

september-october 2020 // retrofitmagazine.com

retrofit

*A Whale of a Project:

An Iconic Train Station Is
Reimagined as an Aquarium

+ More Educational Facilities



TREND ALERT:
future flexible
design

CHANGING SPACES NEVER LOOKED SO GOOD

Transform existing shared spaces into segmented areas with nonporous and easily cleanable wall partitions artfully designed in a variety of patterns and colors. Infusions™ Resilient Partitions are available to ship quickly and retrofit in spaces that need to accommodate requirements for social distancing. Learn more about changing spaces without compromising design at armstrongceilings.com/partitions



INFUSIONS™ RESILIENT PARTITIONS, CALLA® CEILING PANELS, AND JLC TECH T-BAR SMART LIGHTS

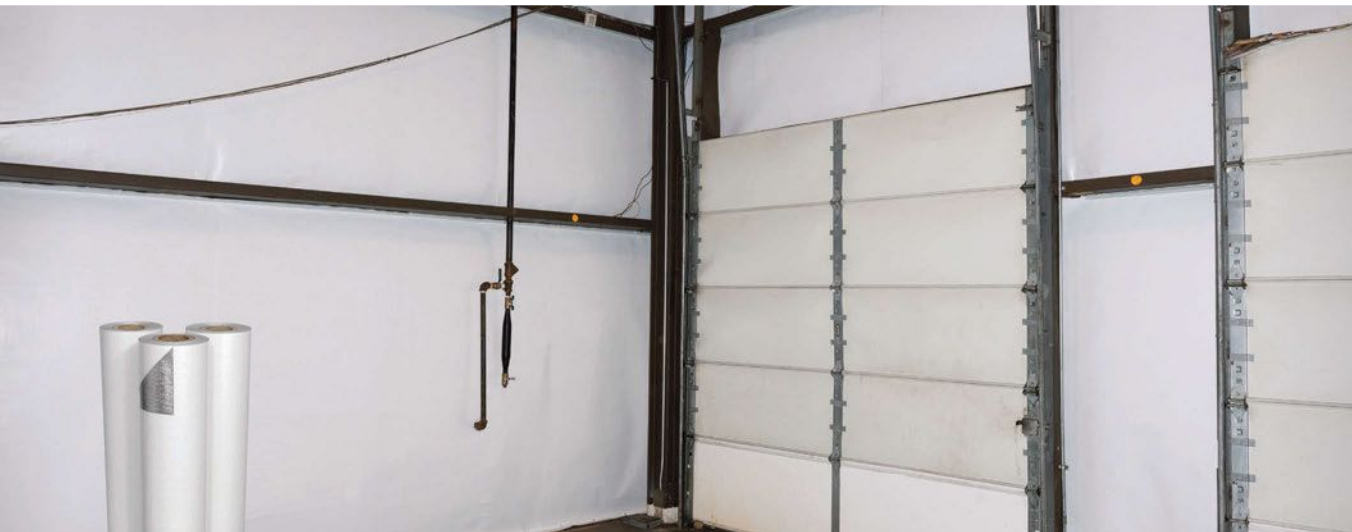
Inspiring Great Spaces®

Circle No. 1
Armstrong®
CEILING & WALL SOLUTIONS

Give your building interior a
NEW LOOK
WITH LAMTEC WMP®-RETRO



B
E
F
O
R
E



A
F
T
E
R

EASY TO INSTALL

Lamtec WMP-RETRO is specifically designed to cover damaged insulation

- Attractive white appearance
- Abuse resistant multi-layer construction

LAMTEC®
CORPORATION

Circle No. 2

Learn more at www.lamtec.com/wmp-retro | 1-800-852-6832

Security *you see* in an instant



Mortise Lock Status Indicators

Newly designed occupancy/status indicator options for ASSA ABLOY Group brand mortise locks provide *optimum clarity* on the locked/unlocked status of a door. Available as an upgrade option to existing applications or as complete lock orders for new installations, these indicators provide the largest viewing window in the industry, a 180° visibility profile, reflective indicator materials and multiple color and text/graphic combinations. The new status indicator options are versatile for any application and provide *assurance* when you need it most.

Circle No. 3

For more information, visit
corbinrusswin.com/ml2000indicator
or sargentlock.com/8200indicator.



Participating ASSA ABLOY Group brands:
CORBIN RUSSWIN | SARGENT



ASSA ABLOY
Opening Solutions

Experience a safer
and more open world

Copyright © 2019, ASSA ABLOY Sales and Marketing Group, Inc., an ASSA ABLOY Group company. All rights reserved. Reproduction in whole or in part without the express written permission of ASSA ABLOY Sales and Marketing Group, Inc. is prohibited. 4653 12/19



PREMIER BUTYL SEALANT TAPES

A LASTING DEFENSE

FOR OVER 30 YEARS, MANUFACTURERS AROUND
THE WORLD HAVE ENTRUSTED THEIR BUILDINGS'
MOISTURE DEFENSE TO THE MOST RELIABLE BUTYL
SEALANT ON THE MARKET, MB10A BUTYL TAPE.



800.288.9489

GSSISEALANTS.COM

Circle No. 4

PROVEN.

LEADER.

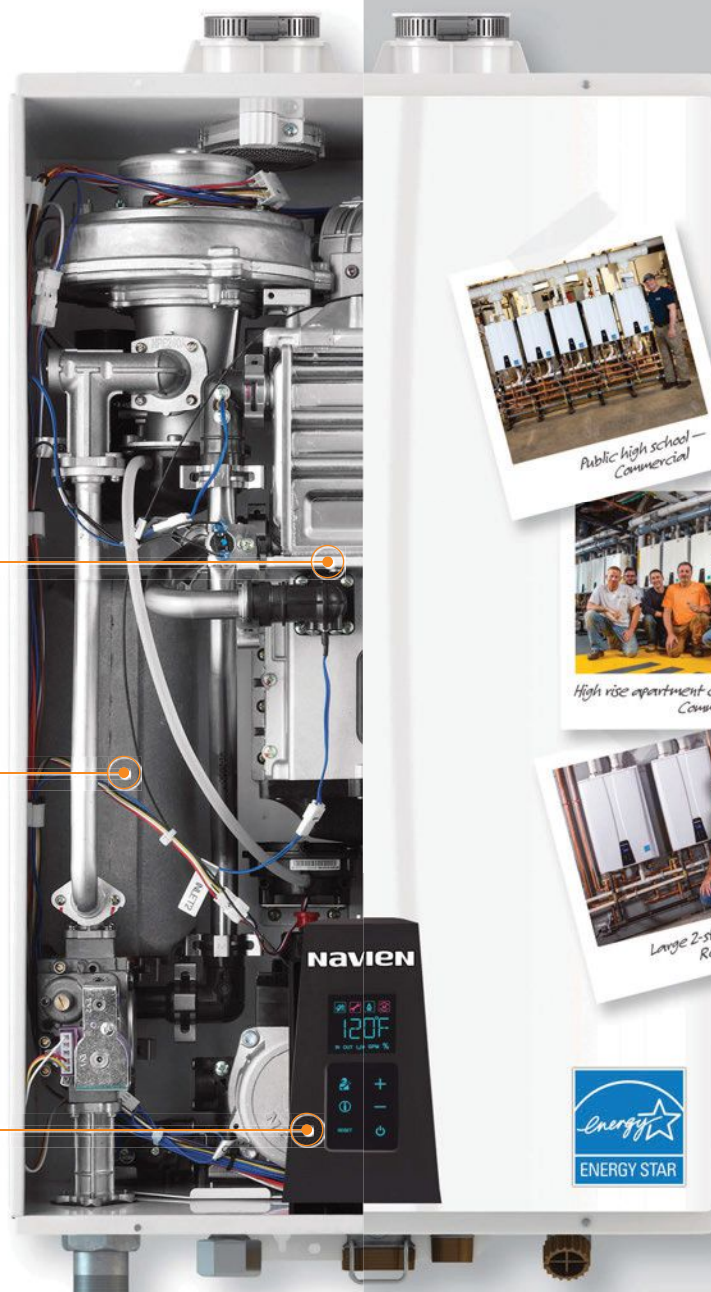
**Navien...
the PROVEN
performer
of highly
engineered
condensing
tankless
water heaters**

Exclusive dual
stainless steel
heat exchangers
resist corrosion
better than copper

ComfortFlow®
built-in recirculation
pump & buffer tank
for NPE-A models

Easier installs with
2" PVC, 1/2" gas and
field gas convertibility

Intuitive controls
for faster set up,
status reports and
troubleshooting



**Navien...
the LEADER
in high
efficiency
condensing
tankless
innovations
since 2012**

**To learn why
Navien NPE tankless
is the best selling*
condensing brand
in North America,
visit NavienInc.com**

*According to BRG

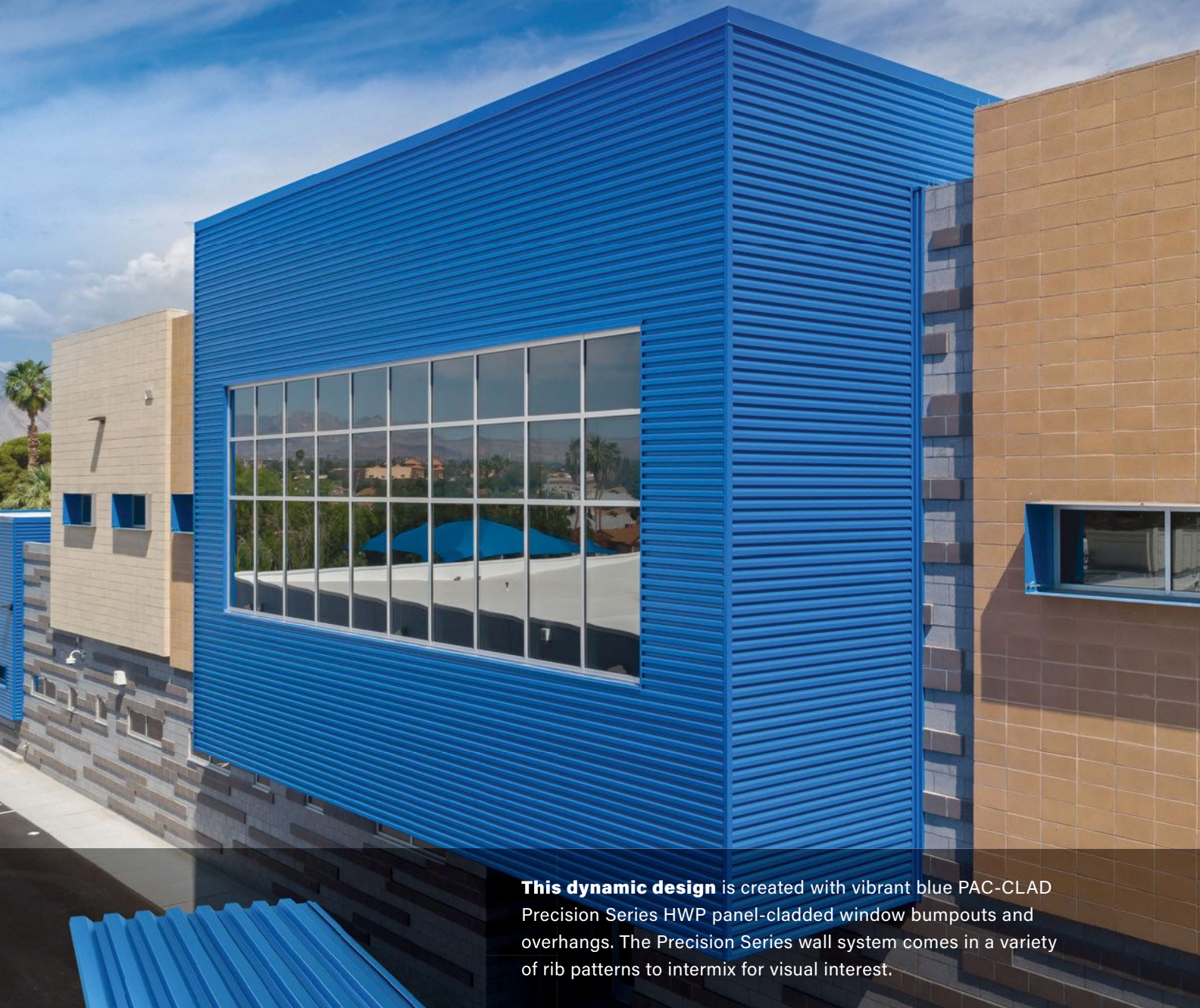
Navien NPE series condensing tankless water heaters

Circle No. 5

KD navien®

T h e l e a d e r i n c o n d e n s i n g t e c h n o l o g y

Bold Dimension



This dynamic design is created with vibrant blue PAC-CLAD Precision Series HWP panel-cladded window bumpouts and overhangs. The Precision Series wall system comes in a variety of rib patterns to intermix for visual interest.

Doris M. Reed Elementary School, Las Vegas Contractor: Andy Russo Jr. Inc. Architect: Gensler & Assoc.
GC: Martin Harris Construction Owner: Clark County School District Photo: alanblakely.com

Precision Series HWP
Metal Wall System
Custom Blue

Circle No. 6

CASE STUDY @ [PAC-CLAD.COM/DORIS-REED](https://www.pac-clad.com/doris-reed)





INSIDE THIS ISSUE

SEPTEMBER-OCTOBER 2020 // VOL 11 // ISSUE 5

➔ feature projects

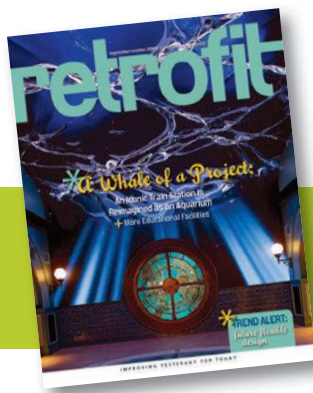
SPLISH SPLASH

An iconic St. Louis train station is reimagined as a 21st century aquarium.



32 PERUSE EDUCATIONAL FACILITIES FROM ACROSS THE COUNTRY:

- 370 Jay Street, New York University, New York
- Wine Spectator Learning Center, Sonoma State University, Rohnert Park, Calif.
- Hill College House, University of Pennsylvania, Philadelphia
- Corcoran School of the Arts & Design, George Washington University, Washington, D.C.
- Kathleen and Tom Elam Center, University of Tennessee at Martin
- James S. McDonnell Planetarium, St. Louis
- The Arthur Rock Center for Entrepreneurship, Harvard University, Boston
- The Momentary, Bentonville, Ark.
- Lancaster Science Factory, Lancaster, Pa.
- L.F. "Tow" Diehm Athletic Facility, University of New Mexico, Albuquerque



← cover

COVER PHOTO: MCCARTHY BUILDING COS. INC.

retrofit

INSIDE THIS ISSUE

SEPTEMBER-OCTOBER 2020 // VOL 11 // ISSUE 5



Business

18

DESIGN SOLUTIONS FOR K-12 EDUCATION

Reopening schools requires an eye toward community and innovation.



Business

22

SAFER SPACES

For campus reopenings, architects and planners should look to reduce density and activate the public realm.

Component

48

#MEET, #EAT, #SLEEP

Adaptive reuse of a 1911 insurance building adds a modern boutique hotel to Michigan Avenue, Chicago.

Transformation

54

HOME SCHOOL

Saint David's School educates 400 boys in a 19th century residential hotel in New York City.

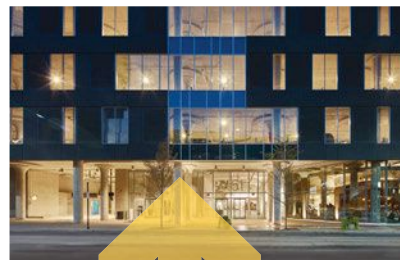


Transformation

62

LESS SCREEN TIME, MORE TREE TIME

1440 Multiversity teaches personal development on a repurposed university campus among the ancient redwoods.



Trend Alert

70

FUTURE FLEXIBLE

Designers anticipate tomorrow's needs in today's buildings.

DEPARTMENTS

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

82 INSPIRATION // As monuments are debated and graffiti spreads, Page & Turnbull helps determine what is important to commemorate.

COLUMNS

14 POINT OF VIEW // Going back to school has never looked so [insert adjective(s) here].

retrofit

➡ stay up to date

Subscribe to **retrofit**'s weekly e-newsletter at www.retrofitmagazine.com. You'll receive the latest news, blogs and content you won't find in the magazine.

Belimo Fire and Smoke Damper Actuators



Technology that Saves Lives

Approximately 30% of installed actuated dampers have defective motors. Ensure protection with Belimo, the industry leader in quality fire and smoke solutions.

Belimo fire safety actuators are UL 555 and UL 555S certified with all major damper manufacturers and backed by a 5-year warranty. Belimo Fire and Smoke Damper Actuators exceed required building codes resulting in reduced risk and ensuring proper protection.



Discover the advantages
www.belimo.us/firesmoke

ROOF & PLAZA PAVERS



Circle No. 8

HANOVER[®]
Architectural Products
www.hanoverpavers.com



**NEW
PERIMETER
SPACER**

retrofit

September-October 2020 // VOL 11 // ISSUE 5

PUBLISHER

JOHN RIESTER

john@retrofitmagazine.com

ASSOCIATE PUBLISHER/EDITORIAL DIRECTOR

CHRISTINA KOCH

christina@retrofitmagazine.com

DIRECTOR OF OPERATIONS

BECKY RIESTER

becky@retrofitmagazine.com

CONTRIBUTING EDITOR

ALLAN BARRY

EDITORIAL ASSISTANT

ANDREA HOFFMEIER

ART DIRECTOR

VILIJA KRAJEWSKI

vilijak@comcast.net

CIRCULATION MANAGER

LYN URE

lyn@retrofitmagazine.com

DIGITAL DESIGN DIRECTOR

RYAN WENGEL

WEB ENGINEER

DEREK LEEDS

ADVERTISING SALES

JOHN RIESTER

john@retrofitmagazine.com

(919) 641-6321

BARRETT HAHN

barrett.hahn@gmail.com

(919) 593-5318

DAN BURKE

dan@burkemediagroup.com

(732) 241-6720

SCOTT CUNNINGHAM

scott@retrofitmagazine.com

(678) 576-1487

EDITORIAL ADVISORY BOARD

NATHAN M. GILLETTE

AIA, LEED AP O+M, CEM

Director, Natura Architectural
Consulting LLC, Grand Rapids, Mich.

WILLIAM E. HOLLOWAY

AIA, LEED AP

Principal, BERNARDON,
Wilmington, Del.

JOHN J. NOONAN

Vice President of Facilities Management
Duke University, Durham, N.C.

RETROFIT // Vol. 11 // No. 5 is published bimonthly by Fisher Media LLC, 98 Booth Meadow Lane, Durham, NC 27713, (919) 641-6321. POSTMASTER: Send address changes to **retrofit**, 2409 High Point Drive, Lindenhurst, IL 60046.

TO SUBSCRIBE or make subscription changes, visit www.retrofitmagazine.com, and click on the "Subscribe" button, or email lyn@retrofitmagazine.com.

Belimo Retrofit Solutions



What You Need, Delivered On-Time

Belimo offers standard and custom retrofit solutions that are delivered fast to ensure your building gets back to operating efficiently with minimal downtime. Belimo Retrofit solutions are designed to easily upgrade your system with the highest quality products ensuring reliable performance and maintenance-free operation.



Discover the advantages
www.belimo.us



THE ANGER STAGE

Perhaps you've seen the memes floating around social media of celebrities, like Reese Witherspoon and Mark Ruffalo, illustrating how they've been feeling during 2020 via scenes from their movies. I identify with Ruffalo's meme (right). From June through September, Ruffalo shows himself as an angry Incredible Hulk. Well, ladies and gentlemen, that's how I feel right now, too.

This is my third column (officially six months) in which COVID-19 is affecting every aspect of our lives and, frankly, I'm furious at this point for our nation's kids! When the 2019-20 school year abruptly was cut short in March, I thought kids would eventually complete the school year face to face. But they didn't. Now, here we are, six months later with the pandemic still raging (and still no end in sight) and we're debating whether to send kids back to school.

Unfortunately, there is no perfect solution to the schooling situation and, in my opinion, every option has its drawbacks: Can working parents' monitor their kids' online learning well and still do their jobs from home effectively? Probably not. If online learning programs created by traditional school systems haven't improved since the abrupt end to last school year, will it leave our kids academically behind in the long run? Probably. (My 16-year-old niece informed me there was little accountability for completing assignments while taking online classes through her public school last spring and there was a lot of cheating among students.) Will teachers and other school staff and kids inside brick-and-mortar schools contract COVID-19 and pass the virus to family members? Probably.

Ultimately, if kids go back to brick-and-mortar schools, unless their school has no safety plans in place related to COVID-19, I'm certain kids' experiences in school will not be the same—or even as good—as pre-COVID. Why do I say that? One of my friends teaches kindergarten. When I spoke to her last week (end of July), she told me she worries she won't be able to hug her students. "You have no idea how many of these kids miss their moms, especially at the start of the year," she said. "Hugging them is how I comfort them and I don't know how I'll help them if I can't give them a hug. It's who I am as a teacher." Hugging may not be a huge concern to most, but think about other ways in which learning will be compromised to avoid sharing of manipulatives and other learning tools or to avoid close proximity between students.

Of course, we all want our lives to go back to "normal" and it seems many people are acting as though life already is normal. Maybe I'm the one living in the Twilight Zone because my husband and I are still being as safe as we can without being complete shut-ins (though we're close to that). At this point, I'm disheartened that this virus continues on (and on and on) and parents and educators are forced to choose between sub-par options at the ultimate expense of our youth.

At least I can provide you a calming voice this issue: Julia McFadden, AIA, who writes about returning kids safely to K-12 schools in "Business", page 18, has a comforting writing style and a positive outlook. I admire McFadden who as associate principal with Svigals + Partners also led the engagement process for the new Sandy Hook School in Newtown, Conn. We need more people like McFadden who are offering guidance in their professional capacities to circumvent complex situations.

My best wishes to parents, students, teachers and staff of America's schools for the 2020-21 school year.

Christina Koch

CHRISTINA KOCH
Associate Publisher/Editorial Director
retrofit

➔ follow us



VIEW OUR DIGITAL EDITION FOR INTERACTIVE CONTENT!

Anywhere you see a video player icon, we've embedded a video in our digital edition of this issue. Visit www.retrofitmagazine.com and click on our digital edition in the top right corner. Then, flip to pages 31, 38, 46, 47, 69, 76 and 84 to watch videos that will give you more insight about the stories, products and ads you see in this issue.



Make the Switch with Retrofit.

Lithonia Basic Retrofit (LBR)

With a variety of options and accessories, Relight is simple with LBR. LBR offers switchable CCTs and lumens to give you the flexibility needed to improve lighting quality while saving money and time.

Now, you can achieve a long-lasting solution without compromising a glare-free experience.

relight



Visit www.Lithonia.com/Relight
today to learn more!

Circle No. 10



Ownership

The Garland way for 125 years



CONTRIBUTING WRITERS



Julia McFadden, AIA, is an associate principal with Svigals + Partners. As a thought leader in the design of safe, inspiring and meaningful educational architecture, McFadden shares insight about reopening K-12 schools during a pandemic. Read her cost-effective recommendations in "Business", page 18.



Architects, planners and institutional leaders looking to navigate safely reopening college and university campuses this fall have unique challenges. **Mike Aziz**, AIA, LEED AP, a partner and the director of Urban Design at

Cooper Robertson, and **Alina Ahmad**, a designer at Cooper Robertson with international experience in master planning and higher-education design work, share several considerations that could represent first steps toward long-term campus improvements in "Business", page 22.



