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ARCHITECTURAL RECORD (ISSN: Print 0003-858X Digital 2470-1513) February 2016, Vol. 204, No. 2 Published monthly, 12 times annually, by BNP Media II, LLC., 2401 W. Big Beaver Rd., Suite 700, Troy, MI 48084-3333. Telephone: (248) 362-3700, Fax: (248) 362-0317.

ANNUAL RATE FOR SUBSCRIPTIONS TO INDIVIDUALS IN THE U.S.: \$72.00 USD. Annual rate for subscriptions to individuals in Canada and Mexico: \$79.00 USD (includes GST & postage); outside North America: \$199.00 (Int'l mail) payable in U.S. funds. Single Copy sales \$9.95; Foreign \$11.00. Printed in the U.S.A. Copyright 2016, by BNP Media. All rights reserved. The contents of this publication may

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Periodicals Postage Paid at Troy, MI and at additional mailing offices. POSTMASTER: Send address changes to: ARCHITECTURAL RECORD, P.O. Box 5732, Harlan, IA 51593.

CANADA POST: Publications Mail Agreement #40015472. GST account: 131263923. Send returns (Canada) to ASENDIA, Local Return Address P.O. Box 1051, Fort Erie, ON, L2A 6C7. CHANGE OF ADDRESS: Send old address label along with new address to ARCHITECTURAL RECORD, P.O. Box

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WEBSITE: architecturalrecord.com. SUBSCRIBER SERVICE: 877/876-8093 (U.S. only); 515/237-3681 (outside the U.S.). Subscriber fax: 712/755-7423. E-mail: arhcustserv@cdsfulfillment.com. If the Post Office alerts us that your magazine is undeliverable, we have no further obligation unless we re-ceive a corrected address within one year. **INQUIRIES AND SUBMISSIONS:** Letters, Beth Broome; Practice, Suzanne Stephens; Books, Clifford A. Pearson; Lighting and Interiors, Linda C. Lentz; Architectural Technology, Joann Gonchar; News, Anna Fixsen. REPRINTS: architecturalrecord@theygsgroup.com. BACK ISSUES: Call 877/876-8093, or go to architecturalrecord.com/backissues.



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Design's Social Agenda

Architecture in the public interest is now part of the Zeitgeist.

THE ANNOUNCEMENT of the 2016 Pritzker Prize winner last month came as something of a shock. Rather than select a precertified star, the jury picked Alejandro Aravena, best known for building smart, extremely low-cost social housing in his native Chile. Then a minor tempest broke out over the fact that the jury knew Aravena very wellhe had been one of them for seven cycles, only stepping down last year. Yet Aravena was, by his own account, as surprised as anyone-and he was quick to defend the jury's integrity (page 25).

The Prize has been a lightning rod for criticism in the past, of course-for neglecting women architects, and for avoiding, usually, the idea of collaboration. But let's look at the deeper significance of this year's honor. The choice of Aravena sends a powerful message about the role of architecture in addressing some of the world's most urgent problems-as did the 2014 prize to Shigeru Ban, famous for his temporary shelters for victims of disaster. The award is formally bestowed each year at a site of architectural significance that has no connection to the winner (Tadao Ando received his 1995 medal at Versailles, of all places), but, this year, it seems perfectly appropriate that Aravena will be celebrated in April at the United Nations headquarters in New York.

The push for the profession to be more engaged in social issues has been rapidly growing, of course, particularly among younger architects and students. When Aravena steps onto another global platform this year, as director of the Venice Biennale, his theme, "Reporting from the Front," will put into sharp focus projects that enhance the built environment and improve the quality of ordinary peoples' lives. The Santiago-based architect promises an inclusive Biennale that will highlight "practices where creativity was used to take the risk to go even for a tiny victory, because when the problem is big, just a 1-millimeter improvement is relevant." Accordingly, the exhibition in the U.S. Pavilion, called The Architectural Imagination, intends to showcase the power of architectural thinking in regenerating postindustrial cities. Cocurated by critic and editor Cynthia Davidson and former dean of architecture at the University of Michigan and now at Princeton, Monica Ponce de Leon, it will look at the potential of four abandoned or underused sites in Detroit, as radically reimagined by 12 teams of architects.

In the UK, 2015's Turner Prize-usually given to an artist-went to Assemble (RECORD, September 2015), a London architecture collective that pursues community-oriented projects. The inaugural Chicago Biennial, which closed last month, also promoted a social agenda, though it was smuggled in under a banner defining the exposition as "The State of the Art of Architecture." Many of the 120 U.S. and international firms invited to participate responded with projects that tackled housing needs, sustainability, and enhancing the urban realm. Studio Gang exhibited a compelling proposal for a model Chicago police station-one that would be less an urban fortress and more a community



center-as an attempt to rekindle trust between citizens and cops on the beat. The project's actual first step was the opening of a public basketball court, carved out of a police station parking lot in a gritty neighborhood-a "tiny victory," to be sure, but an especially timely one as revelations about police shootings of African Americans fueled new outrage in Chicago.

Though hardly alone in undertaking such activities, Studio Gang is a high-profile model practice that balances innovative architecture for commercial and institutional clients with work on social issues, often initiated by the architects themselves-what founder Jeanne Gang calls "actionable idealism."

Not all professionals are pointedly bent on curing the world's ills, but they can bring design excellence and a commitment to responsible architecture to their work. Case in point: the artful renovation or adaptive reuse of an existing building, a profoundly sustainable approach to improving the built environment.

In the following pages, RECORD explores a half dozen such exemplary projects. New spaces for viewing art are among the most popular adaptations these days, and here the transformations of buildings into museums range from what was once a hospital in Renaissance Florence to a 1979 Beijing electronics factory to a neoclassic courthouse in Singapore. Just because these projects didn't start from scratch doesn't mean they are self-effacing; in even the most subtle restorations, the architectural imagination is alive and well.

Cathleen McGuigan, Editor in Chief



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All the concrete dreams in my mind's eye All the joy I see through these architects' eyes –David Bowie, in his 1995 song "Thru' these Architects' Eyes."

Chilean architect

Alejandro Aravena (left) is known for buildings that are both beautiful and address complex social issues. In addition to subsidized housing, he has built a number of institutional projects, including the Innovation Center at the Universidad Católica de Chile

news

WHEN CHILEAN architect Alejandro Aravena speaks about building, he invokes the language of governments and institutes: "investing in brains over bricks"; turning "forces into forms." But unlike the abstract ideas that may emerge from a policy institute, Aravena, with his Santiago-based firm ELEMENTAL, is keen on designing solutions that not only aid but also empower society's neediest.

For this visionary approach, Aravena has been named the winner of the 2016 Pritzker Architecture Prize, the profession's most prestigious honor.

"Few have risen to the demands of practicing architecture as an artful endeavor, as well as meeting today's social and economic challenges," the prize's nine-member jury– which included Pritzker laureates Glenn Murcutt and Richard Rogers and U.S. Supreme Court Justice Stephen Breyer–wrote in its citation. "[Aravena] has achieved both."

Aravena's projects range from a reconstruction plan for Constitución, the Chilean city devastated by an earthquake and ensuing tsunami in 2010, to delivering some 2,500 units of housing in urban slums. He has also designed scores of institutional, civic, and Alejandro Aravena Wins 2016 Pritzker Architecture Prize

EMENTA

cultural works from Chile to China.

The architect will receive the \$100,000 prize and the iconic Louis Sullivan–inspired bronze medallion in a ceremony at the United Nations Headquarters April 4.

When reached by phone in his Santiago office, Aravena—the first Chilean architect and the fourth South American to receive the Pritzker—told RECORD he was still in a state of disbelief. After he got the news, "for a couple of minutes I misunderstood what I was being called for," he says. "Then, when I realized, the emotion was so overwhelming, I couldn't speak. I was too touched."

Aravena studied architecture at the Universidad Católica de Chile. In 1994, two years after graduating, he established his eponymous firm, Alejandro Aravena Architects. His first major project was the Mathematics School (1999) at his alma mater.

Over the course of his career, Aravena–a 2004 RECORD Design Vanguard winner–went on to design several other buildings for the university, most notably the Siamese Tower (2005), a forked glass tower with an innovative skin adapted to Santiago's desert climate, and the UC Innovation Center-Anacleto Angelini



(2014), a muscular concrete edifice with a glazed atrium at its center.

ELEMENTAL began as an academic enterprise too; in 2000, Aravena was invited to teach at Harvard's Graduate School of Design. There he met a young engineer and fellow Chilean Andres Iacobelli, studying public policy at Harvard's Kennedy School of Government. Their discussions led back to Chile, where subsidized social housing was delivered aggressively but was of poor quality. What if, they reasoned, social housing, instead of depreciating in value over time, could increase in value? With architect Pablo Allard, they founded ELEMENTAL in 2001.

They put their ideas to the test in Quinta Monroy, ELEMENTAL's first social-housing

perspective**news**

project in the city of Inquique. The architects needed to design housing for nearly 100 families in a slum on the shoestring government subsidy of \$7,500 per unit. "The consequences of architecture are not easy to erase, so you need to be as careful as possible, moving from paper to reality," he says.

Rather than seek cheaper property on the city's perimeter to stretch the subsidy, the architects opted to provide exactly one-half of a well-designed house, which residents could expand and improve over time as their individual circumstances permitted.

"We were encouraged by the positive results, but we had to prove our point in different environments," Aravena says.

ELEMENTAL was able to secure seed funding by finding business partners-COPEC, a major Chilean oil company, and Universidad Católica de Chile-and has since created similar housing projects in Monterrey, Mexico, and in many more cities throughout Chile. The architecture office is run by four partners in addition to Aravena-Gonzalo Arteaga, Juan Ignacio Cerda, Victor Oddó, and Diego Torres-to whom Aravena credits his Pritzker win.

