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*New Ideas:

A Western Kentucky University Landmark Builds on Its Campus Heritage while Becoming 21st Century Social/Intellectual Space + More Education Projects

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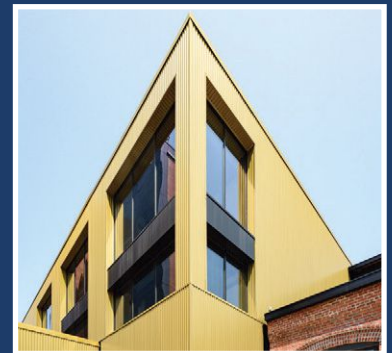
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Metal panels manufactured by ATAS International helped this retrofit to transition from the past to the present. Metafor panels in a custom 70% PVDF Brass colored paint finish were used on the walls of the addition, and perforated Metafor panels in the same finish were used on the entranceway. Design Wall and Opaline panels in Classic Bronze were also installed as wall cladding on the original building, and as separators for the windows on the addition.

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The Foundry Building

Wall Panels: Metafor in custom Brass color, Design Wall and Opaline panels in Classic Bronze color (all in a 70% PVDF finish)

Architect: CambridgeSeven

Contractor: T.J. McCartney, Inc.

Photographer: Kwesi Budu-Arthur

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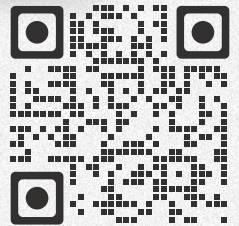
Photo by Steve Morgan

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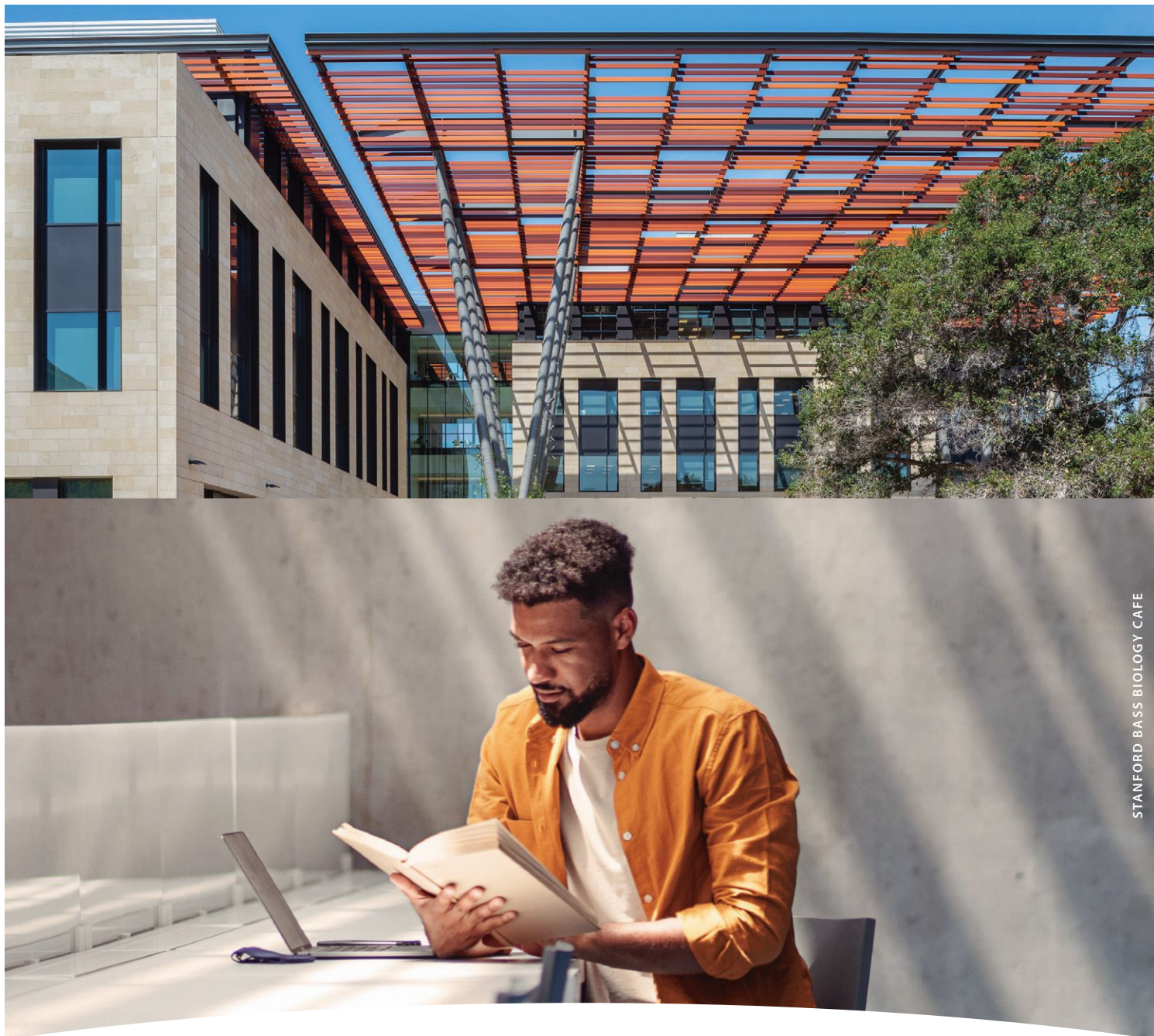


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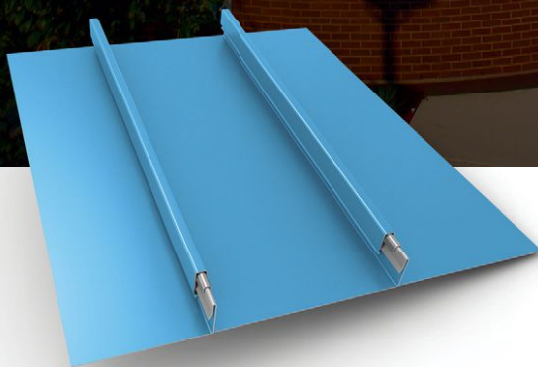
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Whimsical Roofline



Vibrant Dynamic Blue Snap-Clad metal panels brighten the playful roof shapes and walls of two interior courtyards, invigorating this mixed-use building that houses a Chicago Public Library, childcare center and community meeting space.

Altgeld Family Resource Center, Chicago Installing contractor: Progressive Dynamics Architect: KOO LLC
Owner: Chicago Housing Authority Photo: hortonphotoinc.com



Snap-Clad
Metal Roof and Wall System
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case study
and video

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- William R. Murchie Science Building, Flint, Mich.
- Kingsway College School, Toronto
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- Cathedral School for Boys, San Francisco
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← **cover**

COVER PHOTO: NICK MCGINN | DESIGN BY GENSLER

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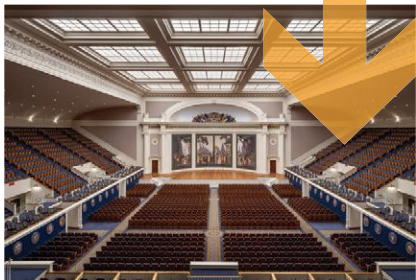
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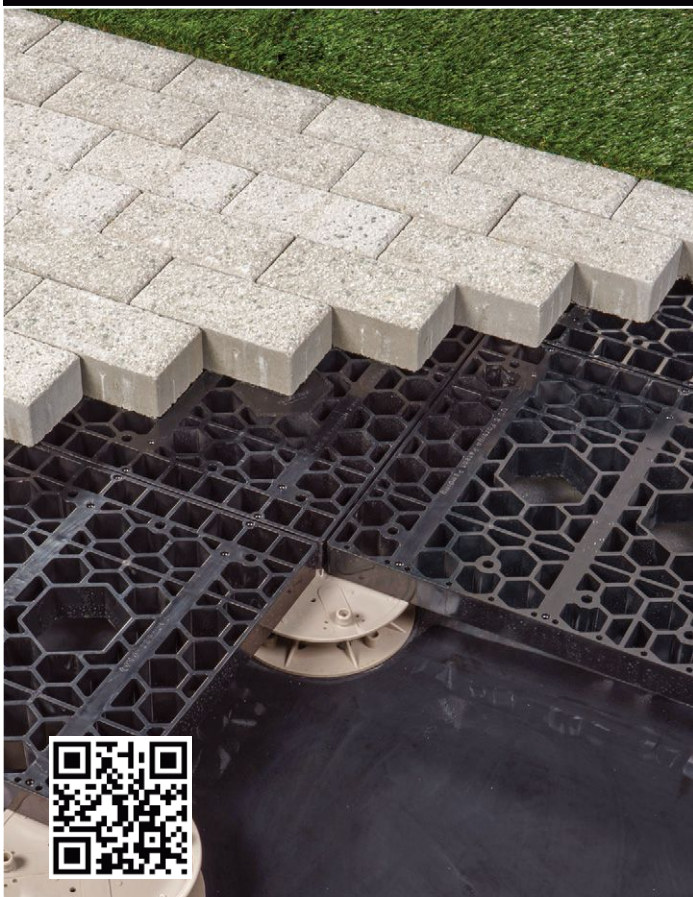
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MOMENT IN TIME

As September arrives, we remember 9/11. For more than 20 years, I've had in my possession a piece of original Pentagon slate recovered after 9/11. I'm ashamed to say, it has been stored in closets as I moved from home to home between three states, until now. Today, the slate is memorialized in a case with museum glass and proudly hung in my home's family room. To me, the slate tells the story of how the roofing industry came together after that horrible day.

On 9/11, I was assistant editor of *Professional Roofing*, a member magazine published by the National Roofing Contractors Association (NRCA) in Rosemont, Ill. I remember being at work on that beautiful morning and watching in horror as the day's events unfolded. Our building, which was adjacent to O'Hare International Airport, eventually was evacuated and closed because authorities had feared one of the planes that were part of the attacks had come from O'Hare.



When American Airlines Flight 77 hit the Pentagon, approximately 60,000 square feet of the slate roof system was burned by jet fuel. Wanting to offer the industry's expertise after 9/11, NRCA organized the reroofing of the Pentagon. I had always enjoyed my job and the industry, but I was particularly proud to be part of this moment as the roofing industry band together, offering monetary and materials donations, as well as time and skills to reroof the Pentagon.

To commemorate the reroofing, every NRCA employee was given an original slate that had been removed from the Pentagon's roof. Each hefty slate measured approximately 10 by 20 inches and was inscribed before it was given to us: Pentagon Roof Project 2001, Original Slate Recovered After 9/11/01. My slate was charred by the fire on the front and particularly on the back. It also had a hairline fracture across the midsection. As careful as I tried to be with the storage of my slate, the fracture eventually broke it in two. At the time, I was upset but when I recently had it encased, I realized I now could show the charring on the back, along with the inscription on the front of the slate.

Although the story of the roofing industry's commitment to rebuilding after 9/11 is often lost in all the other stories of that infamous day, the U.S. House of Representatives passed a formal resolution in June 2002, commending "the patriotic contributions of roofing professionals".

And, now, friends and family who visit my home will have the opportunity to hear me talk about the roofing industry's valiant efforts after 9/11 and view a piece of original Pentagon slate, safely enshrined for decades to come.

Christina Koch

CHRISTINA KOCH

Associate Publisher/Editorial Director
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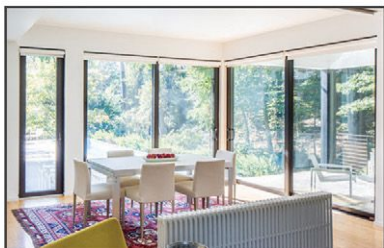


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Janette Scott, AIA, is a project architect, and **Brian Watson**, AIA, is architecture design director for Gensler. The pair write about The Commons at Helm Library, which is located on Western Kentucky University's Bowling Green campus. With Gensler's help, WKU transformed a former basketball arena, turned library in the '60s, into a place where students, faculty, and staff can connect, share a meal and continue instruction beyond the classroom. Read our "Cover Story," page 16.



Cliff Stendel, B.Arch, OAA, OAA, MRAIC, NCARB, is principal and partner with Montreal-based Stendel + Reich Architecture Inc. He directs the practice's exterior and interior design group and, as such, led the transformation of Yaldei School, a 3-story building for children with special needs. Lighting is a key component in creating a safe, engaging environment for the students, as explained in "Component", page 40.



Katie Irwin, AIA, IIDA, LEED AP BD+C, is a senior associate at Quinn Evans. She writes about sensitively renewing the historic laylight in Constitution Hall, part of the National Society of the Daughters of the American Revolution's headquarters, Washington, D.C. The laylight's glass panels had been covered and could no longer be restored. The restoration's innovative lighting solution is explained in "Component", page 44.



Clockwise from top left: **Janette Blackburn**, FAIA, is a principal and leader in Shepley Bulfinch's education practice. **Matthew Gifford**, AIA, LEED AP, is a principal at Shepley Bulfinch. **Amanda Vigneau**, IIDA, NCIDQ, LEED ID+C, is an experienced interior designer at Shepley Bulfinch. **Nathaniel Finley**, AIA, fills many roles at Shepley Bulfinch, including project manager, project architect and design lead. Together, these professionals explain how an addition and renovation at Beatty Hall at Loyola University Maryland, Baltimore, sets students on the path to their futures in "Addition", page 52.



Stefanie Greenfield, AIA, is a principal at CambridgeSeven. She has spent her career advancing the firm's tradition of vibrant placemaking and thoughtful adaptive reuse of historic architecture and, in that capacity, tells the story of Foundry 101. The steam-pump manufactory built in 1890 now is a community hub with makerspaces, art and dance studios, food labs, a central community hall and office tenants. Read the story in "Transformation", page 58.



Lauren Wilcox (left) is a writer, multimedia artist and lighting designer with LUMA. With a degree in communications, **Katrina Emery** loves researching, writing and telling stories. In "Component", page 48, the duo outlines the work of Light on Waste (of which Wilcox is a member), a team of lighting designers seeking to improve the environmental impacts of LED lighting.

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LIBRARY

WRITTEN BY | JANETTE SCOTT, AIA, AND BRIAN WATSON, AIA

A UNIQUE **WESTERN KENTUCKY UNIVERSITY**
LANDMARK BUILDS ON ITS CAMPUS HERITAGE
WHILE BECOMING 21ST CENTURY
SOCIAL/INTELLECTUAL SPACE

VOICES



RAYMOND
CRAVEN
LIBRARY

Founded in 1906, Western Kentucky University's (WKU's) 200-acre campus sits on a hilltop in Bowling Green, offering more than 20,000 students 100 majors across five colleges. With the growing number of students and variety of curriculum offered on the expansive campus during the past few decades, WKU recognized a need for a modernized space that could blend learning, socialization, and academic services while driving engagement and community.



BEFORE

BEFORE

BEFORE PHOTOS. COURTESY GENSLE/WESTERN KENTUCKY UNIVERSITY



Looking within existing campus assets, WKU saw potential in Helm Library, a 1930s structure that was built as the university's first basketball arena and was renovated in the 1960s to become a library. Gensler was guided by the goal to preserve the building's historic presence while activating the space with welcoming energy.

Looking within existing campus assets, WKU saw potential in Helm Library, a 1930s structure that was built as the university's first basketball arena and was renovated in the 1960s to become a library. Guided by the goal to preserve the building's historic presence while activating the space with welcoming energy, Gensler partnered with WKU to bring The Commons at Helm Library into a new era of serving students and faculty.

At the start of the project, Gensler's team was challenged to rethink the typical notion of a library by developing a concept and program that balances the relationship between social and intellectual space. This new vision enables the library to become more than an archaic space to collect books and periodicals. Instead, it provides

students, faculty, and staff an open invitation to connect, share a meal, continue instruction beyond the classroom and develop ideas for collaboration.

THE PROGRAM: HARNESS THE SOCIAL TO POWER THE INTELLECTUAL

To successfully shift the building's purpose from a static purveyor of information to a creator of knowledge, the program melds social and intellectual spaces with the buzziest activities on the ground level, transitioning upward to quieter, more focused activities on the third floor. Circulation paths and the variety of space types within the building welcome a broad set of users and encourage a sense of discovery through

■ RETROFIT TEAM

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- Janette Scott, AIA, project architect
- Brian Watson, AIA, design director
- Sarah Adams, NCIDQ, senior interior designer
- Brian Vitale, AIA, design principal

ARCHITECT OF RECORD AND CIVIL, LANDSCAPE, STRUCTURAL AND MEP ENGINEER //

Luckett & Farley, www.luckett-farley.com

OWNER // Western Kentucky University, www.wku.edu

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GENERAL CONTRACTOR // A&K Construction, akconstruction.com

GLAZING INSTALLER // Bowling Green Glass Co., www.bgglassco.com

■ MATERIALS

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TILE // American Olean, www.americanolean.com, and Ceramic Technics, ceramictechnics.com

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INTERIOR GLASS // DIRT, www.dirtt.com



Students can choose from indoor or outdoor terraced seating that was made possible by opening the façade of the building to engage with the academic heart of campus.

spontaneous experiences.

On the first floor, socialization takes center stage. Four food venues await hungry students, who can choose from indoor or outdoor terraced seating that was made possible by opening the façade of the building to engage with the academic heart of campus. Collaboration niches are tucked throughout the space for students who prefer to work together among the buzz of activity.

On the way to level two, the energy of the social spaces narrows as the program shifts toward collaboration and student support. After fueling up at the coffee shop, students can step into shared study rooms and utilize the central concierge help desk to direct them to the variety of learning support tools and spaces located throughout the building.