Bryan Meyer is project director for McCarthy Building Cos. Inc., which utilizes industry-leading design phase and construction techniques combined with value-add technology to maximize outcomes. Meyer demonstrates McCarthy Building's tactics in our "Cover Story", page 24, which is about the transformation of St. Louis' 1894 Union Station. The former train shed now is a 120,000-square-foot aquarium that offers immersive perspectives of underwater life in the world's rivers, streams and oceans.



The creation of Hotel Julian along Chicago's Michigan Avenue has extended the character of this famous thoroughfare north of Millennium Park. **Howard Hirsch** (left), AIA, ALA, LEED AP, founder and president of Hirsch MPG and

David Genc, AIA, principal of the firm, explain the challenges and opportunities that arose while altering Marshall and Fox's Federal Life Insurance Building of 1911 into a boutique hotel in "Component", page 48.



Serena Losonczy, AIA, LEED AP, is an associate partner at PBDW Architects, focusing her more than 25-year career on designing innovative educational environments, often in historic contexts. **Thomas**

Faust, RA, LEED AP, is a project architect at PBDW Architects who has worked on a broad range of educational and religious institutions. In "Transformation", page 54, the pair write about the conversion of Graham House, an unsuccessful 19th century residential hotel, which now is a vibrant new campus for Saint David's School in New York City.

SCHWEISS

HYDRAULIC & BIFOLD

DOORS

Manufacturing custom designed one-piece hydraulic doors and lift-strap bifold doors ... any application ... any size!

Circle No. 12

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

SCHWEISSDOORS.COM

SAMSUNG

DVM Chiller



Smaller footprint



Bigger hassle

By combining the benefits of chiller and VRF technology, the DVM Chiller from Samsung provides performance, efficiency and incredible space savings. DVM Chiller heats AND cools without the need for a boiler, reducing or even eliminating the need for a mechanical room so you can better utilize that square footage.



Circle No. 13



Product Registration Required
Conditions Apply

HVAC. Built brave.

© 2020 Samsung HVAC

WRITTEN BY JULIA MCFADDEN, AIA

DESIGN SOLUTIONS FOR K-12 EDUCATION

PHOTO: CARL VERNLUND, COURTESY SVIGALS + PARTNERS

Reopening Schools with an Eye toward Community and Innovation

If one needs to find a silver lining in the ongoing pandemic crisis, a big one is the way it has revealed things about our society that we didn't know and crystallized others we suspected to be true. One thing we have learned about our kids is, given the tools and a suitable environment, they can learn quite well from home. Many of them even prefer it. But long-term, there is no replacing the in-person instruction and collaboration that takes place in school buildings, especially for special-education students and those from economically disadvantaged backgrounds.

The primary challenge facing us as we attempt to return to school buildings is that there is no one-size-fits-all solution. Every school building is unique, and so is the community it serves. In this context, the pandemic should inspire innovation. While school boards, administrators and teachers grapple with staggered schedules,

↑ **Hallways in the Riverside Magnet School, East Hartford, Conn., allow for social distancing and active engagement, supporting teaching formats, like Socratic discussions.**

PPE distribution, temperature checks and social-distancing enforcement, building professionals should consider how to retrofit existing K-12 facilities—and rethink designs for new ones.

Our children learn differently than we did at their age, and the student populations are as diverse ever, plus they are digital natives. Our schools need to reflect these paradigm shifts, as well as the given circumstances of a global pandemic and the potential for more of them in the future. Given the costs and projected budget shortfalls, the task seems daunting. But lessons learned from our recent work—and from the experiences of an unexpected switch to supervising distance learning for

many of us and our colleagues—provide a framework for some cost-effective recommendations:

■ **REIMAGINE LEARNING (AND TEACHING).** It's time to move beyond the classroom walls. My colleague Marissa Mead and I have written about adapting to a virtual learning environment, how we learned to create various learning zones both inside and outside our homes, and how our children adapted rapidly. (These articles are listed in "More from McFadden and Mead", page 20.) We need to apply this thinking to the K-12 facility. For example, schools with a robust safety plan can repurpose auditoriums, libraries, cafeterias, gymnasiums and music rooms to afford the room needed for social distancing. These spaces can also provide a haven for students who can't stay at home to work independently. In the warmer

(continues on page 20)

“

**It was really good
to have Graham as a
partner on this project.
Very easy to work with
and great team players.**

”

STEPHEN TORELL, PE, LEED AP
SENIOR PROJECT MANAGER,
PRISM CONSTRUCTION

PROJECT: THE RESIDENCES AT EDISON LOFTS
OWNER: DGP URBAN RENEWAL LLC
ARCHITECT: MINNO & WASKO ARCHITECTS & PLANNERS

HISTORIC REPLICATION WINDOW EXPERTS

Necessity truly is the mother of invention, as Graham discovered in replicating the former Thomas Edison Battery Building's nearly 2,500 windows. The solution required nearly 40 new extrusion dies. But by extensively modifying its rugged S6800 Series window, Graham was able to replicate the original windows' look while also delivering high-end thermal and structural performance. Edison would be proud.

YOUR VISION. OUR EXPERIENCE.™
GRAHAM
ARCHITECTURAL PRODUCTS



↑ Folding glass walls as in the Engineering & Science University Magnet School, West Haven, Conn., can literally open up the learning environment. Schools without such features can institute safety plans that repurpose auditoriums, libraries, cafeterias, gymnasiums and/or music rooms.



PHOTO: ROBERT BENSON, COURTESY SVIGALS + PARTNERS

↑ Exterior views, natural daylight, and other biophilic elements, such as plants and figurative art depicting the natural world, help create a learning environment that is nurturing and welcoming.

months, classes and free-study periods can be conducted outdoors.

■ ORGANIZE FOR FOCUS AND ENGAGEMENT.

There are strategies teachers and administrators can use—reorganizing classroom layouts or even utilizing hallways—to optimize space for in-person attendance while reducing stress and feelings of claustrophobia. One such strategy is to radically reduce clutter, which we have found to improve focus in the virtual setting at home. Another is to tackle certain topics through Socratic discussions in large spaces that allow for social distancing and active engagement. Along these lines, rethinking furniture is timely: bulky desks and casework may now be a relic of the pre-digital, and pre-COVID-19, learning environment. Opening up space and encouraging movement, standing and stretching can contribute to student alertness, engagement and enjoyment.

■ **UTILIZE COLOR.** It is well understood that colors in the learning environment can impact mood and performance. When staff and students return to the school building with concerns over viral transmission on their minds, simple modifications like a reassuring color choice can make a big difference. Adopting principles of Feng Shui, stakeholders can aim for creating a living environment that is calming while simultaneously fostering alertness by adding carefully selected elements for visual stimulation.

■ **BRING STUDENTS INTO THE DECISION-MAKING PROCESS.** When communities are

designed to support all members, they become healthier and more sustainable, and the best way to achieve that is by bringing everyone into the process. Wherever possible, students should have a say in the reimagining of their schools and classrooms, both in appearance and function. As they live and study through seismic change, it's important that schools support their ability to memorialize their experience, perhaps with murals or outdoor projects. Beyond aesthetic and artistic choices, students can benefit greatly from learning about the design, construction and maintenance of their schools in ways that could spur them to consider careers in related fields.

■ **MAKE SCHOOL A SECOND HOME.** When the learning environment is nurturing and welcoming, meeting the social and emotional needs of both students and staff, learning outcomes improve and the community at large reaps the benefits. Combined with views of outdoors and natural daylight, biophilic elements, like plants and figurative art depicting scenes from the natural world, go a long way toward creating an ideal setting. Displays of student projects; wood furniture; and cozy, colorful rugs can provide additional warmth. A space with heart can be a conduit to ideas and innovation. **□**

MORE FROM MCFADDEN AND MEAD

The following articles about education in the era of coronavirus were written by or include comments from Svigals + Partners' Julia McFadden and Marissa Mead:

■ "What I Hope My Kids Are Learning from the 2020 Pandemic" by Marissa Mead, [bit.ly / 3eQ5MyO](https://bit.ly/3eQ5MyO)

■ "When Coronavirus Pivots Education Plans: How to Set up a Homeschooling Space Anywhere" by Amanda Lauren, *Forbes*, [bit.ly / 2CVYWdO](https://bit.ly/2CVYWdO)

■ "7 Ways to Better Prepare Kids for Virtual Learning" by Maressa Brown, *Parents*, [bit.ly / 3fRGGRn](https://bit.ly/3fRGGRn)

120th
ANNIVERSARY
GGI

CELEBRATING 120 YEARS



BRINGING YOUR CREATIVE VISIONS TO LIFE.

From building facades to stunning interiors and public art displays. GGI offers specialty glass solutions, custom fabrication and oversized capabilities designed to enhance the modern built environment. Glass that is functional, decorative and environmentally friendly, combined with precision workmanship and five generations of glass industry expertise.

This is what you can count on from GGI.

Circle No. 15

ALL-GLASS SYSTEMS • DECORATIVE GLASS • FIRE-RATED • SPECIALTY GLASS



800-431-2042



sales@generalglass.com



generalglass.com

SEE WHAT
GLASS
CAN DO
GGI



SAFER SPACES

WRITTEN BY | MIKE AZIZ, AIA, LEED AP, AND ALINA AHMAD

IMAGE: COOPER ROBERTSON

For Campus Reopenings, Architects and Planners Should Look to Reduce Density and Activate the Public Realm

Nationwide, college and university leaders are grappling with questions of how and when to safely reopen in the midst of a global pandemic. In response, many institutions of higher education are turning to architects and planners for guidance through this complicated period—and a number of important trends have already emerged.

One of the most critical considerations is that with the prospect of having far fewer students, faculty and staff on campus this fall, it is ironic but likely that colleges and universities will need more rather than less space to reopen safely. Addressing this reality will require a series of physical changes to the campus, highlighted by a need to reduce density and rapidly transform the public realm, the spaces between buildings. Creative thinking will be essential to transform these learning environments so they can accommodate new public-health protocols without sacrificing the vibrancy of campus life. In fact, this situation presents opportunities, as well as challenges.

With strategic planning and innovative

design solutions, some of these changes could represent a first step toward long-term improvements to models of the campus environment. For architects, planners and institutional leaders looking to navigate these challenges, here are several emerging considerations to keep in mind:

■ **REDUCE CAMPUS DENSITY.** It's likely that as the fall semester begins, college and university leaders will look to populate residence halls with fewer students. This move toward de-densification is already a major trend in student-life departments, and increased efforts to reduce density within campus housing create a clear path for facilitating social distancing.

With finite housing resources, how will colleges and university leaders accommodate this lower density? For one, fewer students wanting to be on campus fulltime will assist in housing de-densification. Strategic partnerships are another option: As an additional measure, for example, George Washington (GW) University in Washington, D.C.—a major university for which Cooper Robertson is in the midst of developing

 Preliminary concepts for open-space improvements at George Washington University, Washington, D.C.

a campus plan—is exploring opportunities to house students who have tested positive for COVID-19, and need to temporarily quarantine, outside of the campus in neighborhood hotels. The hospitality sector has felt significant impacts from pandemic lockdowns, so this temporary situation is seen as a win-win.

On the other hand, Harvard University, Cambridge, Mass., and Georgetown University, Washington, D.C., both universities where Cooper Robertson has recently helped craft long-range master plans, are taking a different approach. They are crafting unique allowances for different classes, with a preference for first-years. Harvard is allowing mainly first-year students and some students in special circumstances back in the fall. In the spring, first years will leave and seniors will return. Second- and third-year students will study virtually from home. Similarly, Georgetown will invite first-years to its D.C. campus and bar most others from living there to protect public

health. (Learn more at nyti.ms/3jtPLSo.)

Staggered on-campus attendance offers another means of reducing density. Similar conversations are taking place in other sectors. As the professional world begins to inch toward reopening, for instance, much of the discussion is centered about how to optimize one's time in the office versus at home. Creative and collaborative work is reserved for the few days of in-office activity while focused efforts are reserved for work-from-home days. Colleges and universities are likely to use a similar model. In this model, students would come to campus for brief, but intensive, face-to-face experiences and then return home to complete the focused work online with their classmates and instructors. Bringing students to campus in successive waves reduces their exposure and allows for greater density control in teaching and social spaces. (Read more about this social-distancing concept at bit.ly/2WHh9Tk.)

■ **TRANSFORM THE PUBLIC REALM.** As the capacity of classrooms, dining halls and social spaces plummets in the face of social-distancing protocols, colleges will also turn to the spaces between buildings—the public realm of their campuses—for much-needed academic and social capacity. The implications for planning and design work are significant. On any campus where there has been a longstanding desire to refresh a plaza, close a street, or upgrade a quad, there will be added incentive to do so and in a way that emphasizes adaptability and flexibility. These outdoor spaces will now serve double or even triple duty as outdoor classrooms, dining centers (long live the food truck!), outdoor living rooms and places to decompress from what is surely to be an emotionally complex start to the school year.

As an example, Cooper Robertson is working on several urban campuses to paint a vision for how these concepts can become a reality. An idea tested last fall for our GW master plan would transform a street at the university's core into a lively and pedestrian-friendly space. Already in the process of exploring "parklets" in place of on-street parking, GW has now requested a temporary closure of parking lanes in that street to accommodate additional space needed to allow adequate social

distancing for pedestrians. The university is looking to rapidly deploy more furnishings to convert the space into a new hub of student activity.

Outdoor learning will also take on a greater role. We're seeing this movement already happening on bucolic campuses nationwide. For example, Amherst College in Massachusetts is planning to set up 20 tents equipped with power and teaching technologies to deliver courses outside. Consistent with the trend to make every space as flexible as possible, the tents at Amherst are being configured to also provide venues for special extracurricular space. (Review Amherst College's plan at bit.ly/2OM96Al.)

Ultimately, every college and university will confront unique challenges during the reopening process, but one thing is clear: The value of maintaining some semblance of on-campus life is a top priority for higher-education leaders and students alike. Three hallmarks of higher education—innovation, collaboration and community—rely on the interpersonal relationships and the social friction that only a tight-knit campus environment can provide. As architects and planners with the ability to shape college and university spaces, we can play a critical role in making these spaces safe in a way that leaves the campus environment better off than before. 



At Longwood University, Farmville, Va., Cooper Robertson is implementing a master plan that includes the phased renovation of two large residence halls with a flexible interior program.



st. cloud
window

Quiet. Safe. Timeless.



Custom Aluminum
Windows & Doors

for commercial buildings
of distinction,
where aesthetics and
advanced performance are
critical considerations.

stcloudwindow.com
800.383.9311

| COVER STORY |

SPLISH SPLASH

AN ICONIC TRAIN STATION IS
REIMAGINED AS AN AQUARIUM

FAST FACT

One-thousand-five-hundred-fifty-two square feet of permanent acrylic panels, weighing 53,000 pounds and ranging in size from 3 by 3 feet to 16 by 18 feet, were installed.



ST. LOUIS AQUARIUM

AT UNION STATION

WRITTEN BY | BRYAN MEYER

Building an aquarium is complicated. But building a spectacular 21st century aquarium inside the footprint of a 19th century train shed designated as a National Historic Landmark adds multiple levels of complexity. Fortunately for McCarthy Building Cos. Inc., which built the 2-story, 120,000-square-foot St. Louis Aquarium at Union Station, construction challenges are its strength.

A signature element of the \$187 million redevelopment is that the aquarium provides visitors with immersive perspectives of underwater life in the world's rivers, streams and oceans, including up-close viewing of more than 13,000 animals, from 257 species, in 44 exhibits. This diverse range of aquatic animals—from freshwater and marine environments—are housed in 1.3 million gallons of water, including a 250,000-gallon shark habitat that serves as the centerpiece attraction.

HISTORY OF ST. LOUIS UNION STATION

Located adjacent to the heart of downtown St. Louis, St. Louis Union Station first opened to the public in 1894 and became one of the world's largest and busiest passenger rail terminals. Designed by Theodore Link, an architect for the 1904 World's Fair, the iconic structure encompasses an 11.5-acre train shed, headhouse and midway.

Union Station closed its doors in 1978 when Amtrak relocated its St. Louis station, but the facility reopened in 1985 following its conversion into a festival marketplace with retail, restaurant and hotel components.

When it was purchased by Lodging Hospitality Management in 2012, St. Louis Union Station was completely transformed again into a family entertainment and tourist destination. Today, in addition to the hotel and aquarium, the complex includes several new restaurants, a ropes course, mirror maze, 200-foot-high observation wheel, carousel and mini-golf course.

RENOVATION GOALS

Retrofitting space that has a national historic designation requires leaving the entire existing infrastructure in place, including protecting and preserving the original columns, footings, foundation, underground piping and other infrastructure.

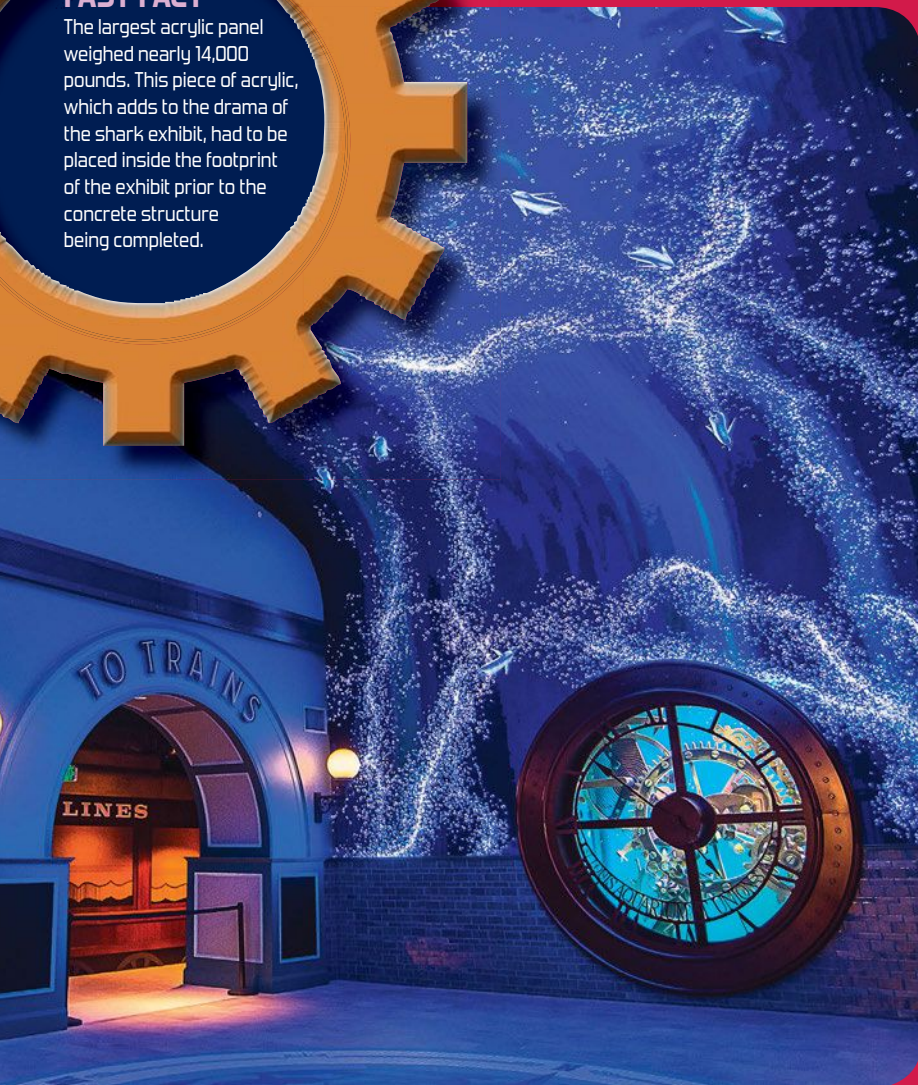
Given these restrictions, builders had to figure out the best way to design and install 17 independent life-support systems to accommodate each of the unique animal species that lives in each exhibit, as well as separate holding tanks, quarantine tanks, piping, ozone and temperature control systems to provide individualized, treated water to each exhibit. In addition, five overhead viewing areas, a switchback tunnel,

FAST FACT

The project created approximately 350 construction jobs with a heavy emphasis on local and disadvantaged businesses, representing the minority and women communities.

FAST FACT

The largest acrylic panel weighed nearly 14,000 pounds. This piece of acrylic, which adds to the drama of the shark exhibit, had to be placed inside the footprint of the exhibit prior to the concrete structure being completed.



RETROFIT TEAM

OWNERS // Lodging Hospitality Management, www.lhmc.com, and zoOceanarium Group, www.zooceanarium.com

GENERAL CONTRACTOR // McCarthy Building Cos. Inc., www.mccarthy.com

ARCHITECT // PGAV Architects, www.pgavarchitects.com

CIVIL CONSTRUCTION // Castle Contracting LLC, www.digcastle.com

MECHANICAL CONTRACTORS // Charles E. Jarrell Contracting Co. Inc., jarrellcontracting.com, and Rock Hill Mechanical Corp., www.rhmc.com

PLUMBING CONTRACTOR // Franklin Mechanical Inc., www.zakcompanies.com

GEOTECHNICAL CONSULTANT // Geotechnology Inc., www.geotechnology.com

BUILDING ENCLOSURE // IWR Building Systems LLC, www.iwrbuildingsystems.com

MASON // John J. Smith Masonry Co., (314) 894-9500

PAINTING // Jos. Ward Painting Co., www.joswardpaintingco.com

LANDSCAPING // Landesign LLC, www.lan-design.net

ELECTRICAL CONTRACTOR // Sachs Electric, www.sachsco.com

CONCRETE CONSTRUCTION // Vee-Jay Cement Contracting Co. Inc., www.veejaycement.com



and deep-water-area panels needed to be built to create an engaging and immersive visitor experience.

CHALLENGES ALONG THE WAY

The most recent set of as-built drawings for the structure dated to the late 1800s, so one of McCarthy's first steps was to laser scan the entire former train shed portion of the facility. Laser scanning enabled team members to accurately assess existing conditions and mitigate future design issues that would potentially delay or complicate the project.

The design and construction team worked together to design, coordinate and install an underground pipeline system encompassing more than 10,000 linear feet of pipe. Custom-built piping assemblies—ranging in size from 2 to 24 inches—service the 17 independent life-support systems, each of which is designed to accommodate the animal species that occupy a specific exhibit. Building Information Modeling (BIM) facilitated the entire process—from model to field layout.

Construction activities also included installation of 1,552 square feet of permanent acrylic panels, ranging in size from 3 by 3 feet to 16 by 18 feet and weighing a total of 53,000 pounds. BIM and laser scanning enabled the team to verify tolerances and embed locations before placing each acrylic



BIM and laser scanning enabled the team to verify tolerances and embed locations before placing each acrylic panel, ensuring precise placement on the first setting and averting the significant installation expense of additional placements.





panel, ensuring precise placement on the first setting and averting the significant installation expense of additional placements.

Other construction challenges involved controlling noise and dust while working in close proximity to an operational 567-room hotel and adjacent restaurants.

SAFETY ONSITE

In addition to routine safety precautions, building an aquarium also required flotation devices, life vests and other life-safety equipment that was staged nearby to protect individuals suspended over water-filled exhibits. Other safety measures included controlling silica dust during the large-scale interior demolition and excavation, ensuring safe access to confined tank spaces and maintaining consistent indoor environmental quality.

Temporary bracing was erected to support the existing structure while individual sections were demolished and replaced with a new self-supporting structure. On the second level, the use of lightweight aerial lifts with outriggers ensured weight remained under loading limits.

A separate safety plan developed for the rockwork/theming contractor emphasized

the safe use of high-VOC products. Installation of above-and-beyond air exchangers helped ventilate workspaces during the application of specialty coatings on tanks and themed features.

Minimal use of gas/propane-powered equipment and the strategic placement of fans ensured exhaust rose above work areas, mitigating carbon-monoxide risk throughout the interior environment. The team also followed meticulous procedures for moving trucks in and out of the site to protect pedestrians in the high-traffic, urban area outside the fence.