Aravena hopes to leverage both the Pritzker Prize and being chief curator of this year's Venice Architecture Bienniale as global plat-



Much of Aravena's social housing has the ability to grow incrementally. For the Quinta Monroy housing complex (2004), ELEMENTAL provided half a house, and residents later added on as their economic circumstances improved.

forms. With the Biennale theme Reporting from the Front, Aravena wants to get architects thinking about concrete design solutions to problems as varied as pollution, security, climate change, and migration. The architect sees this global line of thinking as an emerging theme in Pritzker laureates, beginning with Shigeru Ban in 2014, who is well known for his temporary disaster-relief shelters. But Aravena is uncomfortable with being called a humanitarian. "It's a word that we consciously try to avoid," he

says. "We never claim any kind of moral superiority because we are doing social work."

Aravena himself left the Pritzker jury last year after seven rounds as a judge. "The level of the debate was the highest I'd witnessed," he says. "It was fair to allow new voices to enter."

But some may find it controversial that his colleagues selected him so soon after his departure. "If there is anything in such a jury, it's a level of integrity," he says, slightly bristling.

Aravena prefers to dwell on

the impact of his work. On the opening day of the Quinta Monroy housing complex in 2004, a young mother, part of the Aymara indigenous group, pulled Aravena aside to thank him for her new home. "This housing is not just for me but for my children, and the children of my children," she told him as she poured wine into the ground to honor Pachamama-mother earth. He says, "It was a very emotional moment to know you have created a benefit for a couple generations to come."



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Niemeyer's Forgotten Legacy in Lebanon Faces Threats

BY MOHAMMAD YAGHI AND JACK CROSBIE

ONE DAY in 1962, Oscar Niemeyer found himself strapped into the seat of a helicopter thundering over a tract of land on the outskirts of Tripoli, Lebanon. After two circuits over the city, the nervous architect (Niemeyer hated flying) told his project manager, "OK, we can go back. I've decided the best location for the fair."

At the time, the Brazilian architect was riding the wave of success from his work in Brasilia, the new capital of his home country. Niemeyer's revolutionary designs had spurred a flurry of interest from international clients, among them the Lebanese, who gave him nearly 250 acres of land to design the grounds for a grand World's Fair meant to showcase the country's development and innovation.

The architect completed his plans in 1963, including a wild array of concrete structures that incorporated elements of traditional Arab style into the distinctly modern aesthetic he perfected in Brasilia: a mushroom-shaped helipad over a subterranean science museum, a concrete dome housing an experimental theater, pyramid structures with star-shaped footprints, and a boomerang-like "Grand Ouverture"-the main exhibition hall. Construction began in 1967, but the outbreak of Lebanon's civil war in 1975 brought the slow-moving project to a halt. More than half a century later, Niemeyer's grand exhibition lies in disuse, the remaining seven structures succumbing to decay. Cigarette butts and empty water bottles litter the corners of reflecting pools, dark blue graffiti is scrawled inside a pavilion, and broken concrete pocks the fair's central arch.

The forgotten fairground-now renamed after former Lebanese prime minister Rashid Karameh-is once again attracting interest, but from divergent forces. Tripoli, a city of a quarter million people along the Mediterranean, is becoming a popular tourist destination after years of turmoil, but preservationists say political and commercial interests in developing the site-proposals have included an amusement park-threaten the integrity of Niemeyer's design. These activists are campaigning for UNESCO recognition and for the completion of Niemeyer's original design, turning it into a public park and historic site. They hope that one day Niemeyer's utopian vision-a space for all Tripolitans-will be realized.

When then-Lebanese president Fouad Chehab offered the World's Fair contract to Only seven pavilions were built as part of Oscar Niemeyer's master plan for the Tripoli fairground. The site, disused for years, includes many long reflecting pools (right), which stand empty save for rainwater. The amphitheater's stage (below) provides a view of several of the remaining concrete structures, including the complex's central arch.





Niemeyer, he hoped the architect's work could foster a sense of national identity in Lebanon—a country fractured by sectarian divides and vestiges of colonial power—as the architect's work in Brasilia had. Niemeyer "saw great value in producing works for countries that at the time were viewed as underdeveloped and peripheral," says Styliane Philippou, an architectural historian and author of Oscar Niemeyer: Curves of Irreverence. "Niemeyer conceived of the site as a place of social and political integration, open to all."

But Lebanon's civil war left the fairground first abandoned, then used as a barracks and staging ground for Syrian Army forces. Beneath Niemeyer's concrete dome, militant groups allegedly conducted executions. Its exterior is scarred with bullet holes. "It's dilapidated and in need of attention," says Philippou, "but it has survived, and it has great potential."

Developers see potential in the site too. In 2000, a portion of what Niemeyer envisioned as a residential complex became a nondescript Quality Inn hotel; in 2001, the site's board of directors tried to turn the southern portion into a theme park; in 2006, the site narrowly escaped becoming a permanent exhibition ground for imported Chinese products when the Hezbollah-Israel war broke out. Most recently, a member of parliament proposed turning the fair into a tech hub and university under a plan called Tripoli 2020.

But the real danger to Niemeyer's fairground is the Lebanese government's inactivity. While lawns are mowed, trees are pruned, and walkways are cleaned, the concrete facades are beginning to crack. The site has been on the World

Monuments Fund's biennial Watch List for a decade, but little has been done to save it.

Six months ago, a group of concerned architects and activists launched a campaign to force the Lebanese government and the exhibition's board of directors to make the grounds a protected cultural landmark as a UNESCO world heritage site, the same designation granted to the entire city of Brasilia in 1987. "Listing a monument as a local or international heritage will give the site life," argues Wassim Naghi, the president of the Union of Architects in Tripoli and one of the campaign's leaders.

Naghi has raised awareness at meetings both in Tripoli and abroad. He believes that a UNESCO heritage site status would make the venue more attractive to investors, while keeping the architecture intact. He is finalizing the process of making Tripoli and Brasilia sister cities to foster cultural exchange, with Niemeyer as the common denominator.

He and other preservationists hope that, one day, the fairground will host summer festivals in the outdoor theater, and cultural events, giving Niemeyer's work the chance to become the symbol of Lebanese unity he originally intended, rather than another monument to sectarian conflict and opportunist bureaucracy.





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The Chicago Architecture Biennial, by the Numbers

By nearly all critical accounts, Chicago's inaugural Architecture Biennial– North America's first–was a smash hit. The numbers echo the critics: according to Biennial organizers, more than half a million visitors flooded the venues between October 3 and January 3 to check out dozens of pavilions, exhibitions, and symposia delivered by an international assemblage of architects. Due to its "unequivocal success"–in Chicago Mayor Rahm Emanuel's words–the Biennial will return to the city in 2017.



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[NEWSMAKER] Kengo Kuma

BY NAOMI R. POLLOCK, AIA

IN DECEMBER, Japanese officials announced their selection of Kengo Kuma as the architect for Tokyo's 2020 Olympic Stadium. Their decision resolved a hotly contested debate over the building's design and concluded a second competition for its designer after Prime Minister Shinzo Abe scuttled the building's initial win-

ning design by Zaha Hadid. The controversy continued last month when Hadid refused to sign over her design's copyright to the Japan Sport Council and sign a gag order.

Kuma's scheme, which beat out Toyo Ito's proposal, was lauded for its relatively modest budget and its sensitive architectural expression incorporating live trees and timber construction—one of the architect's signature elements. The 80,000-seat structure is being developed with Taisei Corporation and Azusa Sekkei

Company. Construction is expected to commence as early as December. Kuma spoke to RECORD's correspondent in Tokyo, Naomi Pollock, about the project.

What does the Olympics 2020 stadium mean to the Japanese people?

The Olympics can be an important event that represents the spirit of the time. Tokyo's first Olympics, in 1964, symbolized that Japan had caught up with the West. Now people really want a new kind of monument appropriate for Japan's postindustrial age. Instead of economic expansion, it is a time of quietness and humbleness but also of richness.

When you say "richness," what do you mean? Now we are living in a time when energy and resources are very limited. But I believe we can live richly in that kind of severe condition. Japan can be a good model for solving that problem.

Does that mean that this is an energy-conscious project?

Yes. For example, because of funding constraints, the government decided not to aircondition the arena. We carefully designed a louver system that admits wind from the south in the summer and limits it on the north side in winter.

How else are you coping with the tight budget and schedule?

During the competition phase, we began thinking about the construction method.

Standardized and not so big, the wood panels and beams will be prefabricated at a conventional factory. Composed of these repetitive elements, the section of the building is the same throughout [making it comparatively easy and quick to build].

perspective news

Some say there are similarities between your arena and Hadid's. What do you think?

My idea and philosophy are totally different. For example, Zaha's seating layout is kind of saddle-shaped, extending up two sides of the

building, while we tried to emphasize the horizontality of the building. There are some similarities, since the building code, the site, and the economical span of the concrete are the same, but these are just parts. Why is wood essential to your scheme?

From ancient times, wood has had a profound impact on the Japanese. Though concrete proliferated in the 20th century, it does not fit with our mentality or lifestyle. The Olympics should be a trigger to go back to wood again. Kenzo

Tange's gymnasium [for the 1964 Olympics] symbolized the age of concrete and is the most beautiful concrete building in Japan. But I am trying to create a monument that is the opposite. We plan to use wood from Japan. Personally, I would like to use wood from Tohoku [the region devastated by an earthquake and tsunami in 2011].

How can Japan balance this costly event with the need for reconstruction in Tohoku?