At the top floor, the dull roar quiets to a hum. Whether accessing the reference stacks, finding a place to land in the quiet study area, attending class in an active learning classroom or utilizing the media content development resources, students can find dedicated spaces that allow for focused work. Also implemented is a one button room, where students and faculty can record themselves and practice their presentation skills.

While social spaces activate the

building, the purpose of the commons is to leverage these spaces to drive learning outcomes. Student support services are spread throughout to encourage utilization by students and faculty from across the university. Fusing the program together, offerings like the knowledge network, which encircles the central 2-story gathering space at the center of the building, help to level the playing field and create a connected and inclusive space for peer-to-peer tutoring.

THE INTERVENTION: RESTORE, RECONNECT, REVITALIZE

Dedicated in 1931, the original Health & Physical Education Building was a multi-purpose space that held basketball games, concerts, dances and student class registration. When the basketball program moved to Diddle Arena in 1963, the building was transformed into the Helm Library, where individuals could meet to study, research and learn.

In the process of creating a space for focus, much of the building was closed off from the outside and the volume and history of the building was covered up. One of the design team's priorities for the project was to open the façade, seamlessly uniting the commons and surrounding campus.

The design reinforces the interconnected university environment by drawing



WHILE SOCIAL SPACES ACTIVATE THE BUILDING, THE PURPOSE OF THE COMMONS IS TO LEVERAGE THESE SPACES TO DRIVE LEARNING OUTCOMES.

After fueling up at the coffee shop, students can step into shared study rooms and utilize the central concierge help desk to direct them to the variety of learning support tools and spaces located throughout the building.



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students in through a new glass curtainwall that creates permeability between the building and the WKU community. Acting as a connector, the commons links the campus together, shedding a formerly obstructive addition and creating an accessible path that extends through the building and site. By removing enclosed sections of the exterior and restoring 14 skylights, the design visually unites all levels of the 3-story building while giving the main space ample daylight.

To create dynamic and connected spaces while accommodating the need for sound control, smell control, and differing mechanical needs, the team took a typical central 3-story atrium and shifted it at the middle floor to create two connected, yet separate, spaces. This shift allowed for two distinct bi-level spaces, eliminating the need for a costly smoke-evac system. The upper

2-story space exposes the volume of the former gymnasium, while the second is pushed to the perimeter of the building, engaging the campus hill while connecting down to the basement level. A central stair and circulation path joins the two spaces at the heart of the building at the former center basketball court.

Interior materials reinforce the historic nature of the building with black textured wood, reflecting barns scattered throughout the area, and exposed steel, celebrating the structural frame of the existing building and industrial past of the region.

Celebrating Kentucky's climate and surrounding nature, the exterior renovation thoughtfully uses the existing building as a physical link in the hilly topography of central campus, acting as an accessible path between the upper and lower campus. A large stair connects the program, joining the active food hall to the traditional quiet spaces and giving students the opportunity to move freely between floors from the exterior. Inside and out, the renovation embodies a new focus on wellness for its users, bringing more daylight into the building and strategically using the site for tiered outdoor seating.


RECOGNITION FOR THE COMMONS

To date, Gensler has earned awards for its work at The Commons at Helm Library at Western Kentucky University from the following organizations:

- AIA Chicago
- AIA Kentucky
- IIDA Illinois

THE OUTCOME: A VIBRANT ACADEMIC HUB

Designed for all, The Commons at Helm Library hosts the diverse student population—more than one-third are the first generation in their families to attend college—through warm, inclusive space types for various academic and social experiences. As a unique campus landmark, the new program builds on the heritage of the building as a center for student activity by offering a flexible space to engage individuals and connect disciplines across campus.

As the new intellectual hub in the historic heart of the campus, The Commons at Helm Library successfully achieves the goal of creating a new destination for WKU's students and faculty while honoring the building's historic past. With adaptive reuse and sustainability at the forefront of the design, the commons gives a versatile, inviting new face to the library by shaping environments that support the next generation. 



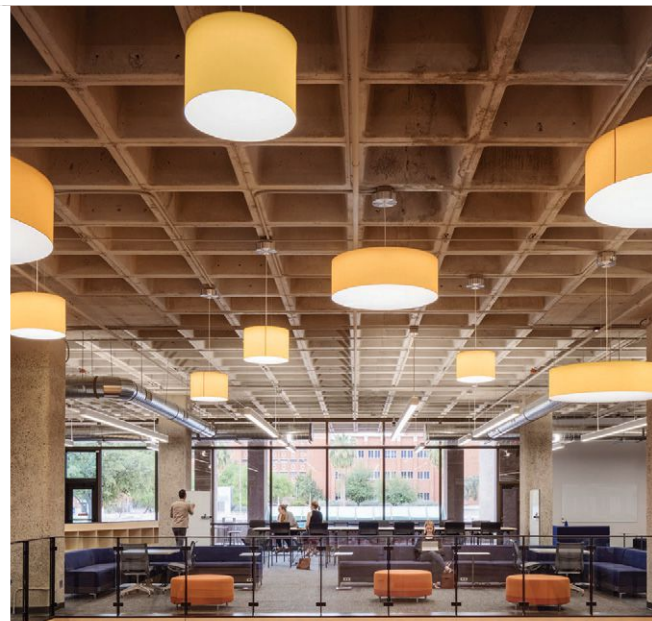
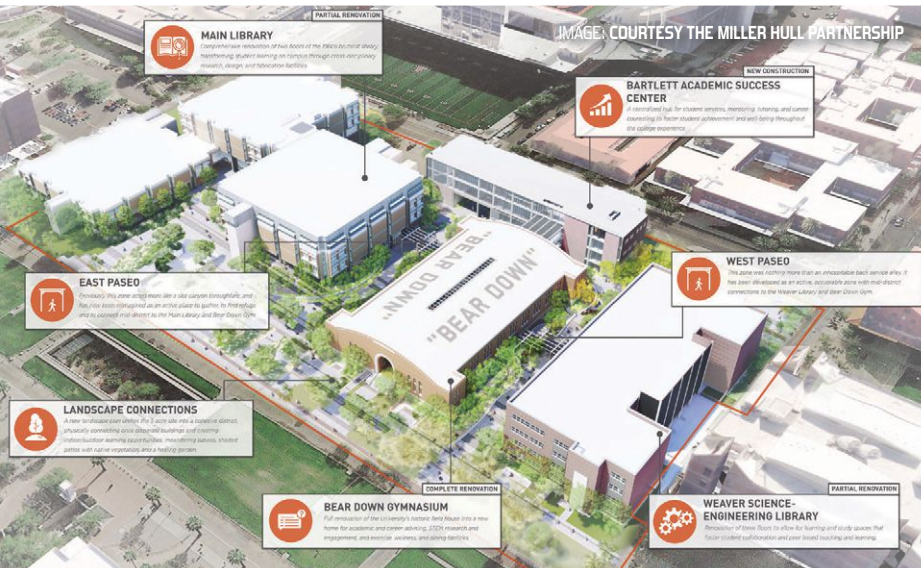
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GENERAL CONTRACTOR: Sundt, www.sundt.com
ENVIRONMENTAL GRAPHICS AND WAYFINDING: Mayer Reed, www.mayerreed.com

» THE RETROFIT

The recently completed 262,000-square-foot Student Success District at the University of Arizona is a groundbreaking addition to the university's urban fabric. The complex project redefines and revitalizes the Main Library and Bear Down Gymnasium, reorients the entry to the Albert B. Weaver Science-Engineering Library and merges them with a new 55,000-square-foot Center for Academic Success to create an interconnected district. Connections between new and existing structures activate outdoor spaces and provide areas for student engagement.

Early involvement with a diverse body of stakeholders and user groups was critical for understanding priorities and possibilities for the district and developing a clear path to the end goal of the multi-phased project.

The established goals pushed the program to integrate space within departments to break the silos that previously existed in the decentralized locations across campus.

Soliciting student input throughout the process provided deep insight into what was most valued: technology, variety of spaces, and power and internet access everywhere. Student input encouraged the team to embrace the goal of creating "a place for every student"—diverse, flexible, technology-rich spaces—by introducing indoor and outdoor shared study and lounge areas in a student-centric, unifying character.

Miller Hull identified design and construction solutions to optimize the broad and varied program within the available physical and fiscal resources. The co-location of student support services provides convenient career counseling, financial skill-building, and mental-health resources to students in a central campus location.

Establishing new connections on an existing campus can be challenging. Spanning 95 years of history, the Main Library, science-engineering library and Bear Down Gymnasium each had differing uses, architectural styles, grade connections and floor-to-floor heights. Understanding the importance of unifying the new district, the design solution was centered on student circulation and hardscape and landscape treatments to create occupiable space between buildings and continuity at building entries. As new entries were cut into the existing buildings, the consistent use of a thin-steel-plate portal was developed to "slice" through the façades and establish a language for the new circulation patterns. These connections and consistent development of spaces between structures became a common thread, stitching the district together and unifying the student experience.

THE BALDWIN SCHOOL | Bryn Mawr, Pa.



PHOTOS: JEFFREY TOTMAN
Unless otherwise noted



» RETROFIT TEAM

ARCHITECT: Voith and Mactavish, voithandmactavish.com
 GENERAL CONTRACTOR: Warfel Construction, www.warfelcc.com
 CIVIL ENGINEER: Chester Valley Engineers, chesterv.com
 STRUCTURAL ENGINEER: DCI Engineers, www.dci-engineers.com
 MEP ENGINEER: Bruce E. Brooks & Associates, www.brucebrooks.com
 LANDSCAPE ARCHITECT: Viridian Landscape Studio, www.viridianls.com
 AV/IT: KMK Technologies, now NV5, www.nv5.com

» MATERIALS

Looking to renew an existing pool house that was no longer needed, The Baldwin School saw an opportunity to support student collaboration and interdisciplinary education on the campus by creating a space for students to keep learning, making and sharing.

The area looks clean and orderly, but also spacious and dynamic thanks in part to the finishes used throughout. Neutral colors and materials, such as the wood flooring and ceiling, combine with white surfaces with blue details. Bright cushions provide a strategic burst of additional color. Through a series of French doors that open to an adjacent courtyard patio, this renewed space connects physically and visually with the rest of campus while allowing

natural light to flood into the interior, resulting in a lively environment that promotes learning and development for students.

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

POOL INFILL, RECLAIMED HARDWOOD: Mixed Hardwoods, Settlers' Plank from Pioneer Millworks, pioneermillworks.com
 CARPETING ON RAMPS: Boucle, Infinity Modular, Sapphire 34923 from Mannington Commercial, www.manningtoncommercial.com
 INFILLED MOSAIC TILE AT NEW DOOR OPENINGS: Keystones, Luminary Gold D142, Artisan Brown D144, Corsilk D160 and Elemental Tan D166 from Daltile, www.daltile.com
 ACOUSTIC WALL PANELING: Atlas II from Knoll, www.knoll.com
 TACKBOARDS: 2187 Brown Rice from Forbo, www.forbo.com
 CEILING: 1400 Series Dowel/Cross Piece Grille, Western Hemlock, Maple Stain from 9Wood, www.9wood.com
 LINEAR CEILING: Edge EX2D from Pinnacle Architectural Lighting, www.pinnacle-ltg.com
 DECORATIVE PENDANTS: Bola Sphere SPH12 from Pablo Lighting, www.pablodesigns.com
 EXTERIOR LIGHTS: 31171 LED Wall Luminaire with Shielded Light from BEGA, www.bega-us.com
 WINDOWS AND DOORS: Reserve Wood Casement

and Hung Windows and Reserve Wood Patio Doors from Pella, www.pella.com
 PLASTIC-LAMINATE-CLAD CABINETS AND CUSTOM WINDOW BENCHES: Panolam, panolam.com
 SOLID-SURFACE COUNTERTOPS: Epoxy Resin worksurfaces in Tan from Durcon, www.durcon.com

» THE RETROFIT

The goal was to make the space comfortable and safe for this all-girls' school with students ranging in age from pre-kindergarten to 12th grade.

The original building, with a footprint of approximately 3,500 square feet, consisted mainly of a large open space where the pool was excavated. To make the most out of these existing conditions and avoid unnecessary costs, the void formerly occupied by the pool was converted into a sunken seating area, which can be accessed by steps or a ramp; it also can be covered over as needed to maximize the efficiency of the space.

With the intention to further optimize efficiency during busy school days, flexible tables and seating were placed to allow for different configurations. Together with the sunken seating, situated low to the ground, there is a comfortable place for even the youngest students. Storage, white boards and display space are available low to the ground. Higher up, out of reach of small hands, there is a maker-space area with 3D printers and other crafting tools.

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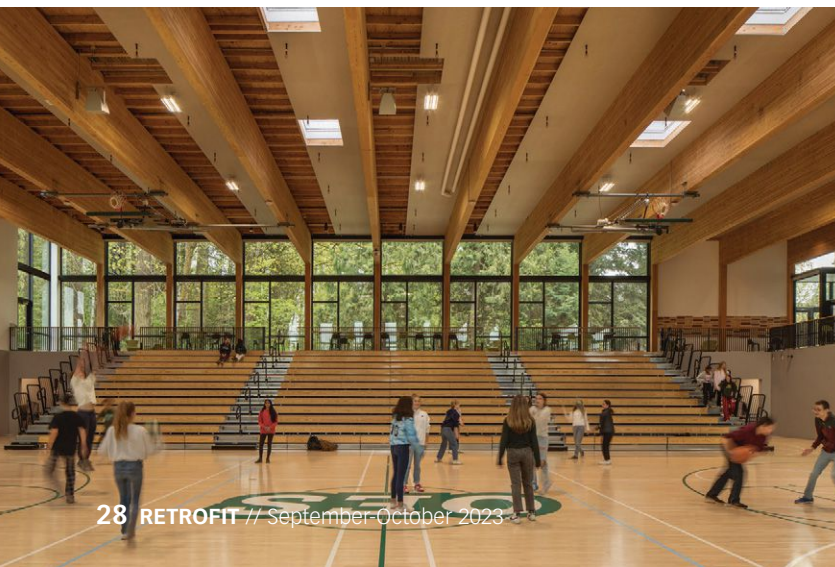


C O M M E R C I A L

pella.com/commercialsolutions

ATHLETIC CENTER, OREGON EPISCOPAL SCHOOL | Portland

PHOTOS: LARA SWIMMER unless otherwise noted





» RETROFIT TEAM

ARCHITECT AND INTERIOR DESIGNER: Hacker,
www.hackerarchitects.com

GENERAL CONTRACTOR: Fortis, fortisconstruction.com

LANDSCAPE: Walker Macy, www.walkermacy.com

CIVIL ENGINEER: Cardno, now Stantec, www.stantec.com

STRUCTURAL ENGINEER: DCI Engineers, www.dci-engineers.com

MEP ENGINEER: PAE, www.pae-engineers.com

LIGHTING: O-, www.o-llc.com

ACOUSTICAL ENGINEER AND THEATRICAL/AV: Listen Acoustics,
listenacoustics.com

» MATERIALS

The directive from Oregon Episcopal School representatives was to create a safe and supportive experience for all students, regardless of their interest or skill in sports, by transforming an aging gymnasium building into a vibrant new athletics center to support varsity team sports and physical education classes. The 22,000-square-foot renovation and 20,000-square-foot expansion of the Athletic Center features flexible student and faculty meeting spaces, dedicated team rooms that replace standard locker rooms, group collaboration spaces throughout, two full-size gymnasiums, and physical education and athletic department offices.

The exterior envelope shares a common language with the recently completed lower school in which vertical wood slats and texture reference the nearby campus woods.

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

CHAIRS AND COUNTER STOOLS: Emeco, www.emeco.net

TABLES AND COUNTER TABLES: Muuto, us.muuto.com

SIDE TABLES AND COFFEE TABLE: EcoPDX, www.ecopdx.com

LOUNGE CHAIRS: National, www.kimballinternational.com/national

WOOD DOME PENDANT LIGHT: Arnsberg, www.arnsberg.com

GYMNASIUM LIGHTS: Zumtobel, www.zumtobel.com

» THE RETROFIT

Oregon Episcopal School (OES) is an independent, co-ed college preparatory school of 800 students from pre-kindergarten through 12th grade. The school's identity is rooted in Oregon's natural beauty and diverse people and history. The Athletic Center design, which embraces nature and the outdoors as a teaching tool, reflects the OES community's desire for open spaces that encourage gathering and support interaction.

The design team's engagement with OES students and athletic department staff heavily influenced the design process with conversations focused on schedules and routines. Partnered in the commitment to be an inclusive, equitable and future-forward campus hub, the design team and OES envisioned a space that replaces locker rooms with flexible, all-purpose team rooms, allowing student-athletes and their coaches a mix of private and communal space. The design centers on the reclamation of underutilized spaces, replacing facilities, like showers and lockers, with flexible, all-purpose team rooms, encouraging team building of all-skill-level mixed-gender teams.

Designed for resiliency, the OES Athletic Center meets strict seismic criteria to provide shelter and support to OES and the surrounding community after a seismic event. With a highly efficient envelope, passive cooling strategy and minimal mechanical conditioning, this building strives for high performance, meeting the Energy Trust of Oregon-Path to Net Zero and aligning with Architecture 2030 Challenge goals. The Athletic Center reduces energy use by 82 percent from CBEC's baseline with an EUI of 15kBtu per square foot per year.