TECHNOLOGY TRANSFORMED HISTORICAL ARCHITECTURE

Laser scanning of the entire aquarium footprint within the existing building enabled the team to identify various columns, walls and foundation conditions that did not match as-built drawings so they could be adjusted on the design documents before negatively impacting the project.

McCarthy's subsurface utility mapping group used an electromagnetic locator, Sonde camera and acoustic pipe locator to gain a better understanding of the existing underground infrastructure and proactively address subsurface concerns to mitigate

MATERIALS

CUSTOM FIBERGLASS TANKS // Waterdog Products Inc., www.waterdogproducts.com

CUSTOM CONCRETE TANKS // Concrete waterproofing admixture by Xypex, www.xypex.com, and constructed by McCarthy Building Cos. Inc., www.mccarthy.com

AQUARIUM ACRYLIC WINDOWS // Reynolds Polymer, www.reynoldspolymer.com

AQUARIUM FILTRATION SYSTEMS // Longhorn Organics, longhornorganics.com

ANIMAL CONTAINMENT PANELS // A thru Z Consulting and Distributing, athruzcad.com

ROCKWORK AND CUSTOM-THEMED ELEMENTS // Nassal, nassal.companiesofnassal.com

CUSTOM SIGNAGE // Warren Sign, www.warrensing.com

CUSTOM CURVED LED CEILING/WALL DISPLAY // DesignLED, designedledpro.com

RETAIL FIXTURES // OPTO, optosystem.com

RECLAIMED WOOD WALL PANELING // Lost Coast Paneling by TerraMai, www.terramai.com

CUSTOM ARCHITECTURAL WOODWORK // Gravois Planing Mill, www.gravoisplaningmill.com

PLASTIC LAMINATE // Formica, www.formica.com, and Wilsonart, www.wilsonart.com

ACOUSTICAL CEILING CLOUDS // MDC, www.mdcwall.com; Arktura, arktura.com; and Kirei, kireiusa.com

RESILIENT FLOORING // Assurance II by Mannington, www.manningtoncommercial.com

FLUID-APPLIED FLOORING // Stonhard, www.stonhard.com

CUSTOM FLOOR TILE MURAL // Keystones by Daltile, www.daltile.com/product/keystones

FLOOR TILE // Ragno, www.ragnousa.com; Mirage, www.mirage.it; and Daltile, www.daltile.com

WALL TILE // Ken Mason Tile, www.kenmasontile.com; Mercury Mosaics,

mercurymosaics.com; and Daltile, www.daltile.com

STONE VENEER // Indiana Limestone Co., www.indianalimestonecompany.com

CARPET TILE // Milliken, milliken.com, and Shaw Floors, shawfloors.com

QUARTZ COUNTERTOP // Cambria, www.cambriausa.com

RECYCLED GLASS COUNTERTOP // Geos, www.eos-surfaces.com/geos

WALLCOVERINGS // D.L. Couch, www.memosamples.com

EXTERIOR DECORATIVE CONCRETE PAVING // Exposed Aggregate System by Bomanite, bomanite.com

LIGHT FIXTURES // Spectrum Lighting Inc., www.spedlight.com; Rosco, us.rosco.com; Eaton, www.eaton.com; Sternberg, www.sternberglighting.com; Lumenpulse, www.lumenpulse.com; and USAI Lighting, www.usailighting.com

LIGHTING CONTROLS // ETC, etcconnect.com

project changes and risk. Utility location data collected by an onsite total station was subsequently developed into a BIM deliverable for use in BIM coordination with other trades.

McCarthy's virtual design and construction (VDC) team then worked closely with the company's subsurface utility mapping professionals to model existing underground utilities to accurately coordinate subsurface conditions with other new utilities prior to the installation of new foundations and piers.

Throughout the design and construction phases, early design team collaboration and 3D building systems coordination was key to keeping the project on schedule and helped facilitate owner buy-in of the aquarium's complex MEP/FP systems prior to fabrication and installation, ensuring long-term maintenance and accessibility.

Laser scanning of all acrylic panel installations created 3D models of the frames with thousands of data points that could be compared to the manufacturers' 3D models to detect any physical abnormalities before installation. This process enabled McCarthy's field team to identify—and correct—a minor discrepancy on the aquarium's largest glass panel, which weighs nearly 14,000 pounds, before installation.

The 3D modeling of concrete lift drawings for field coordination with McCarthy's self-perform concrete team saved time and potential rework by combining all information into a streamlined, coordinated set of graphical, easy-to-understand drawings.

CONSTRUCTION QUALITY AND CRAFTSMANSHIP

McCarthy created mockups to authenticate the optimal concrete placement method for the 1,145 cubic yards of aquatic concrete that form the walls of each exhibit habitat. The 4,000 to 5,000 psi specialty concrete included antimicrobial and moisture-mitigating admixtures.

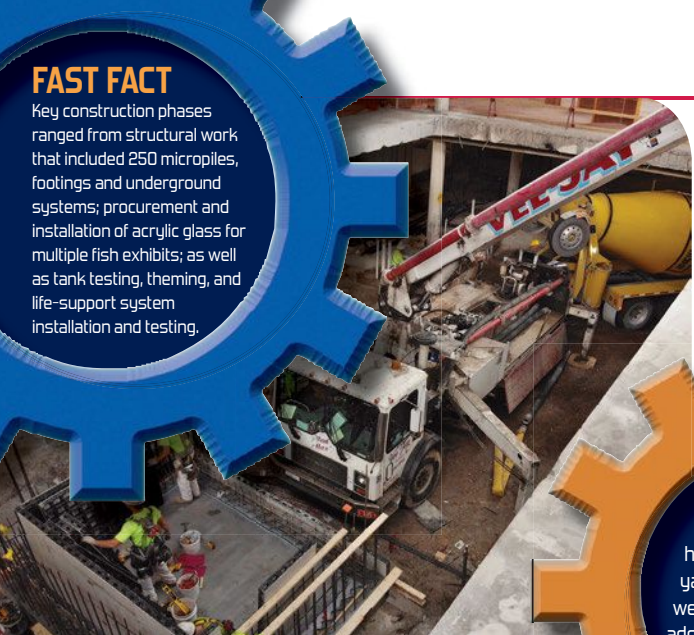
Several building elements, such as the large acrylic viewing windows with thousands of pounds of water pressure behind them, required very precise measurements with virtually no room for error during placement. Through the use of laser scanning and BIM, the construction team pre-coordinated these challenging field installation conditions to ensure that delicate measurements and installations were physically possible



St. Louis Union Station first opened to the public in 1894 and became one of the world's largest and busiest passenger rail terminals. Today, in addition to the hotel and aquarium, the complex includes several new restaurants, a ropes course, mirror maze, 200-foot-high observation wheel, carousel and mini-golf course.

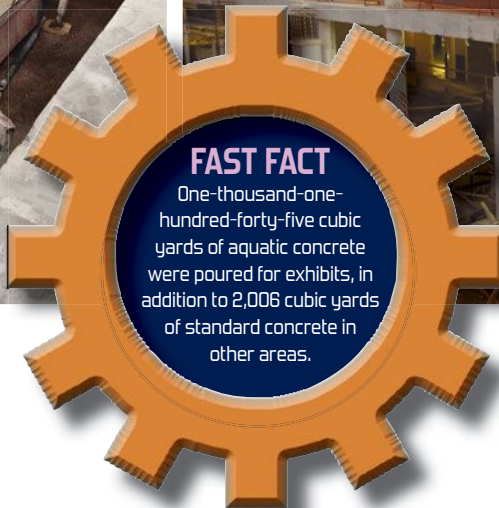
FAST FACT

Key construction phases ranged from structural work that included 250 micropiles, footings and underground systems; procurement and installation of acrylic glass for multiple fish exhibits; as well as tank testing, theming, and life-support system installation and testing.



FAST FACT

One-thousand-one-hundred-forty-five cubic yards of aquatic concrete were poured for exhibits, in addition to 2,006 cubic yards of standard concrete in other areas.



prior to the deployment of expensive cranes and labor onsite.

A sophisticated VDC coordination process drove self-perform concrete placement/lift drawings to ensure field install accuracy and coordination prior to pouring structural elements.

Highly skilled artisan labor constructed the rock work and theming, in addition to the other specialty scopes of work, according to the design by PGAV Architects, a planner and designer of unique destinations for six decades. The firm has designed exhibits at other aquariums nationwide, as well as environments for the grizzly bears, polar bears, and penguins and puffins at the St. Louis Zoo.

UNEXPECTED DISCOVERIES

Historic construction restraints limited access to spaces that would house

pipework—sometimes allowing less than 2 feet of access space. McCarthy successfully coordinated construction in these tight spaces by planning ahead, using compact equipment, and having piping assemblies custom-built for the space and delivered ready to install.

The geotechnical team relied on maps to indicate details associated with the stacked limestone footings and timber pile foundations beneath the original structure, as well as the 50-foot-deep driven concrete piles added in the 1980s to support the redeveloped festival marketplace. To increase loading capacities,

the team reused some of the existing foundations and installed an additional deep foundation micropile system capable of supporting the exhibits, mechanical pump rooms and other back-of-house systems.

A PERSONAL PROJECT

Construction for the St. Louis Aquarium at Union Station began in November 2017 and the project opened Christmas Day 2019. For the McCarthy team, the aquarium was a very personal project. “As a long-time St. Louis-based company, this project has special significance because not only did we build it, but we get to bring our own families to visit the aquarium now that it’s finished,” says John Buescher, Central Region president, McCarthy Building Cos. “There is a unique sense of pride that goes along with that.” 

FAST FACT

Nearly 3 miles of pipe service multiple life-support systems, including public exhibits, each representing a different ecosystem from riverside to oceanside and freshwater to saltwater, as well as back-of-house areas with separate holding and quarantine exhibits.





Power & Lighting All-In-One

Don't power facilities of the future with solutions of the past.

Every facility needs lighting and power—but did you know they don't always have to be separate? Starline's revolutionary overhead Track Busway system combines the flexibility of track lighting with the ability to power other equipment. From commercial office spaces to retail buildings, Starline is compatible with a wide variety of popular lighting fixtures, and eliminates the hassle of wiring devices such as speakers, security cameras, etc. to the ceiling. To see how Starline Track Busway is not your traditional track lighting system, visit StarlinePower.com.

Circle No. 17

Starline®
A brand of **legrand®**





370 JAY STREET, NEW YORK UNIVERSITY | New York

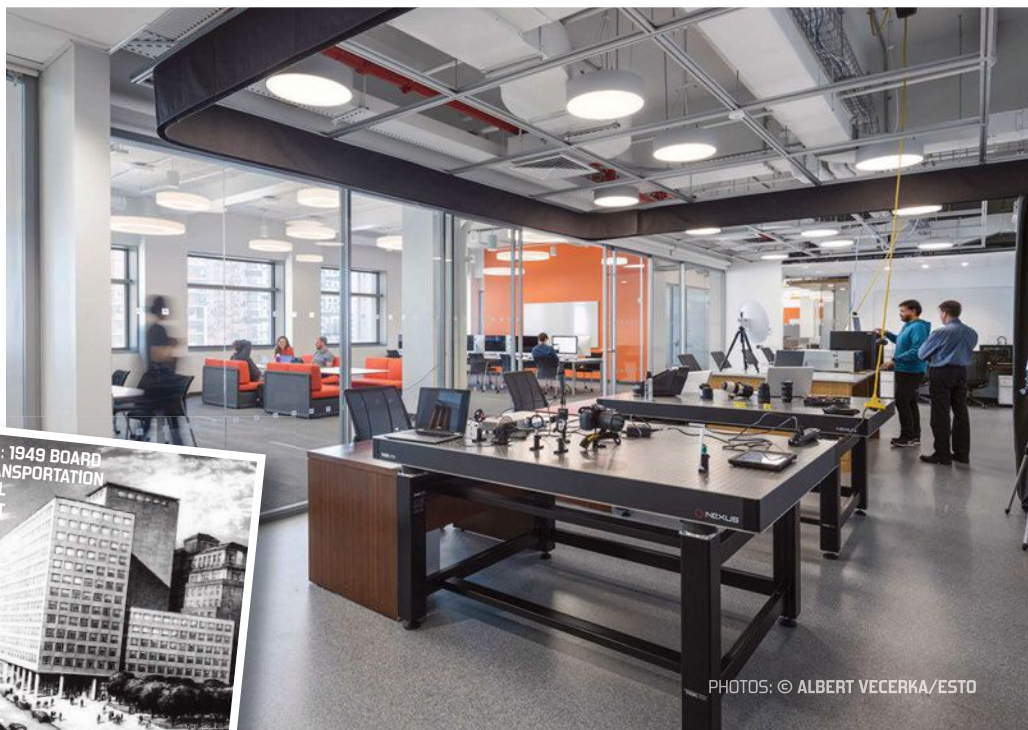
►► RETROFIT TEAM

ARCHITECT: Mitchell Giurgola Architects LLP, www.mitchellgiurgola.com
 CONSTRUCTION MANAGER: Skanska USA, www.usa.skanska.com
 MEP ENGINEER: BR+A Consulting Engineers, brplusa.com
 STRUCTURAL ENGINEER: Silman, silman.com
 LIGHTING: Cline Bettridge Bernstein Lighting Design Inc., cbbld.com
 WORKPLACE DESIGN: Studios Architecture, studios.com

►► MATERIALS

The following is a sampling of materials used in the project:
 ROOFING: Siplast, www.siplast.com
 MODULAR SEDUM CARPET: ZinCo, zinco-greenroof.com
 WINDOWS: Schuco, www.schueco.com
 WOOD CEILINGS: 9Wood, www.9wood.com
 CARPET TILE: Duo + Trio by Interface, www.interface.com
 CERAMIC TILE: Modern Dimensions by Daltile, www.daltile.com
 ACOUSTIC CEILING TILES: ULTIMA and OPTIMA by Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com
 PLASTER: Structolite from USG, www.usg.com
 ACOUSTICAL PLASTER: Acoustement 40 by Pyrok Inc., www.acoustement.com

METAL CEILING: LMD-St213 by Lindner, www.lindner-group.com
 DAYLIGHTING AND LIGHTING CONTROLS: Lutron, www.lutron.com
 MODULAR CONDENSING BOILERS: Benchmark 2500 and 3000 from Aerco, aerco.com
 WASTE-HEAT-RECOVERY BOILER: Cain Industries, www.cainind.com
 THERMAL STORAGE: Calmac, www.calmac.com
 MAGNETIC CHILLERS: Daikin, www.daikinapplied.com/chiller-magnitude-magnetic.php
 IN-ROW SERVER COOLING: Schneider Electric, www.schneider-electric.com
 BUILDING AUTOMATION: Siemens, siemens.com
 COOLING TOWERS: SPX Cooling Technologies, spxcooling.com
 ICE-MAKING CHILLER: Trane, www.trane.com



PHOTOS: © ALBERT VECERKA/ESTO

► THE RETROFIT

370 Jay Street was built in 1948 as the headquarters for the Metropolitan Transit Authority (MTA). It was a spirited expression of the future of Brooklyn with its limestone façades, large windows and innovative massing. However, as time passed, the building fell into disrepair, and MTA had to make do with antiquated systems.

As part of New York City's Applied Science Initiative, the Economic Development Corp. partnered with New York University to transform this significant but virtually abandoned city-owned building into a vital hub for tech innovation. NYU needed a flexible home for leading programs in computer science and engineering, data informatics, gaming, digital media and recorded

music, among others.

The 80-year-old façade was reimagined, re-engineered and reused to create an energy-efficient solution. Extensive daylight analysis revealed the highest amount of annual solar radiation occurs on the southern façade while radiation on the northern end of the eastern façade is relatively low. To address these variances, the depth of each aluminum shade and window recess corresponds to the range of solar radiation, ultimately providing an optimal amount of useful daylight, reducing the risk of glare discomfort and minimizing use of artificial lighting and electricity.

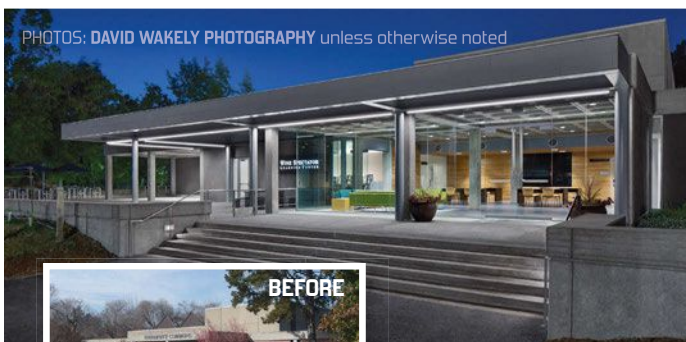
By retaining as much of the existing building as possible, the impact on the environment was minimized: 91 percent of onsite construction waste was diverted from the landfill and the

project is anticipated to achieve a 46 percent reduction in average annual energy costs.

370 Jay Street is one example of how the adaptive reuse of an abandoned mid-century building can contribute to the revitalization of a neighborhood and help nurture the community's academic and technological ambitions for the future. This building also demonstrates how an introverted building can become extroverted. Once totally focused on the internal operations and business of MTA, the building now includes a music performance space, gallery space, retail and restaurants—all at street level. The removal of the sidewalk bridges, the future upgrade of the subway entrances, and the addition of new street-level activity ensure the integration of the building into the fabric of the neighborhood.

WINE SPECTATOR LEARNING CENTER, SONOMA STATE UNIVERSITY |

Rohnert Park, Calif.



» RETROFIT TEAM

ARCHITECT OF RECORD AND INTERIOR DESIGNER: TLCD Architecture, www.tlcd.com
STRUCTURAL ENGINEER: MKM Associates, mkmassociates.com
MECHANICAL ENGINEER: TEP Engineering, tep.net
GENERAL CONTRACTOR: Truebeck Construction, www.truebeck.com
ACOUSTICAL/AV CONSULTANT: Salter, www.cmsalter.com
KITCHEN CONSULTANT: Ballinger Restaurant Design, brequipment.com

» MATERIALS

The following is a sampling of materials used in the project:
TERRA-COTTA WALL PANELS: Cladding Corp., www.claddingcorp.com
HVAC: Trane, www.trane.com
TPO ROOF SYSTEM: Firestone Building Products, www.firestonebpco.com
GLAZING: Vitro Architectural Glass, www.vitroglazings.com
SUSPENDED WOOD GRILLE CEILINGS: Madrid Inc., madridinc.com
CARPET: Interface, www.interface.com
CEILINGS: Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com
COUNTERTOPS: Corian, www.corian.com

» THE RETROFIT

Sonoma State University's Wine Business Institute (WBI) is a globally renowned institution, preparing students for successful careers in the wine industry. The Wine Spectator Learning Center is an education and industry hub designed around advanced-technology classrooms, student commons and gardens, and a collaborative space for faculty and business leaders that supports the executive, professional, and degree programs of WBI, including activities, events and research projects. Multi-point video conferencing and video production with broadcast capabilities enable distance learning with institutions around the world.

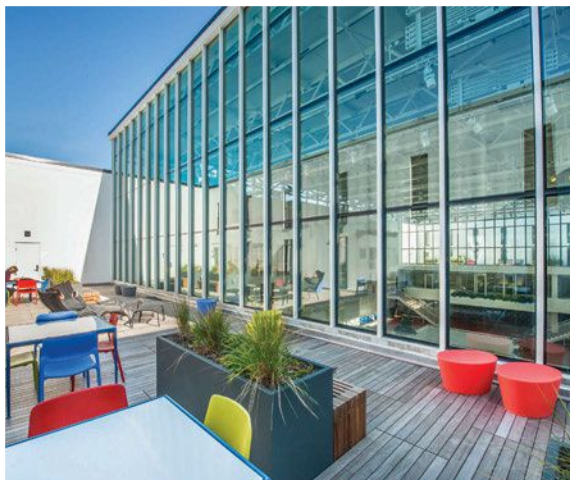
The program, however, had little exposure or presence on the Rohnert Park campus with offices and classrooms tucked away in various buildings. When the Campus Commons (bookstore and cafeteria) was vacated after the construction of a new student center, the 1960s building afforded an opportunity to showcase WBI to the campus, partners in the wine industry and the general public. With intense involvement on the part of WBI faculty and staff, the building transitioned from a dark, internally focused structure to a transparent and welcoming presence on the Campus Green.

WBI hosts a variety of social events at the building, but the generous outdoor terraces were

previously cut off from the interior. The original building was inwardly focused with heavy concrete and brick walls, and the entry points were recessed and dark. The design team's solution included removing large sections of the existing concrete exterior walls while maintaining the structural and seismic performance of the building. Shotcrete was applied to the remaining shear walls, and additional steel bracing allowed full-height concrete and brick walls to be removed at the building perimeter. The main entry was improved by moving the perimeter glazing out one full bay, expanding the lobby and creating a more transparent, visible and inviting entrance with a stronger connection to the terrace.

Providing transparency to the activity within the building and a visual and sensory connection to the campus were crucial objectives of the project. The design achieved this objective by providing new fenestration in strategic locations: at the two main building entrances, which invite visitors into the public zones, and at the building corners, which provide active workspaces. A strong indoor-outdoor connection to the campus extends from the upgraded exterior terraces, which offer views of the lake and gardens to the north and the Campus Green to the south. The iconic pyramidal skylights were retained and glow with light at night, enhancing visibility of the program's many afterhours classes and functions.

HILL COLLEGE HOUSE, UNIVERSITY OF PENNSYLVANIA | Philadelphia



PHOTOS: KNOLL

►► RETROFIT TEAM

ARCHITECT: Mills + Schnoering Architects LLC,
msarchitectsllc.com

INTERIOR DESIGNER: Floss Barber Inc.,
www.flossbarber.com

KNOLL DEALER: CFI, cfi-knoll.com

►► MATERIALS

Designed by Eero Saarinen and built in 1960, Hill College House underwent a 15-month, \$80 million renovation. One of 12 undergraduate residential houses at the university, Hill College House features more public and communal space than any other campus residence. The scope of the renovation included 195,000 square feet, which

encompassed six floors, three private offices, five sets of workstations, seven conference rooms, three lounge spaces and one cafeteria.

Although the architecture continued to foster a strong sense of community, the dated systems, worn finishes and lack of air-conditioning made the building unappealing to prospective residents. Design objectives included strengthening communal living at the heart of Hill College House's original design; respecting the historic materials and details; creating comfortable, welcoming and accessible student accommodations; and attaining LEED Gold certification.