People in Tohoku are very worried that they will be forgotten, especially since March 11, 2016, marks the disaster's fifth anniversary, and they are uncertain about the government's reconstruction policy after that. The Tokyo Olympics can be a magnet that draws attention to Japan. People in Tohoku are trying to reconstruct their villages again as attractive places that can draw tourists and activate the economy. If we design the Olympic facilities carefully, we can support that growth. What will happen to this building after the Olympics are over?

One of our main ideas is Sora no Mori, meaning "forest in the sky." It is an 850-meter running track ringing the top of the building and can be used by runners as well as pedestrians. It will be open to the public every day, even if there are events in the arena. The idea of Sora no Mori is that it can draw people to the building and create a new relationship between the stadium and its neighbors.

noted

New Jersey Residents Seek Removal of Williams and Tsien Pavilion

Residents of Highlands, NJ, are seeking to remove a beach pavilion designed by Tod Williams Billie Tsien Architects as a memorial to Hurricane Sandy. The concrete slab structure – dubbed "the beast on the beach" by locals – was donated by the Iowa-based Tilt-Up Concrete association. The city council is demanding Tilt-Up remove the pavilion.

Architecture Scholar Stanford Anderson Dies at Age 81

Stanford Anderson, founder of MIT's History, Theory and Criticism program, passed away January 5. Anderson enjoyed a more than 50-year career at MIT, and his academic work encompassed modern European and North American architecture, epistemology, and historiography. He chaired the university's architecture department from 1991 to 2004.

NY Governor Andrew Cuomo Unveils \$3 billion Overhaul of Penn Station

New York Governor Andrew Cuomo has announced a \$3 billion plan to overhaul Manhattan's Penn Station, North America's busiest train station. The plan would turn the station into a "world-class transportation hub" by updating the station's maze-like passageways and moving Amtrak tracks to the James A. Farley Post Office building. The state and Amtrak will request developer proposals this spring.

Frank Lloyd Wright Foundation Names New President and CEO

The Frank Lloyd Wright Foundation named Chicago-area businessman Stuart I. Graff president and CEO. The appointment, effective February 1, will put Graff in charge of Taliesin and Taliesin West. Prior to taking the position, Graff was the vice president at Valspar Corporation. He succeeds Sean Malone, who had led the foundation since 2012.



2015 Finishes with ABI Uptick

The American Institute of Architects (AIA) reports that the Architectural Billings Index (ABI) was once again in positive territory, wrapping up 2015 with a score of 50.9 points in December, up 1.6 points from the previous month. Any score above 50 indicates an increase in billings. The New Projects Inquiry index also increased by 1.6 points from November. PHOTOGRAPHY: © THE COURIER







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A PAVILION-LIKE BEACH HOUSE ON MEXICO'S WEST COAST OFFERS PLEIN AIR LIVING WITH VIEWS OF THE PACIFIC OCEAN. BY JOSEPHINE MINUTILLO





SECOND-FLOOR



ò

GROUND-FLOOR

1	ENTRANCE HALL	6	POOL
2	KITCHEN	7	BEDROOM
3	LIVING AREA	8	BATHROOM
4	LAUNDRY	9	OFFICE
5	OUTDOOR SPACE	10	TERRACE

WHEN SEATTLE-BASED designer John Van Dyke visited Cabo Corrientes for the first time nearly a decade ago, he found a kind of place he thought no longer existed. The pristine mountainside and endless beach were easily accessible-located two hours southwest of Puerto Vallarta on Mexico's Pacific coast-but far from the throngs of tourists. "It reminded me of Baja and Cabo San Lucas 40 years earlier."



The simple structure of the 3,000-square-foot residence features stuccoed walls composed of concrete columns and adobe brick infill (top). The upper level's main space is completely open to the outside, acting as both living area and covered terrace (above).

The house Van Dyke designed for himself, working with Puerto Vallarta-based TW Arquitectos, fuses modern influences and local building techniques in a pavilion-like structure perched on the cape's rolling topography. A stonewalled entrance hall opens up to the singular public space of the upper level with unobstructed ocean views. There, a pair of parallel stuccoed walls features a combination of reinforced-concrete structural columns and adobe brick infill. While the northern wall is solid, openings in the southern wall are unglazed, the western face is left completely open, and the large living-area-cum-terrace culminates in a long rectangular pool. The indoor-outdoor spaces and the de Stijl geometry of the house's volumes are a nod to Rudolph Schindler, although Van Dyke also aspired to evoke the minimalism of Mexican master Luis Barragán.

Two bedrooms on the lower level, just 50 feet above the beach, also face west toward the water, and custom-designed furnishings throughout feature low profiles to take advan-

tage of the spectacular vista and sunsets. Rooms without views include laundry and storage, where upper-level furnishings are moved in anticipation of a storm or when the house is not in use.

Van Dyke wanted the naturally ventilated house to have little impact on its unspoiled surroundings. Rainwater is captured and graywater recycled. Twelve rooftop solar panels, out of view behind parapets, help generate more power than is used to fuel the stove, clothes dryer, LED lights, and backup generator. "I could not have designed this house when I was younger," Van Dyke admits. "It takes maturing thoughts about design to achieve the kind of simplicity I was after."

Rocky Mountain



LEFT TO RIGHT: DESIGNER DOOR HARDWARE WITH SPICE LEATHER AND UJ LEVER, MACK DOOR HARDWARE WITH MACK KNOB, AND PROVENCE PULL

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perspective firm to watch

Northern Exposure

A Toronto firm rethinks the conditions of the city and the family.

BY ANNA FIXSEN

AS THE partners of Toronto firm Williamson Chong tell it, they embarked on their practice quite literally in a canoe.

Donald Chong, an Ontario native with his own firm, wanted to teach Shane and Betsy Williamson—an American couple with an architectural practice in Toronto—a thing or two about a classic Canadian pastime. Something clicked as the trio navigated the waterways of Algonquin Provincial Park and schlepped their gear over portages. Chong recalls thinking, "Hey, why don't the three of us dovetail?"

If this boot camp scenario was the proving ground for their relationship, then greater Toronto was the test tube for Williamson Chong's combined interest in devising small-scale solutions to big-picture challenges like the condition of the city and the future of the archetypal family dwelling.

Before teaming up in 2011, the three architects often crossed paths in Toronto's architectural community. Chong, who holds a B.Arch. from the University of Toronto, started his firm in 2004. Shane and Betsy Williamson, who both hold M.Arch. degrees from Harvard's Graduate School of Design, began their firm in 2007 and moved to Canada after Shane took a position at the University of Toronto.

Each party had completed a significant residential project—one rural, one urban. The Williamsons had designed the award-winning House in Frogs Hollow, a muscular concrete structure carved into a landscape of rolling hills, with rich wood details inside and out. Meanwhile, in Toronto, Chong had completed the Galley House, a three-



Williamson Chong (above) have investigated possibilities for multigenerational housing in the Grange Triple Double house (top) and the Ancaster Creek House (above, right). Their House on Fox Lake draws from traditional Korean design and will wrap up this summer (below).

story, 12-foot-wide residence on a narrow urban lot. These projects set the tone for Williamson Chong's work. In Toronto, they have continued to home in on the strategy

explored in Galley House, an approach they term "incremental urbanism"—identifying the latent value in less desirable urban spaces. This tactic is evident in projects such as a 19-foot-wide residence called the Blantyre House (2011), composed of three narrow, stacked volumes, and, most recently, the Grange Triple Double house (2015), a multi-unit residence situated on a once-dilapidated corner in the city's Chinatown.

Grange Triple Double is also representative of a burgeoning area of Williamson Chong's practice – multi-generational housing. Here, the client, a professional couple, opted to build a shared house for their children as well as aging parents. The ground level holds a rental unit for tenants (which could later be converted to an apartment for their kids) while the upper floors contain the family's living areas.

The architects are further investigating multigenerational living in their Ancaster Creek House (set for completion this April), an elegant modernist dwelling composed of two double-height volumes, linked by a central glazed dining

area, for a couple and their elderly parents. The architects incorporated finely crafted details, like a gently twisting staircase, as well as universal design elements including generous entryways and living quarters on the ground level. "No one wants to feel like they are moving in with their parents, so it's important to develop spaces



that are discrete but connect on a family level," says Betsy.

Increasingly, the firm is taking on other building types. "It's risky not to be risky," insists Chong. Alluding to Canada's greatest sports hero, he paraphrases Wayne Gretzky: "You always want to go to where the puck will be."

Half of Williamson Chong's work is currently a mix of commercial, cultural, and landscape projects. The firm has designed the master plan for a ski resort in southwestern Ontario and for both the production and retail facilities for Pilot Coffee Roasters. A recent photo on the architects' Facebook page, a bubbling mass of yeast, hints at what's to come: a craft brewery in Niagara-on-the-Lake, Ontario, just opening now.

The firm, with the three partners and five employees, has racked up awards, including the 2014 Royal Architectural Institute of Canada's Emerging Architectural Practice Award, and an Architectural League of New York Emerging Voices honor that same year.

Williamson Chong continues to push their practice to find new design opportunities by exploring wood technologies and computational design and further developing innovative urban solutions. "Our architectural projects reflect the changing trajectories of cities," notes Chong. "Toronto makes it easy for us, because people here are willing to try out new ways of living."



Contemporary Curve

Jefferson County Western Health Center, Midfield, AL Owner: Jefferson County Department of Health Architect: Birchfield Penuel & Associates, Birmingham, AL General contractor: M.J. Harris Construction Services, Birmingham, AL Installing contractor: CSC Roofing, Birmingham, AL Profiles: Tite-Loc curved, Reveal Wall Panels Colors: Cardinal Red, Sterra Tan



Tom Kidwell, senior associate and project architect, Birchfield Penuel & Associates



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perspective **books**

New York City's Unheralded Legacy

Affordable Housing in New York: The People, Places, and Policies that Transformed a City, edited by Nicholas Dagen Bloom and Matthew Gordon Lasner. Princeton University Press, November 2015, hardcover, 336 pages, \$39.95.

