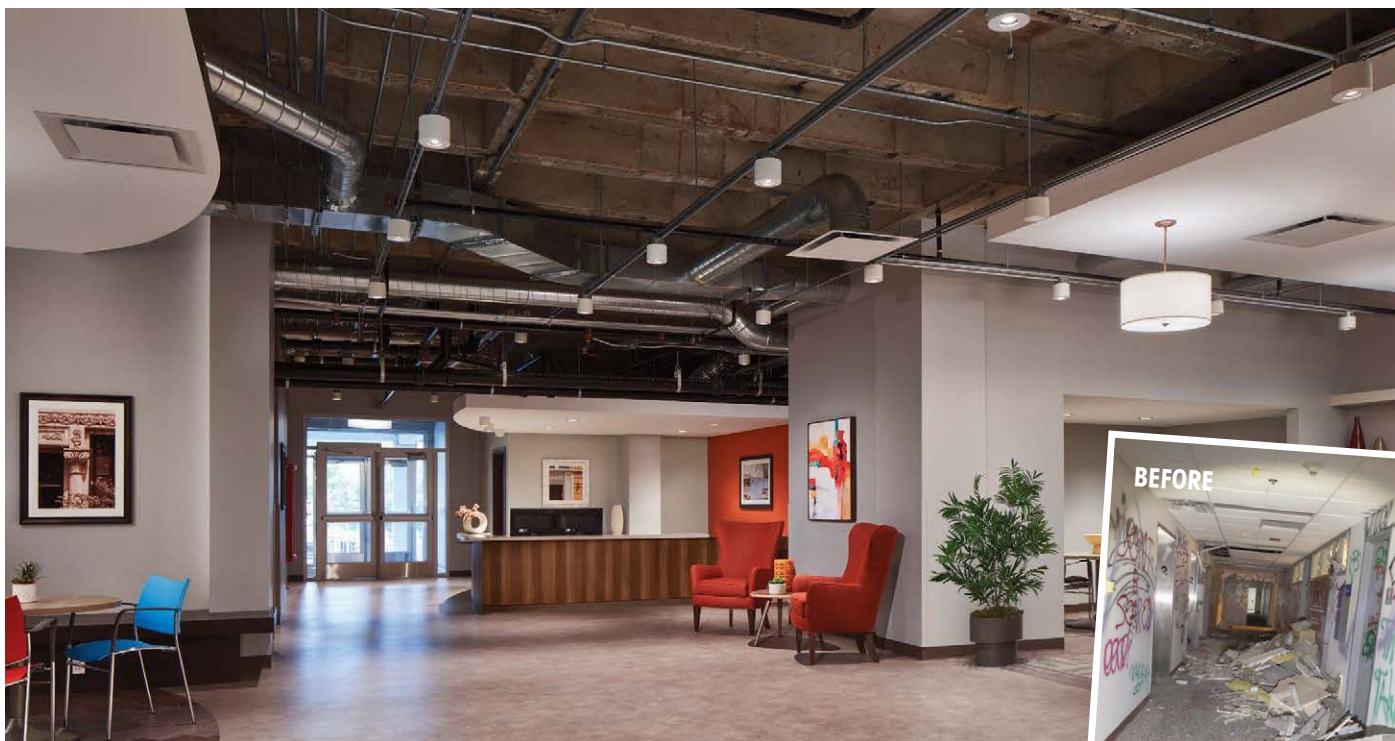
MEP ENGINEER // Diligent Design Group, ddgengineers.com

CIVIL ENGINEER // Eriksson Engineering Associates Ltd., eea-ltd.com

LANDSCAPE ARCHITECT // Laflin Design Group Ltd., laflindesigngroup.com

GENERAL CONTRACTORS // Leopardo Companies Inc., leopardo.com, and Evergreen Construction Co., www.evergreenreg.com/services/construction

CUSTOM MILLWORK // Art Magic Carpentry, www.artmagic.on.ca



All the mechanical, electrical, and plumbing systems were left exposed in many areas to create a modern, industrial interior environment. The fabric drum light fixtures, stained wood trim, warm furniture colors and vibrant accent walls help create an inviting and stimulating juxtaposition to the exposed structural and mechanical elements.





After Ravenswood Hospital closed in 2002, it quickly deteriorated and was heavily vandalized. Today, the senior living facility's comfortable amenities, including its dining room (top), fitness center, salon, library and computer room, demonstrate that nearly any building is worthy of saving.

with the metal-clad school it faces. The refreshed façades, added windows and shining aluminum panels of the addition help create a livelier presence within the neighborhood.

Another key design goal was to provide opportunities for the residents to connect with the outdoors without necessarily having to leave the building. This was accomplished with roof decks on different levels, including a new exterior patio off the main dining room, a roof deck on top of an existing 1-story portion of the building and a roof deck at the sixth floor on top of

the new addition. The new-construction deck that was added off of the SLF's dining room provides views over the neighboring school's athletic field, further reinforcing the potential intergenerational living opportunity of this overall campus.

Ensnconed in all of these design interventions was the matter of environmental sustainability. Aside from a number of energy efficiency, water-resource management and healthy indoor environment features, possibly the greatest sustainability feature was in the reuse of this building. Given its enormous structure,

a tremendous amount of landfill waste would have been generated had this building been demolished. Instead, much of this concrete and steel structure was preserved, conserving material resources and the existing embodied energy of these building materials.

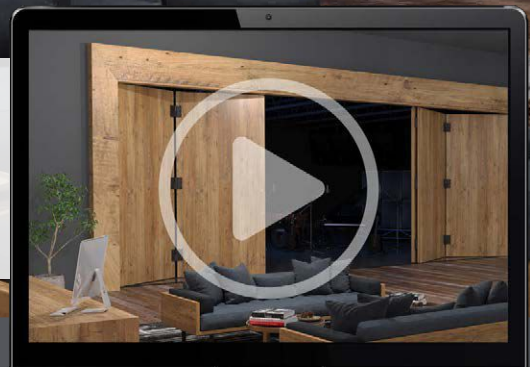
Technical Challenges

As can be imagined, there were a number of technical challenges in executing this project. The renovation of the former hospital included removing all interior walls,

(continues on page 58)

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finishes and mechanical systems down to the structure. Sections of floors needed to be infilled while others needed to be opened. The previous mechanical floors at levels 8 and 9 were especially challenging, given the vast number of existing floor openings and existing changes in floor level that were present.

The original structural design primarily consisted of a concrete frame with non-load bearing exterior walls of CMU and brick. It was discovered that there were significant structural issues with these walls. The CMU was not reinforced sufficiently to handle the wind loads created by the new large windows that were to be added. The solution was to install steel tubes on the interior around each new masonry opening to reinforce the concrete block.

Interior Design

The interior design celebrates the structure of the existing building, which included poured-in-place concrete ceilings and columns. These elements were left exposed in the public corridors and within the units, accentuating the high ceilings that existed. All the mechanical, electrical, and plumbing systems were new and left exposed in many areas to create a modern, industrial interior environment. The fabric drum light fixtures, stained wood trim, warm furniture colors and vibrant accent walls helped create an inviting and stimulating juxtaposition to the exposed structural and mechanical elements. With this approach, the existing structure was celebrated but adapted for a senior living use.

Among the many goals for this development, providing functional spaces to meet the changing needs of the residents was critical. Amenities, such as a welcoming lobby with a cozy hearth, comfortable dining room, as well as a fitness center, salon, library and computer room, offer an inviting, full-service living environment for residents. An in-house space for doctor visits brings necessary services within easy reach for the supportive-living community.