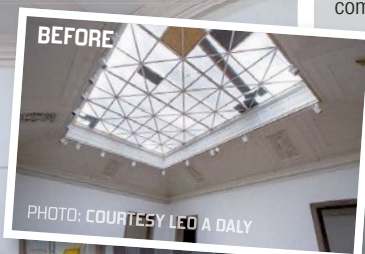
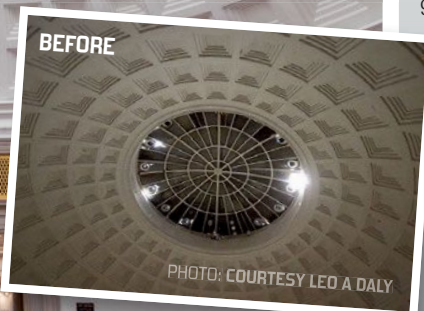
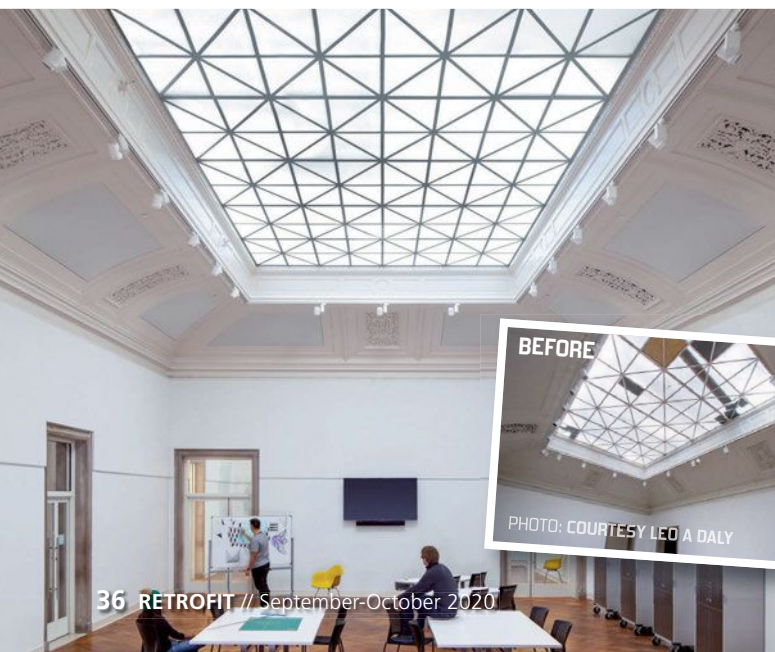
Flooring patterns, finish selections and furniture took cues from mid-century modern

design and details found in Saarinen's other work. For one of the study areas that overlooks the main atrium, the team mixed workstations and Saarinen Executive Swivel chairs with adjacent refuge spaces composed of Saarinen Womb Chairs and Florence Knoll sofas. One level up, there is an outdoor space that feeds light into the building through the large floor-to-ceiling windows. Rather than leave this space empty, the team proposed and installed 1966 Dining Tables with Spark side chairs and Maya Lin Stones. Together these products provide a pop of color and enable students to study or gather outside.

SEATING, TABLES, TEXTILES MANUFACTURER: Knoll, www.knoll.com

PHOTOS: © LEO A DALY,
BY RON BLUNT unless
otherwise noted

CORCORAN SCHOOL OF THE ARTS & DESIGN, GEORGE WASHINGTON UNIVERSITY | Washington, D.C.



» RETROFIT TEAM

ARCHITECT: LEO A DALY, leoadaly.com/about-us/locations/washington-d-c
CONSTRUCTION MANAGER: Whiting-Turner, www.whiting-turner.com

» MATERIALS

LEO A DALY has completed phase-one renovations of the Corcoran School of the Arts & Design, the most significant update of the Beaux-Arts landmark in 90 years. The multi-phased project has been ongoing since May 2016.

The following is a sampling of materials used in the phase-one renovations:

LIGHTING: Alliance Lighting, alliancelighting.us
WINDOW SHADE: Mecho, www.mechoshade.com
ACOUSTIC WALL PANEL: Whisper Walls, whisperwalls.com
ACOUSTIC BAFFLE SYSTEM: Arktura, arktura.com
WALL-PANEL FABRIC: Carnegie, carnegiefabrics.com
CARPET: Shaw Floors, shawfloors.com
ALUMINUM DOORS AND SIDELITES: Oldcastle BuildingEnvelope, obe.com

» THE RETROFIT

The redesign marks a new era for the revered arts institution that was absorbed by George Washington University in 2014. The project preserves an important piece of Washington's architectural and cultural fabric, allowing the Corcoran to continue its legacy as a training ground for fine artists and designers while gaining a platform for engagement within a comprehensive university.

The renovation preserves what is widely considered to be an architectural masterpiece, originally designed by Ernest Flagg, while meeting the needs of 21st century learning. Educational functions that were previously housed in the basement and sub-basement are now elevated with every level, featuring a mix of social, learning and studio spaces.

Designers used a delicate touch in preserving historic interior finishes while transforming many of its functional parameters. The building was placed on the National Register of Historic Places in 1971, and many of its interior spaces were landmarked in 2015, meaning they could not be significantly altered from the original design intent.

To protect the interior finishes, classroom walls are designed to stop short of the ceiling, and their construction is easily reversible with minimal impact. Where needed, acoustic baffles and other acoustical treatments have been added to create an appropriate acoustical environment for education while limiting sound transmission to surrounding areas.

Much of the work is out of sight, or nearly so, to the public. New mechanical and electrical systems are tucked away in the building's courtyard, attic and sub-basement. A new fire-suppression system, required by building code, was surgically crafted to minimize visual impact. Rather than attempt removal of the 120-year-old ornamental plaster ceiling (a costly and potentially damaging prospect), pipes follow the curves of coves and moldings, carefully blending into the architecture. Many plumbing fixtures were added to meet student demand without significantly reducing usable space.

Designers used a combination of laser scanning, ground-penetrating radar, and CCT pipe-camera surveying to create a 3D scan of the walls and their embedded systems. This data was fed into a digital model, creating a detailed picture of nearly every cubic inch of the facility. The team also used hygrothermal wall analysis to forensically analyze the building's envelope for air leakage, moisture ingress and degradation of the building envelope. Then, computational fluid dynamics modeling was used to determine whether mechanical and architectural design solutions would achieve National Gallery of Art criteria.

The information collected was combined into what designers call a "data ecosystem," using Revit. The process captured the intricate ornamentation of the stone work on the exterior and the ornamental plaster and wood paneling of the interiors. As design progressed, the 3D model was updated to reflect improvements. The result is a comprehensive, historically layered picture of the 120-year-old building.



Naturally performing environments

UniQuad®

Translucent Windows

Lighter for the long run

Bright solutions that last

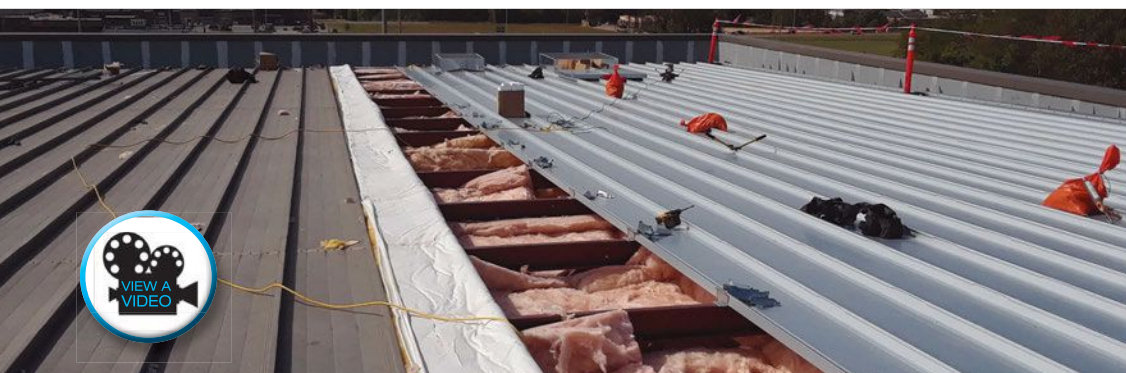
Kingspan Light + Air's modern, energy-efficient UniQuad® Translucent Windows offer the versatility retrofits require. Engineered to seamlessly integrate into any renovation project—reducing installation time and costs—they offer custom sizes up to six feet tall and a variety of glazing options to complement existing installations. Best of all, these modular panels are warrantied to maintain translucence over time, letting in greater full-spectrum light to boost health and productivity for years to come.

For more information visit kingspanlightandair.us or call us at 800.759.6985.



Circle No. 18

©2020 Kingspan Light + Air.
All rights reserved.



PHOTOS: MCELROY METAL

KATHLEEN AND TOM ELAM CENTER, UNIVERSITY OF TENNESSEE AT MARTIN

► RETROFIT TEAM

ARCHITECT: TLM Associates, www.tlmae.com
ROOFING CONTRACTOR: Architectural Paneling LLC, (901) 475-2000

► MATERIALS

The Elam center is the home of intercollegiate athletics and the Department of Health and Human Performance on campus. It houses seven basketball courts with volleyball and badminton options, six racquetball courts, an Olympic-sized swimming pool, interior jogging balcony and aerobics room.

The center's modified bitumen roof had been leaking since its installation 20 years earlier. It had been topped once with sub-purlins and a metal roof system that contained end laps, which were leaking at various areas and required constant maintenance and resealing. The termination/drip edges of the panels were not installed correctly and allowed capillary-action rainwater to infiltrate the building. In addition, the existing insulation did not meet current code requirements, and the cavity underneath the roof was not properly ventilated.

"Our approach, under the guidance of UT Facilities planning, was to specify complete removal and replacement of the entire metal panel system," says Mark Maddox, AIA, of TLM Associates. "Metal was chosen due to its long-term durability and life-cycle cost considerations. We specified a continuous panel, approximately 98-feet long, which required job-site rollforming. It also called for accommodations at the ridge and eave for the proper thermal expansion/contraction of each panel. A special eave/drip edge was extended sufficiently beyond the supporting wall to solve issues along the previous drip edge."

After removing the existing metal roof system, Architectural Paneling replaced the curbs around all the equipment on the roof. The original parapet walls on three sides of the Elam center required work, so Architectural Paneling removed and reinstalled 434 linear feet of parapet wall coping caps.

The 1/2:12 roof runs in one direction, to the back of the building, where 60 linear feet of headwall flashings had to be replaced. As a last

step to preparing the roof for the new panels, 8 inches of unfaced fiberglass insulation was installed between the sub-purlins.

The team erected scaffolding. Then, the rollformer was lifted with a crane to the top where it was bolted to the scaffolding. A crew of 10 to 12 collected the 98-foot-long, 22-gauge Galvalume Plus panels (18-inches wide) as they came off the machine and stacked them on the roof. The crew installed a thermal spacer between the sub-purlins and the 238T roofing panels, which are symmetrical standing-seam panels without male and female seams. Instead, they have matching left and right seams and are joined with a mechanically seamed cap. The panels are non-directional, meaning they can be installed left to right, right to left, or from the center out. Also included with the specification was a Special Total Roofing System warranty with a 20-year no-dollar limit.

EQUIPMENT CURBS MANUFACTURER: LMCurbs, www.lmcubrs.com
238T ROOFING PANELS MANUFACTURER: McElroy Metal, www.mcelroymetal.com



*Metal-Over-Metal
and Metal-Over-Shingles*



THE RECOVER EXPERTS!

**238T METAL-OVER-METAL
RECOVER SYSTEM**

**138T SHINGLE RECOVER
SYSTEM**

Innovative Recover Solutions Featuring:

**138T and 238T Symmetrical Standing Seam Panels
Economical • Easy to Install • Patented
Individual Panel Replaceability • Energy Efficient**

Contact:
info@mcelroymetal.com • www.mcelroymetal.com/recover

Corporate Office:
1500 Hamilton Rd. • Bossier City, LA 71111

JAMES S. MCDONNELL PLANETARIUM

St. Louis

PHOTOS: VERSICO



► RETROFIT TEAM

ROOFING CONTRACTOR: Bade Roofing Co. Inc., www.baderroofing.com

► MATERIALS

Located in Forest Park, a 1,300-acre public park operated by the city of St. Louis, the planetarium opened in 1963 and is free to the public. Its existing roof was saturated and starting to develop leaks, so a total tear-off was required. However, the planetarium houses sensitive equipment that cannot get wet, including a multimillion-dollar projection system that displays on a 360-degree domed screen.

The roof itself is unusual: It's perfectly round, yet slightly bowl-shaped with an interior round penthouse. The unique shape made it difficult to design flashings and terminations. Concrete

step-offs around the perimeter of the building were under the existing roof and, because there were no dimensions on the original plans, creating the tapered insulation layout was challenging.

The facility hosts daily educational presentations for school children, as well as special events and exhibits, so work couldn't take place during business hours. Instead, the roofing crew worked from 5 p.m. until 2 or 3 a.m. each night.

Complications continued because the entire roof is surrounded by 5-foot-tall parapet walls, impeding tear-off and loading of materials. Bade Roofing brought in a crane that could clear the parapet walls to remove the materials that were torn off and load the new materials.

After tear-off, the crew primed the concrete deck with CAV-GRIP 3V and then installed SureMB

120 TG Base Ply/Temporary Roof to ensure the expensive equipment inside the building would be protected throughout the installation process. After that, the crew used Flexible DASH Adhesive to install a base layer of 2-inch SecurShield polyiso, followed by a layer of tapered SecurShield polyiso, also adhered with Flexible DASH. SecurShield polyiso's coated glass facers improve the product's fire and moisture resistance, as well as dimensional stability. Then Flexible DASH was used to install a coverboard, followed by the 90-mil VersiGard EPDM over top of the coverboard. The EPDM, which was installed with G200SA bonding adhesive, offers a 30-year warranty.

PRIMER, TEMPORARY ROOF, POLYISO, ADHESIVE AND EPDM MANUFACTURER: Versico, www.versico.com

THE ARTHUR ROCK CENTER FOR ENTREPRENEURSHIP, HARVARD UNIVERSITY | Boston



PHOTOS: RECOVER GREEN ROOFS

►► RETROFIT TEAM

GREEN ROOF DESIGN-BUILDER: Recover Green Roofs, www.recovergreenroofs.com
ROOFING CONTRACTOR: W.S. Aiken LLC, www.wsaikenroofing.com

►► MATERIALS

The roofing project centered on building two pollinator-friendly green roofs, utilizing previously unused flat-roof space to retain stormwater and protect the underlying structure from solar radiation, which would also moderate the building's temperature in the summer months.

Recover Green Roofs coordinated all roof

elements above Sarnafi's self-adhered G 410 60-mil membrane installed by Sika Sarnafi's elite roofing applicator W.S. Aiken. The 1,600-square-foot upper roof—visible from third-floor office windows, the ground level and surrounding buildings—was transformed into a plant palette and home for two types of small tree species.

Building staff now enjoy taking breaks on the second-floor terrace and watching the bees dance around the roof's new habitat of native flowers. If staff members are patient, they may even catch a glimpse of the roof's resident praying mantis!

ROOF MEMBRANE MANUFACTURER: Sika Sarnafi, usa.sika.com/sarnafi



Ventanas™ w/sound absorbent PET style milk™ ©2019 modulararts, Inc.



Golden™ PANEL ©2019 modulararts, Inc. Photo by Fastlens Photo. @fastlens

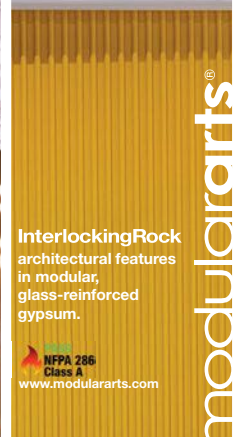


Sepia™ TILE ©2010 modulararts, Inc. Sarah Gallop Design, Vancouver | Photo by Paul Edna Photography



24" t-grid magnetic ceiling tiles for sound control!

AirSense™ ceiling™ Solid Diffuser Ceiling Tiles U.S. Patent # 7,547,231



InterlockingRock architectural features in modular, glass-reinforced gypsum.

NFPA 286 Class A www.modulararts.com

modulararts®

Circle No. 20



PHOTOS: TOM HARRIS ARCHITECTURAL PHOTOGRAPHY



THE MOMENTARY | Bentonville, Ark,

» RETROFIT TEAM

ARCHITECT: Wheeler Kearns Architects, wkarch.com

- Calli Verkamp, AIA, LEED AP, lead project architect
- Brandon Hall, AIA, project architect
- Larry Kearns, FAIA, LEED AP, project principal
- Thomas Boyster, AIA, architect
- Daniel Wicke, AIA, architect

INTERIOR DESIGNER: FODA Design, fodadesign.com

STRUCTURAL ENGINEER: Thornton Tomasetti, www.thorntontomasetti.com

MEP/FP AND IT ENGINEER: McGuire Engineers, www.mepcinc.com

LIGHTING CONSULTANT: Lux Populi, luxpopuli.com

THEATER DESIGNER: Schuler Shook, schulershook.com

ACOUSTIC AND AV DESIGN: Threshold Acoustics LLC, www.thresholdacoustics.com

GENERAL CONTRACTOR AND CONSTRUCTION MANAGER: Flintco, flintco.com

» MATERIALS

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

METAL PANELS: Kingspan, www.kingspan.com

METAL/GLASS CURTAINWALL: YKK AP, www.ykkap.com

GLASS RAINSCREEN: Bendheim, bendheim.com

ROOFING: Carlisle Syntec Systems, www.carlisesyntec.com

GLASS ENTRY: engineered by Linel, www.linel.co; glass by Tristar Glass Inc., www.tristarglass.com; custom frit pattern designed by Addie Roanhorse, www.addieroanhorse.com; and printed by Alice Direct-to-glass Printing by GGI, generalglass.com

LOADING DOCK ADDITIONAL: YKK AP, www.ykkap.com; glass by Viracon, www.viracon.com; custom frit pattern by Addie Roanhorse, www.addieroanhorse.com

GLASS SCRIM: Bendheim, bendheim.com, and custom frit pattern by Addie Roanhorse, www.addieroanhorse.com

TOWER BAR: YKK AP, www.ykkap.com, and glass

by Viracon, www.viracon.com

SKYLIGHT OVER TOWER BAR: Wasco, www.wascoskylights.com

ACOUSTICAL CEILINGS: MARS/MARS High-NRC Logix Acoustical Panels from USG, www.usg.com

SUSPENSION GRID: Fineline DXF from USG, www.usg.com

SOLID SURFACE: Corian, www.corian.com

COUNTERTOP AT TOWER BAR: Neolith, www.neolith.com

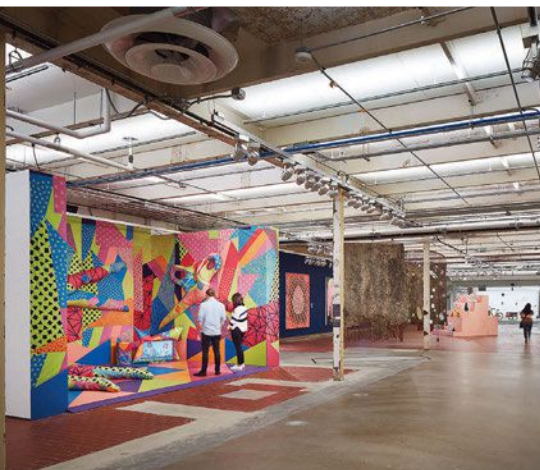
HIGH-PERFORMANCE COATINGS: Tnemec, www.tnemec.com

FLUID-APPLIED FLOORING: Desco Systems, www.descocoatings.com

EXTERIOR LIGHT POLES: ANP Lighting, www.anplighting.com, and KIM Lighting, www.hubbell.com/kimlighting

EXTERIOR AMBIENT LIGHTING: acdc, www.acdcighting.com, and Vista Professional Outdoor Lighting, www.vistapro.com

SCRIM BACKLIGHTING: ColorKinetics, www.colorkinetics.com



► THE RETROFIT

The Momentary, which opened in February 2020, is a contemporary art space satellite to Crystal Bridges Museum of American Art in Bentonville. This adaptive-reuse project within a 63,000-square-foot decommissioned cheese factory is unlike a traditional museum. The focus was on designing a cultural hub with engaging indoor and outdoor areas that would expand experiences in Bentonville and bring artists from around the world to the region.

When approaching the transformation of this building for a new purpose, Wheeler Kearns Architects aimed to keep as much of the existing structure as possible. The team deliberately differentiated the building additions by using contemporary materials, like steel and glass, an open and visible intervention that brings the old and new together in a diverse, but holistic, program. A few highlights of the program include:

- The Galleries are located in the oldest part of the original building, which spans more than 24,000 square feet.
- At 70-feet tall, The Tower is the largest space

in the program allowing for vertical circulation up through multiple pre-existing intermediate mezzanines, which will be used for visual arts, performance and social events. The exterior of the new addition features glass panels.

■ The RØDE House is a multidisciplinary performance space in the old Milk Intake Room, which seats upwards of 350 people. The space can be closed or partially open-air and features an adjustable floor system that allows the room to be reconfigured.

■ Once the enclosure for the plant's massive tank, the Fermentation Hall is a black-box theater. Taking advantage of the natural acoustic isolation with the precast concrete of the existing space, it features high ceilings and a variable acoustic system. It seats more than 100 people in a retractable seating bank.

■ Culinary and beverage offerings include The Breakroom, a social space off the galleries in the former employee lunchroom, and at the top of The Tower is the Tower Bar, which offers panoramic views of Bentonville, as well as a floor skylight looking down into the museum below.

Special Purpose Doors & Windows with Historical Appearance



Acoustical

Blast & Pressure

Bullet & Forced Entry

Tornado & Hurricane

Historical Design with Today's Standards

Krieger can replicate the current historic building design features by maintaining shadow lines, planar qualities, profiles, functional mullions, operating sashes, other details to ensure the new door or window complies with the National Historic Preservation Act.



www.KriegerProducts.com

Circle No. 21

LANCASTER SCIENCE FACTORY

Lancaster, Pa.



►► RETROFIT TEAM

ARCHITECT: Tippetts/Weaver Architects Inc.,
tippettsweaver.com

►► MATERIALS

Housed in a historic cork factory, the science factory recently added a 5,600-square-foot Curiosity Wing (a former mattress showroom) and now features more than 17,000 square feet and 70 exhibits, covering the topics of science, technology, engineering and mathematics.

According to Executive Director Emily Landis, one of the priorities of the expansion and renovation was the improvement of the acoustic environment. "Our existing Hall of Science exhibit space was one large cavernous, 12,000-square-foot, 30-foot-high, exposed-structure space that had plenty of hard surfaces and very little acoustical treatment," she says. "The result was a very loud atmosphere that reduced the quality of the experience for all."

To help reduce noise levels throughout the facility, the Science Factory partnered with Armstrong Ceiling & Wall Solutions and installed four different acoustical treatment options from the company's portfolio to meet the needs of the space.

InvisAcoustics Basics ceiling panels were selected for the existing Hall of Science and the Curiosity Wing. Designed specifically for exposed-structure spaces, the 2- by 4-foot panels maintain the integrity of exposed structure designs while

making the space quieter. Acoustically, the ceiling panels have a Noise Reduction Coefficient (NRC) of 0.75, which means they absorb 75 percent of the sound that strikes them. Black InvisAcoustics panels were chosen for all the Science Factory ceilings because they blended in well with the deck and did not draw attention to themselves.

In the Hall of Science, the panels are attached directly to the webbing of the I-beams in the ceiling. The panels are installed on the south face of each I-beam and additionally on the north face as needed depending on the noise level of the exhibit below. The Curiosity Wing has a much lower exposed deck and no I-beams. As a result, the InvisAcoustics panels were attached directly to the deck to keep the open look and maximize ceiling height. In both cases, the panels provide acoustical absorption while virtually disappearing in the ceiling.

To help absorb sound before it reaches the ceiling, 30 Soundscapes Shapes from Armstrong were installed on two opposite walls of the Hall of Science. All are hexagons, measuring nominal 48 by 48 inches. On one wall, they are installed as individual units. On the opposite wall, they are grouped together to resemble molecular structures. The shapes feature five custom colors taken from the Science Factory logo.

To provide more noise control in the Hall of Science, dozens of SoundScapes Blades from Armstrong were installed. The 2-inch-thick blades

reduce background noise and reverberation time; sound is absorbed on the blades' front, back and sides. The Hall of Science features three ribbons of the vertical acoustical blades.

Onsite acoustical testing validated the acoustical treatments in the Hall of Science. Prior to treatment, reverberation time was 2.6 seconds; following treatment, it was 1.5 seconds.

The Maker Space is a 1,400-square-foot space within the Hall of Science. The space, which is glass-enclosed and totally self-contained, is designed to provide a classroom environment where STEM educators can conduct hands-on workshops. Armstrong CALLA High CAC ceiling panels, which provide a combination of sound absorption and sound blocking in the same panel, were installed. They have an NRC of 0.80 and a Ceiling Attenuation Class (CAC) of 40. The CAC indicates a material's ability to block sound; a CAC of 35 is considered high.