Reviewed by Jayne Merkel

THIS IS a superb history of the numerous ways that New York has provided subsidized housing for low-, moderate-, and middleincome residents from around 1900 to the present. As such, it provides a model to other cities – consider, for example, that the New York City Housing Authority (NYCHA) is the largest public housing agency in the country, overseeing 178,000 low-income apartments, with an official-probably underestimatedpopulation of 403,000. That would qualify as a good-sized city in most places in this country.

In a series of essays, editors Nicholas Bloom and Matthew Lasner, and historians such as Andrew Dolkart, Hilary Ballon, and Karen Kubey, discuss tenement-reform legislation, tower-in-the-park projects, mid-rise buildings oriented to the urban grid, and suburban-style single-family houses on city streets. The contributors explain why various neighborhoods look the way they do, and show how attitudes toward the poor have changed, for better-and for worseover time. In doing so, they describe the complex legal, philanthropic, and financial methods used to create, maintain, and sustain affordable housing, such as the low-rise, high-density Marcus Garvey Housing in Brooklyn (1975) and Via Verde, the model of energy efficiency in the South Bronx (2012). Historic photographs and new ones-some showing residents in their personally decorated homes-supplement plans and models of apartment layouts.

This is no dull study of methodologies for assorted programs. The book brings idealistic characters to life-from Fiorella LaGuardia to Alfred Smith, Clarence Stein, Robert Moses, Ed Logue, and Jane Jacobs-as well as lesser known, often female, pioneering housing advocates. The authors describe how hip-hop music grew up in housing projects in the Bronx. They also explain the role that labor unions played in creating some of the best complexes. For example, Penn South, the 2,820-unit middle-income nonprofit coop, a tower-in-the-park complex, was developed by the ILGWU (International Ladies Garment Workers Union) and thrives



today on Manhattan land that has become very valuable, in West Chelsea, a neighborhood now full of high-end art galleries.

Yet it's well known that there are problems with low-, moderate-, and middleincome housing in this city. With maintenance deficiencies from the recent loss of federal funding, NYCHA housing is less successful than it was when first conceived in 1934. And while Mayor Bill de Blasio has made the creation of more affordable housing a priority, the city lacks the federal subsidies, philanthropic commitment, and the strong unions that built housing in the past. Also missing are public-transportation initiatives to make underused land on the city's edges attractive to developers. The mayor's ambitious 10-year plan to create affordable housing has made some headway: de Blasio claims that more than 20,000 lowcost apartments and residences materialized during the fiscal year of 2015. Yet his call for mandatory inclusionary zoning has met resistance from some community groups who fear that the character of their neighborhoods will change and that there is inadequate infrastructure, such as schools, for projected population increases. Building on the achievements of New York City's past, as described in this essential book, will be a steep uphill battle.

Jayne Merkel is a contributing book-review editor for ARCHITECTURAL RECORD and the author of Eero Saarinen (Phaidon, 2005).

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Old World, New Tech

Art Deco charm meets contemporary workplace in a San Francisco landmark. BY JOSEPHINE MINUTILLO

A SOARING symbol of San Francisco's past, 140 New Montgomery—also known as the PacBell Building—has become a hub for some of the Bay Area's most forward-looking companies. The city's tallest building when it was completed in 1925 for Pacific Telephone & Telegraph, its main tenant these days is Yelp. Staffers for the restaurant and retail-reviews site occupy the lower 13 floors of the 26-story tower, all designed by Studio O+A.

O+A's latest office project holds a place of honor within the PacBell—the penthouse—now home to the San Francisco office of Alibaba, China's largest e-commerce company. Unlike other floors, the penthouse, originally a ballroom, has retained much of its ornate Art Deco detailing, particularly the elaborate hand-painted molded-plaster ceiling, which once covered the ballroom's public areas and was already restored.

Below it, original oak floors complement the molding's autumnal colors. The pecan wood O+A selected for conference room doors and wall paneling keys in with the orange that is the Alibaba signature color. Perimeter walls feature exposed brick. Fairly standard materials are used throughout-Carrara marble on kitchen surfaces and the reception desk, subtly striated carpeting over concrete portions of the floor. O+A eschewed custom desks and case goods in favor of off-the-shelf office systems. The tall dining table features bar stools for a more communal atmosphere.

"This is a new era for tech offices," says O+A cofounder Primo Orpilla. "They need to set a more friendly, approachable tone. We left Alibaba raw and unfinished so that it has a warehouse feel merged with classic details."

Nowhere is the transition from ornamental to austere better illustrated than in the kitchen of Alibaba's new office, where the decorative ceiling meets raw concrete and exposed pipes. Hardwood plywood edges of the cabinetry are left exposed. Marble surfaces the table and countertops.



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Modernity and the Monument

A legendary landmark of architecture showcased in RECORD in 1968 faces a controversial interior renovation.

BY ALEKSANDR BIERIG PHOTOGRAPHY BY EZRA STOLLER/ESTO

THE IMPENDING renovation of the 1967 Ford Foundation headquarters in Manhattan presents an unusual dilemma: the very elements that distinguish this landmark of Midcentury Modern architecture are those that threaten it. Among the earliest major works of the office of Kevin Roche John Dinkeloo Associates (KRJDA), the steel, granite, and glass edifice spares little expense to express the munificence of the Ford Foundation, which was, and remains, among the world's most prominent philanthropic institutions. Given an AIA 25-year award in 1995 and granted landmark status in 1997, the foundation headquarters appears over and over in the pages of ARCHITECTURAL RECORD, first in a cover story from February 1968. In that piece, Jonathan Barnett wrote that the building at 320 East 43rd Street, near the United Nations, projected "ritual, hierarchy, and immense power."

In late December, the director of the foundation, Darren Walker, invoked a similar triad of attributes when he told The New York Times that "this building is not compatible with our culture as an organization. It is hierarchical, off-putting, and inaccessible." Beginning in October 2016, the current site will be vacated for two years for a series of renovations, led by the architectural firm Gensler and expected to cost about \$190 million. These changes will include basic updates to bring the building to code, but will also involve rethinking the very spatial organization that defines its unique presence. The Ford Foundation, led by Walker, is reorienting its operations to focus on what it characterizes as a more structural approach to philanthropy, moving from simply "giving back" to addressing complicated issues of economic inequality and injustice (issues which, as Walker points out, arise from the very same "free market" that has provided the resources for the foundation's work). The building renovation is a small but crucial aspect of this institutional recalibration, or, as he puts it, "an opportunity to reimagine the building as a public-service facility."

The tension between magnificent display and social mission present today at the Ford Foundation was, in fact, acknowledged from the start. In the February 1968 RECORD, Barnett compared Roche's design to the ancient "foursquare building," meaning that the structure's height, length, and depth were of similar dimension. A foursquare building with an interior courtyard, he continued, "is a traditional symbolic representation of the universe, and as such is an ancient symbol of power, used in religious buildings and palaces. The palace of the king of kings, the temple of the New Jerusalem, the house of the world, are the concepts this shape connotes."

Other critics were more concerned with the contradictions that might emerge from an office building that looked like a temple. Kenneth Frampton, writing in the British publication *Architectural Design*, gave some icy praise to Roche Dinkeloo's efforts before dismissing it as "a superbly organized Shangri-La housed with impeccable technique." He called it a "house of Ivy League values and good intentions, dedicated to the dispensation of private profit for the public good, hermetically sealed in an unreal world." Journalist William Zinsser wrote in Life magazine that the building's introverted views and interior furnishings were hostile to office work. Crafted cabinets and desks without drawers "remind their users of how tidy they are supposed to keep them. They represent the eternal dream of architects to curb the eternal sloppiness of man." The building, as a whole, put its own workers on display, with multiple sightlines across the glazed interior courtyard. Everyone could see what everyone else was doing.

The 174-foot-high skylit atrium is the crux of this design, central to the winning pitch that Roche made to the Ford Foundation board in 1963. It was imagined as a place where connections might be renewed—connections to both an alienated natural world and to a common organizational purpose. Roche spoke of the "community" of the office, and he and Dan Kiley, the atrium's





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multiplication of ground floor space the also felt that the Foundation, whi as grown very rapidly over the past rears, suffered from a lack of commu ation and needed to be housed in building strongly expressive of relativ g strongly expressive of d the organization's per

FORD FOUNDATION BUILDING

e is an unusual one, near the ations Building, at the east end treet, one of Manhattan's most inent cross-town streets. ted by the Foundation is in itself, however; it is large It in itself, however; it is not la d does not occupy a comer. The m ent characteristic of the location proximity to Tudor City, a self-c-ed group of apartment houses dat m around 1930, whose frosting abethan detail gives the complex ne. Tudor City's main level is m and does alient charact an a story above 42nd Street, and two arks at this upper level adjoin the Ford

Although Roche

A remain along the at a courtyard of some kind would be an important part of his design, his initial concept was an L-shaped building with a stepped section that terraced down to meet the space of the Tudor City parks. The decision to reach out and enclose the courtyard space established the basic concept, and the rest of the building follows logically from it. The courtyard still steps up an entire story from 42nd to 43rd Street, and several of the lower floors of the build-ng still step back to create terraces; but the interior volume becomes a single space, and pulls the whole building together in a very powerful way. The court becomes a park, which is open to the public and is a tremendously generall along that a the public and is a tremer ous gift to the city, as is restraint with which the estraint with which the building's di-nensions, proportions and colors have seen related to its neighbors. The warm ones of the granite facing and the rust-urfaced steel harmonize particularly. The offices are grouped around the vourt in such as way that it provides both physical and visual transition between he office sace and the world outside

the office space and the world outside The court serves as a giant return for the conditioned air supplied to the offices and the offices and corridors that lool out on the court have doors that can b out on the court have doors that can be opened and slid back. The court also provides a variety of outlook and a con-stant point of reference. Roche speaks of it as a "living room" for the whole foundation that provides a sense o community for everyone who works The of nt, but the visitor find that that "living room" is too don rm. In fact, the space is little



landscape architect, envisioned an environment where 100-foot magnolia trees would eventually match their monumental enclosure. In reality, they only survived a few years, victim to the mechanical conditions and the low humidity of the office environment. The garden's first caretaker, Everett Conklin, gradually replaced many failed species while trying to maintain Kiley's overall aesthetic vision. Now, it seems, landscape architect Raymond Jungles will be in charge of new planting.