Two main intersecting circulation corridors were designed on each level to help with wayfinding for residents and guests


within the large interior spaces on each floor. One of these corridors connects directly with the main elevator bank, which also includes linear LED lighting that helps to identify the vertical circulation. In addition, intersections of the corridors include feature walls and lowered ceiling soffits painted in different vibrant colors, providing another wayfinding tool for residents.

To reinforce wayfinding within the now 223,000-gross-square-foot building, the flooring materials of the ground floor create noticeable zones between the expansive corridors and common spaces. Broadloom carpeting in the resident corridors provides a quiet and upscale experience, leading to each residential unit. Vibrant accent paints are strategically placed to queue residents to specific areas of the building, such as the elevator lobbies and common areas.

The artwork installed in the common areas and corridors utilizes the rich architectural history of the Ravenswood neighborhood. The art was creatively themed around hobbies, music, park scenes, etc., including many vintage photos of the neighborhood. In many locations, common-area room signage also utilizes the artwork themes, providing yet another wayfinding opportunity to help the residents feel at home.

To reinforce the urban feel of the renovated building, furniture selections utilize a mid-century modern aesthetic that naturally resonates with these Chicago residents, aged 55 and over.

Neighborhood Enrichment

Thanks to the collaborative design process, today, Ravenswood Senior Living represents not only the adaptive reuse of a building badly in need of rescue and without a sustainable alternate use, but the realization of its potential to provide new homes for Chicago's seniors in need. The development, which was completed in May 2021, stands as a shining example of how adaptive reuse can not only revitalize a dilapidated building and community eyesore, but also impact the lives of countless community members and families, enriching the neighborhood for generations to come. 

>> MATERIALS

INSULATED ALUMINUM PANELS // Metl-Span, www.metlspan.com

WINDOWS // Vinyl Windows from Pella, www.pella.com

WOOD DOORS // VT Industries, www.vtindustries.com

LUXURY VINYL TILE // Patcraft, www.patcraft.com; Shaw Contract, www.shawcontract.com; and Mannington Commercial, www.manningtoncommercial.com

PORCELAIN TILE // Stonepeak Ceramics Inc., www.stonepeakceramics.com

FIREPLACE SURROUND AND MOSAIC WALL TILE // Marazzi, www.marazziusa.com

BROADLOOM AND MODULAR CARPET // Patcraft, www.patcraft.com

WALL BASE // Roppe, roppe.com

WALL PROTECTION // In-Pro, www.inpro.com

STOCK CABINETS // Procraft Cabinetry, www.procraftcabinetry.com

CEILING GRID SYSTEMS // Rockfon, www.rockfon.com

ACOUSTIC CEILING TILES // Certainteed, www.certainteed.com, and USG, www.usg.com

SOLID SURFACE COUNTERTOPS // Livingstone, www.livingstonesurfaces.com

INTERIOR PAINT // Sherwin-Williams, www.sherwin-williams.com

NEW ELEVATORS // Otis, www.otis.com

CIRCULAR PENDANT FIXTURES // Abra Lighting, www.abralighting.com

DRUM PENDANT LIGHT FIXTURES AND VANITY LIGHTING // Modern Forms, www.modernforms.com

LINEAR LED LIGHT FIXTURES // Cooper Lighting, www.cooperlighting.com

EXTERIOR SITE LIGHTING // Eaton, www.eaton.com

RETAINING WALL // Reading Rock, www.readingrock.com

DINING CHAIRS // Holsag, www.holsag.com

DINING AND ACTIVITY TABLES // Falcon, www.falconproducts.com, and Groupe Lacasse, www.groupelacasse.com

RESIDENT ACTIVITY CHAIRS // Groupe Lacasse, www.groupelacasse.com, and Krug, www.krug.ca

LOUNGE SEATING // H Contract, www.hcontractfurniture.com, and Kellex, www.kellex.com

OFFICE FURNITURE // Groupe Lacasse, www.groupelacasse.com; Via Seating, www.viaseating.com; Great Openings, www.greatopenings.com; and OFS, www.ofs.com

OUTDOOR FURNITURE // By the Yard, www.bytheyard.net

WINDOW SHADES AND DRAPERY // Insolar Window Treatments, www.insolar.com

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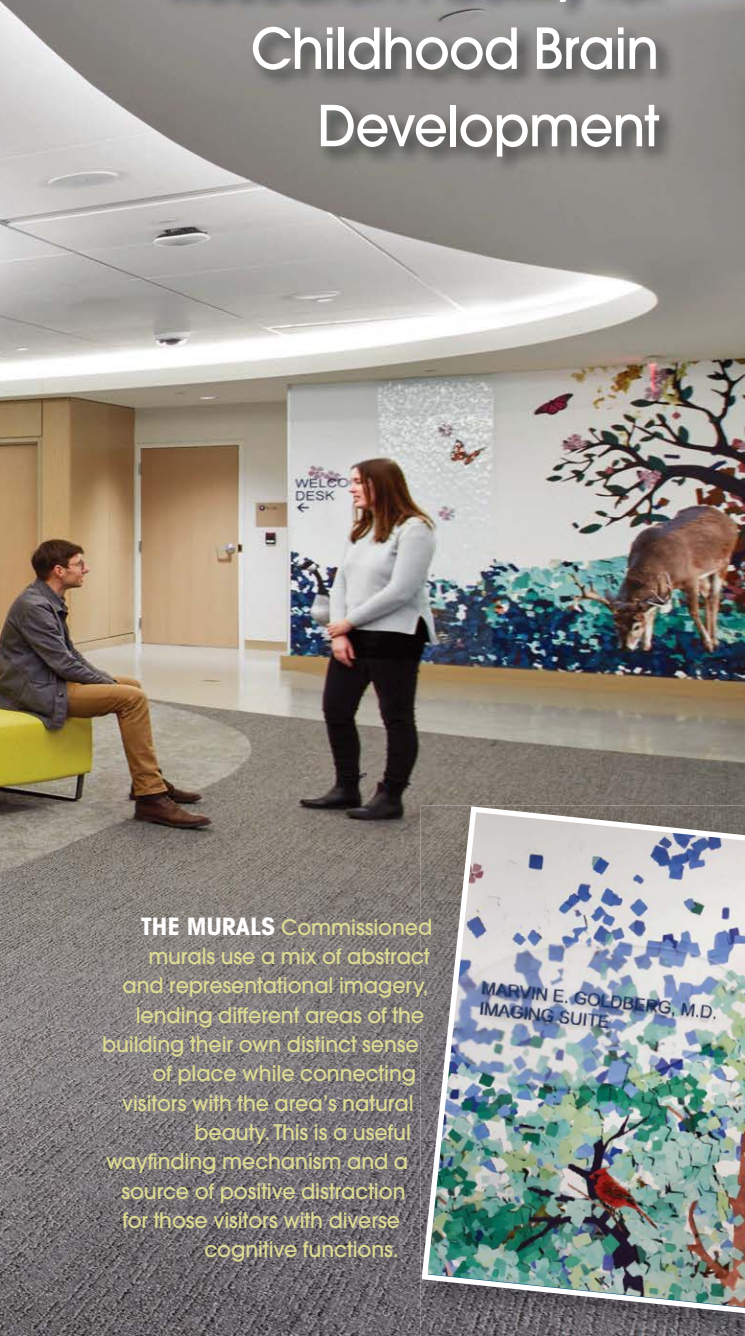
ONCE MORE, WITH FEELING

WRITTEN BY REBECCA KLEINBAUM SANDERS, AIA, NCARB, AND MEREDITH HAYES GORDON, AIA, LEED AP



PHOTOS: COREY GAFFER unless otherwise noted

A Dated Hospital Is Transformed into a First-of-its-kind Clinical Research Facility for Childhood Brain Development



THE MURALS Commissioned murals use a mix of abstract and representational imagery, lending different areas of the building their own distinct sense of place while connecting visitors with the area's natural beauty. This is a useful wayfinding mechanism and a source of positive distraction for those visitors with diverse cognitive functions.