WESTFIELD NINTH GRADE CENTER | Houston



PHOTOS: ALANBLAKELY.COM

► RETROFIT TEAM

ARCHITECTS: DLR Group, www.dlrgroup.com, and Pfluger, pflugerarchitects.com
METAL PANEL INSTALLER: PRC Roofing Co. Inc., commercialroofinghouston.tx.com

► MATERIALS

Located next to Spring Independent School District's Westfield High School, the Westfield Ninth Grade Center formerly housed a middle school, but the facility has been extensively remodeled to separately host 620 freshmen, which relieves pressure on the high school that contains 2,800 students in 10th-12th grades.

Designers with DLR Group and Pfluger made creative use of metal wall panels in two profiles and finishes to create the standout entrance. The plan uses ribbed, perforated panels in a Charcoal PAC-CLAD finish to create a shade canopy above the main doorway and shade the second-floor

curtainwall. It also layers the panels over portions of the first floor's curtainwall for shading and to create a neutral backdrop for the school's signage. The sign's bright red finish is carried to corrugated panels at the building's base and roofline. The project also incorporates Charcoal corrugated PAC-CLAD panels elsewhere along the exterior.

All told, 24,000 square feet of Petersen's 7.2 panels with perforations were specified, along with 3,500 square feet of corrugated panels in Charcoal finish and 8,000 square feet of the same profile in custom Scarlett. All were fabricated from .040-gauge aluminum.

ALUMINUM WALL PANELS: Petersen, pac-clad.com

► THE RETROFIT

Ninth grade can be a challenge for students in

districts with middle school or K-8 class groupings. The move up to a high school building comes with greater academic demands and new routines of rotating through classes and adjusting to a new social environment. Educational researchers have found many students experience achievement and grade declines during this transition. Because of these challenges, a growing number of districts are opening dedicated centers for ninth graders, either as separate floors or wings within a high school or in their own buildings.

The Westfield Ninth Grade Center is an example of the advantages such facilities can offer students at this tricky age. It is one of three dedicated ninth-grade schools the district has opened in the past several years. The center's design, including a striking entryway incorporating a unique use of metal wall panels, helps students recognize right away that the Spring Independent School District sees them as someone special.

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WILLIAM R. MURCHIE SCIENCE BUILDING | Flint, Mich.

Narrow-profile frames and dual coatings color-match adjacent systems for a seamless aesthetic.

► RETROFIT TEAM

ARCHITECT: HED Design, www.hed.design
GLAZIER: Glasco Corp., www.glascoCorp.com

► MATERIALS

Keeping pace with increased STEM enrollment, the University of Michigan-Flint recently expanded the William R. Murchie Science Building. Beyond adding 70,000 new square feet to the building, the renovation focused on creating a facility with almost no visual barriers to encourage departmental collaboration and the visibility of STEM work.

To accomplish these goals, the building's open stairwell and floor design were meant to facilitate idea-sharing and to display scientific innovations taking place in real time. However, because of the

size of the combined levels, fire- and life-safety codes required a fire-rated barrier between floors to inhibit the spread of smoke and flames. To meet these codes and provide visual connection, the school and architects turned to Technical Glass Products' Fireframes Clearview System with Pilkington Pyrostop fire-rated glass, Fireframes Aluminum Series perimeter frames and full-lite Fireframes Designer Series fire-rated doors.

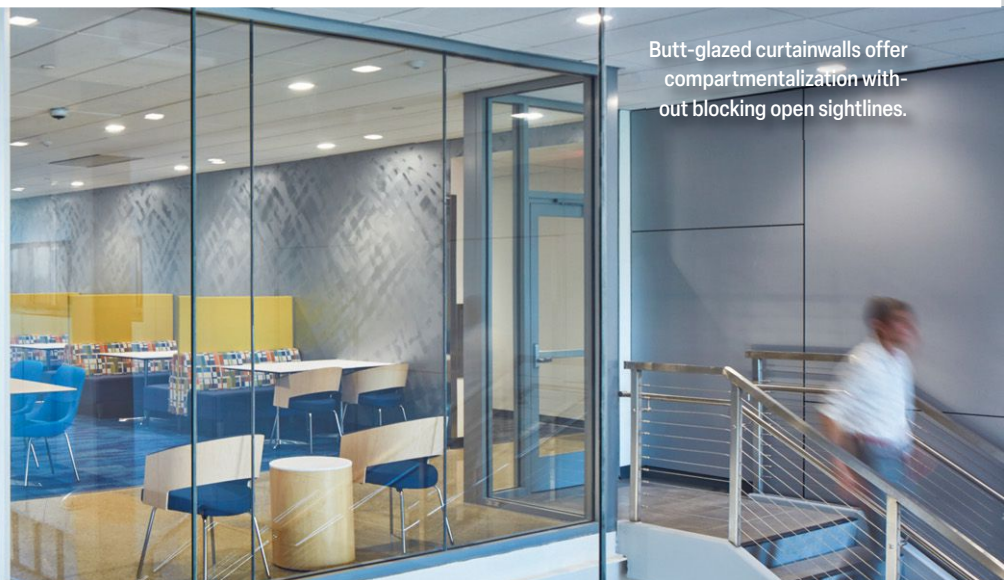
Because of the narrow perimeter frame and nearly colorless transitions between adjoining pieces of 60-minute fire-rated glass, TGP's Fireframes Clearview System with Pilkington Pyrostop fire-rated glass allows the assembly to all but disappear without compromising its level of protection. The floor-to-ceiling butt-glazed assemblies run for more than

30 feet and turn multiple corners. "With such long runs, these systems look great. They show multiple floors and provide a substantial visual connection between what the students are learning and how it can be applied," says Jeremy Raymond, Glasco's senior project manager.

Although the ability to provide a cohesive color scheme across assemblies and neighboring architectural features may seem small compared to preserving design intent and providing a fire-resistant barrier, it still is an important detail. The ability to match the handrails' color helped keep the focus on the openness created by the large lites of fire-rated glass.

FIRE-RATED GLASS AND DOORS: Technical Glass Products, www.fireglass.com

PHOTOS: TOM HARRIS PHOTOGRAPHY, COURTESY
TECHNICAL GLASS PRODUCTS



Butt-glazed curtainwalls offer compartmentalization without blocking open sightlines.

KINGSWAY COLLEGE SCHOOL | Toronto

» RETROFIT TEAM

ARCHITECT: Architecture Counsel Inc., www.architecturecounsel.com
STRUCTURAL ENGINEER: Jablonsky, Ast and Partners, astint.on.ca
MECHANICAL/ELECTRICAL ENGINEER: Crossey Engineering, www.cel.ca
CODE CONSULTANT: Arencon, www.arencon.com
ACOUSTICS: Swallow Acoustics Consultants Ltd., (613) 565-1800

» MATERIALS

The material palette is inspired by nature and informed by biophilic design principles. Harsh angles are avoided in favor of curved glass enclosing the meeting rooms while a delicate overlay of leaves appears along the bottoms of glass walls.

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

EPOXY FLOORING: Sikafloor Morritex Broadcast System from Sika Canada, can.sika.com
RUBBER FLOORING: Geniemat Fit70, Fusion Series, Ocean Blue, from Pliteq, pliteq.com
LUXURY VINYL: #2112 Natural Oak, from True North Luxury Vinyl, truenorthlvt.com
STAIR FLOORING: White Oak with Custom Color by Barwood Flooring, www.barwoodflooring.com
WALL PANELS: White Oak Veneer with Custom Color/Finish by Woodlogix Interior, www.woodlogix.com
WOOD ACOUSTICAL CEILING: Geometrik, geometrik.com
INTERIOR LIGHTING: LD4B, Neo-Ray and Metalux from Eaton, www.eaton.com; Beam 4 Series from Axis Lighting, www.axislighting.com; S ST Series from Pioneer Lighting, pioneerlighting.com; Orex from Kelvix, www.kelvix.com; Pop Core Square 44 LED from Lumenwerx, lumenwerx.com; IYO Small and Large Series from Ferro Light, www.ferrolightdesign.com; C4 Cylinder Calculite from Signify, www.signify.com; TT Top Tier from Cooper Lighting, www.cooperlighting.com; and Basik and Studio Series from Sistematlux, www.sistematlux.com

» THE RETROFIT

When representatives of Kingsway College School (KCS) decided to expand to include grades nine through 12, Architecture Counsel Inc. (ACi) was engaged to create an ambitious, phased master plan that would reflect the school's unique vision and ambition. The first phase, which accommodates grades nine and 10, was completed in September 2022; the second phase now is underway.

The school is the only independent high school in Toronto to occupy 40,000 square feet of space on two levels of an existing 66-story condominium.

Breaking with conventional school architecture, the flexible, open-ended design eschews the typical classroom arrangement and enables the learning environment to operate more like a series of flexible social and innovation spaces. Although the space was originally slated for use by a major Canadian grocery chain, through a careful configuration of spaces in tandem with a democratic approach to natural light, ACi was able to transform the space to appear purpose-built.

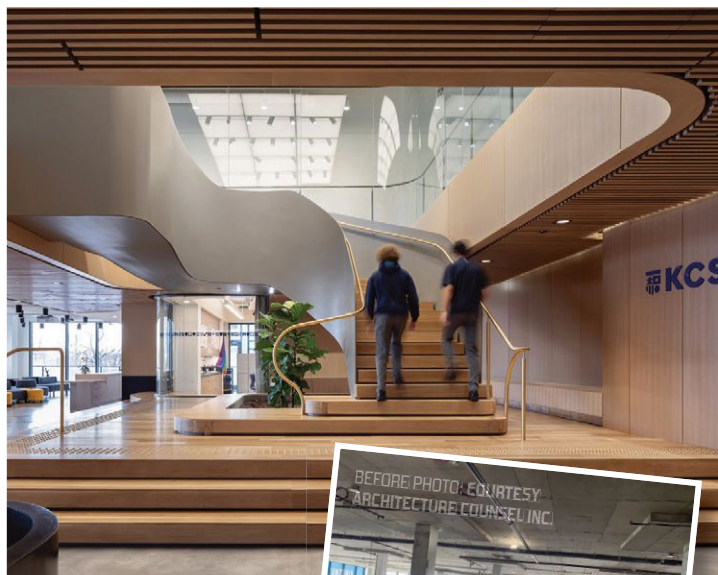
The main entrance to KCS is on the second floor of the podium. Upon entering the grand, double-height reception area, visitors are greeted by an abundance of natural light with an elegant, wood-crafted feature stair anchoring the reception area. The generous stair width organizes the space, adds drama to the entry and functions as one of the many social spaces where students can gather.

To further animate the entry space, views are provided into the Market Place (an ambiantly programmed social and event space), food kiosk, art studio, glazed meeting rooms, classrooms and breakout spaces. In addition, views of the developing cityscape and Lake Ontario are a benefit of the space.

Understanding that pedagogy continues to evolve, ACi's design solution is flexible and open-ended, enabling the school to accommodate future enrollment and inspire generations of life-long learners.



PHOTOS: SCOTT NORSWORTHY
unless otherwise noted



SIDNEY LANIER HIGH SCHOOL

San Antonio



SIDNEY LANIER HIGH SCHOOL
BUILDING 2

PHOTOS: MATTHEW NIEMANN, COURTESY LPA unless otherwise noted



BEFORE PHOTO: COURTESY LPA



» RETROFIT TEAM

ARCHITECT: LPA, lpadesignstudios.com

MECHANICAL ENGINEER: Alderson & Associates, www.alderson-inc.com

STRUCTURAL ENGINEER: Alpha Consulting Engineers, (210) 227-3647

» MATERIALS

The challenge and opportunity in the design process lay within the school's fortress-like appearance and boxy design. Heavy walls, exterior brick arches and windowless classrooms meant the school felt dark and closed off from the outside. The interior layout wasn't easy to follow, leaving many disoriented. Students were cramped in small classrooms with

few meeting spaces outside of classrooms.

But the building was structurally sound and flexible enough for a strategic redesign. To make it work, the team sliced off the roof and top section of the walls to add clerestory windows while inserting a central entry nave to create the atrium and the open entryway—adding light and energizing the interior. Shared central spaces with stadium seating and light-filled corridors replaced the dim hallways and confusing wayfinding. Filling in the brick arches with windows illuminated the ground floor and opened the facility to the surrounding streets.

The entire facility was future proofed; technology throughout the facility underwent a significant upgrade, and major systems, including the roof,

were replaced. Simultaneous enhancement to energy and HVAC systems will cut the school's energy bill by 60 percent.

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

FLOORING: Tarkett, www.tarkettna.com

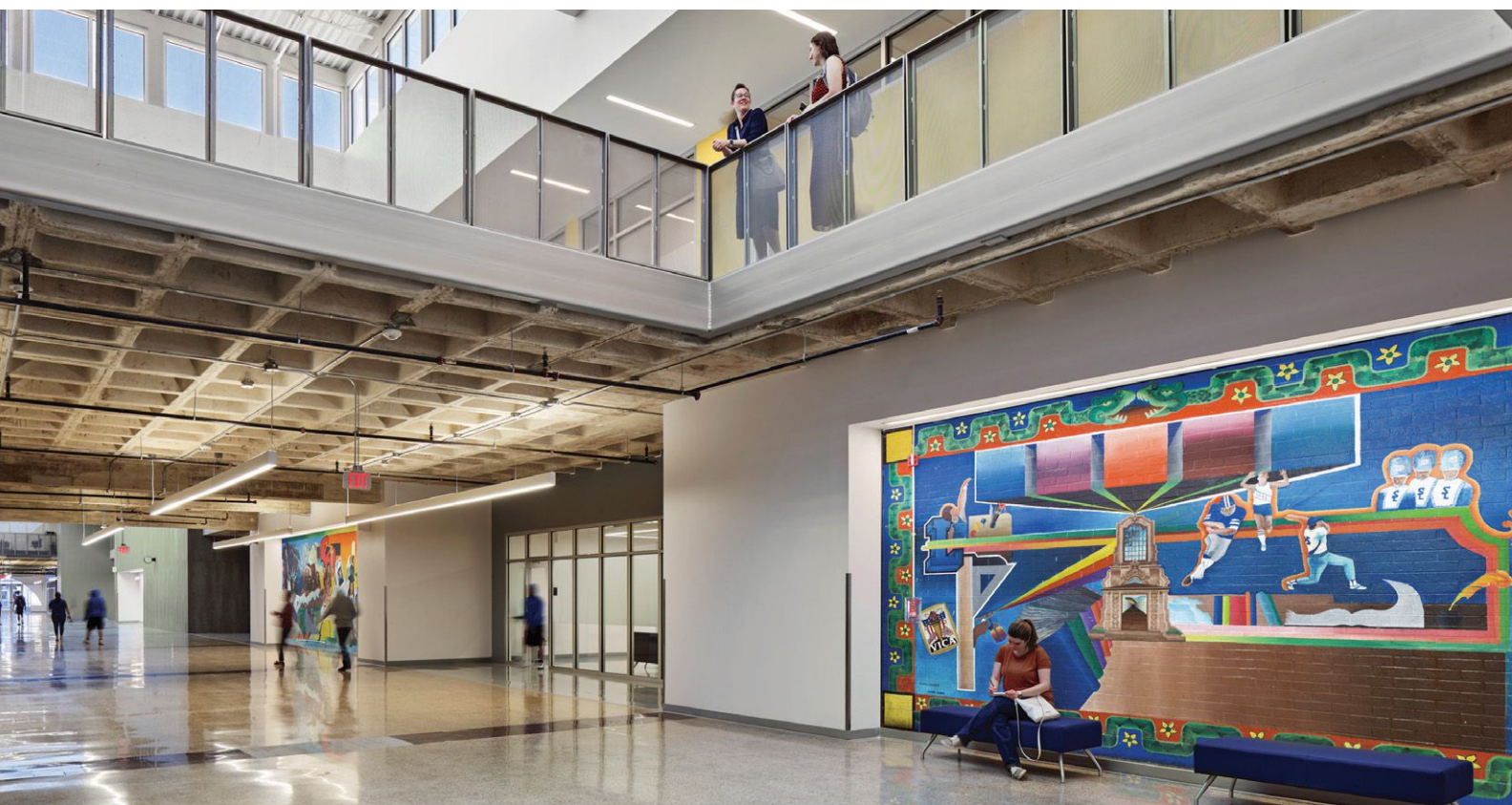
TILE FLOORING ON STAIRS: Cotto D'Este, www.cottodeste.us

CARPET: Shaw Contract, www.shawcontract.com

CEILINGS: Armstrong World Industries, www.armstrongceilings.com, and USG, www.usg.com

MARKERBOARDS: Polyvision from Steelcase, www.steelcase.com/brands/partners/polyvision

LIGHTING: Metalux from Cooper Lighting Solutions,



www.cooperlighting.com; ETC, www.etcconnect.com; Birchwood, www.birchwoodlighting.com; and Eaton, www.eaton.com;
LAMINATE PANELS: PSI Panels, panelspec.com, with Wilsonart, www.wilsonart.com
MURALS: Acrovyn from Construction Specialties, www.c-sgroup.com/acrovyn-wall-protection

► THE RETROFIT

Opened in 1915, Sidney Lanier High School is a community fixture in the cultural heart of San Antonio's historic West Side with a significant number of fourth- and even fifth-generation students attending the school. Mural culture in San Antonio started at and around the school and, over decades,

much of the interior was painted with imagery that reflected the traditions and artistic talent of the community.