In the courtyard's design, Barnett saw a potential model for city life. The former RECORD editor, who by the time his piece appeared in the magazine was the director of the newly formed Urban Design Group for the City Planning Commission, described "a new kind of urban space that stands between the sealed environment of a modern office building and the increasingly harsh and uncontrolled urban landscape outside." These freighted words occurred in the volatile context of protests against racial inequality in Harlem and mounting demonstrations against the Vietnam War. Mayor John Lindsay had to deal with an unwieldy city. In his new role in Lindsay's administration, Barnett worked on a plan to develop a zoning incentive as a public amenity in office buildings that would try to replicate Roche and Kiley's precedent of a spacious air-conditioned internal courtyard for private use. After the Ford Foundation appeared in RECORD, similar spaces began appearing throughout New York and around the world.

More difficult to replicate were the Ford Foundation's impeccable, expensive details. Every surface became part of a total composition of discreet charm: linen and leather, English wool and oak parquet, beige rugs from Puerto Rico and furniture made of Honduran mahogany. This stately palette, combined with the magisterial atrium, created a building in which everyday office life was infused "with an almost ritualistic significance." Barnett was also struck by the preponderance of brass details in door trim, stair rails, and other elements throughout the building. That is, he

added, "One knows it is brass, but actually one thinks of it as solid gold, the ancient perquisite of priests and kings."

Walking around the offices today, which accommodated about 360 people then and 400 now, the details and furnishings (by such designers as Warren Platner and Charles and Ray Eames) give the building its unique quality, transporting visitors back to 1967. It is also this fine-grained sensibility that presents the greatest challenge to the planned renovation. Over the years, many parts of the structure have already been rededicated toward more public uses. A private dining room on the top floor is now reserved for conferences, and parts of the lower floors function as coworking spaces for visiting grantees. Other offices have been awkwardly repurposed into staging areas for printers and IT services. But, on the whole, the achievements of KRJDA's total design have meant a resistance to change; the offices are immured within the peculiarities of their initial conception.







RECORD's coverage (opposite) showed the sight lines afforded individual offices around the atrium, where a stair connects the lower level on 42nd Street to a higher one on 43rd. The offices (this page) illustrate the use of elegant materials such as linen, leather, bronze, and mahogany. Plantings in the atrium by landscape architect Dan Kiley create an oasis in the city.

Current plans by Gensler are still in development and will probably not affect the triumphant scale or its monumental elements, but it will change the executive-suite style to more of an open plan. In a recent interview with RECORD, Kevin Roche said that the transformation from the individual offices to an open floor plan was admittedly "the way office design is going." He hoped that the renovation—on which he and his firm are acting as informal advisors—would preserve the building's "essential features." These include the landmarked exterior and the atrium but also, he added, the basement conference rooms and auditorium, which still summon the aura of the late 1960s, with dark brown leather seating complete with ashtrays tucked into the arms of the seats.

The gnarly question is how to preserve a work of such total, integrated design while also bringing it up to date. The foundation claims that it will make every effort to repurpose the furnishings, but they are so specific to both their midcentury origins and the peculiar layout of the building that it is difficult to imagine how the designers will manage this impossible balancing act.

Gensler's scheme, as portrayed by the foundation, is sensible and necessary, but the peculiar appeal of the Ford Foundation was that it was a fundamentally unusual office environment. It was a built paradox, an opulent house of charity. Perhaps this previous expression cannot be preserved. The 1967 building is a remarkable work of design, but ill suited for the organization today, particularly as its new director seeks a more public and democratic image. However, it would reflect well on the Ford Foundation, and its self-awareness as an institution, if the new offices were reimagined with a confidence that matched the original.

Aleksandr Bierig is a Ph.D. student at the Harvard Graduate School of Design and a former editorial assistant at ARCHITECTURAL RECORD. aces that are designed to promote circulation and llaboration between floors. These double-height eighborhoods" promise variety and a strong connection the surrounding environment.

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Still Life

A surgical restoration preserves an eccentric artist's singular home.

BY PETER PLAGENS PHOTOGRAPHY BY HENRIK KAM

IT'S LIKE restoring a pair of carefully distressed Levi's," said someone who'd been given a preview tour of David Ireland's 500 Capp Street Project, where a thorough restoration and addition have just been completed. "You don't want to take them back to their original state, but you do want to shore them up enough so that there's no unintended further changes."

Ireland's Gesamtkunstwerk- or "total work of art"-is an 1886 wood frame Victorian house in the Mission District of San Francisco, purchased by the artist in 1975 for \$50,000 and then lived in and worked on for most of the rest of his life. (He died in 2009, at the age of 78.) Ireland adhered to an artistic philosophy of, "Why do we have to fabricate a stretcher, a canvas-why not just make art out of an environment?" He was a conceptualist just a material step or two this side of compatriot Tom Marioni, whose 1970 work of social art, "The Act of Drinking Beer with Friends is the Highest Form of Art," is still a weekly event in the city. Ireland not only transformed his house into an enveloping and ongoing metasculpture, but also made it a gathering spot for local artists, and even opened it to the public in 1978.

Moving to the Bay Area from his birthplace in Bellingham, Washington, Ireland earned a bachelor's degree from the California College of Arts and Crafts (now without "Crafts" in its name) in 1953. After serving as a draftee in the army, he traveled extensively in Europe and Africa and, returning to Bellingham, set up an imported-artifacts business called Hunter Africa. The 6-foot-5 Ireland, who led safaris for several years (*Henderson the Rain King* comes to mind), spent a year or so in New York painting Minimalist canvases along the lines of early Brice Marden, then came back to San Francisco to get an MFA from the San Francisco Art Institute (SFAI), a school practically synonymous with obliterating artistic boundaries.

Solid enough to have survived the 1906 earthquake, 500 Capp Street would later withstand the 1989 temblor. Ireland, a professional-grade carpenter, initially set about making the house more livable, but with his polymath's temperament and SFAI-nurtured outlook on art as infinitely expandable, began to turn the whole house into a work of art. The artist peeled off multiple layers of paint and wallpaper, right down to the plethora of cracks and pits in the plaster, which he then lovingly-some might say perversely-preserved with coats of polyurethane. (Being inside this golden-walled house feels like swimming in a jar of honey.) He removed baseboards and the trim around windows but left the exposed sash weights and much of the original ripply glass. When accidents happened-such as heavy exiting objects crashing into a wall-he honored them with plaques: "The Safe Gets Away for the First Time, November 5, 1975"; "The Punch Press is Dragged Away, November 5, 1975." Ireland added his own offbeat works of





A hallway is animated by a sculpture David Ireland made of brooms found on the premises (above). The dining room with animal skulls is "everybody's favorite" room (opposite). The house as seen from the corner of Capp Street and 20th Street (left).



art: a blowtorch chandelier, a cement-and-wire sculpture that's either van Gogh's ear or a map of Africa or both, a semiwearable gown made out of brooms that he found in the place, and an apparently unironic shrine to Natalie Wood. The dining room–everybody's favorite–boasts a long, roughhewn table at which the artist's friends sat for countless dinners, amidst a surround of animal skulls, totems, memorabilia, and photos.

Because of health problems, Ireland left the house in 2005, and 500 Capp Street remained practically untouched until it was purchased three years later for \$895,000. It was a bit of a philanthropic whim on the part of Carlie Wilmans, granddaughter of legendary San Francisco art benefactor Phyllis Wattis. Wilmans, who admired Ireland and wanted to save the house from destruction by developers, set up a charitable foundation. She then engaged San Francisco–based conservation firm Architectural Resources Group and Jensen Architects to keep the place from falling down and to preserve it as a major work of art that arguably ranks right up there with Kurt Schwitters's various *Merzbau* (room-size abstract sculptural environments) and Simon Rodia's Watts Towers.

Predictably, says Jensen principal Dean Orr "the paperwork was a long process, and, because the structure was deemed a historic resource, there was an additional layer of review." Surprisingly, bringing the building up to code was not as arduous as it could have been; the plumbing and wiring were in fairly good shape, say the architects, and only the addition of a wheelchair-accessible elevator from the kitchen to the basement required a variance. The foundation was the biggest challenge, largely because Ireland's excavations beneath the house left it sitting atop unstable bricks. Since the house couldn't simply be lifted on cribbing, workers had to remove dirt by hand until they could get a small backhoe underneath and put in temporary shoring. The new concrete foundation was poured in sections that hopscotched around the perimeter until they all connected. Meanwhile, everyone crossed their fingers against even the smallest earthquake.