Some buildings bear a heavy burden. Health-care institutions certainly fall into that category. They must be dynamic, efficient and conducive to productivity. In these environments, success is measured in several ways: whether the building and its materials promote wellbeing, if equity and inclusiveness are factored into the design, and the quality and quantity of collaborative workspaces.

When the University of Minnesota needed a building for its new Masonic Institute for the Developing Brain (MIDB), an interdisciplinary research and treatment facility devoted to childhood and adolescent brain development, the university found itself at a crossroads. No existing facility on the school's Twin Cities campus was sizable enough (and available) to house various clinical, research, community engagement and workplace functions under one roof. Further, siting and constructing a new ground-up building was an option constrained by time and budget.

It was important for MIDB administrators and staff to have a location that was convenient and accessible for patients, study participants and their families. In addition, they needed something dynamic, versatile and relatively close to the university's main campus.

As luck would have it, in early 2019, a 10-acre campus and

combined 117,000-square-foot building complex used by Shriners Children's Hospital went on the market. Eyeing its optimal conditions and location, as well as the unique opportunity to retrofit a hospital into an interdisciplinary research institute, the university purchased the campus and got to work.

A ONE-OF-A-KIND MEDICAL CAMPUS

Creating a destination health-care campus that combines neurological research, clinical care, education and community outreach functions is an enormous undertaking for which there is no precedent. The former Shriners Children's Hospital campus, constructed in 1991, featured a 103,000-square-foot medical facility; a 14,000-square-foot, 10-room hotel for families of patients, connected to the main building via a skyway; a two-level parking ramp fitted with 172 parking stalls; and, finally, a private and bucolic locale along the Mississippi River that is immediately accessible from I-94 and just 1 mile from the University of Minnesota's Twin Cities campus.

Remodeling a facility of this scale and for its intended purpose came with a long list of design and programming challenges. While some of the more standard infrastructure elements were kept in place, such as elevators, exterior enclosures and onsite features, like a gazebo and playground, the upgrades to MEP systems and the building's overall look and feel were extensive.

To operate by design, MIDB required that various cross-



Existing skylights within the former inpatient area of the hospital were leveraged to provide abundant natural light to staff break areas and borrowed light to the surrounding open office areas.



disciplinary teams be able to function in one collaborative space, where research, clinical care, office work and community engagement efforts could be combined under one roof, rather than compartmentalized, which is the norm in such institutional settings.

HGA had to design for a combination of functions and disciplines that had never been combined before. From the

very beginning, the project's success relied on having a design-build team committed to learning and innovation.

Indeed, the makeup of MIDB's design-build team was essential to its success. Composed of Knutson Construction, HGA and the University of Minnesota, this group met on a weekly basis, performed detailed walkthroughs and made note of necessary design

fixes while in the field, based on existing site conditions and deteriorations to the building.

This workflow helped ensure that cost considerations would be factored in during pre-design phases and that MIDB's design would be achieved as intended. This precluded such outcomes as cleaning up installation mistakes, diverting unnecessary waste and going over budget.

INTERIOR DESIGN WITH DEPTH AND FEELING

It is a new era for health-care design. Today's practice places a premium on the integration of spaces to maximize collaboration. And those spaces are designed with a high regard for the health and wellbeing of staff and patients, as well as the health and wellbeing of our planet. MIDB is a great example of this.





Being a facility that works with young children and adolescents, incorporating a sense of play throughout the building was important. A variety of differently sized energetic spaces and play areas for children feature colorful furnishings, books and games.

While the old Shriners hospital building offered dozens of dedicated rooms for inpatient care, clinical exams and operating, as well as an abundance of private offices, nurses stations, imaging suites and other hospital-specific spaces, retrofitting the building to create MIDB required a true gut renovation.

Many of the sequestered spaces in the old hospital were

not needed for the program HGA was building. They weren't conducive to collaboration, nor had access to natural light.

Before construction began, a virtual 3D walkthrough of the building's interior was performed using scanning technology, courtesy of Knutson Construction. This exercise helped the design-build team verify quantities, conditions

and square-footage specifications, all remotely, which proved invaluable because COVID-19 pandemic protocols went into effect near the start of MIDB's design phase.

One of the first orders of business was to reroute the building's main entrance. The old Shriners facility welcomed staff and patients into a large 2-story atrium from a little-used drop-off entry. The team

determined that being led into a cavernous, hall-like room with poor acoustics coming from the parking garage could prove overwhelming, especially for visitors with sensory sensitivities. The solution, in part, included routing a pathway from the parking garage to a new entryway just north of the atrium, which feeds into a more intimate waiting space that looks out onto a wooded





BEFORE

As part of the Masonic Institute for the Developing Brain's \$27.4 million renovation, the central atrium that was once the building's main reception area was transformed into an energetic and collaborative workspace, flooded with natural light and overlooked by research workspaces above.

KNUTSON CONSTRUCTION, HGA AND THE UNIVERSITY OF MINNESOTA MET ON A WEEKLY BASIS, PERFORMED DETAILED WALKTHROUGHS AND MADE NOTE OF NECESSARY DESIGN FIXES WHILE IN THE FIELD, BASED ON EXISTING SITE CONDITIONS AND DETERIORATIONS TO THE BUILDING.

area. From there, visitors can access all areas with ease.

Although no longer suitable as a primary gateway, the atrium's inherent value did not go unnoticed. Double-height windows already provided the space with ample natural light. HGA introduced a range of kid-friendly alcoves and open seating areas fitted with warm textures, natural earth tones and pops of color. This transformation of the former main reception area into a hospitable and playful space for children and their families also yielded a collaborative clinical workspace with an aesthetic that feels anything but clinical in nature.

Being a facility that works with young children and adolescents, incorporating a sense of play throughout the building was important. A variety of differently sized energetic spaces and play areas for children feature colorful furnishings, books and games. Newly commissioned art murals adorn each floor as tributes to MIDB's surrounding woodlands and setting along the Mississippi River. Having dedicated spaces for calm and respite was critical, as well. An enclosed Calm Room, designed with muted tones, was added adjacent to larger waiting areas as an amenity for visitors who prefer less stimulation. Additionally, positioned throughout MIDB's

public areas are a series of comfortable nooks for children to climb into whenever they need a quiet moment to themselves.