LPA's team, which included a former Sidney Lanier High School valedictorian, began to work with San Antonio Independent School District to plan the school's future. Preserving the rich cultural history was an important part of the discussion. LPA surveyed artists and teachers, seeking the best way to celebrate the significant artwork. The final redesign re-created 10 key works and created a digital mural museum in the new building, preserving the art and its heritage to share with future generations of students. Spaces throughout the school have been reserved for current students to add their own

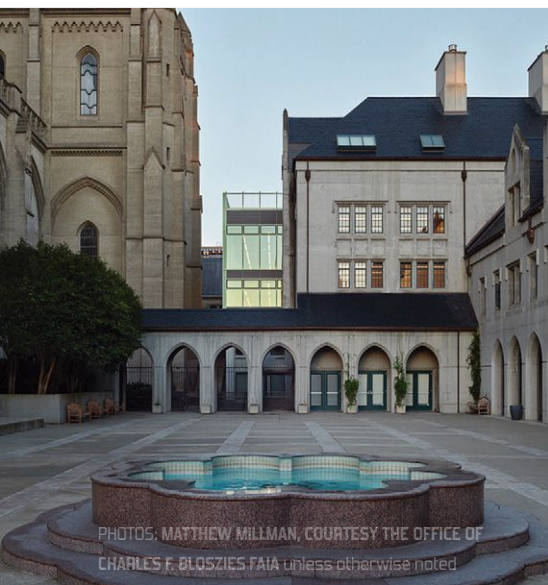
contributions to this tradition.

As a space and school, the new Sidney Lanier High School is more flexible. The purity of the boxy building was turned into an advantage, making it easier to create a system of rooms that could be shifted and combined to fit evolving needs and new classes. More adjustable spaces for collaboration and socialization make layouts and classrooms more fluid, opening up the school, engaging different learning styles and allowing for different curriculums.

LPA's renovation was recognized by AIA San Antonio for its excellence in historic preservation and community impact and received the chapter's Committee on the Environment award for its exemplary use of the existing structure and high-performance design.

CATHEDRAL SCHOOL FOR BOYS |

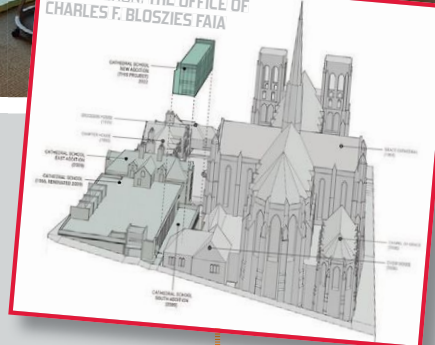
San Francisco



PHOTOS: MATTHEW MILLMAN, COURTESY THE OFFICE OF CHARLES F. BLOSZIES FAIA unless otherwise noted



ILLUSTRATION: THE OFFICE OF CHARLES F. BLOSZIES FAIA



►► RETROFIT TEAM

ARCHITECT: The Office of Charles F. Boszies FAIA, www.archengine.com
 GENERAL CONTRACTOR: Truebeck Construction, www.truebeck.com
 STRUCTURAL STEEL FRAME, CUSTOM FENCE CONTRACTOR: Westco Iron Works, www.westcoironworks.com
 UNITIZED ALUMINUM CURTAINWALL, FRAMELESS GLASS DOORS CONTRACTOR: RankerAMG, rankeramg.com

►► MATERIALS

The multidisciplinary team at The Office of Charles F. Boszies FAIA conceived the 4,000-square-foot, 2-story addition with a glass and aluminum curtainwall, light in appearance and weight with its pale green color recalling the nearby verdigris building elements. The team avoided traditional gray or black mullions, which would have presented a dark form when viewed from the cathedral courtyard. From the inside, the addition captures views not seen before of the cathedral and the city beyond.

The unusual choice of a curtainwall system for the exterior reflected the exigencies of the project schedule: It was erected in just over a week, during the pandemic.

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

CLEAR INSULATED LOW-E GLASS: Solarban 70 Glass from Vitro Architectural Glass, www.vitroglazings.com
 PVC MEMBRANE ROOF: Sika, usa.sika.com

ROOF COATING: GacoFlex E5320 from Gaco, gaco.com
 CARPET: Urban Retreat from Interface, www.interface.com
 WOOD CEILING SYSTEM: WOODWORKS Grille from Armstrong World Industries, www.armstrongceilings.com
 ACOUSTICAL METAL FLOOR AND ROOF: 3Wx HF-36 Hi Form from ASC Steel Deck, ascsd.com
 PAINT: Super White from Benjamin Moore, www.benjaminmoore.com
 AUTOMATIC WINDOW SHADES: Thermoveil from Mecho, www.mechoshade.com
 ROOM-DIVIDING WALL: SL70 from NanaWall, www.nanawall.com
 LINEAR PENDANTS: Stream Oval from Prudential Lighting, www.prulite.com/product/stream-oval
 LED Lighting: Aion LED, aionled.com
 FIRE-RETRACTABLE OPENING: Won-Door, www.wondoor.com
 WOOD-GRAIN LAMINATE CABINETS: Formica, www.formica.com
 CUSTOM LIVING WALL: Habitat Horticulture, habitathorticulture.com
 COUNTERTOPS: Caesarstone, www.caesarstoneus.com

►► THE RETROFIT

An independent elementary school for boys in kindergarten through eighth grade, the Cathedral School for Boys is part of Grace Cathedral Close, which encompasses an entire city block atop

Nob Hill with several venerated and beloved historic landmarks. The steel-framed cathedral, encased in concrete, was completed in 1964 and sits amid ancillary buildings that are historic

in appearance though constructed during the 20th century. The Cathedral School for Boys is perched at the upper-most corner of the site, adjacent to the cathedral's apse end, presenting a concrete structure built in the 1960s that takes cues from Le Corbusier's Chappelle Notre Dame du Haut in Ronchamp, France.

Given the block was already jam-packed with buildings, Boszies and his design team worked from a master plan that identified a sliver of space between the cathedral and the school, where an outdoor terrace structure with classrooms below had been added in 2009. The site afforded a structurally robust platform, the terrace itself, on which to erect an addition without requiring new foundation work or extensive seismic strengthening of the original building.

Although the new addition site flanked the existing school's footprint, its design elevated it as a new focal point by renovating existing classrooms on two levels and adding a wide hall connecting the main entrance lobby and addition. The resulting view into the addition from the entrance lobby, with a glimpse beyond to the cathedral wall and its stained-glass windows, essentially creates a new heart for the school.

MICHELLE OBAMA STEM ELEMENTARY ACADEMY | Hampton, Ga.

» RETROFIT TEAM

ARCHITECT: J.W. Robinson & Associates, www.jwrobinson.com
METAL PANEL INSTALLER: ABUCK, www.abuck.com
METAL PANEL DEALER: Architectural MetalReps LLC, www.metalreps.com

» MATERIALS

Designers knew they needed an external cladding that would give the existing structure a modern, forward-looking appearance. They also sought something that would drive energy efficiency and keep students, staff and faculty comfortable in the hot Georgia climate.

At 170,000 square feet, Michelle Obama STEM Elementary Academy, or MOSEA, features approximately 75 classrooms, several technology and STEM labs, an engineering lab, outdoor classroom spaces and a solar panel array for educational purposes. The school consists of multiple wings, and designers envisioned a custom color scheme for the exterior cladding to give the building a signature look. The chosen material for the façade also needed to be engineered in such a way that it would stand the test of time.

Crews installed CF Light Mesa in Regal Blue and Igloo White for the façade. Light Mesa is a light-profile insulated metal panel designed for use in applications where energy efficiency is paramount.

INSULATED METAL PANELS: Metl-Span, metlspan.com/products/wall/insulated-metal-panels/light-mesa

» THE RETROFIT

When the Atlanta area's Clayton County Public Schools undertook renovations to what was the Eddie J. White Academy, representatives sought to open a new chapter for elementary-school education in the district, one that stretched beyond reading, writing and arithmetic. To honor that commitment, they named the facility after a former First Lady who has embraced education as one of her cornerstone initiatives.

MOSEA is home to more than 1,000 students, pre-kindergarten to fifth grade. Its mission is to not only have students excel in core academic areas, but also in art, music, computer science, physical education and STEM exploration.

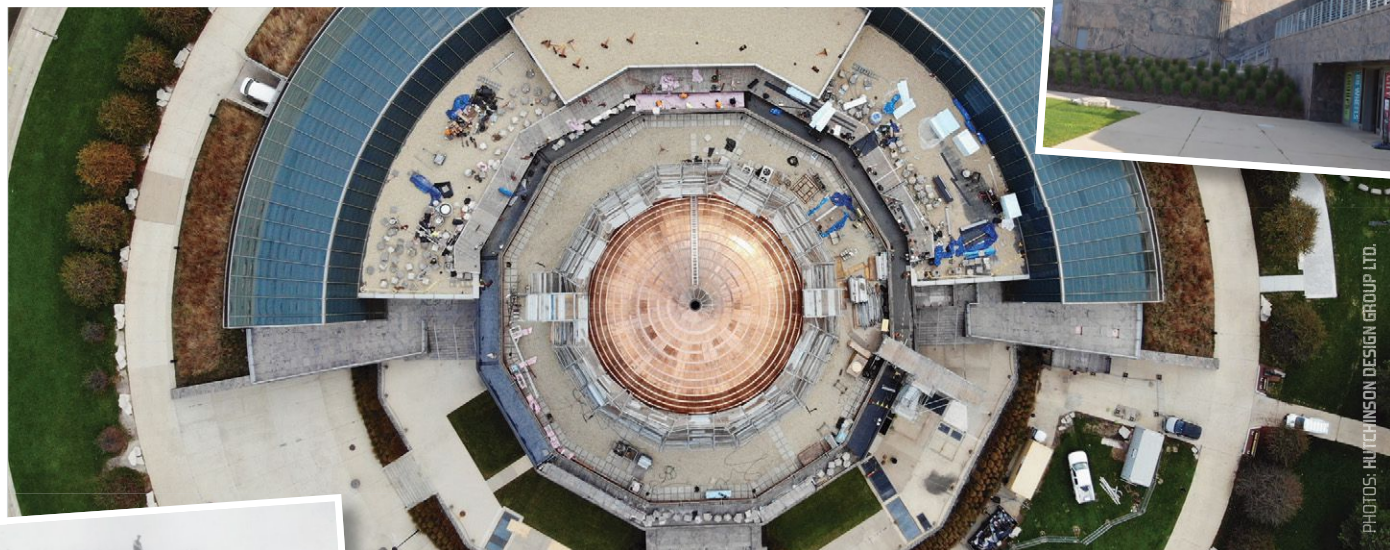
Michelle Obama STEM Elementary Academy opened its doors to students at the start of the 2020-21 school year.



PHOTOS: METL-SPAN



ADLER PLANETARIUM DOME | Chicago



PHOTOS: HUTCHINSON DESIGN GROUP LTD.



» RETROFIT TEAM

ROOF DESIGNER: Hutchinson Design Group Ltd., hutchinsondesigngroup.com
ARCHITECT: Wight & Company, www.wightco.com
SHEET-METAL CONTRACTOR: A-1 Roofing Co., www.a1roofing.com

» MATERIALS

After 70 years, the planetarium's dome reached the end of its service life. Moisture intrusion was apparent near weak points in the design, such as the base of the dome, internal gutters and drains. To maintain the historical accuracy of the structure, the design team restored the dome using copper, one of the most durable, long-lasting roofing materials.

The renovated copper-clad dome is composed of an internal gutter and base copper, 18 rows of shop-fabricated copper panels, topped by a

dome cap. Each of the lower dome panel locks are covered with a decorative horizontal rib, giving the dome an aesthetic visual lightness.

"The new copper dome on Chicago's museum campus will be an architectural landmark from land and the lake for the next century," says Tom Hutchinson, AIA, Fellow-IIBEC, RRC, CSI, principal of Hutchinson Design Group Ltd.

COPPER: Revere Copper, reverecopper.com

» THE RETROFIT

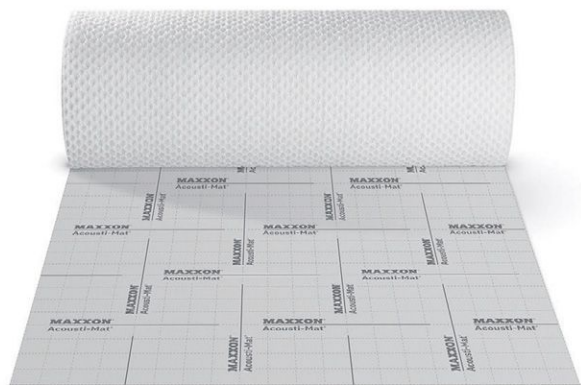
Adler Planetarium, located on Northerly Island on Lake Michigan in the Chicago Museum District, was the first planetarium in the Western Hemisphere and is a national historic landmark.

The dome restoration project was awarded the 2022 North American Copper in Architecture Award from the Copper Development Association.



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SPECIAL NEEDS

WRITTEN BY | CLIFF STENDEL, B.Arch, OAO, OAA, MRAIC, NCARB

Lighting Is a Key Component in Creating a Safe, Engaging Environment for a Renovated School



➤ **THE SCHOOL'S FRONT ENTRY** is designed to support students' disabilities, as well as be a playful, fun, welcoming environment. Axis Lighting's curved Sketch Luminaires mimic the curved accessibility ramp while supporting these design goals. Pixel Recessed Downlights with MikroLite Optics also are installed above the curved ramp, as well as on the first floor over the lockers.

Helping students achieve success and reduce disruptive behavior is critical for schools. Buildings' designs, particularly for those focused exclusively on serving special-needs students, must consider sensory challenges and environmental impacts on behavior and learning. Ensuring structures and public spaces can be accessed by all has become increasingly sophisticated. Understanding students' unique cognitive and physical disabilities when designing these schools, whether for new construction or renovation, increases students' achievements and engagement.

Yaldei Development Center

To help their profoundly developmentally delayed children, Menachem and Devorah Leifer founded the Donald Berman Yaldei Developmental Center in 1998 in Boisbriand, Quebec, Canada. The center started out in their modest home with only three children and three staff members. Thanks to intensive early-intervention treatment, the children began to make miraculous progress. Word of mouth about the school's unique approach led to phenomenal growth and expansions over the years into numerous facilities, each larger than the previous.

In 2016, the school purchased a 1960s-era building for what at that time was a student body of 370. The 3-story building in Montreal would allow the kids to be in one facility all day for therapy and school. The therapy rooms would be located on the second floor—the Yaldei Therapy & Early Intervention Center—and classrooms and administrative offices—the Yaldei School—would be on the first floor. Additional classrooms would be on the third floor. However, extensive renovations were needed to accommodate the students' special needs and, in 2017, after a broad search and numerous presentations by architecture firms, the school's executive board retained Stendel + Reich Architecture Inc.

The Design

The design goal for the entire facility was to create a space that would reduce children's anxiety and make learning fun. To achieve this, the students' different disabilities were studied extensively even before developing plans to present. The team used previous experience designing Alzheimer's facilities, which was helpful in this process. For example, when

Alzheimer's patients get to the end of a corridor they still want to walk straight and don't realize they must turn. This also holds true for many Yaldei students. Understanding this concept led to the creation of oval corridors where, if students turn the wrong way, they just follow it around to where they started.

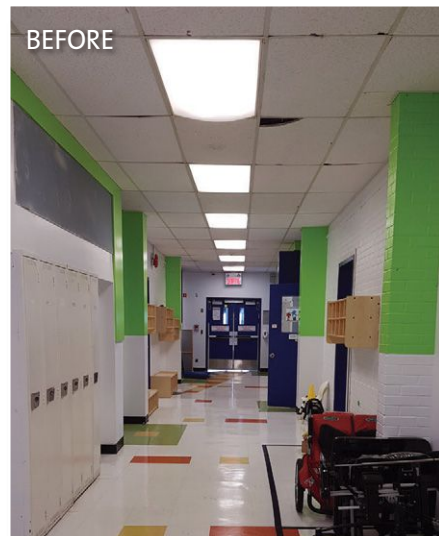
Using color that correlates to each room is another key part of the design to help students. Although many can't read, they are able to identify colors. For instance, blue floor tile corresponds with the blue classroom door that is also carried through with blue acoustic ceiling panels.


Observing students in the therapy rooms led to the realization that students can be easily distracted by things outside. To address this, these rooms no longer have direct windows to the outside. The rooms have a glass wall facing the corridor and on the other side of the corridor are windows letting in natural light. Because the children can't see directly outside, they are less prone to distractions by airplanes, clouds or rain, for example.

Challenges and Solutions

Because the school serves students with many different special needs and developmental issues, the design had to address these simultaneously but without conflicting between each. For example, the design had to work for children with very different sensory processing disorders.

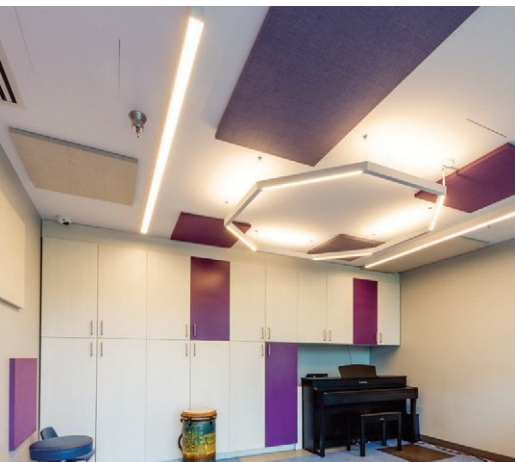
The renovation's lighting prevents those who are too sensitive to bright lights from being adversely affected and distracted by them while providing enough illumination for children who need more light. Additionally, for some children on the spectrum, lighting can be a source of distraction and cause severe anxiety. Luminaires had to



 **AXIS LIGHTING's** Sculpt rectangular pendant luminaires, around the acoustic panels and recessed in the tiles, add interest to the hallway ceilings.