The ceiling panels are black and installed in a DESIGNFlex pattern of intermingled 2- by 2-foot and 2- by 6-foot panels. DESIGNFlex is a ceiling system portfolio that allows architects and designers to mix and match different panel sizes, shapes and colors. In terms of noise control, reverberation calculations inside the Maker Space indicate a reverberation time of 0.7 seconds.

ACOUSTIC CEILING PANELS MANUFACTURER:
Armstrong Ceiling & Wall Solutions,
www.armstrongceilings.com



PHOTOS: ARMSTRONG CEILING & WALL SOLUTIONS



KALWALL®
high performance translucent building systems

Engineering daylight

Today's LEDs may last up to 50,000 hours, but Kalwall will continue harvesting sunlight into museum-quality daylighting™ for a lot longer than that. The fact that it filters out most UV and IR wavelengths, while insulating more like a wall than a window, is just a nice bonus.

FACADES | SKYROOFS® | SKYLIGHTS | CANOPIES

Circle No. 22

schedule a technical consultation at KALWALL.COM



L.F. "TOW" DIEHM ATHLETIC FACILITY, UNIVERSITY OF NEW MEXICO | Albuquerque



PHOTOS: NAVIEN

» RETROFIT TEAM

WATER HEATER INSTALLER: Futures Mechanical, www.futuresmechanical.com

PLUMBING REPRESENTATIVE: RepNet, repnet1.com

» MATERIALS

Named for Tow Diehm, who served as UNM's athletics trainer for 31 years, the athletic facility includes offices, common areas, locker rooms for home and visiting teams, and a weight room, all of which underwent an \$800,000 renovation in 2014.

However, that renovation didn't address ongoing problems with the facility's domestic hot-water system, which provides hot water to all fixtures within the building, including the home and visitor locker-room showers. During the past few years, nonstop pump failures, electrical problems and a leaking hot-water storage tank plagued maintenance crews. Inevitably, these problems surfaced at the worst times, like game day. Hot water was being supplied by two large, atmospheric-volume water heaters with capacities of 490,000 Btuh each.

"When we received a work order to replace the failing system, we evaluated a straight, in-kind replacement with standard-efficiency water heaters. Installing a similar storage tank would've required removing part of the roof. We also looked at tankless-style system options. Energy savings was a big consideration, as was redundancy and serviceability," notes Jesse Hart, facilities engineer for UNM's facilities management department. UNM's facilities team looked at various tankless products and contacted their local Navien representative, Jordan Mahboub. Mahboub and

Hart worked closely with Navien sales engineers to create a design based on the peak hot-water demand at the facility: 82 gallons per minute at 120 F. The university wanted the ability to meet peak demand with one or two units offline.

Once the design was approved, the volume water heaters and storage tank were removed and 18 Navien NPE-240S condensing, tankless water heaters were installed. The NPE-240S is a 199,900 Btuh condensing, wall-hung water heater that features dual stainless-steel heat exchangers, a 10-to-1 turndown ratio and efficiencies up to 0.97 UEF.

Water heaters were installed in two independent systems, one on either side of the mechanical room to serve each locker room. Navien's Ready-Link manifold and rack system was used to simplify the installation and save space. The manifold system provides everything required for a multi-unit installation, including manifolds for water and gas, racks for floor mounting, valves, connections and flex lines. Up to 16 NPE-240 units can be common vented, so only four roof penetrations were needed at the athletic facility.

When the new system was tested, every hot-water fixture in the facility was opened for almost two hours. The units cascaded to meet demand while the systems operated at 60 percent input, according to the facilities team. The entire project took three months during the 2018 summer break and was completed just in time for football season. The facilities department has been so impressed with the units that it has decided to use Navien systems in other locations across campus.

TANKLESS WATER HEATER MANUFACTURER: Navien, www.navieninc.com

Helping Leaders Create Healthy Working Environments for Hard-Working People



As HVAC Specialists, Cambridge Air Solutions has been helping manufacturers and warehouse leaders care for their people for more than 60 years.

We believe providing better HVAC solutions for your environment delivers comfort and improved indoor air quality that increases productivity, enhances recruitment capabilities, and improves retention of the very people committed to the success of your organization — all while reducing your overall energy footprint.

We are dedicated to helping leaders create better working environments for your hard-working people with the primary purpose of "Enriching Lives."



www.cambridgeair.com • 800.899.1989

S-Series HTHV Heaters • M-Series Make-Up Air • ESC-Series Evaporative Cooling

To learn more ► www.cambridgeair.com/enrichinglives

#MEET, #EAT, #SLEEP

WRITTEN BY | HOWARD HIRSCH, AIA, ALA, LEED AP, AND DAVID GENC, AIA

Adaptive Reuse of a 1911 Insurance Building Adds a Modern Boutique Hotel to Michigan Avenue

The Michigan Avenue wall is an iconic part of what makes Chicago such a special place. It is full of beautiful examples of historic architecture, modern interventions and terra-cotta-clad buildings. The Hotel Julian is the renovation, addition and adaptive reuse of one of these iconic structures: Marshall and Fox's Federal Life Insurance Building of 1911, designed by the noted Chicago architect Benjamin Marshall.

This once beautiful terra-cotta-clad structure sat vacant and in major disrepair after a failed redevelopment attempt. Saving it from the wrecking ball; adding five-floors plus a penthouse to the top of the existing structure; and transforming it into the Hotel Julian, a boutique 218-room hotel named after St. Julian, the patron saint of travelers, has helped extend the character of the Michigan Avenue wall north of Millennium Park.

Doing so has helped to preserve a part of Chicago's architectural history and provide activity and a human scale to a stretch of the boulevard south of the Chicago River, that has long been neglected.

Design Concepts

The 12-story steel-frame and clay-arch building was originally designed by Marshall and Fox for a future 4-story addition. Original construction drawings for the building were obtained through the Benjamin Marshall archives located at the University of Texas. Annotative references to the future addition were included in the archive but no graphics could be found. Party-wall agreements for the north and south walls include a statement and table indicating the design capacity of 16 floors plus a roof.

Because there were no images of the building with its future 4-story addition, the final design was left to the imagination of the team. The addition was necessary because the economics of the deal and the ability to successfully develop and run a hotel required a minimum number of keys that could not be provided within the shell of the existing building.

Several different design concepts were considered, including the continuation of the terra-cotta skin on the addition, cladding the addition with a modern glass curtainwall and even recladding the entire building. In the end, the design team decided that extending the terra cotta on the new floors would drastically



Because so much time and effort were spent on the Michigan Avenue façade (left), the original design did not include an ornate terra-cotta façade for the west face of the building (right), but a glazed brick one with ornamental lintels and sills along with a single ornamental cornice at the top, the only element tying the front and back façades together. To address this change in material, the addition facing west was clad in a dark-gray brick instead of curtainwall, relating better to the original glazed brick façade.

« Retrofit Team

DEVELOPER // Oxford Capital Group LLC, www.oxford-capital.com, and Quadrum Global, www.quadrumglobal.com

HOTEL OPERATOR // Oxford Hotels & Resorts LLC, www.ohrllc.com

ARCHITECT // Hirsch MPG LLC, www.hirschmpg.com

- Howard Hirsch, AIA, ALA, LEED AP, principal in charge
- David Genc, AIA, design principal
- Matthew Starman, AIA, project architect

INTERIOR DESIGNER, HOTEL ROOMS/FLOORS // Gettys Group, www.gettys.com

INTERIOR DESIGNER, RESTAURANT, LOBBY, AMENITIES // Workshop/APD, www.workshopapd.com

GENERAL CONTRACTOR // W.E. O'Neil Construction Co., www.weoneil.com

PROJECT MANAGER // Daccord LLC, www.daccordllc.com

STRUCTURAL ENGINEER // TGRWA, www.tgrwa.com

MEP-FP ENGINEER // WMA Consulting Engineers, now Salas O'Brien, www.wmace.com

MASONRY/HISTORIC CONSULTANT // New World Design Ltd., www.nwdarchitects.com

TERRA-COTTA PRESERVATION // Central Building & Preservation L.P., www.centralbldg.com

TERRA-COTTA RESTORATION CONSULTANT // BTL Architects Inc., www.btlarchitects.com

EXTERIOR LIGHTING DESIGNER // Schuler Shook, www.schulershook.com

PERMIT CONSULTANT // Cornerstone Permit Co., www.cornerstonepermit.com

« Materials

TERRA COTTA // Boston Valley Terra Cotta, bostonvalley.com

BRICK // Manganese Ironspot, Velour, Utility, and Orleans Sands, Heritage, Modular, from Endicott Clay Products Co., endicott.com

GRANITE // Black Honed from Quarra Stone Co. LLC, www.quarrastone.com

EAST-ELEVATION CURTAINWALL AND PUNCHED OPENINGS // Alliance Glazing Technologies, allianceglazing.com, and Superwall SSG from Wausau Window and Wall Systems, www.wausauwindow.com

SOUTH- AND WEST-ELEVATION PUNCHED OPENINGS // K300 from Auburn Corp., auburncorp.com

ELEVATORS // Kone (cab retrofit, existing hoist way), www.kone.com, and Cabworks Custom Elevators (interior), www.cabworks.com

MILLWORK // Vantage Architectural Solutions, govantage.us

50 RETROFIT // September-October 2020

change the proportions of the existing building.

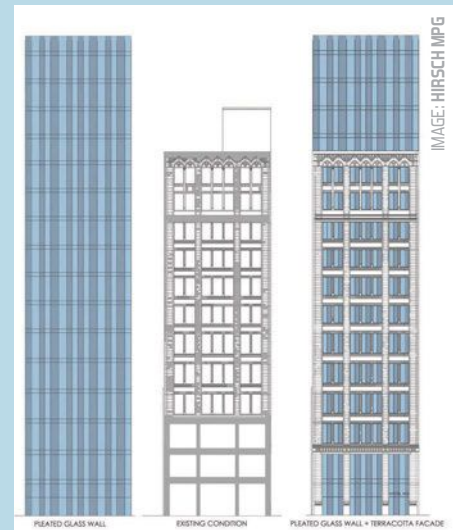
Working with the building's existing façade and adding a new, modern and different glass curtainwall on top would be more reverential to the original design and something, we believe, Benjamin Marshall would have advocated. The final design clads the addition in a faceted, chamfered glass curtainwall and extends it down through the framework of the original terra-cotta-clad façade in the form of faceted glass windows within the original punched openings, perfectly aligned with the curtainwall above. The design of the curtainwall and the new punched windows was inspired by the chamfered ends of the building's restored terra-cotta colonettes. These angular planes of glass, which ultimately connect through the entire façade from the third floor to beyond the roof, formally integrate the new with the old.

A detailed review and analysis of the existing terra cotta was performed onsite to determine which pieces could remain, which could be repaired in place, which needed to be removed and repaired, and which needed to be replaced. The original drawings were invaluable in developing the details and process for the repair and replacement program. In the end, the new and repaired terra cotta blends seamlessly with the existing, restoring that portion of the façade to what it must have looked like in 1911.

Creative Solutions

When the project team started on the design in 2016, the existing structure was in bad shape because of the partial demolition performed by a previous developer. Thirty to 40 percent of the terra cotta was missing or damaged, including on the first three floors, which had been removed during a mid-century modern renovation done in the 1960s. Large holes had been cut into the clay-tile-arch floor structures. The roof was leaking, windows were missing and wet construction debris was piled in the basement.

From this starting point, figuring out how to insert new vertical transportation elements within the compromised existing structure, reinforce the existing



The final design clads the addition in a faceted, chamfered glass curtainwall and extends it down through the framework of the original terra-cotta-clad façade in the form of faceted glass windows within the original punched openings, perfectly aligned with the curtainwall above. The design of the curtainwall and the new punched windows was inspired by the chamfered ends of the building's restored terra-cotta colonettes.

structural elements and then add five floors on top of it—all within a very limited footprint—required detailed coordination between the contractor, architect and engineers. A thorough review of the existing drawings, extensive field observations of the existing conditions and a detailed structural analysis revealed that the existing structure was indeed able to support the weight of the originally proposed 4-story addition.

In fact, by switching to lighter composite construction, a fifth floor could be added, and the existing structure was able to accept the imposed gravity loads. However, the original design did not account for the increased lateral load imposed by the addition. A hybrid lateral system consisting of new steel-braced frames running continuously through the building as part of a new elevator core was combined with new steel knee braces at existing columns and beam connections to solve this issue.

Once the structural design requirements that would allow for the addition were determined, creative construction techniques were needed because of the small footprint that would not allow for a tower crane and provided very limited staging areas. The site is surrounded on

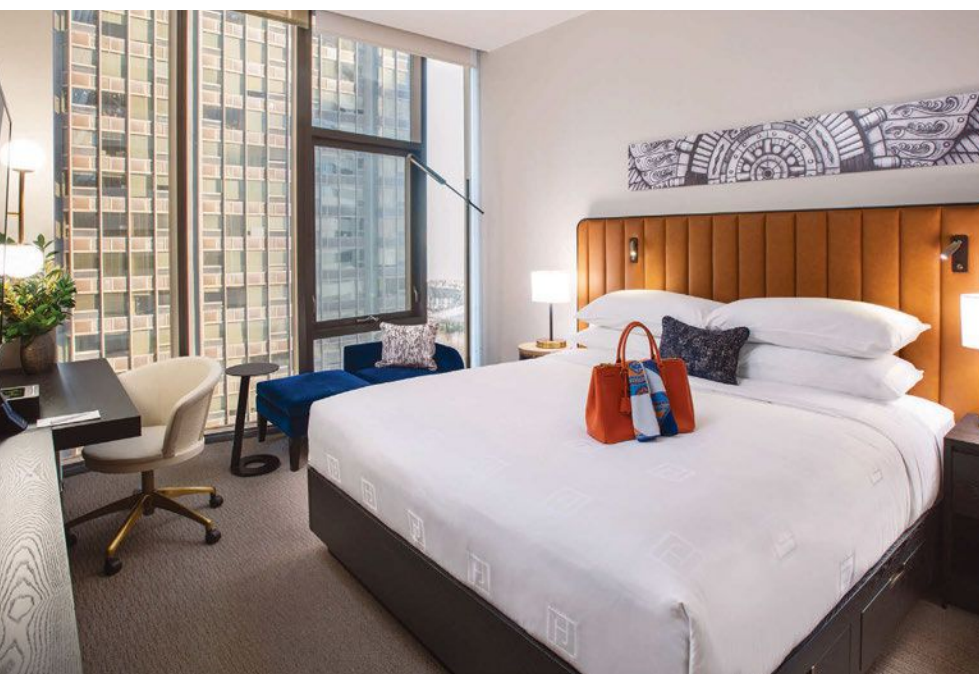


Graphics extend throughout the building from the entrance to the elevator doors, stairwells and even the toilet rooms. The restaurant dining space (above) is overlooked by a mural of Benjamin Marshall, the architect who originally designed the building.



PHOTOS: DANIEL KELLEGHAN





The Front Door

The original building design had a 3-story base that always seemed too tall for the building. The design program called for a 2-story restaurant and lobby along Michigan Avenue. Because none of the original terra cotta remained on the first three floors, the design team chose to switch to a 2-story base, relocating an ornate terra-cotta cornice down one floor and infilling above to match the upper floors. Defined by three new terra-cotta portals, which frame a folding glass wall that opens up the restaurant and lobby to the street, the base responds to the existing design while providing a more pedestrian scale to the sidewalk along Michigan Avenue and creating a new “living room” for the neighborhood.

Although technically an “infill” building, access to Michigan Avenue for hotel guest drop-off and pick-up was not allowed, requiring Garland Court, technically a street but appearing more like an alley, to act in that capacity. This dual entrance program required careful attention to how the back-of-house elements could coexist with the building’s west entrance, the first impression for guests arriving by car, taxi or rideshare.

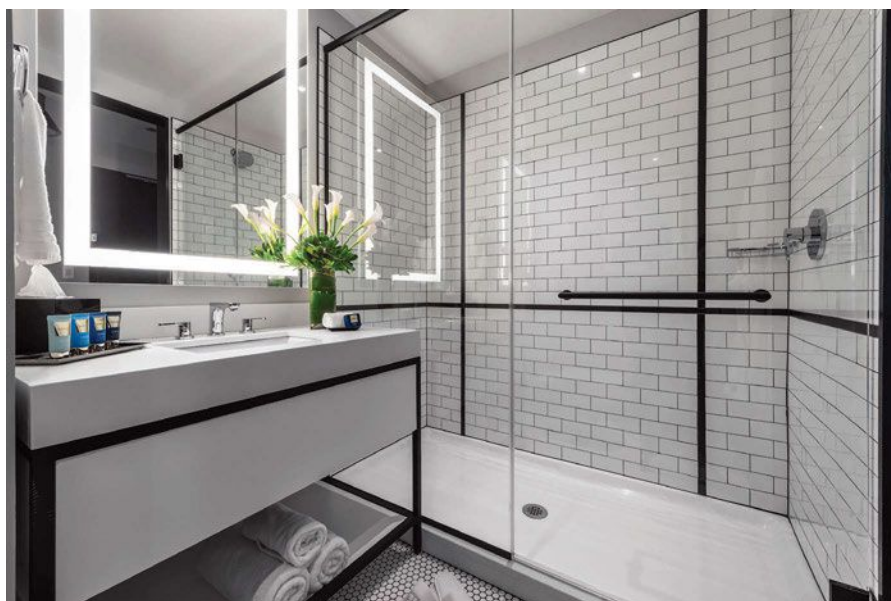
Much time and effort, in both the original design and renovation, were spent on the Michigan Avenue façade, which is not only the front door to the building, but in a sense, a front door for the city. Because of that, the original design did not include an ornate terra-cotta façade for the west face of the building, but a glazed brick one with ornamental lintels and sills along with a single ornamental cornice at the top, the only element tying the front and back façades together. To address this change in material, the addition facing west was clad in a dark-gray brick instead of curtainwall, relating better to the original glazed brick façade.

Modern Interiors

The interior design of the building is modern, chic and playful, appropriate for a boutique hotel in this prime location, though the design still nods to the building’s historic past. Upon entering the hotel, one is greeted by a wall graphic that states, “#Meet with me, #Eat with me, #Sleep with me @ The Julian”.

The rooms are clean and contemporary with traditional details, like subway tile and black metal.

The lobby and restaurant, About Last Knife,



The rooms are clean and contemporary with traditional details, like subway tile and black metal.

two sides by existing buildings and the other two sides by streets (Garland Court and Michigan Avenue) that could not be obstructed.

The general contractor and design team worked together to reinforce the existing structure to support mobile cranes on the highest constructed floor to erect the floor above. Then the crane was raised to continue construction upward. Additional reinforcing was required when, after the original roof was removed, it was determined that the existing columns were not completely vertical, causing imposed eccentric loading that needed to be rectified before the addition could be built.

a modern take on a Chicago steakhouse, expose elements of the existing structure, like exterior masonry walls and rivetted-steel columns and beams, and meld them with a playful aesthetic of movable screens, wood and graphics.

The restaurant dining space is overlooked by a mural of Benjamin Marshall himself and features a large central bar with steel detailing. A series of movable walls, shelves and screens, allow the lobby and restaurant to open to each other, making the small footprint feel larger and providing for flexibility in how the spaces can be used. Graphics extend throughout the building from the entrance to the elevator doors, stairwells and even the toilet rooms.

The Hotel Julian project allowed a beautiful but deteriorated Benjamin Marshall building to be saved and transformed into a truly unique addition to the Chicago skyline and Michigan Avenue streetscape. The quality of the design and construction of this adaptive reuse has been transformative to the building and city, continuing



PHOTO: HIRSCH MPG



PHOTO: TORMA

the revitalization of this once neglected stretch of Michigan Avenue.

From design, engineering and construction viewpoints, there were many obstacles overcome and creative solutions implemented. Completed in 2018, the modern design is fully integrated into the old, creating something better than could have been achieved by tearing down or renovating the existing structure on its own. 

When the project team started on the design in 2016, the existing structure was in bad shape because of the partial demolition performed by a previous developer. Large holes had been cut into the clay-tile-arch floor structures. The roof was leaking, windows were missing and wet construction debris was piled in the basement.

Let our customers tell our story

We could tell you about the numerous benefits of Aquatherm large diameter pipe for mechanical applications: lightweight, durable, and long-lasting, plus so much more...

Circle No. 24

But you'd probably rather hear about Aquatherm from satisfied customers, right?

Visit www.aquatherm.com/casestudies



aquatherm

we've got a pipe for that

HOME | SCHOOL

Saint David's School Educates 400 Boys in a 19th Century Residential Hotel in New York City

WRITTEN BY | SERENA LOSONCZY, AIA, LEED AP, AND THOMAS FAUST, RA, LEED AP



■ Retrofit Team

PROJECT AND RESTORATION ARCHITECT //
PBDW Architects, www.pbdw.com

STRUCTURAL ENGINEER // Murray Engineering
P.C., www.murray-engineering.com

MEP ENGINEER // Skyline Engineering,
www.skylinenyc.net

LIGHTING DESIGNER // Melanie Freundlich
Lighting Design, www.mfldesign.com

CODE CONSULTANT/EXPEDITER // William
Vitacco Associates Ltd., www.vitacco.com

ACOUSTIC CONSULTANT // Longman Lindsey
Acoustical Engineers, www.longmanlindsey.com

THEATER CONSULTANT // P&PFC Inc.,
www.ppfconsulting.net

GEOTECHNICAL ENGINEER // GTA,
www.gtaeng.com

FAÇADE CONSULTANT // Forst Consulting and
Architecture PLLC, www.forstca.com

ELEVATOR CONSULTANT // Iros Elevator Design
Services LLC, www.iroselevator.com

FOOD SERVICE CONSULTANT // Romano
Gatland, www.romanogatland.com

SIGNAGE // Piscatello Design Centre,
www.piscatello.com

AV CONSULTANT // TM Technology Partners
Inc., www.tmttechpartners.com

MILLWORK // Courtney Wood Products Inc.,
(610) 393-3794

OWNER'S REPRESENTATIVE // Zubatkin,
www.zubatkin.com

CONSTRUCTION MANAGER // Hudson Meridian
Construction Group, www.hudsonmeridian.com

**ORNAMENTAL STONE
CARVINGS** on the street
façades of Graham House.

Anchoring a busy residential corner on Madison Avenue in Manhattan's Carnegie Hill Historic District, the distinctive Graham House, once an unsuccessful 19th century residential hotel, has been transformed by PBDW Architects into a vibrant new campus for Saint David's School's 400 elementary and middle-school boys. Following an eight-year-long adaptive-reuse process, the long-neglected edifice is filled with the sound of happy, young voices and renewed purpose while its beautifully restored exterior enlivens the surrounding neighborhood.