Ensuring that natural light penetrated as many communal and private spaces as possible proved an interesting design challenge. Built as a hospital, Shriners was constructed with deep floor plates (a common feature for this building type), thus limiting the amount of natural light in the interior spaces. To compensate, a large portion of the ground-floor ceiling was removed in a section directly underneath an existing second-floor skylight, creating a vertical corridor of natural light and connecting

THE B3 GUIDELINES

Minnesota's B3 (Buildings, Benchmarks & Beyond) program was established in 2002 as a sustainable design framework and benchmarking tool related to site, water, energy, indoor environment, materials and waste. Adoption of B3 is required for all new buildings or renovations that receive general obligation bond funding from the state of Minnesota. (The program can also be adopted voluntarily for non-bond-funded projects.) The Masonic Institute for the Developing Brain was designed to meet B3 Version 3.1. Learn more at b3mn.org.

AIA FRAMEWORK FOR DESIGN EXCELLENCE

In 2019, the American Institute of Architects formally adopted its Framework for Design Excellence (formerly the COTE Top Ten Measures). The framework is made up of 10 interrelated principles for architects to consider relative to a project's size, context and intended use. When implemented together, the principles are designed to achieve a zero-carbon, equitable, resilient and healthy built environment. The Masonic Institute for the Developing Brain's design considered the framework principles. Learn more at aia.org/sustainability.

diverse workspaces on both floors. Additionally, drywall on the upper floor was removed to reveal existing spandrel windows, and enclosed fire stairs were opened up and converted into "communicating stairs" between the floors.

TRANSFORMING MORE THAN JUST A BUILDING

Wear and tear had plagued the old Shriners building for the better part of three decades. Maintenance concerns with the exterior roofing and window sealants had to be addressed, as did performance and code issues with the building's mechanical, electrical and plumbing systems. Coupled with these systems and structural upgrades, a ground-floor auditorium was removed and partially infilled to grade level to become an open workspace; a second-floor swimming pool was infilled and sound-absorbing acoustic baffles were installed on the ceiling to become an office workspace for MIDB's research department; and the former 10-room hotel was converted into an


annex building fitted with all new mechanical systems for additional collaboration and community space.

Beyond the facility's physical transformation, MIDB's design-build team of Knutson Construction, HGA and the University of Minnesota established from the start that this project would abide by strict standards of sustainability, equity and wellness.

When it comes to operating a healthy building that actively supports the health and wellness of its staff, patients, study participants, associated family members and other members of the community, simply moving into a building with a leaky roof, drafty windows and enclosed spaces with no natural light just wasn't going to cut it.

To that end, approaching the retrofit to meet the state of Minnesota's B3 (Building, Benchmarks & Beyond) guidelines, as well as the principles of the American Institute of Architects Framework for Design Excellence, meant committing to a set of heightened performance standards that are outside the norm.

From the early stages of site assessment and pre-design, through planning, construction, and finally daily operations and maintenance, MIDB has continuously committed to tracking and achieving optimal facility performance metrics for materials and waste, water and energy usage, indoor environmental quality and more.

HGA set out to do more than convert a hospital into a clinical and research institute; the firm set out to create a sustainable and accessible asset for the community. 

>>RETROFIT TEAM

GENERAL CONTRACTOR // Knutson Construction, www.knutsonconstruction.com

ARCHITECT, INTERIOR DESIGNER, MECHANICAL AND ELECTRICAL ENGINEER, LIGHTING DESIGNER AND TECHNOLOGY // HGA, hga.com

STRUCTURAL ENGINEER // Palanisami & Associates Inc., www.palanisami.com

CIVIL ENGINEER // EVS, www.evs-eng.com

ROOFING CONTRACTOR // Central Roofing Co., www.centralroofing.com

ENVIRONMENTAL GRAPHICS // A partnership of HGA, hga.com, and HJNovak Design, www.hjnovak.com

>>MATERIALS

3D SCANNING TECHNOLOGY // Matterport, go.matterport.com

EPDM ROOF SYSTEM // Johns Manville, www.jm.com

ACOUSTICAL CEILING TILE // USG, www.usg.com, and Rulon International, rulonco.com

CARPET // Shaw Contract, www.shawcontract.com, and Interface, www.interface.com

RESILIENT FLOORING // Shaw Contract, www.shawcontract.com; Flexco, flexcofloors.com; Nora by Interface, www.nora.com; and Lonseal, lonseal.com

TERRAZZO // Terrazzo & Marble Supply Cos., www.tmsupply.com/terrazzoflooring

PLASTIC LAMINATE // Panolam, panolam.com; Formica, www.formica.com; Wilsonart, www.wilsonart.com; and Arborite, www.arborite.com

SOLID SURFACE // Corian, www.corian.com

TEXTURED PANELING // 3form, www.3-form.com, and Soelberg, soelbergi.com

BACKLIT ART PANELS // Vara Kamin's Impressions of Light Inc., varakamin.com

DECORATIVE GLASS // Skyline Design, skydesign.com; Forms + Surfaces, www.forms-surfaces.com; and Nathan Allan Class Studios, www.nathanallan.com

FURNITURE // Fluid, fluidinteriors.com; Atmosphere Commercial Interiors, www.atmosphereci.com; Henricksen, www.henricksen.com; KI, www.ki.com; Intereum, www.intereum.com; Innovative Office Solutions, innovativeos.com; Wood from the Hood, woodfromthehood.com; and General Office Products, www.gopco.com

| TREND ALERT |

WASTE NOT

RETHINKING WASTE
IS A WAY TO COMBAT
CLIMATE CHANGE

ORIGINAL

PHOTO: ANTON GRASSI

As we think about sustainability and the built environment's contributions to the fight against climate change, there are many competing priorities and factors to consider. Of course, carbon looms large in the conversation right now. While that is of great importance, it's also vital to not lose sight of other elements of sustainability, including the landfilling of waste. According to data from the EPA, in 2018, the U.S. generated 292.4 million tons of municipal solid waste. In that same year, the construction industry generated more than twice that, approximately 600 million tons.

WRITTEN BY | JIM SCHNEIDER

It's clear that part of the path to a more sustainable future must include moving away from the culture of disposability that has been established in the past century. We need to rethink the idea of waste, reuse more materials and landfill less.

No Room in the Dump

The sad fact is that we have relied on landfills as the first option for such a long time that landfills are reaching capacity. In many parts of the country, the cost of landfilling is rising and budget pressures are starting to drive projects toward higher levels of waste diversion.

"We're seeing landfills fill up and transfer stations close down because they don't meet the state's requirements for recycling and diversion, so that means waste haulers are waiting longer in lines at the transfer stations" says Laurel Christensen, AIA, WELL AP, sustainable design leader at Dyer Brown in Boston. "That additional time costs money, and that cost is going back to the client. Not only from a sustainability perspective, but functionally looking at the budget of the project, I think we're nearing a turning point where waste diversion is going to become the norm. Not just for sustainability reasons but for capacity reasons."

There has long been an emphasis on



the idea of recycling as an alternative to landfills, but there have been many practical and technological barriers to overcome. As an example, some plastics are recyclable,

but many are not. However, there recently have been some exciting advances that may change that.

"The issue with recycling is that only the valuable stuff and the good plastics are recycled—things like soda and shampoo bottles," explains Sebastian Sajoux, founder and CEO of Arqlite, a recycling technology company based in Santa Ana, Calif. "Polypropylene and polyethylene are the most recycled materials. All the other streams end up being mixed plastics that have no value. Sorting and reprocessing it is more expensive than just burying it."