SCULPT SURFACE LUMINAIRES FROM AXIS LIGHTING are installed in geometric shapes in the art room for a streamlined look while providing visual comfort without performance trade-offs.



AXIS LIGHTING'S HEXAGON-SHAPED STENCIL PENDANT LUMINAIRES are installed in the music room to deliver wide 3D distribution, layers of light and visual interest. Sculpt Surface luminaires also provide a streamlined look.

be specified that didn't have significant intensity or glare but still provide the necessary illumination.

A wide range of lighting products complement the unique design and accommodate the complex ceiling plan. Working closely with the lighting manufacturer, 152 total donated lights were selected for Phase 1 and Phase 2 of the project. These include recessed downlights installed over each classroom door that deliver visual comfort and color mixing with their optical system. The project also includes an innovative linear ambient LED lighting tool with a two-sided lens that produces people-friendly vertical illumination, sending more light to the eye and improving facial recognition. Additionally, a semi-circular-shaped luminaire mimics the curve of the circular entrance ramp, delivering comfortable and efficient illumination.

Typical 2 by 4 fluorescent or LEDs were specifically not selected for use in the classrooms. Instead, skinny strips in various designs were installed to ensure that a child with a sensory processing disorder

who might be bothered by light would find these fun. They also appear less institutional.

Results

Focusing on the design objectives, the luminaires helped create a good balance of not over- or under-lighting the rooms. The lighting also played an important role in helping keep the facility's atmosphere fun for the students.

Therapists have commented on the advantages the RGB lights that are installed in some rooms provide in aiding children's therapy. For example, if kids are getting distracted during therapy, the color of the lights can be changed to redirect the students.

The design's consistent use of details, colors and themes helps reduce children's anxiety and agitation, which can lead to aggression. Adhering to this same principle, the lighting's shapes and angles are the same throughout the building, providing familiarity and comfort to the children.

Along with the unique architectural

RETROFIT TEAM

ARCHITECT AND INTERIOR

DESIGNER // Stendel + Reich Architecture Inc., www.stendelreich.com/en

STRUCTURAL ENGINEER // SBSA, now Charles Taylor, www.charlestaylor.com

MECHANICAL ENGINEER // BPA, bpa.ca/en

ELECTRICAL ENGINEER // Consultants Orval, (514) 486-2560

FIRE-PROTECTION ENGINEER // Civelec Consultants Inc., www.civelec.com

GENERAL CONTRACTOR, PHASE 1 // Clobracon, www.clobracon.com

GENERAL CONTRACTOR, PHASE 2 // Propers Construction, www.propers.ca

MATERIALS

LINOLEUM FLOORS // Forbo, www.forbo.com

PORCELAIN TILE, FLOORS AND WALLS IN RESTROOMS // Olympia Tile + Stone, www.olympiatile.com

PORCELAIN TILE, MAIN ENTRANCE // Centura, www.centura.ca/en

FELT CEILING BAFFLE, SECOND FLOOR // FilzFelt, www.filzfelt.com

ACOUSTIC CEILING PANELS // Decoustics, decoustics.com

CEILING TILES // Certainteed, www.certainteed.com/ceilings-and-walls

PLEXIGLAS // Mtl Display Inc., www.mtldisplay.com


INTERIOR GLASS WALLS // LDMA, ldma.ca/en

COLOR FILM IN GLASS // Solyx, www.solyxfilms.com

PAINT // Benjamin Moore, www.benjaminmoore.com
LAMINATE, WALLS AND MILLWORK FURNITURE // Formica, www.formica.com
LIGHTING // Axis Lighting, www.axislighting.com

- Pixel Recessed Downlights with Mikrolite Optics
- Sculpt Pendant
- Sketch Luminaire
- Sculpt Recessed Luminaires
- Sculpt Surface Luminaires
- Aura 2 x 2
- Hexagon-shaped Stencil Pendant Luminaires
- Cove Perfekt

and interior design, the lights enhance the spaces and create a nurturing, playful environment for the students.

The third and final phase of the school's construction, which completed the third-floor classrooms, was concluded in fall 2022. For continuity and to support the students' needs, the design for these classrooms is the same as the other two floors and includes 63 donated luminaires. 

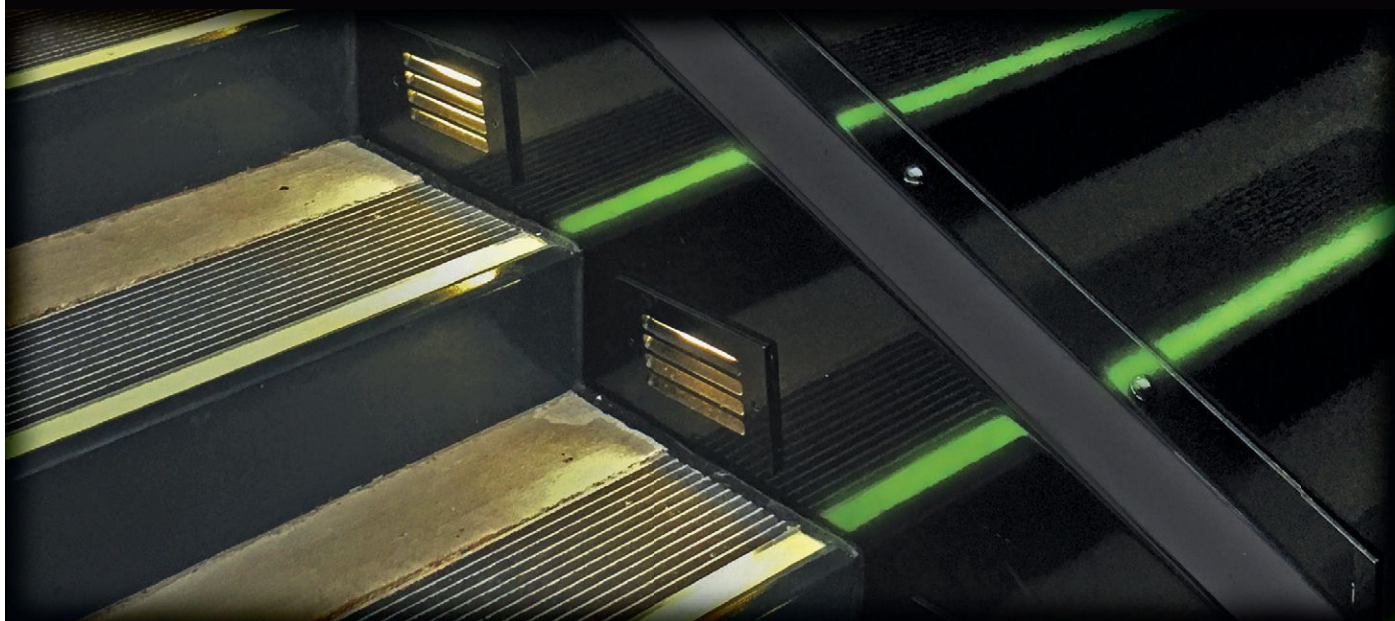
A LIGHTING DONATION

AXIS LIGHTING has had a relationship with the Donald Berman Yaldei Developmental Center for many years. When company representatives learned about the necessary renovations for the school's latest building, they immediately offered luminaires. Two-hundred-fifteen lights were donated during two phases of construction.

Axis Lighting's commitment to contributing to the community aligns with the school's mission of "helping to transform the lives of the people who need us the most, facilitating the process of discovering and revealing the greatest untapped potential of each child with disabilities."

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CROWN JEWEL

The Historic Laylight at Constitution Hall Is Restored During a Comprehensive Restoration

PHOTOS: RON BLUNT PHOTOGRAPHY unless otherwise noted

WRITTEN BY | KATIE IRWIN, AIA, IIDA, LEED AP BD+C

For nearly a century, Constitution Hall has served as a premier venue for concerts and cultural events in Washington, D.C. As part of the historic headquarters of the National Society of the Daughters of the American Revolution (DAR), the building is set prominently within the block along the Ellipse, just south of the White House. The building opened in 1929 and was designed in the Neoclassical style by acclaimed architect John Russell Pope. Constitution Hall was named a National Historic Landmark in 1985.

Designed to host DAR's annual Continental Congress, Constitution Hall seats 3,704 patrons in an elegant auditorium that features a U-shaped tier and 52 boxes that rim the orchestra-level seating and separate it from the tiered seating above. The space is highlighted by a grand laylight within the coved ceiling; scenic murals; and decorative plasterwork throughout, including ornamental medallions, rosettes, scrolls, flutes and dentils. A series of iconic state seals, introduced by Pope in his original design, are also displayed prominently

during DAR's annual meetings.

A comprehensive restoration and rehabilitation of Constitution Hall was recently completed as the "grand finale" in an ambitious, three-phase modernization of DAR's entire headquarters complex. A painstaking process to replicate

conservation experts and the contractor to realize DAR's vision of enhancing the hall's functionality while preserving the building's historic integrity.

The Historic Laylight

Restoring Constitution Hall's central laylight, among the building's most dramatic features, required an entirely new strategy. The laylight consisted of 972 panels that originally aligned with the ceiling beneath a skylight and were designed to filter sunlight and starlight into the interior. The skylight is believed to have been blacked out during World War II, however, and subsequent changes through the decades resulted in the dramatic laylight being permanently concealed. More recently, a solar panel array was installed on the roof that eliminated any possibility of restoring the laylight's glass panels to their original function of allowing natural light to enter the hall. Despite these obstacles, DAR sought to restore the laylight as an architectural highlight within the hall. "The more we challenged our architects to bring us a solution, the more they became excited

(continues on page 46)



A HISTORIC PHOTOGRAPH from the 1930s shows the original John Russell Pope design.

the original laylight and the introduction of a new rigging infrastructure for staging were among the key challenges of the project.

The Quinn Evans design team worked closely with DAR leadership, the hall's operations staff, specialty consultants,



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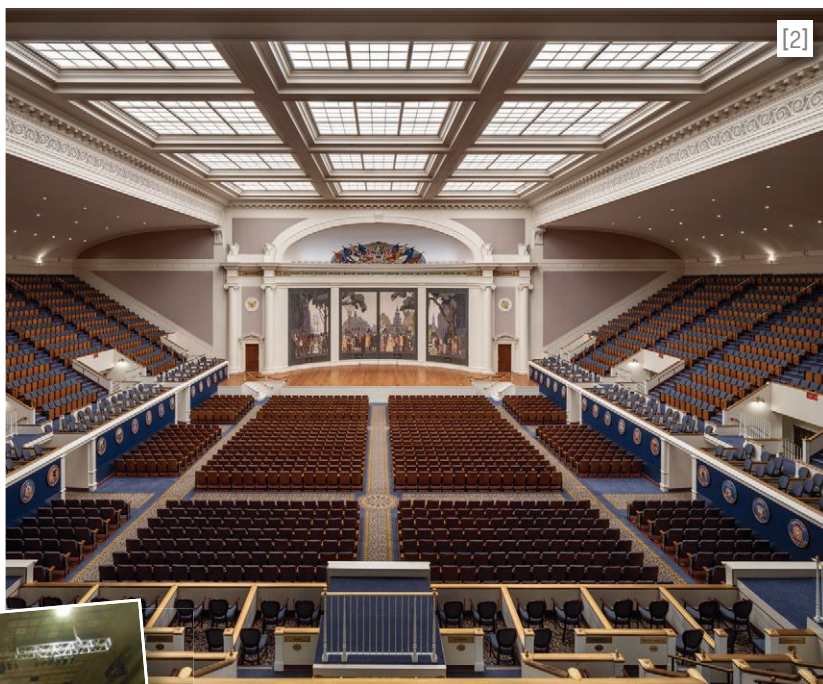
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[1]



[2]



[1] **THE RESTORED LAYLIGHT** features 972 customized dual-mode (daylight and starlight) LED panels. Each light fixture can be removed to provide an access point for rigging lighting trusses, speakers and more. [2] **A FLEXIBLE SEATING SCHEME** in the renewed auditorium now allows for sections of the orchestra seating to be removed for wheelchair access or staging requirements. [3] **THE RESTORED AUDITORIUM** has reopened for DAR meetings and major touring events. The ceiling was repainted in the original cream shades that were identified in a historical paint analysis, accentuating the drama of the laylight.

RETROFIT TEAM

OWNER // National Society of the Daughters of the American Revolution, www.dar.org

ARCHITECT // Quinn Evans, www.quinnevans.com

CONSTRUCTION MANAGER // The Christman Company, www.christmanco.com

HISTORIC FINISH AND PAINT ANALYSIS // Artifex Ltd., matthewjmosca.com

STRUCTURAL ENGINEER // 1200 Architectural Engineers, www.1200ae.com

THEATRICAL DESIGN CONSULTANT // Schuler Shook Inc., www.schulershook.com

MEP ENGINEER // Loring Consulting Engineers Inc., www.loringengineers.com

ACOUSTICS // Jaffe Holden Acoustics, www.jaffeholden.com

by the opportunity to make our performance venue unique,” stated DAR President General Denise Doring VanBuren in the organization’s *American Spirit* magazine. “I didn’t want to settle for good enough when it comes to the restoration of the hall. That laylight is the crowning jewel of the entire place. I want it to be remarkable. I want it to be astounding.”

The architectural team worked closely with lighting specialists to create a new series of layered LED panels within the intricate laylight framework still in place. One layer of panels mimics the sun’s daylight rays and the other creates the impression of a nighttime sky with LED points that are programmed to twinkle. The panels can be fully on, as well as provide levels of dimness. For a more nuanced effect, dawn and twilight effects can be achieved with the stars turned on.

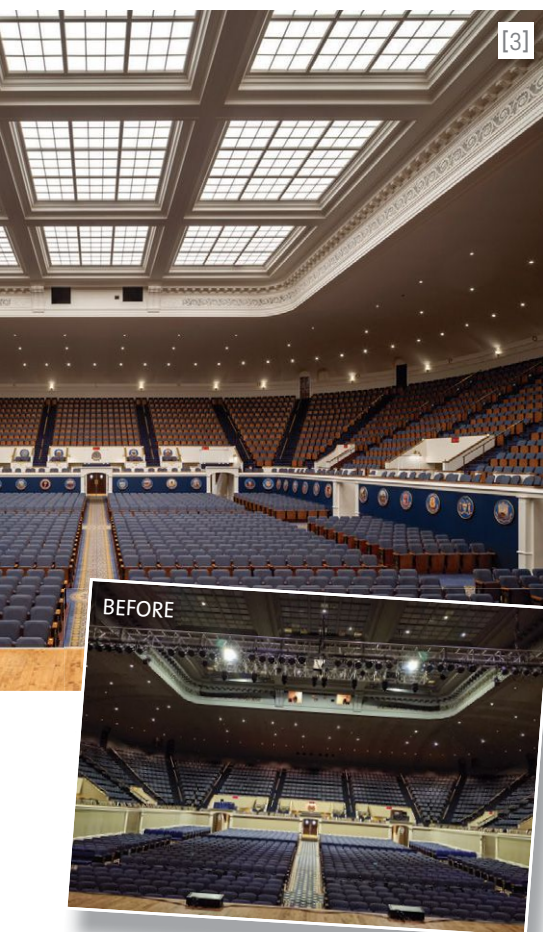
The team was challenged to make the stars crisp and bright and not diffused soft patches of light, so theatrical design consultant Schuler Shook Inc. contacted manufacturers, seeking a custom diffused light panel that combined point sources. Mockups were created until the team was satisfied with

the panel. The final design features 1/8- to 1/4-inch holes drilled into the acrylic diffuser to create the stars, which are located directly behind the panel’s surface.


Enhanced Functionality

In addition to hosting the annual meeting for DAR’s members, Constitution Hall is the location of numerous graduations every year, as well as events ranging from musical performances and comedy shows to tapings of television programs. The hall’s adaptable auditorium can now transform to accommodate a variety of performances. The stage and platforms are extended over the orchestra seating multiple times throughout the year. Dedicated removable seating allows for the installation of stage platforms that do not undermine or cause undue wear on the seats.

The design also provides possibilities for rigging through the 972 LED light panels in the laylight. These panels are utilized safely from a new access floor, above which steel beams for rigging are placed at regular intervals. The new guardrails at the technical bridges within the hall also enhance safety



and are removable, depending on the performance.

The elegant and thoughtful design solutions fully achieved the goal of creating a safer, more flexible and accessible venue for a wide variety of performances. Most importantly, Constitution Hall has reclaimed its architectural grandeur and will continue to serve DAR members and patrons for new generations. 

MATERIALS

LAYLIGHT PANELS // Folio, www.folio.it/en

LIGHTING // USAI Lighting, www.usai-lighting.com; Lucifer Lighting Co., www.luciferlighting.com; Rejuvenation, www.rejuvenation.com; Bartco, www.bartco-lighting.com; Luminii, www.luminii.com; Lithonia Lighting, lithonia.acuitybrands.com; Mark Architectural Lighting, marklighting.acuitybrands.com; Hudson Valley Lighting Group, www.hvlgroup.com; and Robert Abbey Fine Lighting, robertabbey.lightingnewyork.com



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LIGHT on WASTE

A Team of Lighting Designers Seeks to
Improve the Environmental Impacts of
LED Lighting

PHOTOS: LAUREN WILCOX

Circularity, carbon neutrality, and human-centered design are moving from the periphery of priorities to the forefront of the design process and policy.