PHOTO: PBDW ARCHITECTS

■ Materials

GEL-BASED TRANSLUCENT SKYLIGHT

GLAZING // Solera by Advanced Glazings Ltd., www.advancedglazings.com

CARBON-SEQUESTERING CONCRETE

MASONRY UNITS // CarbonCure, www.carboncure.com

PRE-FAB ACOUSTICAL ROOMS AND DOORS //

IAC Acoustics, www.iacacoustics.com

ACOUSTICAL WALL PANELS IN

PERFORMANCE SPACE // RPG Acoustical Systems, www.rpgacoustic.com

ACOUSTICAL CEILING PANELS IN

PERFORMANCE SPACE // Claro by Decoustics, www.decoustics.com

OPERABLE GLASS PARTITIONS //

NanaWall, www.nanawall.com

BULLET-RESISTANT GLASS //

School Guard Glass, www.schoolguardglass.com

CUSTOM RESTORATION WINDOWS //

Skyline Restoration, www.skylinere Restoration.com

FIRE-RATED GLASS //

Technical Glass Products, www.fireglass.com

EXTERIOR CURTAINWALL ASSEMBLIES //

YKK AP, www.ykkap.com

BRICK //

Glen-Gery, www.glengery.com

WATERPROOFING AND ROOF //

Blueskin from Henry, www.henryblueskin.com

VIBRATION ISOLATION FLOOR SYSTEMS //

Mason Industries, www.mason-ind.com

VCT //

Johnsonite by Tarkett, commercial.tarkett.com

CARPET //

Bentley, www.bentleymills.com

WOOD FLOORING //

Plyboo, www.plyboo.com

TERRAZZO TILE //

Wausau Tile, www.wausautile.com

GYM EQUIPMENT //

Draper, www.draperinc.com

RUBBER SPORTS FLOOR //

Ecore, www.ecoreathletic.com

PAINT //

Benjamin Moore, www.benjaminmoore.com

CLASSROOM PENDANT LINEAR LIGHTS //

Verve IV by Focal Point, www.focalpointlights.com

CORRIDOR SURFACE-MOUNTED LIGHTS //

Omnia by Inter-Lux, www.inter-lux.com

The **TERRAZZO FLOOR PATTERN** in the lobby blends classical and contemporary styles.



Above and middle top: The new STEAM wing puts science and art classrooms in close proximity to informal collaborative workspaces.



The Lower School Library features a story-time area near the fireplace and window seats.



Paired homerooms are connected by a shared common area.

History Lesson

The Graham Hotel and Apartments, as it was originally called, was designed in 1891 by architect and builder Thomas Graham as a 7-story Romanesque Revival-style residential hotel, the first such hotel east of Central Park. The L-shaped building, with its impressive limestone base, iron spot Roman brick in rich golden hues and exuberant 2-story carved entryway, had 150 windows, an unprecedented number for its time.

Unfortunately, it never met with much success as a hotel, possibly because of its then-remote uptown location. After passing through numerous owners, the hotel was converted entirely into apartments in 1922. Fire escapes were added, the elegant interior finishes were removed, and the corner dining room was converted into a grocery store. During the '20s and '30s, the building was stripped of the decorative band courses that wrapped around its fourth and sixth stories and the large copper lamps that flanked the entryway, all of which were most likely sold for scrap.

In 1951, Saint David's School opened on an adjacent lot with modest beginnings in one of a trio of Delano & Aldrich-designed neo-Federal-style townhouses. Founded with just one teacher and four students, the school steadily grew to occupy all three contiguous residences. In the 1970s, the school acquired the neighboring Graham House, incrementally renovating and converting one-third of the building into academic spaces as tenants moved out. By 1995, a separate building on 94th Street housed the school's gymnasiums, an arrangement that required students to be bussed between the two campuses in a process that extended the school day to 4 p.m.

In 2010, looking to consolidate the separate academic and athletic campuses, as well as meet the evolving needs of the school's curriculum, Saint David's School commissioned PBDW Architects to reconfigure the entirety of Graham House and renovate the existing townhouses. The placement of the regulation-sized middle school gym within the L-shape footprint of

Graham House largely dictated the floor plan. Although the elegant façade suggested a monolithic building, Graham House actually was composed of three discrete sections separated by bearing walls and a light shaft. This configuration, along with the need to comply with current fire codes, necessitated demolition of the utilitarian rear of the apartment building and creation of an entirely new structure behind its historic street façades.

Even though the addition is set back behind a row of townhouses on Madison Avenue and its street presence is secondary, approval of the proposed design entailed three public hearings by the New York Landmarks Preservation Commission and numerous meetings with the community. The contemporary addition seamlessly integrates the exuberant architecture of the adaptively reused north wing of Graham House with the more restrained expression of the Delano & Aldrich wing and simultaneously conveys a fresh institutional presence for the school. On the roof, a pair of skylights runs the entire length of the new

AFTER

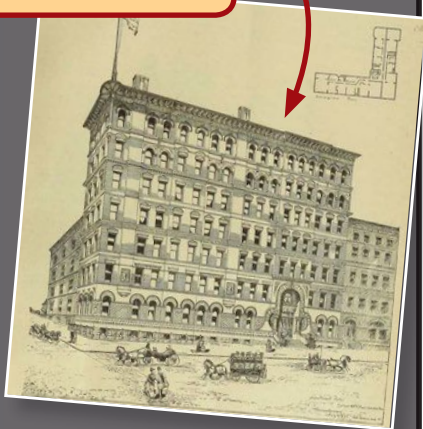


BEFORE



BEFORE PHOTOS: JON WALLEN

Original architect and builder
Thomas Graham's 1891
RENDERING as it appeared
in the *Real Estate Record
and Builders' Guide*.



gym and a new penthouse fitness center above the historic building's impressive cornice provides much-needed fitness space for the students. The design was also informed by feedback from the local community. For example, the penthouse was lowered and translucent glazing was used to afford privacy for adjacent apartments. In response to neighbors' concerns about light emitting from the gym skylights after dark, gel-based translucent glazing (which also reduces heat gain) was used to diffuse light and limit its transmission. The new structure's exterior walls were built with concrete masonry units that use technology to trap liquid carbon from industrial effluent in the concrete and chemically bind it into the concrete, preventing tons of CO₂ from polluting the atmosphere.

Surprisingly, few images exist of the historic façades pre-1922. In approaching the restoration of the historic exterior, PBDW Architects used Thomas Graham's original 1891 rendering in the *Real Estate Record and Builders' Guide* as a template to focus design efforts. The exuberance of

the main entryway, diminished by years of neglect, was restored by rebuilding the limestone stoop and exterior wood doors. In addition, the unsightly fire escapes that obscured the façade were removed and a missing section of cornice was recreated. Masonry cracks were repaired with hand-selected Roman bricks, and the long-lost frieze bands were replaced with fiberglass-reinforced plastic reinterpretations, creating a rejuvenated street presence. Replacing 150 windows with energy-efficient aluminum insulated low-e units created a tighter building envelope, reducing heat loss.

Test Time

Construction took place over three and a half years. Maintaining the stability of the historic 7-story masonry façade while everything behind it was demolished required a complicated sequencing plan that dictated the schedule and influenced the building's structural design. Only two alternating floors could be demolished at a time, and new steel and concrete had to



RENDERING: HYPERTEXTURE

be installed before repeating the sequence on the next two floors. Because the school continued to occupy the campus during construction, new building phases required an imaginative reorganization of available space each summer; at the extreme, the school had to compress its activities into an area that was two-thirds of its full size.

Inside, the adaptive reuse posed more challenges, especially in the horizontal circulation between the 7-story Graham House and the 6-story Delano & Aldrich townhouses. Above the third floor, floor levels lined up almost perfectly. However, significant level differences between the lower floors were reconciled by PBDW Architects via a dramatic open stair that interconnects the old and new buildings and provides unexpected vistas across a series of carefully scaled overlapping spaces. Leading up to a 300-seat performance space and libraries, the stair is the focal point of the new lobby and unifies the more public areas of the campus vertically and horizontally, symbolizing the new

heart of the school and helping to foster a sense of community.

To ensure desirable adjacencies, classrooms were strategically redistributed. Paired homerooms are connected by a shared common area and the new STEAM wing puts science and art classrooms in close proximity to informal collaborative workspaces. Warmly furnished Upper and Lower School libraries share a mezzanine level and are lined with cozy window seats, where boys can curl up with a book and dream. Open views between different program spaces allow for cross-disciplinary connections and observation of other students and activities.

Given the location of the historic street entrance in relation to the gym above, the new elevators and egress stair were consigned to a far corner of the half-block campus. To mitigate the resulting long travel paths, corridors were widened, offset, and punctuated with seating nooks and common areas. The multitude of existing windows provide abundant natural light and views to the surrounding urban



As part of the renovation, the unsightly fire escapes that obscured the façade were removed and a missing section of cornice was recreated.

>> SURPRISINGLY, FEW IMAGES EXIST OF THE HISTORIC FAÇADES PRE-1922.



A dramatic open stair interconnects the old and newer buildings and provides unexpected vistas across a series of carefully scaled overlapping spaces, including the Upper School Library (shown here).

context. Memorable elements of the buildings, such as stained-glass window panels, chandeliers, and decorative millwork, were salvaged and reused. An intricate Graham House floor mosaic was painstakingly reconstructed in the new lobby.

Fulfilling Its Mission

Although the transformation of the physical campus was unprecedented, the intimate, residential character of the foundational building was maintained throughout as a reflection of the school's

defining culture. The completed project has transformed the entire student and faculty experience. Collaborative learning is the norm. An added dining room has reduced lunch from three periods to two, resulting in greater flexibility for scheduling classes.

ZIPWALL®

DUST BARRIER SYSTEM

800-718-2255

**Start every job
with ZipWall®.**

- Install in just a few minutes
- Up to 20' high
- No ladders, no tape, no damage

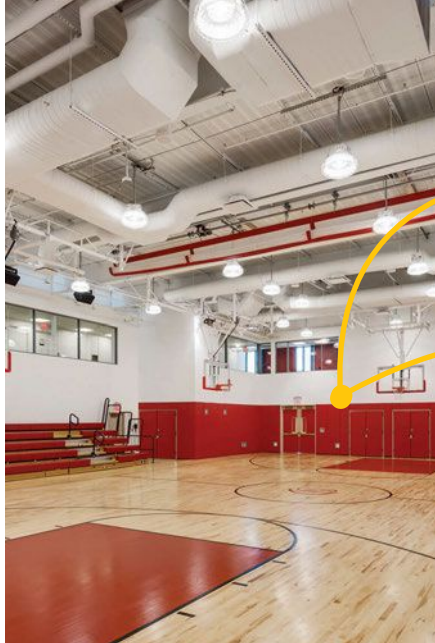
See how easy it is at
zipwall.com.



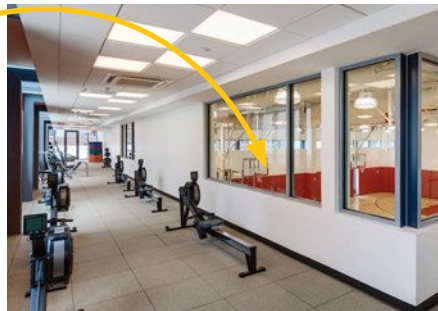
Circle No. 25



The entire school is able to gather in the new performance space for celebrations.



Relocation of the athletic facility to this centralized campus has shortened the school day because children are no longer bussed to another site for gym activities. The penthouse Fitness Center wraps around the gym.



Relocation of the athletic facility to this centralized campus has allowed the school day to be shortened by half an hour. Inter-connectedness and open views across old and new provide students with a unique physical, as well as intellectual, perspective.

The entire school is able to gather in the new performance space for celebrations.

The new building and renovation have created a bright, warm and welcoming environment in the school that is critically conducive to learning. Saint David's

School has realized its 40-year dream of a single campus, enabling the school to fulfill its educational mission and, for the first time in its long history, Graham House is occupied by an institution dedicated to preserving its character. [\[i\]](#)

CREATING ENVIRONMENTS WHERE PEOPLE CAN SHINE™

RETROFIT READY

SKYLIGHTS, CANOPIES & TRANSLUCENT WALL SYSTEMS

From pre-assembled systems that can be on-site quickly to more complex custom designs, we have a daylighting solution that's right for your next project.

MAJOR INDUSTRIES

SKYLIGHTS / CANOPIES / WALL SYSTEMS
MAJORSKYLIGHTS.COM
 888-759-2678
 Circle No. 26

| TRANSFORMATION |

LESS SCREEN TIME, MORE TREE TIME

WRITTEN BY | CHRISTINA KOCH



PHOTOS: 1440 MULTIVERSITY unless otherwise noted



1440 Multiversity Teaches Personal Development on a Repurposed University Campus

In a world that seems more chaotic than ever before, we could all use some time to relax, self-reflect and heal. And what better location for pure self-discovery than among the beautiful redwoods, majestic trees that have endured countless environmental cycles during their 20-million-year existence.

1440 Multiversity—named for the number of minutes in a day—is a Bay Area retreat, tucked in the mountains between San Jose and Santa Cruz and surrounded by a forest of ancient redwood trees. The retreat was established by Scott Kriens, a former Silicon Valley executive, and his wife Joanie Kriens. It offers various workshops related to personal growth, health and wellness, professional development, and belonging and unity. It attracts faculty from diverse backgrounds, including artists, athletes, health experts and business leaders, who guide participants on journeys of self-exploration and discovery.

The Krienses created 1440 Multiversity on the abandoned campus of Bethany University in Scotts Valley, Calif. They had a vision for a “nurturing physical location where people of all walks of life could come together in community—to explore, learn, reflect, connect and re-energize.” However, they had trouble finding an architect who could create their vision within a cluster of uninspired 1950s and ’70s block buildings. Representatives from the Krienses’ general contractor, South Bay Construction, introduced the couple to an architect with whom South Bay had a long working relationship: Jerry Yates, owner of Yates Architecture. Although Yates doesn’t specialize in adaptive reuse, he understood the Krienses’ desire to transform the campus into a Zen-style retreat.

“Because of their philosophy, the Krienses wanted something that architecturally fit in with the redwoods and California,” Yates explains. “The vein of Craftsman that I like is the



PHOTO: YATES ARCHITECTURE

■ Retrofit Team

ARCHITECT // Yates Architecture,
yatesarchitecture.net

GENERAL CONTRACTOR // South Bay
Construction, www.sbc.com

LANDSCAPE ARCHITECT // Heather
Hardie Harwood Landscape Architecture,
www.heatherharwoodasla.com

LANDSCAPE CONTRACTOR // Douglas
Landscape Construction Inc., www.
douglaslandscapeconstruction.com

INTERIOR DESIGN // Jansen & Jansen
LLC and Artefact Design & Salvage,
www.artefactdesignsalvage.com

STRUCTURAL ENGINEER // Universal
Structural Engineers LLC,
www.universalstructuralengineers.com

MECHANICAL CONTRACTOR // Trillo
Mechanical, (831) 636-7825

ELECTRICAL CONTRACTOR // Howell
Electric, howellelectric.com

PLUMBING CONTRACTOR // Fresno
Plumbing & Heating Inc.,
www.fresnoplumbinginc.com

FRAMING CONTRACTOR // Ciarra Con-
struction, www.ciarraconstruction.com



FITNESS CENTER



BEFORE



OUTLOOK



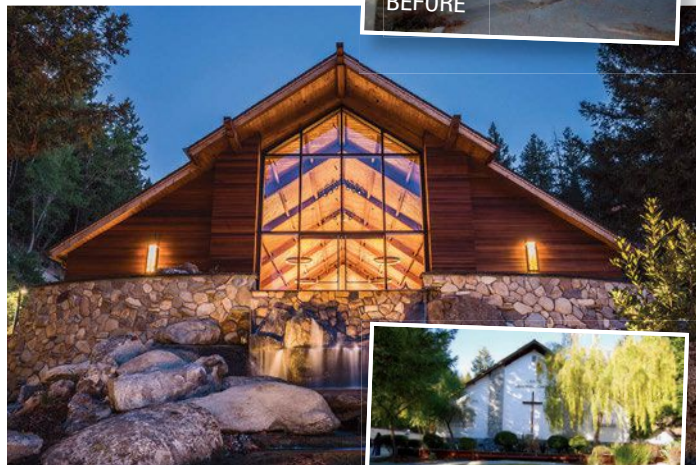
BEFORE



LODGE



BEFORE



SANCTUARY



BEFORE

Greene and Greene style, which is one of the few indigenous California design styles. It was basically developed in Pasadena during the beginning of the last century. Greene and Greene took the arts and crafts movement, which started in England, and modified it with a Japanese influence. To me, that style is an amalgam of American, European and Pacific Rim architecture, and that fits with the global humanity focus of 1440 Multiversity. The Krienses liked that idea.”

Once the design style was agreed upon, the challenges began because—as Yates points out—it’s much easier to build new structures in any style you want. It’s exponentially more difficult to adapt buildings “you’re stuck with.” Thus began a transformation that was supposed to last about a year and a half and cost \$30 million but lasted four years and cost \$120 million.

SAVED BUILDINGS

Despite its mountain setting, 1440 Multiversity is easily accessible on the main

traffic artery from Santa Cruz to Silicon Valley. Its location makes it a favorite destination for businesses looking to perform team building, as well as couples seeking to improve their relationships before exploring nearby wine country.

Although the 80-acre site was an idyllic setting for a college campus, Bethany University, which had operated there since 1950, struggled financially before folding in 2011. Yates’ team saved and remodeled seven university buildings on campus, tore down many more and built six new buildings to meet the needs of the retreat.

Some of the renovations were more straightforward than others. For example, the 15,735-square-foot main classroom building, called Outlook, maintained most of its existing classroom layouts. “We had to construct a new entry on the building because it never really had one that was decent,” Yates recalls. “In California, because we have earthquakes, when you have either a change in occupancy or do a certain

amount of work on a building, you have to bring the buildings up to code for seismic, so that was something we had to complete on the retrofitted buildings.”

The campus had several typical dormitories, in which a room is shared by two to four people who access bathroom facilities down the hall. “We didn’t totally gut those buildings,” Yates recalls. “In Trillium, the largest existing residence hall at 20,520 square feet, we took the common showers out and used the extra space to make larger, upgraded suites. We modified the dorm rooms so they would have toilet and shower facilities in each one and, essentially, created a hotel room with two queen beds.”

Two smaller dorm facilities, each measuring 7,307 square feet and known as Oak and Madrone, are for guests who wouldn’t mind the college-dorm experience. Some of the rooms maintained the original dorm layout while other rooms were transformed

(continues on page 66)



QuietRock® used in 1440 Multiversity Sanctuary for acoustic separation between retail and assembly area where meditative and other contemplative classes occur.

EASY RENOVATION— QUIET® SPACES

When you're looking for a simple way to **INCREASE STC RATINGS** of wall assemblies—especially **IN** building **RENOVATIONS**, QuietRock® Sound Reducing Drywall is your solution. That's why the architect for **1440 MULTIVERSITY** chose QuietRock®. By adding a **SINGLE LAYER** of QuietRock® over the existing walls, the **STC PERFORMANCE** was maximized while **SPEEDING UP** project **TIME** and **REDUCING** labor **COSTS. NO DEMOLITION REQUIRED.**

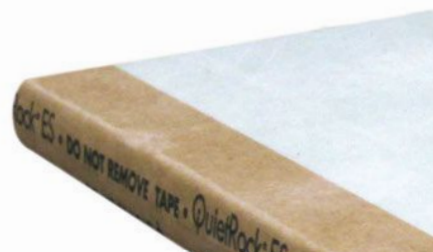


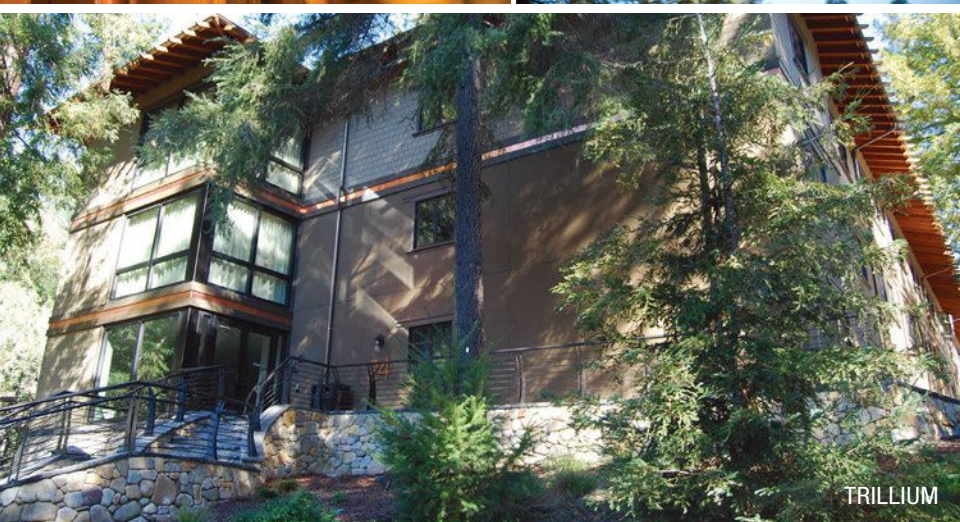
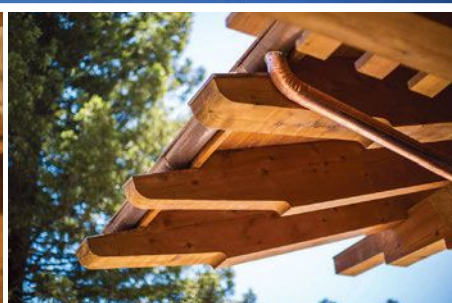
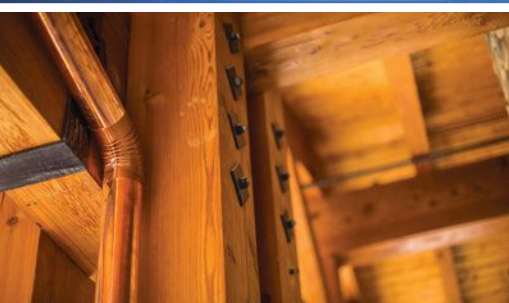
QuietRock® used in Outlook building for acoustic separation between classrooms.

Call **1-800-797-8159** or visit
WWW.QUIETROCK.COM

Circle No. 27

QuietRock®
by  **PABCO** Gypsum





■ Materials

ACOUSTIC WALL SHEATHING // QuietRock from PABCO, www.quietrock.com, and ToughRock from Georgia-Pacific, buildgp.com

ACOUSTIC FLOOR ASSEMBLIES // Gyp-crete 2000 and Acousti-mat from Maxxon, www.maxxon.com

RETROFIT SKYLIGHTS // Velux, www.veluxusa.com

SLATE ROOFING // SlateTec, www.greenstoneslate.com

CABLE RAILING // Feeney, www.feeneyinc.com

FIBER-CEMENT SIDING // HardiPlank Lap Siding and HardiShingle Siding by JamesHardie, www.jameshardie.com

FIRE-RATED EXTERIOR SHEATHING // Dens-Glass Gold from Georgia-Pacific, buildgp.com

BATHROOM ACCESSORIES // Bobrick, www.bobrick.com

PLUMBING FIXTURES AND FITTINGS // American Standard, www.americanstandard-us.com;

Kohler, www.us.kohler.com; and Moen, www.moen.com

RETROFIT LIFTS // AmeriGlide, www.ameriglide.com

CRAFTSMAN-STYLE EXTERIOR DOORS // Simpson Door Co., www.simpsondoor.com

ALUMINUM-CLAD WINDOWS // Loewen, www.loewen.com

CURTAINWALL // Arcadia, arcadiainc.com

CURTAINWALL GLAZING // Solarban 90 from Vitro Architectural Glass, www.vitroglazings.com

ACOUSTIC CEILINGS // CALLA from Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com

MINI-SPLITS // Daikin, www.daikin.com

CUSTOM COPPER GUTTERS AND DOWNSPOUTS // Wildcat Metals, www.wildcatmetals.com

SANCTUARY LIGHT FIXTURES // Architectural Lighting Works, alwusa.com

into suites. “Those were partial guts,” Yates says. “We took the floor plans and adapted them, but those buildings were in bad shape and we had to tear the roofs off and do a lot of structural repairs.”

To ensure guests have various levels of accommodations to choose from, a new 4-story, 31,516-square-foot building was constructed. Known as Sayanta, it contains the most hotel-like suites. In addition, sleeping pods for guests who want to experience 1440 Multiversity on a budget are available under the newly constructed 23,734-square-foot Redwood building’s auditorium floor.