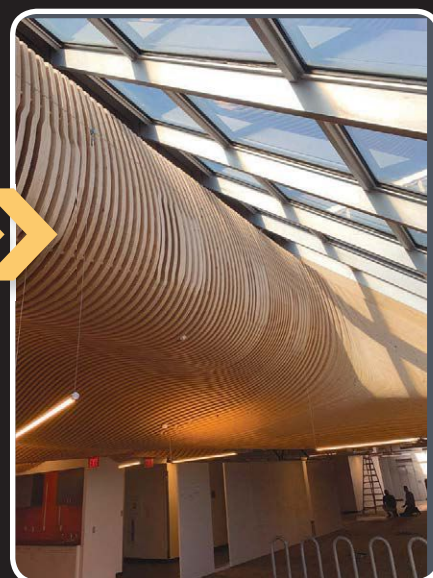
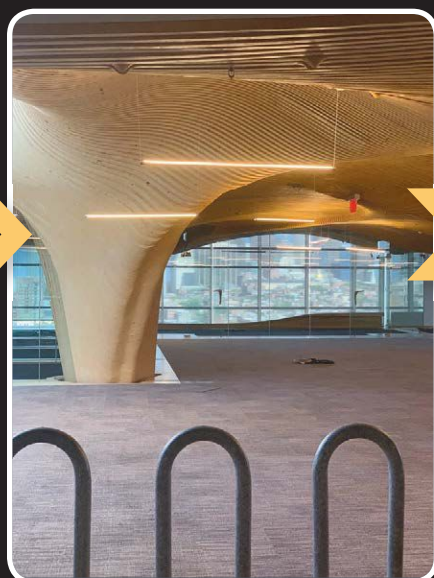
Sajoux's firm has developed technology to find utility for those mixed plastics and keep as much of it as possible out of landfills.

"The other stream we have is flexible packaging, like chip bags and energy bar wrappers," Sajoux says. "We are able to take those rejected plastics and use them as raw material for a product called Smart Gravel. It's much lighter than mineral gravel, doesn't generate dust and is a good insulator. There are lots of companies like ours trying to tackle pollution, but the real solution is the development and use of sustainable materials. I believe people are becoming more responsible and want to purchase things that are recyclable."

Laurel Christensen, AIA, WELL AP, sustainable design leader at Dyer Brown, was inspired to join the reuse conversation by this custom interiors project in Cambridge, Mass. Dyer Brown's task was to demolish and white box the space for the next tenant, but Christensen wanted to save the materials, though what was remaining was far from the original design.

ORIGINAL

SALVAGEABLE



Christensen's feeling that it would be a travesty to send these custom, crafted wood interior finishes to a landfill led to the formation of a reuse subcommittee within Boston's Carbon Leadership Forum chapter to foster conversations around reuse in the Boston market.

Planning Reuse

Among architects, there is a sense of responsibility to do the best possible work for the environment and, when it comes to materials, there is also an added layer that comes from respect for the materials themselves.

"I was introduced to the reuse conversation because of a beautiful interiors project that had been done about 10 years ago in Cambridge [Mass.]," Christensen recalls. "It was a gorgeous space and was conceived with low-embodied carbon and waste diversion in mind, but renovations by subsequent tenants had chopped away bits and

pieces of it, so what was remaining was far from the original design. It was custom and unique, but our task was simply to demolish it and white box the space for the next tenant. I thought, there has to be some way to save this."

This set Christensen on a path of learning more about the salvaging and repurposing of materials. It felt like a travesty to send custom, crafted wood interior finishes to a landfill.

"We couldn't use that material on any of our projects at that time, but maybe someone else could," she continues. "This

(continues on page 70)



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PHOTOS: LARRY PIERCE



A lifelong hockey enthusiast, Larry Pierce, founder and owner of LCP Group, undertook an extensive project to build a community hockey rink on his farm. Material reuse was an integral part of the process because, as Pierce notes, it would have cost several million dollars to build the rink from new materials. Boards came from a roller hockey rink associated with the Washington Capitals and the scoreboard is from Cornell University.

investigation ultimately led us to form a reuse subcommittee within our local Carbon Leadership Forum chapter to foster conversations around reuse in the Boston market. We have a lot of participation from contractors, owners, architects and designers committed to reducing embodied carbon through reuse. We now are more likely to see drawings that require a certain percentage of diversion and more designers and owners starting

to prioritize products and materials from manufacturers that offer take-back programs for their materials to be recycled and reused.”

Beauty and Budget

Beyond the sustainability benefits, salvaged and reused material can really add to the aesthetic of a space, in terms of pure looks and sometimes also for

(continues on page 72)



ARRIS-clip Champagne
Smooth



University of Southern Indiana: Physical Activities Center
ARRIS-clip Champagne | Photo: CannonDesign

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ITEMS FROM OLDE GOOD THINGS, AN ARCHITECTURAL SALVAGE COMPANY



1 Waldorf Astoria modern art sculptural screen room divider.

2 Waldorf Astoria white marble mantel with etched floral designs.

3 Flatiron Building copper window frame mirror.

4 Waldorf Astoria Duke of Windsor suite main room flush mount crystal chandelier.

5 1970 Paris holophane streetlamp turned into a pendant light.



bringing a richness of history to a design. An entire industry has grown up around saving and repurposing items of beauty from buildings that might otherwise end up in a landfill. That work requires a keen eye and skilled touch.

“Unlike demolition, architectural deconstruction requires finesse instead of sheer force. Reusable items, such as marble mantels, crystal chandeliers, tin ceilings, large mirrors and intricate cabinetry can lose their value if they are damaged during the salvage process,” explains Jim DiGiacoma, store manager with Olde Good Things, an architectural salvage company with three brick-and-mortar retail locations in New York, one in Los Angeles and a warehouse in Scranton, Pa. “While some items are sold just as found when they were salvaged from renovation sites, others have been modified for home use. There are Paris street lamps reconfigured as large pendant lamps to hang above kitchen islands or in loft apartments and window frames from historical buildings, like New York City’s Domino sugar factory or Flatiron Building, now fitted with mirrors to be hung on walls.”

There also can be significant cost savings when projects are able to reuse materials rather than buying new. For some builders, this can become central to their operating model.

“We were inspired by necessity, and necessity inspires ingenuity,” says Larry

Pierce, founder and owner of LCP Group in Vestal, N.Y. “We try to incorporate building materials we salvage into other building projects, rather than putting it in landfills. The first time we did it, we tore down a 20,000-square-foot furniture store and I was taking out the steel I-beams and they were about \$200 per piece for us to scrap. I called a local mill and found that buying new ones would be \$1,800 to \$2,000 per piece. At the same time, we were trying to build a log timber-frame home and the timber-frame trusses were about \$20,000, so we just used the I-beams. The value-add was there. It became a mindset for us: Let’s not throw this stuff out; let’s try to reuse it.”

A lifelong hockey enthusiast, Pierce undertook an extensive project to build a community hockey rink on his farm. Inspired by the passing of his sister, who also was a passionate hockey player and the recipient of the college hockey humanitarian award, Pierce wanted to honor her memory and give back to the community. Material reuse was an integral part of the process.

“We never could have built this hockey rink if we had to buy all the materials new,” Pierce says. “It would have cost several million dollars. A lot of the materials, including the structure and the sub-base, are recycled or reused materials. The hockey rink itself is a set of boards that came from a roller hockey rink for a roller hockey team associated with the Washington Capitals. They were getting a new rink; the old one

was being torn down; and we had an opportunity.”

Having an ear open and being aware of the availability of materials presented many opportunities for salvage, reuse and major cost savings. It’s as if Pierce’s dedication to reuse helped manifest the entire project.