The lighting industry has made gains with the advent of LED lighting, but as the research shows, there is still work to do. This is exactly what lighting firm, LUMA, and its designers Christine Cornelius, Colin Johnstone, Lauren Wilcox and Sara Duffy evaluated at the onset of 2021.

LUMA's internal Research and Development team cares about the impact of the firm's daily actions, from the products the lighting designers are specifying to what is purchased and brought into their homes. "As designers, we want the industry we support to reflect both our individual missions and the missions of LUMA and our parent company, PAE Engineers. As we looked at the carbon impacts of lighting manufacturing, a seed was planted: How can our collective decisions create a positive impact on our planet?" Duffy shares.

With funding from an internal company grant, the team's ambitious intent was to develop a light fixture that was fully biodegradable. "I wouldn't say our goal was unreachable, but we quickly realized we were hyper-fixating on a band-aid solution instead of addressing the deeper issue," Cornelius says. The team's preliminary research illuminated the bold fact that true industry change needs to consider more than just fixture materiality.

The cleverly titled "Light on Waste" team began surveying manufacturers to gain a better understanding of the current state of the industry. The concurrent research focused on the key setbacks to sustainable lighting development: policy exclusions, minimal sustainable building standards, financial impacts, lack of life-cycle transparency and industry acceptance of construction waste.

"We wanted to better understand what

standards and policies currently existed in our industry," Johnstone notes. "We started evaluating LEED, WELL, Declare, Living Building Challenge, and Cradle to Cradle, seeing where they overlapped and where gaps lie." In all these certifications, lighting was often exempt because of complex manufacturing and electronic components.



➤ The Light on Waste Team is **DECONSTRUCTING AND EVALUATING FIXTURE COMPONENTS** with the goal of developing a light fixture that is fully biodegradable.

"The materials that make up a typical luminaire are extracted from all corners of the planet with expansive supply chains that often travel thousands of miles from their origin. The supply chain adds an extra level of emissions with materials transported via automobiles, trucks, aviation, marine and railways throughout the globe," Cornelius explains. "Key challenges to designers and manufacturers include a lack of viable alternative materials, high-cost impacts of sustainable sourcing and minimal transparency throughout the supply chain."

As an example, a key material in luminaire manufacturing is aluminum. It is often used for the luminaires' housing frame, reflector, LED heat sink, hardware and more. On a typical linear fixture with an extruded aluminum housing, aluminum makes up 54 percent of the fixture weight. It is a preferred material because of its light weight, thermal conductivity, reflectance and efficient fabrication processes. Sadly, manufacturing, smelting and refinement are harmful to the

environment. It is an extremely energy-intensive process and emits significant quantities of CO₂ and perfluorocarbon gases. As a result, the aluminum industry alone is responsible for around 1 percent of global greenhouse-gas emissions. Each ton of aluminum recycled avoids 9 tons of CO₂ equivalent emissions.

A primary component of aluminum processing is bauxite, an aluminum-rich ore that covers 8 percent of the Earth's surface. Bauxite mining results in negative environmental and social consequences, such as the contamination of water and local ecosystems, the destruction of land and the displacement of local communities.

Although the environmental impacts of the previously listed components are significant, there are sustainable options and alternate approaches for all the housing components of a fixture. "We're aiming to push the industry in the direction of using 100 percent recycled aluminum, carbon-neutral steel, and recycled or biodegradable lenses," Cornelius stresses.

Similarly, LED production requires a combination of gallium, arsenic, indium, phosphorus, aluminum, copper, lead, zinc, rare-earth elements and more. These materials are chemically combined to create unique compounds that can be used to refine the color temperature, wavelength, performance and quality of an LED light source. For example, aluminum can be added to the gallium-arsenic-compound gas to create a red-light output, and indium can be added to increase lifespan, lumen output and efficiency.

As technology develops, the chemical makeup of LEDs and other electronics change, further complicating documentation and supply of the material makeup of a light source. Because of a lack of available information, manufacturers are not required to document the life cycle of their lighting components to meet most sustainability program requirements. Currently, there are no clear market alternatives to LEDs and their required electronic or material components. To create a low-waste, circular approach to lighting production, a policy-centered framework needs to be developed to encourage healthy, transparent

◀ **LIGHT ON WASTE RESEARCH TEAM**, including (from left to right) Christine Cornelius, Colin Johnstone and Lauren Wilcox. Sara Duffy is not pictured.



➤ **NATURAL, FLAME-RETARDANT AND CHEMICAL-FREE** mycelium packaging is almost identical in form, function and cost to plastic with the added ability to decompose.

production and holistic recycling and reuse processes.

With all that said, a sustainable lighting industry cannot focus exclusively on the fixture. It transcends beyond, taking into consideration each segment of a product's life. The Light on Waste team viewed shipping and packaging as an extension of a fixture and considered materiality, transportation efficiency and emissions for a holistic view. "Currently, there are no universal sustainable shipping standards; shipping companies and ports approach the issue of environmentally friendly shipping in different ways. This variation in outlook can be an issue for retailers who are looking to streamline their processes in a monetarily conscious way," Johnstone says. As consumer understanding grows, the shipping industry is no longer able to justify excessive packaging for the sake of speed and profit.

Unlike electronic components, current standard shipping materials, like plastic and polystyrene, have comparable eco-friendly alternatives. Packing peanuts and air pillows have substitutes that utilize cornstarch from agricultural waste. Cardboard boxes are being revitalized to avoid environmentally harmful inks and adhesives while being

simultaneously sourced from certified and sustainably managed forests. Mushroom packaging, a non-petroleum-based filler, and biomaterial take biodegradable materiality a step further. Studies show that mycelium-based packaging is almost identical in form, function and cost to plastic with the added ability to decompose. Similarly, seaweed-based products, such as kelp bioplastics, have the added feature of absorbing CO₂. It is essential to identify areas in the supply chain where harmful products can be reduced, reused or eliminated. Unfortunately, the gap lies in demand; most surveyed manufacturers are skeptical about alternative shipping materials and services.

Light on Waste originated with the idea that as stewards of the planet, it is our responsibility to create a better future for all. The enlightened goal is to create a more sustainable day-to-day design process while pushing for policy upgrades and holistic industry change. "Our goal is to educate ourselves and to connect with designers, manufacturers and creative thinkers worldwide," Duffy says. "As consumers we have a choice: choose with longevity in mind, have conversations about waste reduction and support our Earth." 

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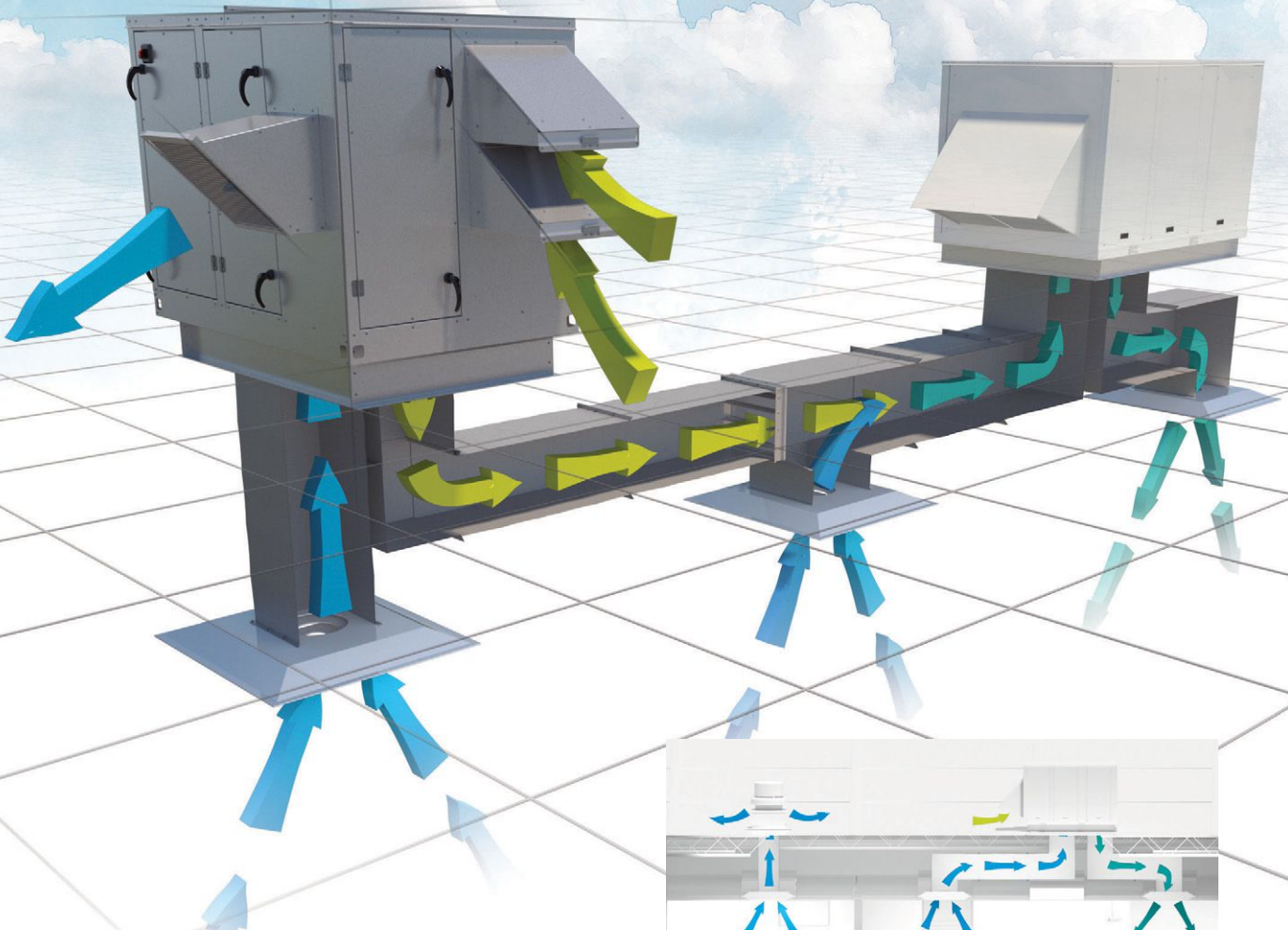
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ADDITION

COMMUNITY

WRITTEN BY

JANETTE BLACKBURN, FAIA;
MATTHEW GIFFORD, AIA, LEED AP;
NATHANIEL FINLEY, AIA; AND AMANDA
VIGNEAU, IIDA, NCIDQ, LEED ID+C



PHOTOS: ANTON GRASSL unless otherwise noted

CONNECTION

An Addition and Renovation at Loyola University Maryland Sets Students on the Path to their Futures



Baltimore-based Loyola University Maryland's collegiate foundation is based upon the Jesuit virtue of exploration: to go forth and create meaningful professional service and leadership. Connection to the community expresses itself not only in sending students out into the world but also inviting the world in. This give and take is at the nexus of the transformational renovation and addition to Beatty Hall.

THE MIGUEL B. FERNANDEZ FAMILY CENTER for Innovation and Collaboration is an addition that metaphorically serves as a welcoming "front porch" between campus and community.



■ Retrofit Team

ARCHITECT // Shepley Bulfinch,
shepleybulfinch.com

GENERAL CONTRACTOR // Whiting-Turner
Contracting Co., www.whiting-turner.com

MEP ENGINEER // Mueller Associates,
muellerassoc.com

STRUCTURAL ENGINEER // Hope Furrer
Associates, hfurrer.com

CIVIL ENGINEER // Whitney Bailey Cox &
Magnani, wbcm.com

SUSTAINABILITY CONSULTANT //
Thornton Tomasetti,
www.thorntontomasetti.com

LANDSCAPE ARCHITECT // Hord Coplan
Macht, www.hcm2.com

■ Materials

LINEAR LIGHTS AND PENDANTS // Axis
Lighting, www.axislighting.com

PENDANT, MEETING ROOMS // Fluxwerx,
fluxwerx.com

DECORATIVE LIGHTING, CAFÉ //
Rich Brilliant Willing, bit.ly/43UrPO1

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

CARPET TILE // Interface,
www.interface.com

WOOD-SLAT CEILING // Certainteed,
www.certainteed.com/ceilings-and-walls

STONE-LOOK FLOOR TILE //
Creative Materials Corp.,
www.creativematerialscorp.com

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www.filzfelt.com

GLAZING // Kawneer, www.kawneer.us

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www.rockwool.com/north-america

The addition of the Miguel B. Fernandez Family Center for Innovation and Collaboration augments active learning opportunities and provides a home for collaboration and innovation through spaces for diverse social interactions and connections. The center's interactive, versatile teaching and learning spaces highlight Loyola's signature programs, such as the Forbes Idea Lab and Rizzo Career Center, creating a link between student learning and the exploration and pursuit of future goals.

The renovation breathes new life into Loyola's historic Beatty Hall, completed in 1922, and doubles its size of approximately 30,000 square feet. The design of the 62,445-square-foot center positions the renewed Beatty Hall as a centerpiece of the historic campus green while the new city-facing expansion creates a new campus gateway and link to the community. Previously, Beatty Hall was used for academic programs and departments in soft sciences. While some of the departments were brought back into the building, newer programs were also added. The original building was in need of contemporary active learning classrooms, a home for the new program of innovation and entrepreneurship, as well as a new home

for the career center. The concept for Beatty Hall and the Fernandez center is to enhance connections between faculty and students, students and the community, Loyola life and the world beyond in multidirectional relationships.

A Student Hub

At the heart of the newly renovated Beatty Hall, the Forbes Idea Lab serves as an interdisciplinary student hub for research, project work and entrepreneurship. It is the most experimental spot in the building, serving as the physical and metaphorical center where innovative ideas and interdisciplinary connections will occur. The space can be used for multiple classes to combine or as the starting point for workshops that break into the smaller surrounding rooms.

The complex addition and renovation is designed to allow for community mingling and ensure attention is paid to the space in between. While each faculty office section functions as formal and informal meeting spaces, the Academic Loft on the third level offers the largest unassigned work and lounge area for students and faculty to meet. During the day, the space is a hub of activity with different seating choices, encouraging students to

A LIVING GREEN WALL in the café space in the addition gives a natural backdrop to the interior community social space in the building while views of campus and the community provide a connection to the landscape.





The **INTERIOR CONCEPT** for the center connects to the campus' natural landscape through the color palette and organic textures.





THE CONCEPT FOR BEATTY HALL AND THE FERNANDEZ CENTER IS TO ENHANCE CONNECTIONS BETWEEN FACULTY AND STUDENTS, STUDENTS AND THE COMMUNITY, LOYOLA LIFE AND THE WORLD BEYOND IN MULTIDIRECTIONAL RELATIONSHIPS.

hang out and providing a space for faculty to meet and work outside of their offices.

Sustainability Goals

The building addition and renovation blurs the boundaries between inside and outside. A living green wall in the café space in the addition gives a natural backdrop to the interior community social space in the building while views of campus and the community provide a connection to the landscape. To further the connection to nature, outdoor classrooms were created to encourage teaching and learning outside.

Aspirational sustainability goals were one of the primary focuses of the project.

The guiding principles aligned with the values of the institution to prioritize occupant health and wellness, energy efficiency and stormwater management. To achieve these goals, the project incorporated healthier materials, biophilic design principles, high-performance mechanical systems, and a green roof and bioretention area as part of a three-phase stormwater retention system.

On the interior, sustainability focuses on the health of the occupants. Low-VOC materials and paint were used throughout the building. Biophilic-inspired patterns can be found in the carpets, which are made from recycled materials. Natural wood is used in the ceilings and wall paneling with

wool-felt panels on the built-in benches. Integrated LED lighting throughout helps to reduce the buildings energy consumption while providing great light.

Natural light provides the most benefits for the center's users. High-performance glass harnesses daylight and views. Sun shading was not just decorative but is designed at an angle that will block the high summer sun and let in some of the low winter sun, reducing the glare within classrooms and offices, and allowing for unobstructed views out of the building.

Energy modeling was used to guide decision-making and optimize performance through the implementation of high-

Daylighting⁺



photo: Darris Lee Harris

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efficiency HVAC equipment and a high-performance building envelope. The new and existing building envelope includes high R-value insulation. The high-performing HVAC filtration systems combined with access to outdoor social spaces increases the air quality and comfort of the space.

The focus on designing sustainably provided the opportunity to combine new and evolving programmatic elements with forward-thinking architectural concepts. This innovative and sustainable approach to design earned the project LEED Gold status, the first academic building on Loyola's main Evergreen campus (one of three campuses) to receive this certification.

The Front Porch

The Miguel B. Fernandez Family Center for Innovation and Collaboration serves not only as the physical gateway to campus but also the link to the community. Located on Cold Spring Lane, the addition metaphorically serves as a welcoming

"front porch" between campus and community. To ensure the building responded to its contextual environment, it was important to evaluate exterior materials.

Stone was chosen to be sympathetic to the Beatty Hall stone and relate to the adjacent Donnelly Science Center while the window frame colors relate to other window frame systems on campus. The glass exterior served multiple purposes. The glass on the south side of the building, facing Cold Spring Lane, is as clear as possible to increase daylight and views. On the north side, where the building faces Beatty Hall, glass has more reflective properties so Beatty Hall would be seen in the reflection of the addition. When looking at the Fernandez center from the campus quad, it does not appear like a glass box but rather pays homage to Beatty Hall and the historic campus.

The interior concept for the center connects to the campus' natural landscape through the color palette and organic textures, reflects the collegiate community

through transparency into and within the building, and encourages discovery through the layering of interior spaces and materials, as well as orientation to daylight and views. The interior design constantly converses with the form and materials of the exterior; they are visually connected via large planes of glass. The materials and finishes for the building's interior started first with understanding the visual weight, color and texture of the exterior Beatty Hall wall that now anchors the center of the building and the interior circulation.