The architects then repaired some of the wood framing (going voluntarily beyond code mandate), inserted adhesive between the lath and plaster, and installed waterproofing. The most visible contribution—to a project in which the

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The living room features custom-made couches, a blowtorch chandelier, and honey-colored polyurethaned walls.

invisibility of post-Ireland improvements is its signal virtue-is Jensen's gorgeous, minimal concrete-and-steel addition at the back, which houses a small gallery displaying some of Ireland's hand-drawn floor plans, a basement archive and office, and is topped by a small deck

Preservation was just as touch-and-go. All the movable art-some of it only marginally more portable than the safe and punch press–was packed and taken off-site. "What couldn't be moved," says David Wessel of ARG, "was protected in place." Then the conservators dealt with old wood damaged by moisture, and deteriorated windows-leaving the ones where Ireland had simply replaced the glass with metal plates or plywood. The major task, emphasizes Wessel, was restoring Ireland's variations on the house without disturbing or worsening the original building.

In the end, the project was-and this is not an overstatement-a triumph. From the outside, the house is an intact Victorian, with the name of a previous tenant (ACCORDIONS - P. GREUB) still in gold on the front window. Inside, it's a fascinating amalgam of Duchampian irreverence and the preciousness of Joseph Cornell; 500 Capp Street is a deceptively unmonumental monument to an eccentrically San Franciscan communal aesthetic.

(By appointment, 500 Capp Street is open to the public. 500cappstreet.org)

Peter Plagens, a New York-based painter and art critic, has a regular column, "Fine Art," in The Wall Street Journal. His book on the artist Bruce Nauman was published by Phaidon in 2014.

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By Julie Taraska



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RENOVATION RESTORATION ADAPTATION

Preserving architecture is not just about nostalgia. It reflects a growing aversion to gratuitous waste and destruction of buildings, tossing them away like outmoded computers or cell phones. Not only is reusing a structure the responsible thing to do in terms of sustainability, but it also maintains the legacy of a particular time and place. The projects shown here recognize the need to advance these goals. From a hotel in Chicago that was once an athletic club to an art museum in a Renaissance hospital, these buildings pay homage to their former lives by carefully conserving or highlighting certain elements while creating inventive solutions for today's world.

Minsheng Contemporary Art Museum | Beijing | Studio Pei-Zhu

FULL METAL JACKET



An abandoned electronics factory is converted into a sprawling space for contemporary art. BY CLIFFORD A. PEARSON





SHIFTING SCALES To break down the immense size of the 354,000-square-foot former factory building, Pei Zhu inserted an angled block that serves as the main entry (above) and wrapped it in a delicate quilt of 2.3-foot squares made of almost paper-thin aluminum (left).

t 985 feet long, an abandoned Panasonic television factory in Beijing offered tantalizing potential as a cultural space–and huge challenges. Set at the northern edge of Factory 798, the buzzing arts district that has developed in a cluster of mostly defunct industrial facilities during the past 20 years, the building was a logical site for China Minsheng Bank to create a museum to anchor its expanding presence in the contemporary art world. (The bank already had a museum in Shanghai, founded in 2008.) But converting the derelict leviathan in China's capital, with its vast acreage of generic space, into a humanely scaled place for art would not be easy.

The bank started the process in 2011 by hiring Thomas Krens, the former director of the Solomon R. Guggenheim Foundation, to devise a programmatic strategy. Krens brought in Pei Zhu, the Beijing-based architect (RECORD, Design Vanguard, December 2007, page 68) who had worked with him on a never-realized branch of the Guggenheim in the city and had also designed Pace Gallery's outpost in the 798 art zone in 2009.

Much of Zhu's work explores the notion of scale, playing with perceptions of size and orientation. For example, his Digital Beijing telecommunications center, built for the 2008 Olympics, looks like a giant computer chip, and his OCT Design Museum in Shenzhen takes the form of a three-story, metallic-skinned pebble. Both of those buildings obscure their size and present no obvious front or back. For the Minsheng commission, his task would be the opposite-making the 1979 building for the Japanese electronics giant more legible by breaking it into various parts and accenting its main entrances.

Prompted by Krens, Zhu approached the project as a chance to investigate the role of museums in the 21st cen-







SECTION A - A



SECOND-FLOOR PLAN



- 1 ENTRANCE
- 2 LOBBY
- 3 MEDIUM BOX
- 4 BIG BOX
- 5 ARTIST STUDIO
- 6 CAFÉ
- 7 COURTYARD
- 8 SMALL BOX
- 9 BOOKSTORE
- 10 VIP

credits

ARCHITECT: Studio Pei-Zhu ENGINEERS: Shanghai Construction Design and Research Institute; BIAD John Martin International Architectural Design CONSULTANTS: Arup (acoustical); United Artists Lighting Design (lighting)

GENERAL CONTRACTOR:

- 7th Group Shanghai Construction Engineering
- CLIENT: China Minsheng Banking Corp.
- SIZE: 354,000 square feet COMPLETION DATE: April 2015

SOURCES

11 RESTAURANT

13 ART STORAGE

15 CONFERENCE

16 CALLIGRAPHY GALLERY

18 PERFECT GALLERY

12 BLACK BOX

14 FILM SHOP

17 LIBRARY

19 OFFICE

GLASS CURTAIN WALL: King Glass Engineering LIGHTING: Flux (downlights); Erco, RCL (Task); Targetti, Reggiani, Vas (exterior)

CONVEYANCE: Express Elevator

20 M.
MINSHENG CONTEMPORARY ART MUSEUM

BEIJING

SPATIAL ROTATION A sophisticated play of shifting angles helps animate the main lobby. A grand stair made of precast concrete (below) leads to the second floor (right), rotates 45 degrees, and then rises to a third level. A courtyard (opposite) will be used for displaying art when the second phase is completed.





tury. "We kept talking about the art museum of the future," says Zhu. "We felt it should emphasize activity rather than static galleries and should be flexible enough to accommodate different kinds of art-from painting to performance."

Zhu's strategy for taming the enormous building was to work through both subtraction and addition. To break down its expansive length both on the outside and inside, he carved out two full-height spaces for entrance lobbies, cutting concrete floor slabs and inserting new steel and concrete structural elements. Shiny metal boxes, tilted to attract attention, announce the two entries: the main one an angled cube projecting from the relentlessly horizontal old factory structure, and the secondary one topped by a canted light scoop that Zhu likens to a volcano. To clad the main entrance and parts of the elevation on either side of it, the architect used an inexpensive material-aluminum sheeting normally specified for air ducts. Working with the manufacturer, he reduced the thickness of the metal to 0.02 inches (0.5 millimeters), so it's almost paper thin and has a fragile beauty set in tension with the toughness of the old building. Applied in 2.3-foot squares, the aluminum has the appearance of a quilted silk jacket of the kind often worn by people in northern China.

In the main entry cube, Zhu animated the space with a concrete stair that flares out as it rises to the second floor and then rotates 45 degrees as it goes to the third. Designed for sitting as well as climbing, the stair works as a social hub where people can hang out or watch performance art and presentations. Since the museum opened in May 2015, curators have sometimes borrowed the upper-level stair for art installations, says Zhu. Instead of poured concrete, the stairs are made from precast pieces, fabricated on-site.

Zhu removed the roof from a section of the north side of the building to carve out a long courtyard that can accommodate large works of art. Two overhead beams that slide along rails on the roof will help with the installation of heavy art pieces when the outdoor space is completed, later this year. To the west of the courtyard, the architect raised the steel-truss roof of the existing structure to create a "big box" that's 45 feet high. Responding to the call for a variety of spatial experiences and the needs of different kinds of art, Zhu also designed a "medium box" and a "small box." On the second floor, he laid out what he calls "perfect galleries" with 16-foot-high ceilings and dimensions that work for art such as painting and calligraphy.

Referring to the two lobbies, with their tall spaces that can be used in many different ways, Zhu says, "Creating ambiguous spaces is one of my signatures." He points to Chinese artists who for centuries have painted landscapes with empty spaces that hint at the concept of infinity. Zhu hopes to recreate this effect in the museum.

Due to changes in the top ranks of Minsheng Bank, the project has moved along more slowly than expected. Work on the smaller lobby, some of the galleries, a black-box theater, and ancillary spaces for a café, an artist's studio, and a VIP lounge—the second phase of construction—will start early in 2016. In the meantime, the museum has a rough-around-the-edges character that reinforces the muscular nature of certain elements, such as the sculptural concrete stair, but undermines others, including the more refined "perfect" galleries.

Built right after Deng Xiaoping began opening the Chinese economy to the rest of the world, the Panasonic factory was the first international joint venture with a non-Communist country. Now Zhu hopes the building can once again point China in a new direction as it looks beyond its industrial past and recycles its building stock, instead of always tearing down and starting over.



MINSHENG CONTEMPORARY ART MUSEUM

BEIJING

SHOW TIME With skylights above, a bridge overlooking the main lobby is an excellent place to display art (right). The architects exposed the building's original concrete beams in galleries, connecting the past to the present (below).









Museo Novecento | Florence Avatar Architettura

A STITCH IN TIME

A bold intervention links the Renaissance to the world of 20th-century art.

BY DAVID COHN

PHOTOGRAPHY BY PIETRO SAVORELLI

View additional content at architecturalrecord.com.





OVERARCHING BEAUTY The museum occupies the Hospital of San Paolo, designed by Michelozzo in the late 15th century and located in Florence's Piazza of Santa Maria Novella.

t's not always easy to be an architect in modern Italy, where contemporary design must measure itself against the weight of historic patrimony. That was clearly the case for the Florentine studio Avatar Architects when it won the commission to install the city's collections of 20th-century Florentine art in a minor Renaissance masterpiece, Michelozzo's Hospital of San Paolo, located

in the Piazza of Santa Maria Novella. The intervention had to be reversible – and thus provisional. Working with bursts of color, immersive lighting effects, and exquisitely crafted materials, Avatar connects with the original architect across the centuries while creating a sensitive environment for the works on display and the curatorial program.