“We bought the boards and the glass from the old rink, paid for the move and bought a used tractor-trailer to get it all out for about \$14,000,” Pierce says. “The value of the boards themselves is close to a quarter of a million dollars. In addition, I used to play hockey at Cornell University and through connections there, I found out when they were getting rid of their old scoreboard. They were able to give it to us for free, knowing it would be repurposed for an outdoor rink on our farm. The extra boards to build the benches and penalty boxes also came from Cornell. We salvaged a lot of the door parts and hinges to complete parts we were missing from the other boards.”

In the span of a few months, Pierce had built a beautiful community facility, using almost exclusively material that would otherwise have been landfilled. It is a story of reuse and cost savings.

“The materials popped up at the right time at the right place,” Pierce says. “I was excited for a rink for the kids to skate on. It’s for all different people at all different levels.”

Community Efforts

Along with work being done on the construction and design front, there are more communities trying to drive waste-diversion efforts on an everyday level. One example is Battery Park City, a 92-acre planned community on the southern tip of Manhattan. The Battery Park City Authority recently released a climate action plan committed to achieve carbon neutrality by 2050. Built into that plan is a 75 percent overall reduction in waste sent to landfills with 90 percent of organic waste diverted from landfills.

“What we’re modeling here in terms of reductions are things like waste diversion, keeping more things away from the landfill, whether that’s

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“ WE WERE INSPIRED BY NECESSITY, AND NECESSITY INSPIRES
INGENUITY.—Larry Pierce, founder / owner, LCP Group ”

through incentivizing renewable materials, recycling more or composting,” explains Mikayla Hoskins, associate on the Cities Team at Buro Happold, an international sustainability consultancy tapped by the Battery Park City Authority to help develop the climate action plan. “The Battery Park City Authority operates its own onsite composting program, which has been very successful, and they are looking to grow that. They have a big push toward zero waste.”

The authority leads by example in its own operations and public spaces but also hopes to inspire more spaces in Battery Park City to conduct regular waste audits so residents can have real data about how much is being recycled or diverted from landfills. Having that information helps

shape behaviors.

Another example in New York City is the Peninsula project in the Bronx. It transformed an old juvenile detention facility into a vibrant, mixed-use community with 740 affordable housing units, along with commercial space, retail and light industrial. The Peninsula’s design, by WXY architecture + urban design with Body Lawson Associates Architects & Planners, includes a comprehensive plan to reduce waste and separate recyclable materials.


“Waste is a major component in our daily lives, both as individuals and communities, and waste management is critical to the long-term sustainability of any new development,” says Victor Body-Lawson, FAIA, founding principal of Body Lawson

Associates. “Particularly on this project, the waste-management systems support the operations of not only the light-industrial building, but also the residential buildings. The operations are synchronized, and the light-industrial building becomes a hub for managing waste.”

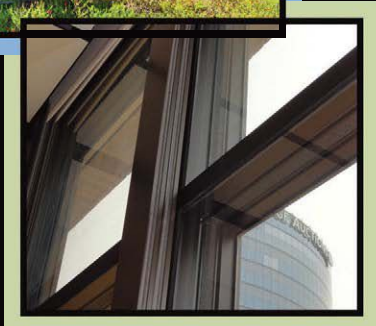
“We have a full waste-reduction program,” explains Ismene Speliotis, executive director of MHANY Management Inc. in Brooklyn. “The light-industrial building [Building 1A] has a biodigester available for compost for residents of that building and for residents of Building 1B. For building 1B, there are paper mini containers for compost in each apartment and larger containers in the refuse room on each floor. Maintenance staff members are responsible for collecting all recycling and compost materials each day and delivering it to Building 1A. We have training materials, videos and ongoing support for residents.”

“Building 1A has refrigerated and shelf storage for surplus edible food so it can be donated to local partners,” says Clare Mifflin, executive director of the Center for Zero Waste Design and founder of ThinkWoven in New York. “Food waste will be separated by the food businesses and processed into fertilizer with a dry anaerobic biodigester. This takes up to 0.55 tons of food waste per day and processes it with microbes and heat to create a fertilizer.”

In his book, *Cradle to Cradle*, William McDonough points out that in nature, there is no waste. One thing becomes food for something else. Waste itself is a human-made construct. The more we create, the more important it becomes to find ways to repurpose the things we no longer need.

One person’s trash is another person’s treasure. Whether it’s building materials or items from everyday use, by simply applying some forethought and reimagining the very concept of waste with greater focus on reuse and recycling, we can make a major impact on the footprint humanity makes on the environment. 

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➔ HIGH-SPEED DOOR PROVIDES LONG CYCLE LIFE

Clopay Corp. has partnered with LiftMaster to launch the Extreme Series Door, powered by LiftMaster. This high-performance door system operates three times faster (at 24 inches per second) and five times longer (at 50,000 cycles) than standard doors, all for a more cost-effective investment than other high-speed doors. The Extreme Series Door will be offered by the Clopay, Cornell and Cookson brands as a system with LiftMaster's direct drive operator. Clopay's Extreme Series is suitable for fire stations, automotive dealerships and service centers that need an aesthetic door that also offers higher speeds and a longer cycle life. The Extreme Series portfolio includes more than 20 models and includes a dependable LiftMaster motor, featuring seamless myQ technology, a cloud-based access-management control system with monitoring capabilities.

www.clopaydoor.com



⬆ LED STRIP OFFERS WIDE RANGE OF TEMPERATURES, COLORS

Luminii has added a plethora of options to its Kurba product series, which is suitable for direct-view, curved soffit, cove and accent lighting. The enhanced features include higher outputs, smaller profiles, pool and sauna rating, and domed and black lens options. The flexible Kurba LED strip is a direct-view, small-profile, energy-efficient product for indoor and outdoor applications. Featuring horizontal (side) and vertical (top) bends down to a 2 1/2-inch radius, the Kurba product series offers a noteworthy level of customization in a wide range of CCTs and color options, including Dynamic White, Warm Dim, RGB, RGBW and a programmable Pixel. Designed with an internal reflector for uniform light output, Kurba end caps are injection-molded for a dependable seal and seamless end-to-end connection no matter the length. The product also features lens coating to prevent yellowing, which can happen over time, especially in outdoor applications.

www.luminii.com



⬆ SMART STREET LAMP CAN POWER OTHER TECH EQUIPMENT

S2A Modular has partnered with Conflow Power Group to give customers direct access to iLamps, a smart streetlight. Each iLamp generates its own power from a wide variety of different technologies, including enhanced battery, solar and generators, which allows the iLamp to run multiple components, such as security cameras, wireless communications, charging capabilities, weather tracking and more. iLamps are suited for use in residential communities, commercial businesses, planned developments and municipalities. In addition to providing valuable services to citizens, excess electricity generated by iLamps is sold back to the grid, resulting in added revenue for the streetlight owners.

www.s2amodular.com

➔ REDUCE SOLAR HEAT GAIN WITH SINGLE-BLADE SUNSHADE

C.R. Laurence has announced the 8010 Adjustable Series Single Blade Sunshade for reducing solar heat gain. Blade angles can be adjusted from zero to -35 degrees in 5-degree intervals with specialized brackets that attach to storefront and curtainwall frames. Multiple blades can be attached to frames, horizontally or vertically. These customizable aesthetic configurations are interchangeable, resulting in unique façades. Key features include 12-inch blade depth, splice joints available for long spans, airfoil and rectangular blade options, and custom powder or Kynar paint finishes. The sunshade has been wind, snow and dead-load tested.