ACOUSTICS AND COMFORT

College dorm rooms are not known as the most acoustically sound spaces. However, the Krienses were interested in acoustic separation in their guest facilities to keep their visitors happy. “It’s always interesting to come up with your acoustic partitions—what materials you use,” Yates notes. “It’s one thing when you’re constructing a new building, but it’s another when you’re retrofitting what basically were wood-framed buildings with 2- by 4-walls. There’s a further challenge when you have partitions in rooms that are a given size, and then you’re getting down to inches on clearances, so having a product that can perform better than just standard drywall is really useful.” The team used special sound-reducing drywall to achieve an STC of 50 to 54 and the required fire ratings.

In addition, the 2-story Outlook classroom building features a 400-person auditorium/lecture hall on the lower level and two larger-than-typical classrooms directly above the auditorium. These larger classrooms were designated for dance classes and other workshops that may disturb a lecture below.

“We had to reinforce the structure and add acoustic separation details to the floor framing to dampen the vibrations and to carry the loads of people up there,” Yates recalls.

The team chose mini-splits to keep retreat-goers comfortable in their guest suites. “These smaller dorm rooms were not designed with any interstitial spaces or chases, so we were limited. We didn’t want to really go so far as to tear apart all the floors either,” Yates states. “Given the constraints, we went with a little more utilitarian look and just mounted the units on the wall.”

To create the Craftsman look, various natural materials were specified. Cedar planks act as columns and trusses; redwood was used for a pedestrian bridge; reclaimed wood from Napa



TO CREATE THE CRAFTSMAN LOOK, VARIOUS NATURAL MATERIALS WERE SPECIFIED, INCLUDING CEDAR PLANKS IN THE SANCTUARY.



Protect Your Facilities FROM AIRBORNE CONTAMINANTS

ASHRAE guidelines for COVID-19 suggesting MERV 13 or better air filtration make the Dynamic V8 Air Cleaning System an ideal choice for retrofitting into existing buildings

- MERV 15 performance with a MERV 13 or MERV 14 rating (power off).
- Enhanced ability to remove ultrafine particles, odors and VOCs, without ionizing or Ozone generation.
- Extend filter change-out intervals from every few months to every several YEARS.
- Very low pressure drop enables retrofitting into HVAC systems not designed for high-efficiency air filtration.
- Highest dust holding capacity on the market (10 times higher than standard cartridge and bag filters).
- Consumes 2/3 less fan energy compared to MERV 14 filters.



AIR CLEANING SYSTEM

Circle No. 28

Visit DynamicAQS.com or ask us about a free Life Cycle Cost Analysis to find out how much you can save on fan energy and maintenance costs while improving the overall air quality in your building.

Dynamic
Air Quality Solutions
The Science of Clean Air™



can be found; slate roofing was installed; and more than 1,400 tons of Montana river stone with basalt accents appears on the new and retrofitted buildings. Copper gutters and downspouts complement the buildings' appearance while ensuring longevity.

In some cases, sourcing these natural materials, such as new wood from the Pacific Northwest, proved a challenge in and of itself. "We had team members actually go in the forests up in Northern California, Washington, Oregon to look for trees that would be suitable for use here to create the

look we wanted," Yates says. "Between the natural materials and my interpretation of the Japanese influence on the Greene and Greene architectural style, I think the buildings definitely feel Zen."

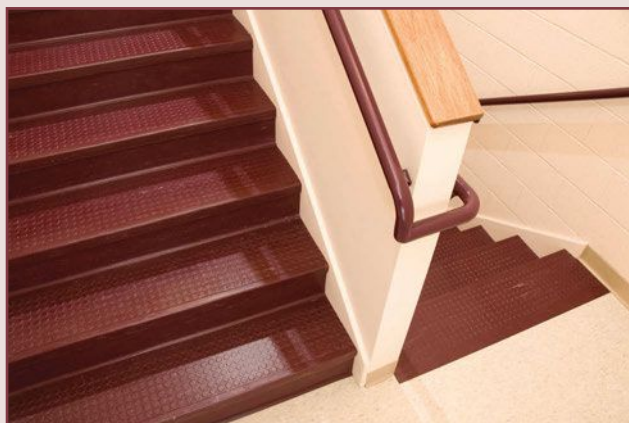
To avoid overloading the structures with the weight of slate roofing, Yates specified a real slate product that requires less overlap, which minimizes the weight on the roof by up to 40 percent.

As each decision was made, the budget for the project increased. "Scott and Joanie were dream clients," Yates notes. "When they started this, they obviously didn't plan

on the time and the money, but once we got into it, they were great because the more we did, the more they wanted to do better quality. They really wanted 1440 Multiversity to look good and didn't worry too much about how much it would cost."

To the Krienses, this project was personal and, while working with them, Yates was touched by the Krienses' passion, too. "It was just very fulfilling to be part of something like this," he says. "The 1440 philosophies and life skills they're teaching, I think it's a public service and it was just gratifying to be part of it." 

RUBBER STAIR TREADS • COVE RISERS • SHEET RUBBER



Enjoy the safety, comfort and longevity of rubber stair treads, cove risers and sheet rubber.

Available in a variety of styles and colors, these products require no special waxes or finishes to maintain their appearances, drastically reducing maintenance costs.

Circle No. 29

Call or email us for a brochure and more information.



MUSSON RUBBER CO.

P.O. Box 7038 • Akron, Ohio 44306
800-321-2381 • Fax 330-773-3254
info@mussonrubber.com • www.mussonrubber.com



WOOD YOU BELIEVE?



Who knew ultra-durable top rails could look this good? DesignRail® from Feeney® makes it easy for your customers to bring their vision to life with its wood grain powder-coated top rail finish that provides an extra layer of durability, coupled with the beautiful look of wood. But don't take our word for it, discover how Feeney can elevate any project with a Cherry, Walnut or Weathered Gray wood grain top rail.

Become a believer at FeeneyMakesItEasy.com.

Circle No. 30



Feeney Makes It Easy™



Future Flexible

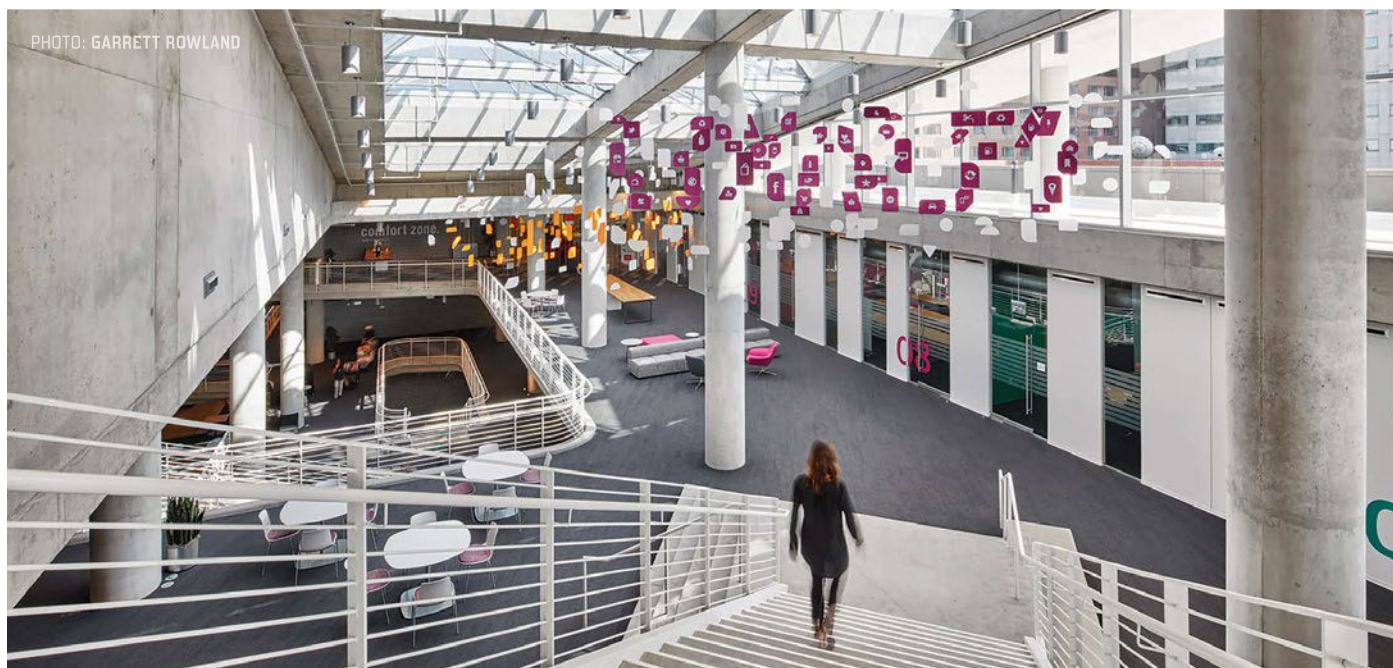
DESIGNERS ANTICIPATE
TOMORROW'S NEEDS IN
TODAY'S BUILDINGS

WRITTEN BY | ALLAN BARRY

PHOTO: M MOSER ASSOCIATES, COURTESY
AMERICAN SOCIETY OF INTERIOR DESIGNERS

The new M Moser workspace in New York represents an agile, future flexible “living lab” for ongoing adaptation and change. Strategy and design teams created the workplace to address individual needs through new digital strategies, space planning, flexible furniture and technology. The office serves as a co-working space and enables M Moser Associates to test and develop a broad range of workplace strategies to ensure the best results for clients.

One of the challenges on any retrofit or adaptive reuse project is that a building constructed decades ago most likely won't anticipate the needs of today's occupants. It was built to serve a purpose specific to its time and its role in the community at that time. Designers often have to figure out how to work around structural constraints to properly incorporate modern technology and function.



The 280,000-square-foot 84.51 Centre, which is designed to maximize productivity and staff engagement, is bathed in natural light. Read more about this project on page 72.

But what if today's new construction anticipated tomorrow's needs? Although it is impossible to predict the future, it is possible to design flexibility into the equation so it is easier to use and reuse buildings years from now.

The concept is starting to pick up momentum and has often been referred to as "futureproofing."

"It's a good buzzword, but I don't really love it because it's impossible to completely anticipate something to the point you could futureproof it, so I think it's a little far-fetched," says Brent Mather, design principal with Gensler's Denver office. "I prefer to use the term future flexible. It's dynamic, so you can plan for anything."

"The term futureproofing works if you're clear which future you're proofing for," notes Eric Corey Freed, senior vice president and director of sustainability for CannonDesign. "In reality, it's a blanket term for thinking ahead through the lens of resilience. We plan and anticipate all the possible stresses and shocks that could

disrupt operations in the near and long-term future. This can be done for a technology, a policy, a building, a neighborhood or even an entire city. It's an excellent way to test the utility and lifespan of ideas."

"The essence of futureproofing is long-term thinking," adds Evan Reis, executive director and co-founder of the U.S. Resiliency Council. "It should consider not only the capacity of a building to adapt to changing uses, but also to future hazards, natural and manmade."

Minimize Impact

An increased focus on sustainability, embodied carbon, life-cycle assessment and long-term building performance has inspired more attention to this future-flexible concept. Programs, such as LEED, have put emphasis on the environmental impact of constructing a building. But what about the impact of tearing it down? Demolition generates a great deal of waste and forces new construction that generates more waste. There has been a

tendency to view buildings as somewhat disposable.

"By their nature, buildings are big, expensive, immovable objects, so you'd assume they would be perfect candidates for reuse," Freed says. "Yet our first instinct is to tear them down and build something new. This is a missed opportunity. The increasing competition for and dwindling supply of construction materials, skilled labor and energy will drive demand to reexamine how we look at our existing buildings and infrastructure. In addition, the upfront carbon produced from demolishing and rebuilding will become too expensive a cost to bear."

"Echoing a quote from Carl Elefante, FAIA, principal emeritus, Quinn Evans Architects, 'the greenest building is one that is already built,'" Mather notes. "We all want to design net-zero, carbon-neutral buildings, which is great and aspirational, but if you have a building with good bones, you're automatically lightyears ahead in terms of reducing the carbon footprint and



PHOTOS: GARRETT ROWLAND

84.51 CENTRE

Located in the central business district of Cincinnati, 84.51 Centre is a mixed-use development designed by Gensler. It includes underground and above-ground parking with street-level retail and the headquarters for a consumer analytics company above.

The 280,000-square-foot headquarters space, designed to maximize productivity and staff engagement, is bathed in natural light. Office areas are organized into neighborhoods, centralized spaces or shared areas with the majority of workspaces open-plan. Two full-height light canyons create visual connections across all five levels of the workspace, shortening travel distances between floors while drawing people together and encouraging collaboration.

The above-ground parking levels are designed with the same floor-to-floor dimensions and structural detailing for expansion. Built with the future in mind, 84.51's parking garage can be transformed into offices when the need arises years from now.



not disturbing the site environment.”

“I don’t necessarily believe that future-proofed buildings would use less material during construction, but the ability to remodel and reuse buildings without having to throw away and replace materials is certainly a benefit,” Reis states. “The largest benefit from a long-term sustainability perspective may be not having to replace the building after a natural-hazard event.”

Keep Options Open

It is impossible to know what the needs of a building’s occupants will be in the year 2050 and beyond, but it is possible to design and build in ways that help keep options open.

“The structure often gets in the way of easy repurposing of buildings, especially with respect to interior spaces,” Reis says. “Buildings that are able to accommodate long interior spans without a forest of columns should naturally lend themselves to adaptive reuse. Buildings that are naturally stiff may allow for modification more easily while still maintaining their strength.”

“We already go to great lengths to keep buildings flexible for future technology,” Freed asserts. “Raised-access flooring, demountable partitions and open floor plans are pretty standard in offices. The larger opportunity is in how we design the base building. The floor-to-floor heights, the numbers of bathrooms and elevators, and the locations of fire exits can really make or break how easily an office, for example, can be converted into something else.”

“One of our recent projects was for a non-profit called JEWISHcolorado and all the electrical, lighting, mechanical and insulation were dated and replaced, but the structure of the building was fantastic,” Mather recalls. “We were able to completely repurpose it to where it’s effectively a new building.”

Today’s retrofits often face challenges incorporating data infrastructure because no one was thinking about broadband cabling and server rooms in the 1960s. Because today’s buildings must account for that, and data technology is getting more compact, this will likely be less of an issue in the future.

“In the 1990s, we put coaxial cables into every wall because we thought that was the future of communication,” Freed

explains. “Then we used ethernet cables for another decade until Wi-Fi made those obsolete, too. Today we’re installing wireless sensors that measure air quality, room occupancy and much more and then transmit that information to a central hub. Technology updates will continue to have a smaller footprint. What we need to plan for is strengthening the backbone structures, like power and data, that run those systems.”

Here Today, Home Tomorrow

By their very nature, some building types are better suited to future adaptation than others. In some segments, particularly with housing in the U.S., there is a tendency to build as quickly and cheaply as possible without really looking very far into the future.

“I look at the proliferation of low-cost, mostly wood-framed, multifamily for-rent products around the country and those are clearly not designed for the long term,” Mather says. “Some are built to a little higher quality for condo conversion, but most of the time they are not because they are usually flipped to another developer as a commodity and not really adaptable for future use. I would say that projects like office buildings are probably the easiest to adapt because they are intended to be flexible, where tenants can do whatever they want in a big envelope.”

With the changing nature of the office and its role in business, it is possible that there might be a high demand for repurposing office space in the future. As society’s needs shift, and we see a greater need for housing, future-flexible buildings can become extremely useful.

“When it comes to envisioning future-use cases of buildings, I have heard a lot about the reimagining of workspaces,” Reis says. “What we’ve learned from COVID is that for high-occupancy buildings, like offices, there is a great deal more flexibility for people to work from home than previously thought. Given our desperate need for urban housing, we may be at a very opportune time to consider how office buildings might be repurposed for housing, retail or other uses.”

“Hotels are actually pretty adaptable, especially with the emergence of micro apartments,” Mather adds. “We’ve seen that around the country because they are

smaller spaces. Whether that’s one unit or two, they lend themselves well to that kind of conversion. I’ve also seen some of the older government buildings, particularly federal buildings, that may have been offices at some point, become less usable for office space because they have small floors with shallow distances from the perimeter to the core. They can become more amenable to hotel or residential use.”

“We’ve all heard for years that malls are dying. That doesn’t have to be true,” Freed notes. “A 5-acre building swimming in the middle of a 20-acre sea of asphalt parking could be radically reimagined into a diverse, mixed-use community hub of housing, dining and dense retail. You could de-pave those parking lots and infill new jobs and housing. They often are already centrally located on major transit lines, even in the suburbs.”

we can scale down the amount of parking required. In 2016, Gensler completed an 8-story office building in Cincinnati that has three levels of parking above the ground floor. Those parking levels are designed to be converted to office space in the future.” (Learn more about this office building in “84.51 Centre”, page 72.)

As construction and demolition’s impact on the environment becomes better understood, the value of building for the present and future increases. The longer the lifespan of a building, the more its impact is spread out over time. Designing with an eye to flexibility will allow future owners and designers to make the most of the structures being built today.

“The only thing I don’t like about the term ‘futureproofing’ is that it implies these are issues we don’t have to worry about right now,” Freed says. “In reality,



One thing the M Moser Associates team has learned is that spaces that were intentionally designed for a particular use were not used in the way intended, creating further lessons for the team. Although the project was initially studied pre-COVID, M Moser Associates already has made adaptations for a post-COVID reality.

Park Place

Housing may indeed be in greater demand in the future as the population continues to grow, shift and centralize, but other building types may see decreased demand. Parking structures are one area where architects are beginning to design for adaptive reuse in a future that may be less car-dependent.

“We’re definitely working on some office-building concepts that include future-flexible parking,” Mather explains. “Parking has driven building design for a long time, but with different modes of mobility, like cycling, scooters and autonomous vehicles, becoming more prevalent,

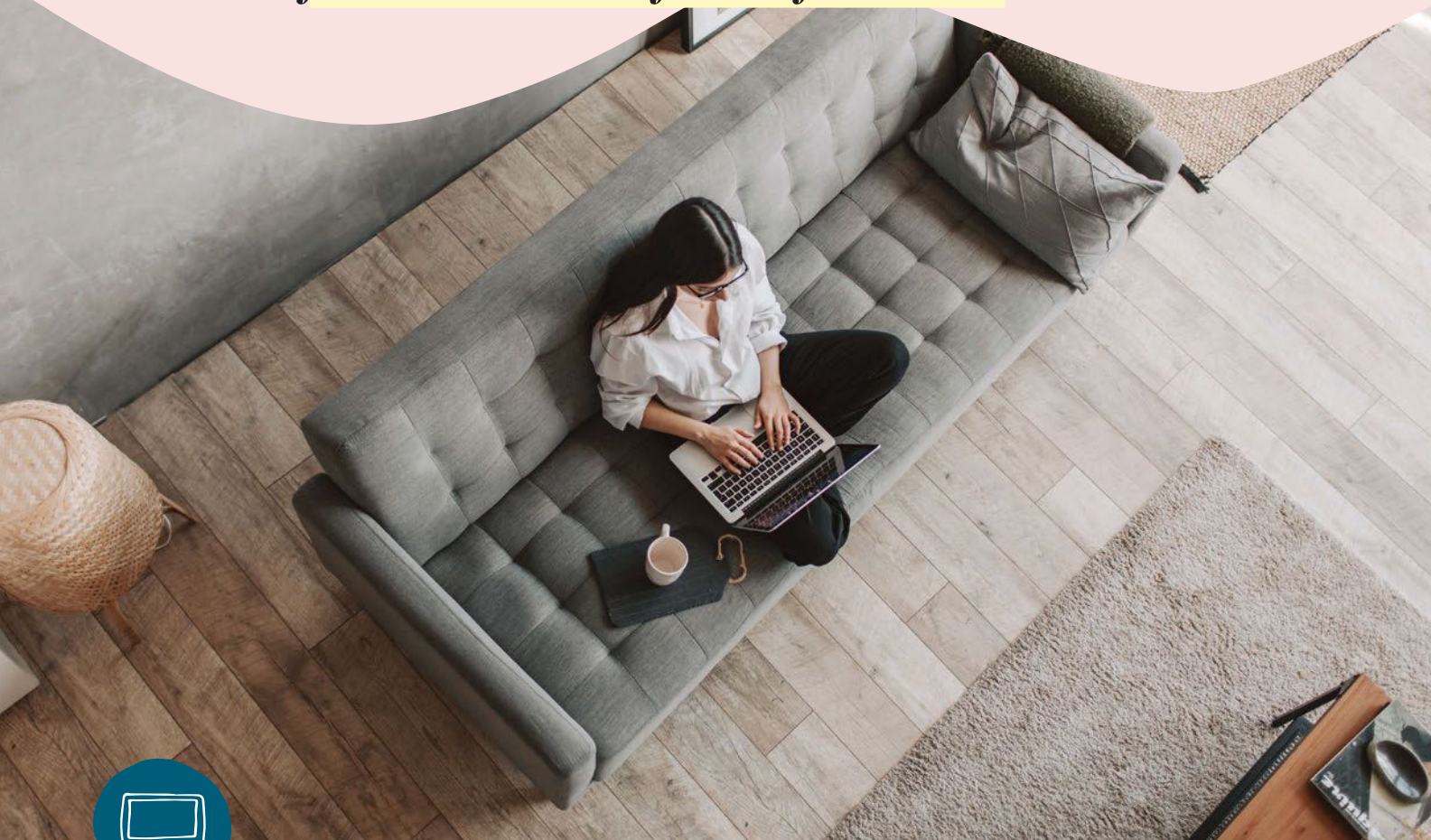
everyone should be incorporating future-proofing into their annual planning processes and using it to prepare for likely disruptions.”

In an industry and society that can so often be focused on the immediate return, it can be challenging to plan for and consider a future we can’t even imagine. But it has been done before and it can be done again.

“The Iroquois people have a saying,” Freed continues. “In our every deliberation, we must consider the impact of our decisions on the next seven generations.’ Even if you simply do this as a mental exercise, you will see the benefit of the approach.” 

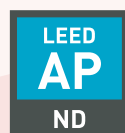
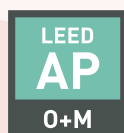


Take your LEED exam online, *from the comfort of home.*



The LEED Green Associate and LEED AP exams are now available online.