The new Miguel B. Fernandez Family Center for Innovation and Collaboration and renovated Beatty Hall transformed the campus into a contemporary hub that strengthens Loyola's active engagement and focus on innovation, entrepreneurship and design thinking. With this type of innovative renovation, you have the ability to not only create a beautiful space, but also the opportunity to transform and foster community. 



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▲ The **RENOVATION** harnessed the architectural history of the building's masonry shell and original fenestration to shape a space that is welcoming; inspiring; and conducive to the creative, ever-changing needs of the community.

PHOTOS: ANTON GRASSL unless otherwise noted

“Anyone who walks into this building should feel welcome here.” This was the mission the clients—the City of Cambridge and Cambridge Redevelopment Authority—gave to CambridgeSeven at the outset of this project.

Vacant for almost 20 years, Foundry 101—a steam-pump manufactory built in 1890—now is a vibrant community hub with makerspaces, art and dance studios, food labs, performance space, a central community hall, and a mix of non-profit and market-rate office tenants, all infusing the historic building with 21st-century energy and creativity.

Where gantry cranes were once suspended from mighty wood trusses and machinery hummed and clanked, neighbors and artists now gather to learn hip hop, teach carpentry, practice a new language and inspire students.

The transformation of this manufactory in the Kendall Square neighborhood of Cambridge, Mass., was driven by the City of Cambridge’s vision and the tenacity of the community. Originally designed by Luther H. Gager and developed by the Blake and Knowles Steam Pump Company, the building is a designated protected Cambridge Historical Landmark.

INCLUSIVE PROCESS

The residents were eager to preserve a pocket of the neighborhood for public use within a building that represents the last remaining fabric of the city’s industrial history. The planning and design of this unique civic hub, intended to inspire and serve residents of all ages and abilities, grew from a broadly inclusive process, involving city leaders, the Cambridge Redevelopment Authority, the Foundry Consortium, a local Foundry Advisory Committee of East Cambridge residents and field experts, and the Cambridge Historical Commission. Partnering with neighborhood groups in frequent sessions that solicited ideas for the project vision was key to the project’s success. In particular, the group worked to include voices from a range of ages, abilities, ethnicities, religious and economic backgrounds, culminating with an inclusive event by the well-known artist, Candy Chang, called “I Wish This Was,” designed to elicit imaginative ideas for future uses of the vacant industrial building.

Central to concerns raised by the community were the





▲ **A NEW ADDITION** clearly stands out from the original brick with its corrugated, brass-colored cladding that speaks to the original metalsmithing that took place within the building.

■ Retrofit Team

ARCHITECT, INTERIOR DESIGNER AND COMMUNITY ENGAGEMENT LEAD //

CambridgeSeven, www.cambridgeseven.com

OWNER //

City of Cambridge and The Cambridge Redevelopment Authority, www.cambridgefoundry.org

GENERAL CONTRACTOR //

W.T. Rich Company, www.wtrich.com

CIVIL ENGINEER //

Nitsch Engineering, www.nitscheng.com

STRUCTURAL ENGINEER //

Simpson Gumpertz & Heger, www.sgh.com

MEP AND FIRE-PROTECTION ENGINEER //

AKF, akfgroup.com

ENVIRONMENTAL GRAPHIC DESIGN //

One2Tree, www.one2tree.net

LANDSCAPE ARCHITECT //

Mikyoung Kim Design, myk-d.com

LIGHTING DESIGN //

Lam Partners, www.lampartners.com

ACOUSTIC AND AV ENGINEER //

Acentech, www.acentech.com

PUBLIC ARTIST //

Elisa Hamilton, www.elisahamilton.com

financial and spatial inequities affecting local artists and creatives. Foundry 101's design responds by providing access to specialized spaces and equipment—open for all community members to use. Offering makerspaces, multipurpose rooms, a dance studio, art studio, performance space, woodshop and culinary lab, the project brings STEAM disciplines under one roof for the Cambridge community with reservable spaces and opportunities for public programming. Levels two and three include office space leased by startups; the revenue allows the Foundry Consortium, which manages the building, to run free public events and programs.

RESTORING HISTORY

The renovation harnessed the architectural history of the building's masonry shell and original fenestration to shape a space that is welcoming; inspiring; and conducive to the creative, ever-changing needs of the community. The triple-height atrium, which had been unsympatheti-

cally divided with occupied floors in the 1980s, was restored to its original volume, providing a central Community Hall with physical connections between the workshops and fostering visual cross-pollination between activities.

The design juxtaposes new insertions against the historic fabric, using a palette of structural steel, metal panels, and wood storefront that contrasts with the original heavy timber columns and trusses and masonry façade. A new addition clearly stands out from the original brick with its corrugated, brass-colored cladding that speaks to the original metalsmithing that took place within the building. The addition complements the original structure with a bold and vibrant accent, provides necessary infrastructure for the building—such as an electrical vault, an elevator and egress stairs—and harmonizes with the original brickwork of the historic factory.

A new sculptural entry invites visitors from the exterior into the interior



■ Materials

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INTERIOR WOOD STOREFRONT SYSTEM //

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www.durathermwindow.com

ACCESSORIES // Sugatsune, www.sugatsune.com

BATH FITTINGS // Sloan, www.sloan.com; Moen, www.moen.com; Delta, www.deltafaucet.com; Elkay, www.elkay.com; Just Manufacturing, www.justmfg.com; Chicago Faucets, www.chicagofaucets.com; and Franke, www.franke.com

BATH SURFACES // Stone Source, www.stonesource.com, and Daltile, www.daltile.com

CEILINGs // CertainTeed, www.certainteed.com/ceilings-and-walls

FLOORING // Shaw Floors, shawfloors.com, and Milliken, www.milliken.com

KITCHEN APPLIANCES, EQUIPMENT // Wolf and Subzero, www.subzero-wolf.com, and Alto-Shaam, www.alto-shaam.com

KITCHEN SURFACES // Silestone, www.silestoneusa.com, and Wilsonart, www.wilsonart.com

LIGHTING // Barbican, barbican.ca; Fluxwerx, fluxwerx.com; Mark Architectural Lighting, marklighting.acuitybrands.com; Lumenwerx, lumenwerx.com; Lumenpulse, www.lumenpulse.com; Gotham, gothamlighting.acuitybrands.com; Scout, scoutlighting.com; Lithonia Lighting, lithonia.acuitybrands.com; Visa Lighting, www.visalighting.com; and Juno, juno.acuitybrands.com

PAINT // PPG, www.ppgpaints.com

SKYLIGHT // Clearshade from Panelite, www.panelite.us

ACOUSTIC FLOOR ISOLATION AND NOISE CONTROL // Kinetics Noise Control, kineticsnoise.com

EXTERIOR

CLADDING/FAÇADE SYSTEMS // Waterstruck Brick from Stiles and Hart, www.stilesandhart.com; ATAS International Inc., www.atas.com; and AkzoNobel, www.akzonobel.com

DOORS // Reynaers, www.reynaers.com

CUSTOM STAGE DOOR // Noise-Lock from IAC Acoustics, www.iacacoustics.com/case-studies-full/acoustic-doors-in-cambridge-massachusetts

GLAZING // Oldcastle BuildingEnvelope, obe.com

LIGHTING // Zaneen, zaneen.com

WINDOWS // Marvin, www.marvin.com

EPDM ROOF MEMBRANE AND ROOF INSULATION // Johns Manville, www.jm.com

OUTDOORS

LANDSCAPE PAVERS // Hanover Architectural Products, hanoverpavers.com

LIGHTING // Lumenblade from Lumenpulse, www.lumenpulse.com; Hydrel, hydrel.acuitybrands.com; LF Illumination, lfillumination.com; and Kelvix, www.kelvix.com

■ **THE NOW ALL-ELECTRIC BUILDING** FEATURES HIGH-PERFORMANCE WINDOWS AND INCREASED ROOF INSULATION THAT REDUCES BUILDING ENERGY USE WITHOUT DEGRADING THE HISTORIC CHARACTER OF THE ENVELOPE.

Community Hall, which is punctuated with plywood details and graphics. Flanking the Community Hall, three new concrete-on-steel deck floors were inserted on steel framing that is structurally separated from the original granite and heavy-timber structure. Additionally, new braced frames were installed to strengthen the historic masonry end walls.

DYNAMIC ENVIRONMENTAL GRAPHICS

Environmental graphics also make the space navigable and welcoming while telling the building's story. Historic photos show the bold sans serif typography of the day, reflected in the choice of Druk as the font for this building. Circular graphic motifs in the floor and millwork areas are a nod to the patterns of nuts and bolts. The red, black and brass colors in the graphics recall the building's original use.

Additionally, graphics and text integrated into the architecture enliven the industrial interiors and memorialize the passage of the first Minimum Wage Act for Women in the country in 1912 sparked, in part, by women working in this steam-pump foundry. Additionally, more modern history is commemorated with Elisa Hamilton's art installation, titled "The Juke Box", an interactive local arts project that shares recorded stories from residents about their lives in Cambridge, documenting personal histories to be heard by future generations.

HIGH PERFORMANCE

The 50,000-square-foot building welcomes Cambridge residents with an intent to minimize its environmental impact today and on future generations.


The now all-electric building features high-performance windows and increased roof insulation that reduces building energy use without degrading the historic character of the envelope.

The project is targeted for LEED Gold and adheres to the City of Cambridge's Zero Energy Ready requirements, including eliminating fossil fuels from daily building operations. In addition, the basement (added in the 1980s for parking) was filled in, bringing the ground floor above the projected base-flood elevation for 2070 and improving the building's resiliency in the face of climate change.

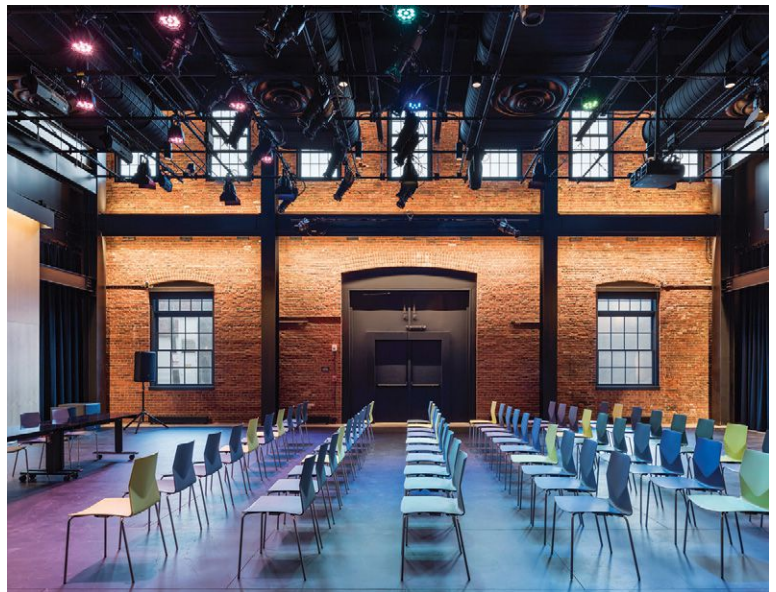
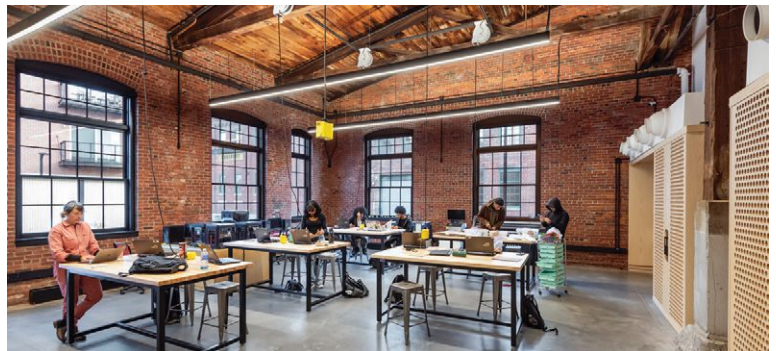
The design team is working with the City of Cambridge to create a self-guided tour for tenants and visitors that highlights the sustainable features of the building, including the environmental benefits of preservation.

GOOD NEIGHBOR

Alongside the restored Foundry 101 building is a publicly accessible park with seating and bike storage for visitors and employees. The street in front of the building was previously an unwelcoming industrial alley. This street was widened so that it can be shared by vehicles, pedestrians and cyclists. Additionally, new planters, rain gardens, street furniture and lighting increase the area's safety and accessibility. Today, this shared enlivened street acts as a drop-off area that can also host events, art fairs and food trucks.

By taking inspiration from the original architecture, Foundry 101 has been transformed from an underused industrial building into a community hub for creativity with spaces that welcome community members and their diverse interests and passions. 

► **VACANT** for almost 20 years, Foundry 101 now is a vibrant community hub with makerspaces, art and dance studios, food labs, performance space, a central community hall, and a mix of non-profit and market-rate office tenants.



BUILDING INCLUSION

WRITTEN BY | JIM SCHNEIDER

The Design and Construction Industry Puts Growing Emphasis on Diversity, Equity and Inclusion

IMAGE: WILDPixel

According to a 2021 study by the U.S. Bureau of Labor Statistics (www.bls.gov/cps/cpsaat18.htm), the construction workforce is 87.9 percent white and 89 percent male. Just 9.9 percent of construction professionals are women, 6.2 percent are Black and 2 percent are Asian.

Similar research gathered in 2023 (www.ncarb.org/nbtn2023) by the National Council of Architectural Registration Boards (NCARB) came up with similar results. Although there are some signs of progress—early on the path, near-gender parity was maintained with women accounting for 49 percent of individuals starting the experience program—there are still major disparities in ethnic diversity. Looking at the faces that currently make up the profession, fewer than one in five architects identifies as a racial or ethnic minority, and only two in five are women.

There are many factors behind the building industry's challenges of equity, some of it cultural and some of it having to do with practical issues, like access to higher education. In the past few years, there has been a concerted effort to create a more diverse industry.

Diversity in the Data

"At a high level, we really think it's important to be transparent with our data, even if it reflects poorly on us or others historically," says Michael Armstrong, CEO of NCARB. "For example, several years ago we released exam success rate data by demographic group, race, ethnicity and gender. It was clear that white candidates had a higher probability of passing the exam than nonwhite candidates. That led us to do an internal review of how the exam is written and if there are any unconscious biases or impediments we could remove. As we expose that data for greater conversation, we also apply it internally to our own programs."

"The current state of DEI [diversity, equity and inclusion] in the design and construction industry is complex and evolving," says Tiffany D. Brown, executive director of the National Organization of Minority Architects (NOMA), a group formed 50-years ago to represent the

needs of African American architects. "Despite the removal of DEI initiatives in certain states, the Supreme Court's ruling on Affirmative Action, and how those have affected people of color in leadership, the industry has shown a commitment to advancing diversity, equity, inclusion and accessibility through executive orders and strategic plans."

"When I entered the industry 17-plus years ago, everything was focused on LEED and sustainability," says Jason Pugh, global director of Diversity, Equity and Inclusion for Gensler and immediate past president of NOMA. "Every firm seemed to be promoting how many LEED APs they had or the number of LEED-certified projects they completed. In that moment, the design community was leading that conversation. We were the ones explaining the ROI to our clients and the community. Eventually those sustainable strategies became best practices for every project and embedded in our standard scope of services. My hope is DEI will also become embedded in our everyday practice across the building design industry, especially with the rise of ESG [environmental, social, governance] goals."

Why DEI?

There was a time when the idea of encouraging diversity in any profession was just considered a good idea on its face, but the cultural winds have shifted and real resistance to the idea of diversity, equity and inclusion programs has come to the fore. In much the way the sustainability movement launched simply with the goal of doing the right thing and eventually faced backlash, now many industries and firms find themselves needing to make an ROI argument for investing in workforce diversity. Fortunately, there is a strong case to be made.

“
I often describe the benefits a more diverse profession can provide with six major points: broader perspective and innovation, enhanced problem-solving skills, inclusive design, increased cultural competence, improved representation and role models, and positive impact on society.

—Tiffany D. Brown,
executive director,
National Organization of
Minority Architects

”

“

Our Chicago office recently launched a pilot program called Gensler Apprentice Program, which is an apprenticeship program that leverages these alternative pathways and expands opportunities for young people from traditionally underrepresented backgrounds and communities to enter the industry and learn on the job.

—Jason Pugh, global director of Diversity, Equity and Inclusion, Gensler, immediate past president, NOMA

”

“Diversity in the profession fosters creativity, empathy, inclusion and broader social impact,” Brown explains. “It encourages innovative thinking, enhances problem-solving skills, and results in designs that are responsive to diverse needs and experiences. I often describe the benefits a more diverse profession can provide with six major points: broader perspective and innovation, enhanced problem-solving skills, inclusive design, increased cultural competence, improved representation and role models, and positive impact on society.”

“There are a number of economic studies that have suggested that companies benefit by speaking to a more diverse consumer base because their employees are more diverse,” Armstrong says. “It brings credibility to the value of the practice if the people you are working to protect through design are represented on your team or at your firm. It’s going to resonate better with the community, whether it’s a new library, school or any other type of project. I think the relationship between architect and client can be very personal and special. It makes sense that people that have similar perspectives and backgrounds are going to be more collaborative.”