bit.ly/3IDTKYU



↓ GLASS PRODUCTS PROVIDE ENERGY PERFORMANCE, AESTHETICS

Guardian Glass North America has launched two products in its commercial range of double silver-coated glass: SunGuard SNR 35 and SunGuard SNR 50 coated glass. The products provide a low solar heat gain, neutral silver appearance and neutral reflectivity, providing options for architects to use individually or in different areas of a project to achieve a specific aesthetic. The products provide a range of performance features: SNR 50 offers a balance of medium reflectivity and neutral aesthetic with a 48 percent visible light transmission and 0.25 solar heat gain coefficient; SNR 35 delivers a crisp, reflective look and features a solar heat gain coefficient of 0.17. Designed to be used on the No. 2 surface of a standard insulating glass unit, SNR 50 and SNR 35 can be paired with a variety of substrates and are available on jumbo and super jumbo lites and can be heat strengthened or tempered.

www.guardianglass.com/us/en/our-glass/sunguard-superneutral



→ LOUVER CAN BE CUSTOMIZED

The new BLD723 from Ruskin is a bold line, drainable louver designed with a 7-inch wind-driven rain accent blade and 5-inch-deep wind-driven rain-resistant blade for protection and architectural appeal. AMCA-certified for air, water and wind-driven rain performance, the BLD723 is suited for architects who want to make a statement without sacrificing function. The BLD723, which features easy-to-maintain aluminum construction, was designed to enhance the façade of commercial buildings with an accent blade that can be customized to give office and university buildings a branded or distinctive look. With 46 percent free area, the BLD723 has closely spaced horizontal blades and is available in sizes, ranging from 8 inches by 8 inches to 120 inches by 90 inches. It can be produced with visible mullions or hidden if a continuous blade architectural look is preferred.

www.ruskin.com/model/bld723



→ WINDOW FILM IS INSTALLED WITH WET-APPLY ADHESIVE

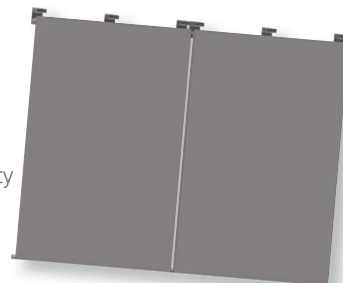
Avery Dennison Graphics Solutions has introduced its Dusted Crystal decorative architectural window film. The frosted film, available in a matte and luster finish, offers privacy while providing a translucent light effect for interior environments using glass to signify specially designated spaces. The film features a wet-apply quick-release adhesive that allows the film to be repositioned during installation and removed easily after drying with virtually no residue left on the glass. Moreover, the film's adhesive doesn't stick to itself, which eliminates mishaps when removing the film from its liner prior to application. Interior spaces suited for Dusted Crystal decorative architectural window film include corporate meeting spaces, schools, medical offices, hospitality reception areas and glass partitions.

graphics.averydennison.com/dustedcrystal

→ NEW METHOD SPEEDS INSTALLATION OF ACM PANELS

ALUCOBOND has launched a cost-effective installation method for commercial wood-frame construction in the multifamily and mixed-use sectors. ALUCOBOND EasyFix features an innovative design that enables the efficient attachment of ALUCOBOND PLUS panels. By combining two types of folds, this advanced solution provides an attractive, finished look similar to traditional ACM systems while offering simplicity and efficiency in meeting tight construction schedules. Trend-forward color possibilities along with customizable panel layouts, reveal options and lengths allow for freedom in design.

alucobondusa.com/product/easyfix



➔ LAMINATED GLASS 3D SEQUINS INTERLAYER DETERS BIRDS

Eastman, in partnership with SEEN AG, has introduced a polyvinyl butyral (PVB) interlayer for laminated glass: Saflex FlySafe 3D. It is an effective solution to avoid bird collisions without compromising on the view or beauty of glass façades. The product features 3D reflective sequins between two layers of glass. The sequins catch the light at different angles, subtly twinkling to deter birds from the glass—something 2D dots and stripes don't do. Because of the 3D nature of the sequins, less coverage is required; the discreet sequin pattern covers less than 1 percent of the glass area. The sequins are layered between glass, so it is a long-lasting bird-protection solution. Collision Laboratories in Austria has tested and rated the 3D reflective technology, classifying it as highly effective, durable and offering better aesthetics.

saflex.com/flysafe



◀ SUPPRESS TRANSMITTED NOISE AND REFLECTED VIBRATION

Kinetics Noise Control Inc., a Catalyst Acoustics Group company, has introduced MetaWrx, a new class of isolator designed by engineers at HyperDamping Inc. and offered exclusively by Kinetics. MetaWrx's design leverages principles of structural engineering to convert the applied transverse loads to lateral bending and stretching of the beam network, thus maximizing damping for enhanced transmission loss and minimal residual vibration on the surface of the applied load. MetaWrx is suitable when transmitted noise and reflected vibration must be suppressed. This is of utmost importance in fitness facilities, dance studios, performing spaces and other facilities, using lightweight low-profile floor build-ups. Because MetaWrx pulls more performance out of the bulk material via a patented design philosophy, it is suited for spaces that otherwise struggle to meet isolation metrics with conventional polymer isolators or spring suspensions. With its thin design, it is a good match for low-profile floor build-ups that need to satisfy strict space requirements for installation.

kineticsnoise.com/metawrx



↙ HEAT-PUMP PIPES FEATURE POLYURETHANE FOAM INSULATION

Huntsman, in close collaboration with BRUGG Pipes, has developed a next-generation polyurethane foam system that can be used to create flexible, thermally efficient, pre-insulated pipes for connecting ground-source heat pumps and local heating units to domestic and commercial buildings. The closed cell SUPRASEC/DAL-TOFOAM TE system produces foam with better insulation properties (low lambda value) than PE. The result is pipes with a thinner layer of insulation compared to PE that still deliver good overall insulation performance (low U-value). In addition, thinner, lighter pipes are more flexible, meaning they are quicker and easier to transport and install, as well as reduce heat loss.

www.bruggpipes.com/en/flexstar



➔ LIGHTING CONTROL UNIT MEETS SECURITY STANDARDS

Universal Douglas' Dialog Lighting Control Unit, WLC-4150-SC, received the UL 2900-1 Standard for Software Cybersecurity Network-Connectable Products. The Dialog Lighting Control Unit, a large touchscreen used for changing system settings, is an updated component to Universal Douglas' Dialog System, a digital, centralized and programmable lighting control system for entire floors, buildings and large multi-building applications. The UL 2900-1 Standard, which is part of UL's Cybersecurity Assurance Program, covers evaluations and tests of network-connectable devices as it relates to vulnerabilities, malware and software weaknesses. Additionally, the ioXt Alliance, the global standard for IoT security, has evaluated and certified the Dialog Lighting Control Unit against its Security Pledge, which is a set of standards that bring security, upgradability and transparency to the market.

www.universaldouglas.com





← UNITS SANITIZE HANDS AND RESTROOM AIR

Bobrick Washroom Equipment Inc. has launched its Pure Hygiene Solutions collection, including PureDri and PureSphere, which are proven to eliminate 99 percent of bacteria, viruses, mold and fungi in less than 10 minutes. The units' technology works by destroying existing microorganisms from bacteria and viruses in the air and on surfaces through continuous sanitization using a three-step process.