Michelozzo is best known for his design of the Medici Palace in Florence. For San Paolo, he was inspired by Brunelleschi's first work, the Ospedale degli Innocenti, for the stately cadences of rounded arches over classical columns of the entry loggia and cloister. The former hospital has housed different public schools since 1780, but fell into disrepair as plans for new uses dragged out for decades. Finally, municipal architects restored the building for the Museo Novecento (as the 20th century is termed in Italian), as well as a forthcoming photography museum in an adjoining space. Unfortunately, they added a few jarring details, enclosing the gallery of the cloister in glass with heavy framing, and adding clumsy railings to its open-air upper story.

The museum's design team wisely left the magnificent loggia and cloister relatively empty, with the exception of a few sculptures and installations in the latter, and confined the museum to rooms on the second and third floors. In their role as exhibition designers, Nicola Santini and Pier Paolo Taddei, who founded Avatar in 2001, laid a "carpet" of dark steel plate flooring across the lower gallery of the cloister, just inside the entry, to create a path through the bookshop and ticketing areas to the worn stone staircase that leads to the second floor. The steel plate, with soundabsorbing padding underneath, covers the undistinguished tiles of the municipal restoration. It serves as an introduction to the steel floors in the rest of the exhibition spaces and asserts itself as a decidedly contemporary intrusion (recalling, for example, the steel-plate floor sculptures of Carl Andre) within the exquisitely proportioned order of the Renaissance cloister.

On the cloister's second level, visitors encounter three deep metal portals painted brilliant orange, yellow, and red-that lead, with a flourish of theme-park mystery, into the dark, immersive exhibition spaces on either side of the main stair. Curator Valentina Gensini organized the works in reverse chronological order, so the first rooms are dedicated to recent art, maximizing the shock of transition. Things come to a climax with a hall dedicated to the pop and conceptual art of the 1960s and '70s. Acrylic cylinders drop from the ceiling, piping in electronic music and contemporary sound bites, while drawings, posters, and documents crowd the black, spotlighted walls. Presiding over the space is the vibrantly colored Superarchitettura installation of 1966-67 by Archizoom, the avant-garde design studio. Clearly, this is the period with which the architects most identify. "We Italians have this complex of not being able to compete with the international scene," says Santini, laughing as he notes that the '60s Florentine collective was able to attract wide attention.



THIRD-FLOOR PLAN



SECOND-FLOOR PLAN





SECTION A - A

30 FT. 10 M.

- 1 ENTRANCE
- 2 RECEPTION
- 3 COAT CHECK
- 4 BOOKSHOP
- 5 CAFÉ
- 6 HALL
- 7 TEMPORARY EXHIBITION
- 8 EXHIBITION
- 9 SCULPTURE GARDEN
- 10 READING ROOM

credits

ARCHITECT: Avatar Architettura – Nicola Santini, Pier Paolo Taddei, principals; Lily Kani, Julia Salas, team. Municipal Design Office – Daniele Gualandi, Giorgio Caselli, Massimo Occupati

GENERAL CONTRACTOR: A.T.I. Sollazzini, Biagiottie e Bertini

CLIENT: Municipality of Florence

SIZE: 26,000 square feet

COST: \$1 million

COMPLETION DATE: June 2014

10 M.







The architects have created a minimalist backdrop in the galleries, lining the existing walls with gypsum board to hide windows, moldings, and other distractions. For budgetary reasons, they had to leave the dropped ceilings and track lighting of the municipal restoration, and completed the project in just three months with a budget of \$1 million. As the journey through the museum reels back in time, the spaces and the lighting brighten. In transitional areas of midcentury art, the white walls are accented with freestanding black metal panels-from which paintings hang-each supported on a wide, millimeters-thin steel base. Display cases and sculpture pedestals of medium density fiberboard, and carpet-covered benches, are similarly understated, but there are also flashy moments, as when a transparent screen drops from the ceiling to receive ghostly film projections of Florentine opera from the 1930s.

Another high point, the long hall over the loggia showcases a collection of early 20th-century art. Here Avatar subdivided the space only partially, with short panels, each cantilevered off the wall and supported on a thin steel leg. Though irregularly spaced, the panels respect the rhythm of windows overlooking the piazza, reestablishing a subtle connection with Michelozzo's work.

Avatar joins other Italian architects who have crafted contemporary interventions for historic buildings, starting in the 1950s with Franco Albini's Museum of the Treasury at the San Lorenzo Cathedral in Genoa, and Carlo Scarpa's Castelvecchio Museum in Verona, as well as his Gallerie dell'Accademia and Palazzo Querini in Venice, among others. The studio is currently renovating the scholar's library of the Uffizi, following in the footsteps of previous interventions there by Scarpa and others. Like them, Avatar uses the exceptional Renaissance architecture of the Museo Novecento as a frame for its own spatial explorations, establishing a dialogue that highlights the best qualities of both.

DARKNESS TO LIGHT The embracing, immersive spaces of the first exhibition rooms (above, with sculptures by Mirko Basaldella) yield to a more harmonious interaction with Michelozzo's building in the long hall over the loggia (left). Here the spaces are subdivided by square panels cantilevered off the walls.

Apple Store, Upper East Side | New York City | Bohlin Cywinski Jackson |

BANKING ON DISCRETION



TIME TRAVEL In February 1923, RECORD published photos of the classical-style bank building at 940 Madison Avenue in New York (above). Now, decades later, it houses Apple's revolutionary products, yet its limestone exterior has been restored with such deportment it is hard to tell things have changed.

> pple's latest store to open in New York is ultradiscreet. No large glass cube beckons passersby as it does on Fifth Avenue at 59th Street; no backlit Apple logo grabs your attention, as you find in its Grand Central Terminal location: the neighbors on the Upper East Side of Manhattan wouldn't want either. Here, between the posh residential palaces of Fifth Avenue on the west and Park Avenue to the

> east, the Apple Store sits on Madison Avenue at 74th Street amid elegant shops, galleries, museums, and quiet hotels. In this enclave of restrained taste, you would sooner expect to see billionaires Michael Bloomberg, Stephen Schwartzman, or David Koch strolling past a window of Stubbs & Wootton slippers before you would a younger generation of with-it consumers trolling for the next iPhone.

> The store is ensconced within a late English Renaissancestyle two-story building designed in 1921 by Henry Otis Chapman of Barney & Chapman (RECORD, February 1923, page 143) as a branch of the United States Mortgage & Trust Company. As is frequently Apple's policy with new stores, not only in New York but internationally, such as in Paris, Amsterdam, and Berlin, it seeks to retain the aura of an original structure while accommodating its famously future-oriented technological goods. For 940 Madison Avenue, the company again enlisted Bohlin Cywinski Jackson (BCJ)–the Seattle and Philadelphia offices–as it had with four out of the five previous Manhattan outposts.



Apple takes its futuristic wares to a stately building in an historic neighborhood. **BY SUZANNE STEPHENS**

PHOTOGRAPHY BY PETER AARON/ESTO







PROPRIETY, THEN AND NOW The original banking room (above), shown in RECORD in 1923, changed a lot over the years: Bohlin Cywinski Jackson brought back the Botticino marble floors and recreated pilasters with Corinthian columns on Venetian plaster walls, along with wheel-shaped chandeliers (opposite). The proportions and scale of Apple's oak display tables replace check-writing stands and tellers' windows.

While the Apple emporia have proved to be great boons to their respective New York neighborhoods, this locale did not throw open its Armanijacketed arms to greet the new arrival. Residents signed a petition last spring protesting the hot dog carts and crowds that might camp in front of the store. One property owner, Herbert Feinberg, filed a lawsuit that is still pending, arguing that, according to a fire protection consultant he hired, the new place may not be in compliance with fire codes. BCJ architects say they cannot comment because the case is in litigation.

Regardless of its chilly reception, Apple opened last June at its new location in the historic building, where the sales area totals 4,850 square feet, which the market director at Apple Retail, Jason Barlia, pointed out in a community hearing is a "boutique" about half the size of the Upper West Side store. "Apple's gift is a real-estate team that finds unique buildings and places to put a store," notes BCJ principal Karl Backus. To gain a foothold in this neighborhood, the company had to get approval of the proposed alterations for the building, which is in the Upper East Side Historic District, from the city's Landmarks Preservation Commission. It has leased the main floor and the lower



GROUND-FLOOR PLAN



floor, formerly for the bank vault and storage; the top (second) floor remains in the hands of the ever-chic David Webb jewelers, which has its own entrance on the northeast corner of the building.

Working with CTS Group Architecture/Planning, BCJ cleaned, restored, and repaired the entire facade. The efforts included installing new glass and replacing muntins in the windows while keeping the mullions, and obtaining the right color and texture of Indiana limestone for requisite replacements for the exterior cladding.

The interior, however, needed to be completely overhauled. Throughout the years, the 1921 bank fittings and furnishings had been lost with various tenants that included a Chase branch, an antiques store, an art gallery, and most recently a luxury handbag and jewelry shop. The tellers' windows and low marble balustrade dividers on the banking floor were long gone. So were the pilasters with shallow basrelief Corinthian capitals on the walls, along with the original chandeliers. But the latter two features BCJ and Apple decided to bring back: working with artisans, the design team not only recreated the pilasters and capitals but installed new wheel-shaped chandeliers mimicking the old. Although much of the coffered ceiling could be kept, it had to be repaired, and downlights and sprinklers inserted. Similarly the architects kept the grilles for heating vents and cloned new ones where needed. "It wasn't just a deep clean," says David Andreini, BCJ project director. "We had to adapt to the requirements of fire, universal access, and energy codes."