“At the end of the day, our firm believes in diversity of thought and experience on our teams,” Pugh says. “We believe diverse teams produce the best product, the best projects and the best designs. That’s really what it comes down to. It’s also recognizing the changes across the global landscape. Our society is growing more diverse every day. The young professionals entering the workforce are growing more diverse every year. This next generation has grown up in a very inclusive world, and diversity is something they value and are looking for when they come into the industry. Companies that embody DEI values are the ones attracting top talent.”

Addressing the Issue

Groups like NOMA and NCARB have been studying and trying to gather data and counter the lack of diversity in the profession for many years, but more attention came to the issue after the murder of George Floyd in 2020. It launched a cultural conversation as society at large began looking at the significant gaps that have long existed.

“While progress has been made, systemic inequalities and discrimination persist in many areas, and some groups continue to face barriers and underrepresentation,” Brown explains. “The pace of change can vary significantly between different regions and communities, and progress may not be uniform across all sectors and industries. Some countries have passed laws to protect the rights of minority groups and women, and there has been growing recognition of the importance of representation in various fields, such as politics, business and media. It feels discouraging at times reading about the elimination of DEI programs here in the U.S.”

“I think the architecture profession is not alone within the building sciences for having a lack of diversity for many reasons,” Armstrong says. “People with ethnically or racially diverse backgrounds haven’t chosen the building sciences like they do law or medicine. Some of this may be based on systemic bias and who people think are supposed to go into those industries based on whom they’ve seen publicly. In the pantheon, we tend to glorify famous white male architects.”

“After the murder of George Floyd in 2020, you were hard-pressed to find many companies that would talk openly and publicly about racism, but we developed five strategies to fight it in our firm,” Pugh recalls. “Racism is a very charged word, almost taboo, and society likes to tiptoe around it. But we need to attack it head-on and say racism is real, it’s something that impacts the building industry, and we must do something about it. Our strategies are very robust and focus on recruitment and retention, expanding access for and diversity of the pipeline bringing in new professionals from the next generation, as well as our projects, our work in our communities and partnerships with our clients.”

The Path Forward

Realizing there is a gap is the first step, but the real challenge is finding ways to transform the actual face of an industry that isn’t always known for rapid change. There is a great deal to be done at all levels, and impacts can be made at the individual and firm level.

(continues on page 68)

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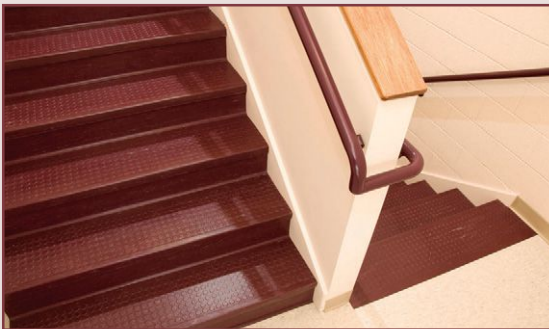
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"It starts with small steps, not necessarily grand gestures," Armstrong says. "We all must risk a little bit of criticism and introspection and learn how to behave differently. That's not something that changes overnight."

"I believe the industry can make strides toward true equity in the next 10 years. My hope is to see this reflected in the leadership of architecture firms and entities that shape the profession as a whole," Brown says. "It should be common practice to provide opportunities for minorities to lead projects, individually and in joint ventures. Society should revisit systemic barriers in promotion policies, and companies should take intentional steps to diversify their boards of directors. The future of diversity in the profession rests with university leadership and architecture firms themselves. Those currently in leadership roles should use their positions to promote diversity by seeking out a more diverse workforce."

It is universally acknowledged that addressing the pipeline of young people coming into the industry is vital in diversifying the industry. Part of that is simply outreach and exposing young people in different communities to professionals working in architecture and construction so they begin to see it as a viable career choice. And another part is enacting programs and structural change that indeed make the professions more accessible to all.

"We're seeing growth in the number of Latino and Asian American newly licensed architects, but growth of newly licensed African American architects is not very impressive," Armstrong admits. "NCARB supports NOMA's 2030 challenge to double the number of Black licensed architects coming into the profession by 2030. We're reaching out to Historically Black Colleges and Universities to encourage them to adopt our Integrated Path Initiative where students earn experience credits while they're still in school, which shortens the timeline to licensure."

"Currently there are 134 schools with accredited architecture programs around the country. Of those, seven are Historically Black Colleges and Universities, and those seven schools produce more than a third of all the Black students that graduate and enter the building design industry each year," Pugh says. "There are currently 17 states and U.S. jurisdictions that do not require a professional degree in architecture to get licensed. There are nontraditional paths and opportunities available to support the dreams of someone who wants to be an architect or planner but college is simply not in the cards for a variety of reasons. Our Chicago office recently launched a pilot program called Gensler Apprentice Program, which is an apprenticeship program that leverages these alternative pathways and expands opportunities for young people from traditionally underrepresented backgrounds and communities to enter the industry and learn on the job."

"Together, as individuals, let's begin to explore and dismantle the barriers set in place so long ago," Brown says. "Let's commit to rebuilding equitable structures at all levels. Society must invest in community, arts, and leadership education for every person and every child. We must begin to enact and navigate the monumental change that is necessary. By pairing diversity in leadership with the removal of systemic barriers, the industry can take the necessary steps forward." 

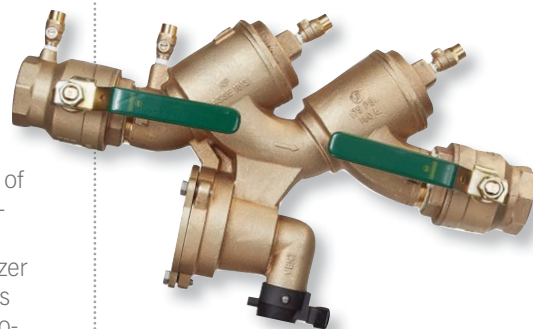


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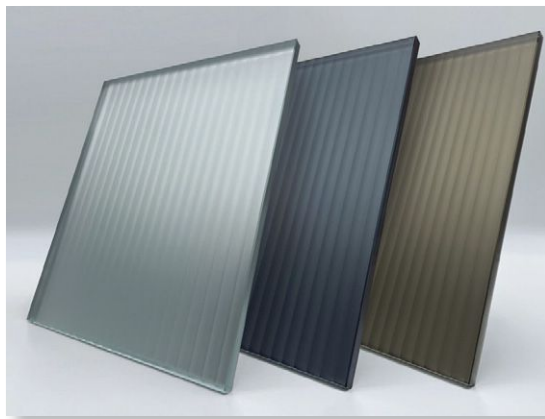
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bendheim.com/campaign/evolution-collection

→ SECURITY GRILLE, DOOR PROVIDES THREAT PROTECTION

Clopay Corp. has introduced CrossingGard with ThreatProtect available on grilles, doors, or insulated doors through its Cornell and Cookson brands. CrossingGard with ThreatProtect creates lockdown zones within a building when a hostile event alarm is triggered. It also opens to allow freedom of movement in the event of a fire alarm. ThreatProtect controls are determined by end-user protocol, based on the building design and emergency-management plans. The operating system uses two alarm inputs and a self-contained backup power supply to provide flexibility to assist in managing threatening situations. The product can help restrict an intruder from moving freely about the building, obstruct an intruder's view or open egress for evacuation.

www.cornelliron.com/product/crossinggard-with-threatprotect
www.cooksondoor.com/product/crossinggard-with-threatprotect_k





← CARPET COLLECTION INSPIRED BY WASSILY KANDINSKY

Mannington Commercial has launched its Composition Collection, which was inspired by Wassily Kandinsky, a pioneer of abstract art, and his groundbreaking Composition series. The modular and broadloom carpet collection features three coordinating styles with the simple forms that Kandinsky favored—lines, squares and triangles—layered and expressed in neutrals, brights and deep jewel tones. The broadloom and 24-inch-square carpet tile allow designers to approach the collection like an artist with a canvas, arranging styles and colors to compose a harmonious environment. The styles are as follows: Sublime State features a geometric pattern and layers tonal blocks over a striated background; Trance End provides detailed triangles arranged among delicate scaffolding; and the more linear Inner Share can be used on its own or as a transition between the other styles.

www.manningtoncommercial.com/products/collections/new-composition

→ PRIVACY SOLUTIONS NOW CAN BE MADE IN INFINITE COLORS, MATERIALS

SpeedPro Irving has partnered with Loftwall to provide customizable privacy solutions for corporate interiors in an endless number of colors, materials and textures. This partnership will streamline Loftwall's operations, improve efficiency and reduce lead times. Many of Loftwall's products are recycled from single-use plastics. Through this partnership, Loftwall can offer even more sustainable products through SpeedPro Irving's eco-friendly approach to printing: The company's entire production line can produce 100 percent UL GREENGUARD Gold-certified products.

loftwall.com



→ METAL-FRAMED GLASS SKYLIGHTS MEET STRINGENT ENERGY CODES

Kingspan Light + Air has released KlearSky metal-framed glass skylights, which are available in a wide range of options to suit diverse architectural needs. These options include standard configurations, like pyramids, polygons, segmented barrel vaults, single slopes (which can span up to 22 feet) and ridges (which can span up to 40 feet), in addition to fully customizable shapes. A varied array of UV-stable glass glazing options also are available to meet stringent energy-code performance requirements. Architects also can choose from an extensive range of frame finish options, including powder coat, anodized, or fluoropolymer paint in standard and custom colors. The quick and easy installation process is facilitated by KlearSky's Quick-Link technology, which requires 75 percent fewer fasteners.

www.kingspan.com/us/en/products/metal-framed-skylights



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Schweiss Doors designed and built the glass bifold doors for the Golden 1 Center in Sacramento, CA



↑ HEAT PUMP WATER HEATER PROVIDES RELIABLE DOMESTIC HOT WATER

Lochinvar has made available the Veritus Air Source Heat Pump Water Heater, which provides energy savings and reliable domestic hot water for a variety of commercial applications. ECM pumps, fans and a scroll compressor work together to enable Veritus to operate with a high coefficient of performance, optimize heat transfer and minimize emissions. Veritus heat pumps are modular, meaning units can be manifolded together, ensuring ample hot-water supply, built-in redundancy and capacity matching for larger commercial water-heater demands. The modular design allows installing contractors to transport individual models to a rooftop in a freight elevator. The water heater utilizes a low Global Warming Potential Refrigerant (R513A). When paired with Lochinvar's Thermal-Stor storage tank, the tank's patent-pending baffle ensures the system performs optimally by controlling the stratification of hot water as it's stored.

www.lochinvar.com



↑ EMERGENCY DRIVERS OFFER EXTENDED RUNTIME

IOTA has introduced the ILB2H and ILBHI 2H Series emergency drivers, which combine advanced-performance features with extended two-hour runtime capability for luminaires in applications requiring emergency operation beyond the standard 90 minutes outlined in the Life Safety Code. These extended-runtime applications include certain FEMA shelter, Canada egress applications, and local or municipal codes that may supersede national code. The patented constant-power output delivers consistent, non-diminishing emergency illumination for the entire runtime. Self-test/self-diagnostics automatically conduct required monthly and annual tests. The emergency drivers are available in select wattage, voltage and mounting options to match the requirements of individual fixture designs.

www.iotaengineering.com



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➔ GYPSUM CEILING PANELS PROVIDE QUICK ACCESS TO THE PLENUM

Armstrong World Industries has introduced CastWorks Metaphors ceiling panels, a portfolio of standard, pre-cast 24- by 24-inch Glass Fiber Reinforced Gypsum tegular ceiling panels. The panels are offered in five modern designs—Botanical, Pinnacle, Crests, Tectonic and Tidal—and four standard colors—White, Gun Metal Grey, Silver Grey and Black. The geometric and dimensional panels provide quick access to the plenum and install on standard Armstrong Suprafine XL 9/16-inch grid. The modular panel designs provide the opportunity to create many custom looks based on layout. Each panel is one solid piece. When installed with acoustic infill panels, Botanical panels achieve an NRC up to 0.85. Select panels have pre-cut downlight openings or flat areas for field-cutting to seamlessly add lighting fixtures or other MEP integrations.

www.armstrongceilings.com



↑ AIR CURTAINS BOAST QUIET OPERATION

Berner International has introduced the Architectural Icon 8 and Icon 10 to its Architectural Collection of air curtains. The models are redesigns of Berner's Architectural Low Profile 8 and Architectural High Performance 10 air curtains. In addition to quieter operation, the redesign includes architectural-quality aesthetical upgrades and AMCA-certified performance while maintaining a similar price as their predecessors. The Icon 8 (1/5 horsepower) and Icon 10 (1/2 horsepower) PSC motors combine with other air-movement components and a refreshed cabinet design to deliver low operating sound and harmonic decibels. EC motors (1/5 and 1/2 horsepower) are optional and equally quiet. The Architectural Icon 8 (8 1/4 by 20 inches) and Icon 10 (12 3/4 by 25 1/2 inches) air curtains are available from 3- to 10-foot and 3- to 12-foot lengths, respectively.

www.berner.com



↑ ENHANCE FOCAL POINTS WITH WALL WASH TRACK FIXTURES

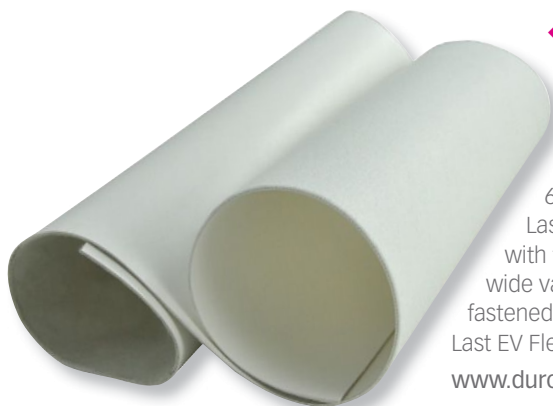
Juno has released a family of Trac-Master Narrow Profile LED Wall Wash Track Fixtures. The fixtures provide intense, evenly distributed light with full-wall coverage making them an option wherever a wide, uniform beam pattern is desired to enhance an accent wall, signage, product display or any focal point on the room perimeter. Using 30 percent less materials than previous wall wash Trac-Master models, Juno's slim, non-invasive design maintains a discreet presence. Minimal aperture brightness fights glare, improving user comfort. Fixtures even can be aimed straight down to provide widespread ambient lighting. Match lighting performance to the size of the space and desired effect with a choice of seven lumen packages.

www.acuitybrands.com/products/family/narrow-profile-led-wall-wash

← ROOF MEMBRANE OFFERS FLEXIBILITY, WELDABILITY IN LOW TEMPERATURES

Duro-Last has released Duro-Last EV 80-mil and Duro-Last EV Fleece. Duro-Last EV is a Ketone Ethylene Ester-containing membrane, utilizing Elvaloy from Dow. Offering flexibility and weldability in low temperatures, Duro-Last EV is available in 50-, 60- and now 80-mil-thickness options. Further expanding EV membrane options, Duro-Last EV Fleece combines high-quality fleece material on the underside of the membrane with the proven performance of the Duro-Last EV roofing membrane. Compatible with a wide variety of substrates, Duro-Last EV Fleece is a solution for adhered and mechanically fastened low-slope roofing projects, requiring a long-lasting, energy-efficient membrane. Duro-Last EV Fleece is available in 60- and 80-mil thicknesses.

www.duro-last.com



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CONTEMPLATIVE SITE

A Place of Reflection Honors the 607 Who Lived and Labored at Monticello



Interdisciplinary design firm HGA and Nelson Byrd Woltz Landscape Architects have completed the Contemplative Site at Monticello in Virginia. It was dedicated during a private Juneteenth celebration.

This new place of reflection at the end of Mulberry Row, the industrial hub of Thomas Jefferson's 5,000-acre mountaintop plantation, honors the 607 enslaved men, women and children who lived and labored at Monticello, as well as offers an opportunity for greater understanding and healing.

Designed in collaboration with descendants of the enslaved community and Monticello staff, the Contemplative Site provides visitors a place to reflect on the realities of slavery at Monticello, the people entangled in it and its lasting impact on society.


"Throughout the design process our team

read widely and worked closely with a diverse group of stakeholders. This site lies not only with history and memory but also with the opportunity to offer a fuller perspective on the story of Monticello," says HGA Design Principal Peter D. Cook.

The subtly curved 60-foot-long wall of Corten steel traces a "path of labor" and holds the names of the people enslaved by Jefferson during his lifetime. The panels also contain open spaces that allow for new names to be added as they are discovered through additional research. The openings—inspired by Maya Angelou's poem, "Still I Rise"—increase as the wall rises from the ground.

The landscape space held by the Contemplative Site at Monticello brings the visitor alongside the historic path used by enslaved

people to bring water from the North Spring to the house. The footsteps on this path literally brought life to the mountaintop in the form of water. The long arcing form of the meditative space lies parallel to this historic path, revealing it once more and bringing visitors adjacent to the authentic line of energy in the site.

"Our collaborative team designed this space to bring comfort by connecting us with the authentic stories that are embedded in this land and to nature," explains Thomas Woltz, principal of Nelson Byrd Woltz Landscape Architects. "We hope this space of reflection will allow for visitors and descendants and all the people that will encounter this site to consider the lives and the histories of those whose enslaved bodies created this bedrock of American history." 

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*When compared to a 10'x10' door with a Logic 5.0™ operator set to an average 8" per second. Clopay® and Extreme Series™ are brands of Clopay Corporation. Logic 5.0™ is a trademark, and LiftMaster® is a registered trademark of the Chamberlain Group Inc. © 2023 Clopay Corporation. All rights reserved.



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