The PureDri Sanitizing Hand Dryer protects hands with a blast of super-concentrated ionized air, following the drying cycle, while providing continuous sanitization in rooms up to 215 square feet. PureSphere Air Sanitizer purifies the air continuously using an internal UV lamp and ionic processes. In addition, the unit provides odor control so rooms feel fresh and smell clean.

bobrickpure.com



← PAINT KILLS VIRUSES AND BACTERIA

Behr Paint Co. has launched BEHR COPPER FORCE Interior Paint, which affords homeowners, residents, and building occupants an extra layer of protection against bacteria and viruses, including SARS-CoV-2.

The culmination of two years of intense research and development, BEHR COPPER FORCE Interior

Paint is powered by Corning Guardiant antimicrobial technology, which harnesses the intrinsic benefits of copper to kill viruses and bacteria without copper's traditional look, feel and cost. The paint kills 99.9 percent of viruses (SARS-CoV-2 and feline calicivirus [EPA proxy for human noroviruses]) and bacteria (staphylococcus aureus and pseudomonas aeruginosa) within two hours of exposure on the painted surface for a period of six years (based on EPA test protocol as long as the integrity of the painted surface is maintained and is part of a comprehensive infection-control and hygiene program), all while beautifying walls and other interior surfaces and providing the paint performance you expect from Behr.

www.behr.com/consumer/copper-force

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HAT Collective has launched HAT Collective Healthcare, a division that offers products specifically designed to support the technology needs of health-care providers and improve the point-of-care experience for the caregiver and patient. Point of care is commonly regarded as the point of interaction where caregiving and information exchange occur between a patient and caregiver. The lineup of ergonomic and customizable products, proven to perform within demanding 24/7 health-care environments, includes wall mounts, mobile carts, workstations and articulating monitor arms. Areas where HAT Collective Healthcare products can be utilized include patient rooms, exam rooms, operating rooms, patient registration areas and diagnostic testing.

healthcare.hatcollective.com

➔ WINDOW WALL MEETS THERMAL PERFORMANCE REQUIREMENTS

YKK AP America Inc. has introduced its YWW 60 XT window wall, which is designed to meet stringent thermal-performance requirements and is suitable for mid- to high-rise building applications, particularly in cold-weather climates. The product has the ability to handle higher structural loads and up to 12-foot mullion spans. To accommodate a wide range of architectural designs and applications, YWW 60 XT offers multiple options, including pre-glazed or field-glazed; inside or outside glazed; captured, two-, three- or four-sided structural silicone glazing configurations; dual-finish capability; a large glazing pocket that accommodates 1-inch insulating glass or 1 5/16-inch insulating laminated glass for projects with stringent acoustical performance; and more. YWW 60 XT features a U-factor of 0.36 BTU/HR/SF with a COG of 0.29 with standard 1-inch glass. Thermal performance is enhanced by 40-millimeter polyamide isostruts, along with YKK AP's patented ThermoBond Plus technology and a patented process to prevent dry shrinkage.

www.ykkap.com/commercial/productguide/windowwall/yww60xt

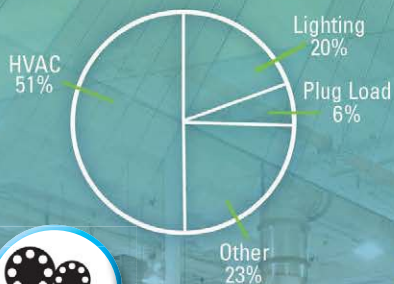


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www.arriscraft.com



ASSA ABLOY
ASSA ABLOY/Sargent Page 47
sargentlock.com/8200indicator-112020



Belimo Page 11
www.belimo.us



Bradley Corp. Page 13
www.bradleycorp.com/evero



Carlisle Syntec Systems Page 15
www.carlisesyntec.com



Clopay Page 9
www.clopaydoor.com/retrofit

DORLEN PRODUCTS INC.

Dorlen Products Inc. Page 79
www.watalert.com



Dynamic Air Quality Solutions Page 80
www.dynamicaqs.com



Excel Dryer Page 59
www.exceldryer.com



Flex-Ability Concepts Page 73
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FritsJurgens Page 19
www.fritsjurgens.com



GSSI Page 4
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Hanover Architectural Products Page 10
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IAC Acoustics Page 43
www.iacacoustics.com



IOTA Page 73
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Kalwall Page 51
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Lamtec Corp. Page 3
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Modular Arts Page 14
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NanaWall Page 84
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Noise Barriers Page 57
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NSG Pilkington North America Page 27
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Prosoco Page 33
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Schweiss Page 79
www.bifold.com



Scout Services Page 35
www.scoutservices.com



St. Cloud Window Page 74
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Ultra-Tec Page 37
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Universal Douglas Page 75
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WOOSTER PRODUCTS

Wooster Products Page 41
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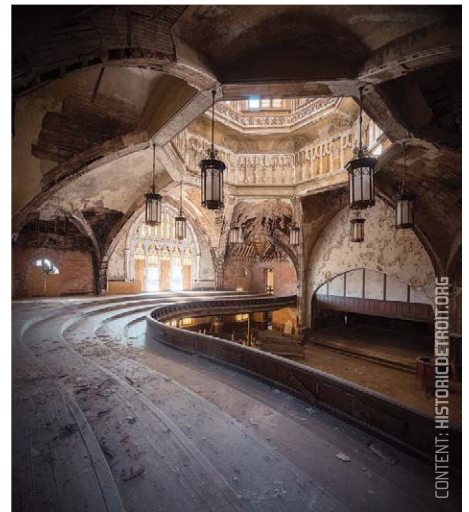
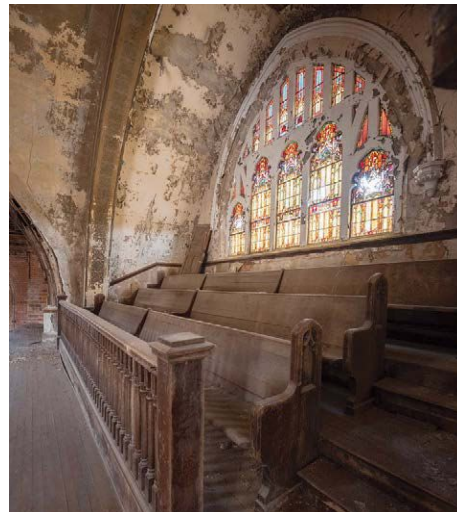


ZIPWALL Page 40
www.zipwall.com

BY FAITH



PHOTOS: ERIN BELL, WWW.INSTAGRAM.COM/ERINJPHOTOGRAPHS



CONTENT: HISTORICDETROIT.ORG

Completed in 1911, Woodward Avenue Presbyterian Church, Detroit, was designed by Cleveland-based architectural firm Badgley and Nicklas in a modern English Gothic style. Its tall octagonal lantern that rises from the center was a design characteristic for which Sidney Rose Badgley, a prominent church architect at

the turn of the 20th century, was known. The interior is composed according to the Akron Plan in which an auditorium-like worship space is surrounded by offices and classrooms.

Over the years, the church lost many parishioners and eventually broke away from the Presbyterian church all together in

the hopes that a new congregation could keep the beloved church building operating. When the new pastor died in 2005, the church was abandoned and quickly became the target of vandals.

According to an article in HistoricDetroit.org, a renovation that is financially viable "is going to be by faith." [f](#)



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