Download the credential handbook, review requirements & schedule your exam today.



usgbc.org/credentials

→ CHANDELIER ARE UNIQUE SHAPES

Luminii has made available its Senso Vesta chandelier collection. The five uniquely shaped models—Vesta X, Vesta Y, Vesta SQUARE, Vesta HEXAGON and Vesta TRIANGLE—are available in direct and direct/indirect options. Each ready-to-order chandelier is designed with a universal, round canopy to support cohesive installations and product continuity. The canopies conceal all hardware for a clean and uniform installation. Vesta delivers 90+ CRI and R9 values up to 60 across the dimming curve with minimal color shift. A variety of finishes, light outputs and CCTs (2700K, 3000K, 3500K, 4000K) also are available.

luminii.com // Circle No. 32



↓ DISINFECT NON-POROUS SURFACES



The Garland Co. Inc. offers its Defense Force line of products designed to clean, disinfect and/or protect commercial facilities. The flagship product is D7, an EPA-registered antimicrobial disinfectant that kills bacteria, fungi, germs and viruses in minutes and has demonstrated effectiveness against viruses similar to the coronavirus/COVID-19. It can be applied to

hard, non-porous interior and exterior surfaces, providing the assurance of clean and safe facilities. D7 is mixed and applied with standard sprayers. There is no specialized training required for the application of D7, so disinfection can take place almost immediately.

www.garlandco.com // Circle No. 33

↗ TOUCHLESS HANDWASHING STATION IS ADAPTABLE TO PUBLIC ENVIRONMENTS

Elkay provides access to quick handwashing with a hands-free station, Model EHS25SSNT, that adapts to public environments. With a touchless faucet and soap and towel dispensers, the mobile unit helps contribute to a healthier community. The unit provides hot water on demand with a 2.5-gallon electric heater and pump; an adjustable thermostatic mixing valve is installed. The station is constructed of 300 series stainless steel for durability and easy cleaning, making it suitable for busy areas. The mobile unit has two locking casters to keep it in place and features recessed pull handles making it easy to reposition or relocate when needed. The unit, which requires 120V power, features two removable water tanks: a 5-gallon tank for fresh water and 6-gallon tank for wastewater. The product is certified to NSF 169 for food equipment.

www.elkay.com // Circle No. 34



← CREATE A PRIVATE BALCONY WITH A ROOF WINDOW

Designed to provide a cost-effective alternative for opening up attics with low, angled ceilings, VELUX has introduced the CABRIO Balcony Roof Window MK19. The new size is 20 percent smaller in width than the standard CABRIO Balcony and costs 35 percent less. CABRIO Balcony Roof Windows provide views and natural light. They open in seconds into a private balcony, adding fresh air and a rooftop retreat. When closed, the CABRIO is flush with the roof.

whyskylights.com // Circle No. 35





← IMPROVE THE APPEARANCE OF A METAL BUILDING'S INTERIOR

Lamtec WMP-RETRO has been designed to re-cover damaged insulation facings and update a metal building's interior. The multi-layer construction provides abuse resistance while its glossy white surface provides 85 percent light reflectivity to brighten a building's interior. WMP-RETRO was developed using an encapsulated glass mat technology to stiffen a proven metal building facer for better installed appearance. It does not rely on adhesive or tape for attachment but utilizes mechanical fastening for a permanent installation. WMP-RETRO comes in 500-square-foot rolls.

www.lamtec.com/wmp-retro // Circle No. 36

→ POLYCARBONATE GLAZING SYSTEM STRENGTHENS EXISTING GLASS

Designed to keep intruders out and prevent smash-and-grab burglary, DefenseLite is a patented security glazing system manufactured by Impact Security LLC. This retrofit security shield is designed to mount onto the existing glazing to transform windows and doors into impenetrable openings that are 250 times stronger than glass alone. DefenseLite is not an applied security film but rather a heavy-gauge architectural-grade polycarbonate and extruded framing system. The surface of the polycarbonate is UV-coated to protect against scratching, graffiti and other factors that may result in the degradation of the material. The bullet-resistant version of DefenseLite, BulletShield, is independently tested to provide UL 752 ballistic ratings. BulletShield can be installed over existing glass from the interior or exterior.

www.defenselite.com // Circle No. 37



← EXTERIOR LUMINAIRES REDUCE GLARE AND LIGHT SPILL

Luminis has improved and expanded its Maya family of exterior luminaires. The new pendant mount version is suitable for indoor or under-canopy applications, enabling the Maya aesthetic to be carried

further throughout a space. An

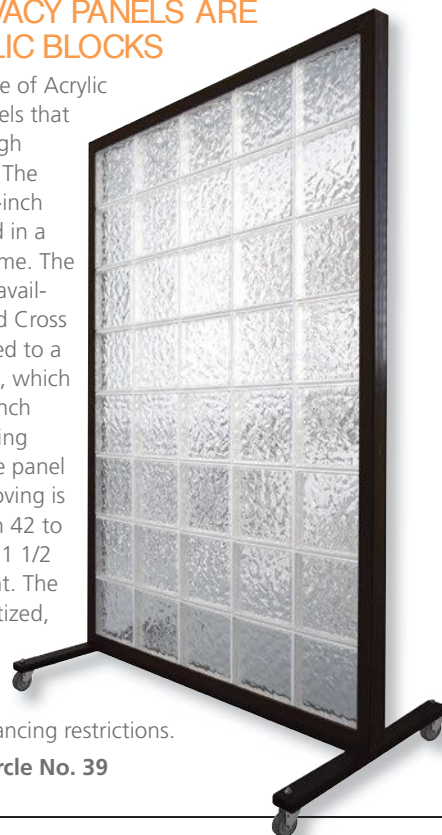
outdoor catenary version, compatible with the recently released catenary attachment, also is available. A new 90-degree arm configuration for the post-top version adds a contemporary aesthetic option to the pre-existing 180-degree version. Other improvements across the family include a new micro optics design with reduced glare, new micro house side shield to reduce light spill, up to 25 percent increase in output across the range and a higher output on amber versions. Maya luminaires offer 70 CRI and 4000K as standard with 2700K, 3000K and 3500K temperature options available. Featuring type II, III, IV and V light distribution, they are dimmable to 10 percent and can be configured with a motion sensor.

www.luminis.com // Circle No. 38

→ ROLLING PRIVACY PANELS ARE MADE OF ACRYLIC BLOCKS

Hy-Lite has released a line of Acrylic Block Rolling Privacy Panels that allow light to flow through while protecting privacy. The 1 1/2-inch-thick, 8- by 8-inch acrylic blocks are secured in a white or bronze vinyl frame. The panel of acrylic blocks—available in Wave, Glacier and Cross Rib styles—is then secured to a welded metal black base, which features a set of four 2-inch casters, each with a locking mechanism to ensure the panel remains in place until moving is desired. Sizes range from 42 to 58 inches in width and 71 1/2 to 79 1/2 inches in height. The panels can be easily sanitized, making them suitable for a wide variety of businesses working to reopen under social-distancing restrictions.

www.hy-lite.com // Circle No. 39





↑ KNITTED YARN SHADES DIFFUSE LIGHT

Made by Hand, a Danish lighting design brand, is now available in North America through AMEICO. The Knit-Wit pendant collection distributes light through the knitted yarn pattern of each shade, making each fixture distinctive and decorative. The shades across the collection are knitted in three dimensions to provide visual texture and interest. The Knit-Wit family of lighting solutions are unique focal points in residential, commercial and hospitality spaces that provide warmth through their diffused ambient light. The pendants come in four sizes (45, 60, 65 and 75 inches) and five colors (Black, Pearl White, Sandstone, Silver and Stone Blue).

ameico.com/pages/lighting // Circle No. 40

↓ GALVANIZED PANELS MODERNIZE LOWER, WIDER BUILDING PROFILES



CENTRIA has launched Versawall H+ Insulated Metal Panel, which is comprised of a galvanized steel face and foam insulation.

The panel delivers weather resistance and moisture protection. From a design perspective, the panel enables architects to create a modern look for large-scale buildings that have lower, wider profiles, including warehouses, schools and shopping centers. The Versawall H+ is available in modules of 30 and 36 inches and in 2- and 3-inch thicknesses. Panels can be manufactured in a wide variety of finishes and colors.

www.centria.com // Circle No. 42

↓ CREATE CUSTOM WALL DESIGNS WITH CERAMIC TILES



Crossville Inc. has released Swatches ceramic wall tile collection, which offers 16 colors for creating custom wall designs. The colors can be mixed and mingled to create exciting patterns or installed monochromatically for uniform looks. The line offers an expansive selection of sizes, including five calibrated field tile options—2 by 8, 4 by 8, 3 by 12, 6 by 6 and 3 by 6 inches—and a

thorough trim package to finish every space professionally. Swatches wall tile collection is suited for interior vertical applications in commercial and residential settings and requires only minimal cleaning and maintenance. It may be specified with Hydrotect, Crossville's invisible coating that offers added defense against dirt.

crossvilleinc.com // Circle No. 41

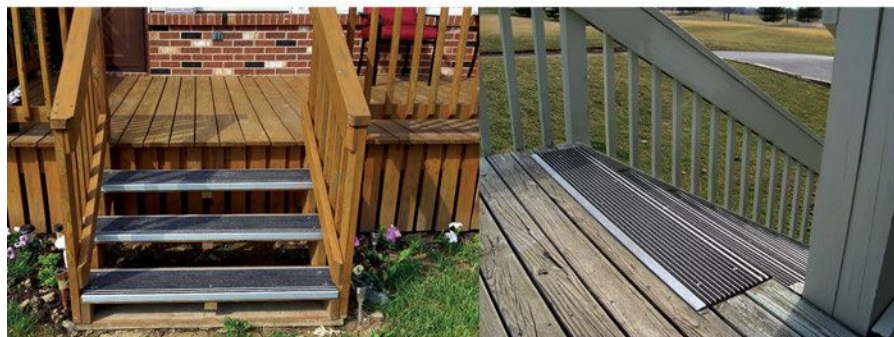
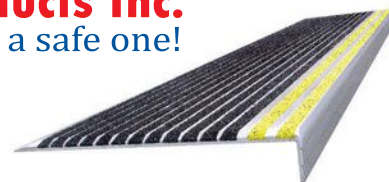


Wooster Products Inc.
Making every step a safe one!

Stairmaster® Safety Treads

Stairmaster® Safety Renovation Treads:

- Designed for the modernization and restoration of all stair types
- High quality to assure long tread life under heavy pedestrian traffic
- Durable and long lasting treads for both indoor and outdoor use



Wooster Products Inc.

Anti-slip safety stair and walkway products

For more information contact us today!
woosterproducts.com | 800-321-4936

Circle No. 43



← HEAT-PUMP WATER-HEATER MODELS MEET ENERGY GOALS

Lochinvar has launched 20 commercial heat-pump water-heater models, ranging from 25,000 to 250,000 Btu per hour and with modular installation capabilities up to 2 million Btuh per hour. The product line gives specifying engineers, architects and plumbing contractors additional options to meet energy-savings and sustainability goals when bidding on large commercial properties. Heat-pump water heaters transfer heat instead of creating it. Unlike typical HVAC heat-pump systems, heat-pump water heaters provide hot water using atmospheric heat (air source) or geothermal/waste heat (water source). The air-source models cool and dehumidify the surrounding ambient air, cutting down on air-conditioning usage and costs. The water-source units absorb heat from water sources, including return chiller water, process and groundwater.

Designed for indoor or outdoor use, heat-pump water heaters work in conjunction with storage tanks and can be tailored to meet specific application requirements.

www.lochinvar.com // Circle No. 44

↓ VALVE HANDLE CAN BE ACCESSED FROM EITHER SIDE OF THE MANIFOLD



AGF Manufacturing has improved its Universal 3-Way Gauge Valve, Model 7600. The repositioned handle creates flexibility and accessibility on preassembled manifold risers. The UL-listed valve is used as

a component on RISERPACK Manifolds and select TESTANDRAIN models and can also be purchased on its own. When preassembled to floor-control assemblies, most 3-way valve-handle positions are oriented for access from one side of the manifold. AGF's hand-wheel is accessible from either side and has been redesigned to make it easier to grip.

www.agfmfg.com // Circle No. 45

↓ UNDERLAYMENT RESISTS FIRE AND HIGH TEMPERATURES

Polyglass U.S.A. Inc. has released Polystick XFR, a self-adhered waterproofing underlayment. The product combines Polyglass' ADESO and Burn-Shield technologies to achieve UL Class A fire ratings for combustible decks while providing long-term weathering performance. Utilizing ADESO Dual-Compound Self-Adhered Technology for labor-saving application, Polystick XFR features an SBS (elastomeric) modified bitumen upper compound and an aggressive self-adhesive compound on the bottom. Fiberglass reinforcement provides additional strength and stability. The penetration-resistant underlayment is rated to withstand temperatures up to 265 F. Because Polystick XFR is designed for high-temperature applications, it is suitable for metal roof coverings, like steel, copper and similar materials. It also is approved for use under asphalt shingles, mechanically attached tiles, and any other application where fire resistance is needed or desired.

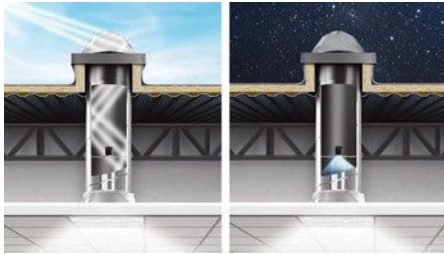
polyglass.us // Circle No. 46



↑ SUSPENSION LAMP DIFFUSES LIGHT THROUGH CRYSTAL

Lodes has introduced the Jefferson Suspension Lamp. Its crystal form evokes the prismatic visuals of the late '60s counterculture. Created through a special pressing technique that imprints meticulous details on the crystal surface, the fixture is suspended from a thin yet strong Kevlar-reinforced cable. The lamp is available in various sizes and compositions to suit any space, including cluster configurations that multiply the kaleidoscopic effect of the light. The Jefferson mini consists of two elliptical crystal diffusers joined together on a black chrome frame. When lit, the undulating pattern on the crystal bodies appear to spin. Similarly, the small and medium variations are created through the addition of cylindrical modules made possible by extension joints that cater to all scales and ranges of spaces. The lamp's 3-watt LED module features a CRI equal to 90.

www.lodes.com // Circle No. 47



↑ TUBULAR DAYLIGHTING DEVICE IS INTEGRATED WITH LED

Solatube International Inc. has introduced the Integrated LED Light Kit, which allows the integration of natural light and traditional electric light from a single fixture for a cleaner ceiling appearance and nighttime illumination. It works by harnessing the sun's (free) natural light during the day and additionally offers cost- and energy-efficient LED lighting at night. In addition, the high-efficiency LED lighting system includes a dimming option that can be paired with manual and automated dimming controls, which are suitable for offices and schools where lighting control and comfort are important.

www.solatube.com // Circle No. 48

↗ DISPENSE WATER VIA SMARTPHONE

Bevi has announced a new touchless water-dispensing feature that provides users with a means to hydrate without using a machine's touchscreen. The feature can be added to any existing Bevi machine with an internet connection by pushing a software update. When the touchless feature was released, an animation appeared on all Bevi machines with an internet connection that explained how to enable touchless dispensing using a simple toggle. Once enabled, the touchless dispensing capability can be accessed through a cell phone camera or QR code scanner app. Users simply scan the QR code and a replicated machine-dispense screen will appear on their phone. From there, users can explore ingredients and select from all the customization options, including still or sparkling water, flavor choice and flavor strength.

www.bevi.co // Circle No. 49



Flex-C Trac

Even Your Newest Guy Can Frame Precise Curved Walls



Circle No. 50

John is that newest guy. Using Flex-C Trac, he is already building curved walls like a veteran.



Pick up Flex-C Trac
at Your Local Distributor
and Start Framing

**FLEX-ABILITY
CONCEPTS**
The Curved Wall People™

Toll Free 866.443.FLEX
(866.443.3539)
www.flexabilityconcepts.com
MADE IN THE USA



Emergency Lighting for the
reasons that matter most...

Life. Safety.

Circle No. 51



Find field-installable emergency solutions for almost any project at

1-800-866-4682 www.iotaengineering.com

AD INDEX



SHARING IS CARING

Share this issue with a colleague and encourage him/her to subscribe for **FREE** at www.retrofitmagazine.com/subscribe.

SEPTEMBER-OCTOBER 2020



Acuity BrandsPage 15
www.acuitybrands.com



aquatherm
AquathermPage 53
www.aquatherm.com



Armstrong Ceiling & Wall Solutions ..Page 2
www.armstrongceilings.com



ASSA ABLOY Pages 4-5
corbinrusswin.com/ml2000indicator,
sargentlock.com/8200indicator



Belimo Pages 11, 13
www.belimo.us



Cambridge Air SolutionsPage 47
www.cambridgeair.com, (800) 899-1989



Dynamic Air Quality SolutionsPage 67
www.dynamicAQS.com



EemaxPage 83
www.eemax.com



FeeneyPage 69
www.feeneyinc.com



Flex-Ability ConceptsPage 79
www.flexabilityconcepts.com, (866) 443-3539



The Garland Co. Inc.Page 16
www.garlandco.com



General GlassPage 21
www.generalglass.com



Graham Architectural ProductsPage 19
www.grahamwindows.com



GSSIPage 6
www.gssi-sealants.com, (800) 288-9489



Hanover Architectural ProductsPage 12
www.hanoverpavers.com



IOTAPage 79
www.iotaengineering.com, (800) 866-4682



KalwallPage 45
www.kalwall.com



Kingspan Light + AirPage 37
www.kingspanlightandair.us



Krieger Specialty ProductsPage 43
www.kriegerproducts.com



Lamtec Corp.Page 3
www.lamtec.com



Major IndustriesPage 61
www.majorskylights.com, (888) 759-2678



McElroy MetalPage 39
www.mcelroymetal.com



Modular ArtsPage 41
www.modulararts.com



Musson RubberPage 68
www.mussonrubber.com



NanaWallPage 84
www.nanawall.com



NavienPage 7
www.navieninc.com



Pabco GypsumPage 65
www.pabco-gypsum.com



PetersenPage 8
www.pac-clad.com, (800) 323-1960



Samsung HVACPage 17
www.samsunghvac.com



SchweissPage 16
www.bifold.com



St. Cloud WindowPage 23
www.stcloudwindow.com



StarlinePage 31
www.starlinepower.com



USGBCPage 74
www.usgbc.org



Wooster ProductsPage 77
www.wooster-products.com, (800) 321-4936



ZIPWALLPage 60
www.zipwall.com

retrofit

IMPROVING
YESTERDAY
FOR TODAY

WHAT IS YOUR JOB FUNCTION?

- 02 ☐ Architect
03 ☐ Facility Manager
04 ☐ Building Owner
05 ☐ Contractor
06 ☐ Remodeler
10 ☐ Other

WHAT TYPE OF FIRM?

- 02 ☐ Construction
03 ☐ Architectural
04 ☐ Government
05 ☐ Remodeling
10 ☐ Other

HOW MANY EMPLOYEES IN YOUR FIRM?

- 01 ☐ 1-10
02 ☐ 11-20
03 ☐ 21-30
04 ☐ 31-50
05 ☐ 51-75
06 ☐ 76 or more

FIRM'S ANNUAL DOLLAR VOLUME:

- 01 ☐ Less than 1 million
02 ☐ 1-2 million
03 ☐ 2-4 million
04 ☐ 4 million plus

FOR MORE INFORMATION BY PRODUCT CATEGORY:

- 235 ☐ Building Controls
236 ☐ Retrofit Roofing
237 ☐ Retrofit Walls
238 ☐ Insulation
239 ☐ Mechanical Systems, HVAC
240 ☐ Electrical/Lighting
241 ☐ Flooring
242 ☐ Water Management
243 ☐ Solar
244 ☐ Windows/Doors
245 ☐ Clips/Attachments
246 ☐ Fasteners
247 ☐ Tools and Equipment
248 ☐ Paints/Coatings
249 ☐ Glass
250 ☐ Concrete
251 ☐ Snow Retention
252 ☐ Curbs, Vents, Gutters
253 ☐ Window Treatments

FREE PRODUCT INFORMATION

Interested in the products and systems you read about in the pages of this magazine? We can help you obtain more information!

Fill out this page completely. Then, scan it and email the page to **rscards@cds1976.com**,

or mail it to

Creative Data – retrofit
440 Quadrangle Drive, Suite E
Bolingbrook, IL 60440-3000

For the fastest response, visit www.cdsreportnow.com/get?retrofit and fill out the web-based card.

YES

- ☐ Sign up for a **FREE** subscription
☐ Sign up for the **FREE** digital edition and e-newsletter
☐ No, thanks

For a free subscription, visit www.retrofitmagazine.com/subscribe.

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE (_____) _____ FAX (_____) _____

EMAIL _____

SIGNATURE _____ DATE _____

PLEASE CIRCLE READER SERVICE NUMBER BELOW FOR FREE PRODUCT INFORMATION FROM OUR ADVERTISERS

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017

018 019 020 021 022 023 024 025 026 027 028 029 030 031 032 033 034

035 036 037 038 039 040 041 042 043 044 045 046 047 048 049 050 051

052 053 054 055 056 057 058 059 060 061 062 063 064 065 066 067 068

069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084 085

086 087 088 089 090 091 092 093 094 095 096 097 098 099 100 101 102

103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119

120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136

137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153

FAX: (630) 739-9700

RETROFIT / SEPTEMBER-OCTOBER 2020



By submitting this form, you are choosing to receive product information, emails and/or phone calls from advertisers representing the product categories you have selected.



The angel mural, which appears over a door at Richardson Hall, 55 Laguna Street, was painted as part of a Works Progress Administration project when the building was the San Francisco State Teachers College. Page & Turnbull oversaw the preservation of the mural as part of its work to adapt the building into a 55-plus-age, LGBTQ-welcoming, 40-unit residence operated by Mercy Housing.

CONSIDERATION OF CULTURAL RESOURCES

As Monuments Are Debated and Graffiti Spreads, What Is Important to Commemorate?



Survey SOMA for San Francisco's South of Market neighborhood helps the city plan for growth and change in historic neighborhoods. Christina Dikas, an architectural historian with Page & Turnbull, appears in the foreground.



The boots-on-the-ground phase of the Survey LA process documented Los Angeles' historic resources covering 880,000 land parcels and 500 square miles.



Can architects and urban designers help determine the fates of Confederate monuments or Black Lives Matter murals?

In fact, that's an emerging specialty for the preservation experts at Page & Turnbull, a national design firm based in California, led by president H. Ruth Todd, FAIA, and a team of architectural historians and planners.

As part of the firm's work on historic resource surveys, cultural landscape reports, and historic context statements, the cultural resources planners at Page & Turnbull help property owners, elected officials and other public-sector leaders to evaluate their options for significant artworks, new and old.

The team's rallying cry is "context and informed analysis for decision-makers," and team members have analyzed an extraordinary range of properties. Page & Turnbull makes determinations of historic significance, identifies character-defining features, and develops recommendations informed by national standards, such as the Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes.

Research is paramount in the process, Todd says, "ensuring that decisions are well-informed and outcomes are ultimately supportable for a property owner."

For example, if community members ask to remove a Confederate monument, what is the impact on the historic setting, and what monuments or installations could take its place? As part of political movements, like ongoing Black Lives Matter activism, when are newly installed murals considered historically consequential enough to merit preservation?

The cultural resources planners work to provide informed guidance for tangible and intangible heritage. Recent major works by Page & Turnbull have included SurveyLA, "the largest and most comprehensive survey ever completed by an American city." Over a number of years, several historic preservation firms, including Page & Turnbull, documented L.A.'s historic resources covering 880,000 land parcels and 500 square miles. (Learn more about SurveyLA at www.page-turnbull.com/portfolio-items/recognition.) Recently, Page & Turnbull architectural surveys and design guidelines also have assisted other California cities—Napa, Palo Alto, Sacramento, San Francisco and Sonoma—plan for growth and change in their historic neighborhoods.

Ultimately, Page & Turnbull provides an important service of cultural resources planning and preservation in today's challenging contexts. 



Eemax® Delivers Hot Water and Sustainability

Help reduce your carbon footprint and meet net-zero goals

Eemax is leading the evolution of hot water with cutting-edge technologies that provide advanced tankless electric water heating solutions for building retrofits. We are empowering building design professionals with trusted and versatile products that can accommodate a multitude of installation scenarios. Today, Eemax products deliver energy-efficient hot water for whole homes, multi-family properties, and commercial enterprises.



**endless
hot water**



**save
space**



**save
energy**



**save
time**



**save
money**



**no
venting**

Circle No. 52



Eemax™
evolving hot water

To learn more go to eemax.com
or call (800) 543-6163



UN OBSTRUCTED.

SLIDING GLASS WALLS
THAT STACK REMOTELY

SWING DOORS SLIDE
AWAY WITH PANELS

OPEN CORNERS

© 2020 NANA WALL SYSTEMS, INC.



NanaWall® HSW systems' single track sliding glass walls offer unlimited numbers of panels up to 12 feet tall, helping you develop striking architecture with wider, more sweeping views. Resistant to weather and commercial use, panels may be easily stacked remotely in parking bays or hidden closets.

Free your space at nanawall.com/hsw.

NanaWall®

Circle No. 53

Boundaries **Unbound.™**