To restore the stone floor, Apple sent the design team on seven trips to Italy match the Botticino marble. The process, explains Brigham Keehner, BCJ senior associate, required dry laying—mounting the marble on boards—at a fabricator before it was shipped to New York and installed. The typical Apple-designed stalwart oak display tables and shelving units also needed to be fine-tuned to the scale and proportions of the space.

Downstairs, the architects refurbished the old bank vault and its original door on the north end and fitted out the interior of the vault with a modern demonstration room. On the south end of the lower floor, BCJ inserted a new accessories area for ancillary Apple products, again with oak display tables and walls. In order to carve out a space from the original storage rooms, the architects removed columns and 18-inch-thick concrete bearing walls, and in turn beefed up overhead beams. In bestowing some of the 1921 architecture where it hadn't really existed in this low basement space, BCJ created a coffered ceiling with new chandeliers, shallower and smaller than the ones upstairs.

The final result blends the old and the new in a manner befitting the demeanor of the neighborhood, and with an interior that is straightforward about its modern function but in a sympathetic rela-

credits

ARCHITECT: Bohlin Cywinski Jackson – Karl A. Backus, David Murray, Peter Bohlin, principals; David Andreini, associate principal and project director; Brigham Keehner, Jeffrey Lew, senior associates ASSOCIATE ARCHITECTS: CTS Group Architecture/Planning – David Abramson, principal

ENGINEERS: Eckersley O'Callaghan (structural); WSP Group (m/e/p); Larson Engineering (interior framing); Langan Engineering and Environmental Services (civil)

CONSULTANTS: Higgins Quasebarth & Partners (historic preservation); ISP Design (lighting); EverGreene Architectural Arts (historic craftsmanship); Jablonski Building Conservation (conservation) CLIENT: Apple SIZE: 10,730 square feet COST: withheld COMPLETION DATE: June 2015

SOURCES

ACOUSTICAL CEILINGS: BASWAphon, Pyrok CHANDELIERS: Aurora Lampworks DIMMING/LIGHTING CONTROL: Lutron



FILTERED LIGHT Working with dark spaces downstairs, the architects left the vault, separating it from the accessories room and lower lobby with the restored security screen (left). They inserted shallow coffers and smaller circular chandeliers in the sales space (below). Upstairs on the main floor the restored windows admit daylight on the east and south walls (opposite).

tionship to its older trappings. A striking display of black-and-white photographs of the Upper East Side in the main salesroom unfortunately gave way to backlit panels of Apple products over the holidays, which sabotaged the soft lighting emanating from the chandeliers. Let's hope that a more harmonious exhibition follows-as promised by Apple representatives on the floor. Meanwhile, anecdotal observation indicates the crowds seem to be under control and have not spilled out onto the sidewalk (yet). Apple may have found a way to make itself beloved here: the company will receive the New York Landmarks Conservancy Chairman's award in March for three Apple stores in traditional buildings-in Grand Central, in a former post office on Prince Street, and, even with neighborhood hesitance, 940 Madison Avenue.





The Whitworth | Manchester, England | MUMA

MANCHESTER UNITED

A classically modern addition opens up a Victorian museum to its parkland setting. BY HUGH PEARMAN

PHOTOGRAPHY BY ALAN WILLIAMS

he Whitworth Gallery, in England's booming second city, Manchester, is a cultural institution that took a walk in the park back in 1889–it was the first English art museum to adopt a parkland rather than urban setting–and now has taken another. The story is a familiar one: venerable creaking-at-the-seams regional establishment receives total makeover and expansion to accommodate a growing collection and audience. But it is rarely done so convincingly as this. Its ingenious addition embraces the landscape and transforms the old building, in what is the breakout project for its architects, MUMA.

The firm founders–Gillian McInnes, Simon Usher, and Stuart McKnight–were relatively unknown when they won the competition for this \$22 million project back in 2009. The trio first met at the Glasgow School of Art and had worked for Michael Wilford, surviving partner of James Stirling, before forming MUMA in 2000. By 2009, the firm's most noteworthy accomplishment was a beautifully realized reworking of the Medieval and Renaissance galleries at London's Victoria and Albert Museum. The Whitworth, however, is its first project with a substantial new public face.

MUMA's big move was to interweave building with landscape at the rear. Originally, the Whitworth-created to inspire the region's textile industry and housed in a typically grand, if relatively small, Victorian/Edwardian civic building in red brick and terra-cotta, designed by J.W. Beaumont-was in the 20-acre Whitworth Park but not of it, remaining resolutely blank-walled but for its set-back street frontage. A good mid-1960s rearrangement by architect John Bickerdike began to put that right. He inserted big windows in the previously blind arcade on the south side, providing views across the park. The new architects noticed how visitors tended to move toward the view and resolved to integrate the building more fully with its setting. As McKnight puts it, "The extension not only connects with the park, creating an outdoor gallery-the Art Garden-it also acts as a pressure relief, allowing us to reconfigure and rationalize the existing building.'

The original structure terminated with the blank brick ends of three barrel-roofed galleries, set above a semi-basement. MUMA has spliced a 21,200-square-foot, H-shaped extension onto this, providing circulation space to either side and via a broad glass-walled ambulatory across the ends of this new series of galleries. This is protected from



FRESH-FACED Original architect J.W. Beaumont's 1906 gallery frontage is now home to a new sculpture terrace (right). The new glazed west elevation features a delicate brise-soleil (topped by Scottish artist Nathan Coley's illuminated text) to shade the ground-level promenade and incorporates sculpted Purbeck stone seating that faces the Art Garden (below).







- **1** SCULPTURE TERRACE
- 2 ENTRANCE HALL
- TEXTILE GALLERY 3
- OFFICE 4
- COLLECTION GALLERIES 5
- EXHIBITION GALLERIES 6
- PROMENADE GALLERY 7
- 8 LANDSCAPE GALLERY
- 9 CAFÉ
- 10 GRAND HALL
- 11 SCULPTURE COURT
- 12 MEETING ROOM



SECOND-FLOOR PLAN



15 M.

GROUND-FLOOR PLAN



the southwesterly sun by a filigree brise-soleil made of slender vertical strips of stainless steel. A pair of two-story wings extends westward: one, on a side street, contains a large red-brick-clad gallery, used often for display of the museum's collection of landscape drawings and paintings, with a library and study center beneath, while the other is a delicate, Miesian rectangular box of a restaurant, high enough to feel as if it is in the canopy of the park's trees. It cantilevers beyond the end of the level beneath (an education center) and has an upward-folding glass end wall, allowing it to open up to the outdoors in summer. The ambulatory and restaurant are rendered ethereal by triangular flanking columns in highly polished stainless steel. The new brick elements,



meanwhile, are textured, even "stitched," with white ceramic insertions in a nod to the museum's textile collections.

The final move was to lower the semi-basement to give a proper story height to this new parkside entrance to the museum, behind which is the new Collection Centre on the same level. As with much that MUMA designed, says the museum's director, Dr. Maria Balshaw, this was not in her original list of asks. "Did it exceed the brief? Yes, it did, in unexpected ways. It's really changing the way we operate," she says. "We didn't think how amazing it would be, for instance, to have everything in the collection on one level. The Collection Centre area–a bonus spot–has become one of the most popular parts of the building." Its

creation also resulted in an important shift in the original building; the high daylit volume of the Grand Hall, where collection storage had been moved in the 1970s, has now been recovered as a place for lectures and events.

Prior to this reworking of the Whitworth, all visitors came and went via the original entrance, which was often congested with deliveries, school groups, and a busy café. Now, says Balshaw, museumgoers use the back entrance almost as much as the front, especially in summer months—understandably, given the Art Garden between the two new rear wings, landscaped by Sarah Price. This is edged with benches, carved from Purbeck limestone, integrated with the architecture be-



ROOM WITH A VIEW The new café was designed to sit among the trees in Whitworth Park. Its highly polished stainless steel reflects the greenery so the structure visually dissolves (above). The roof-lit central Exhibition Gallery has a new view to the park (opposite). tween building columns. Inside the lower ambulatory, the benches are duplicated in oak. "It's a convivial place," says Balshaw. Buried deep beneath it is a phalanx of "earth tubes" cooling the inlet air to the building so that air-conditioning is not needed. This and ground-source heat pumps are key to the reworked building's gaining a BREEAM "Excellent" from the UK's BRE Environmental Assessment Method, a rating considered more difficult to achieve than LEED Gold. By eliminating high-energy-consumption mechanical-cooling and humidity-control devices, overall carbon emissions are reduced by 10 percent even though the building is now almost a third larger, with doubled public areas and visitor numbers.

The new museum is effectively two interconnected buildings back-to-back. Although the older portion has been lightly refurbished and is now served by elevators to all levels, inevitably it is the addition that provides the main draw. Once forbidding, the Whitworth has become informal and approachable. And as befits the museum's collecting tradition, it is a work of craft as much as architecture. ■

credits

ARCHITECT: MUMA (McInnes Usher McKnight Architects) ENGINEERS: Ramboll (structural); Buro Happold (m/e/p)

CONSULTANTS: Hann Tucker Associates (acoustical); Arup (facade); Penny Anderson Associates (environmental)

GENERAL CONTRACTOR: ISG

CLIENT: University of Manchester

SIZE: 21,200 square feet (addition); 98,900 (overall) COST: \$22 million

COMPLETION DATE: February 2015

SOURCES

BRICK: Northcot BRISE-SOLEIL: T.P. Aspinall & Sons GLAZING AND GLASS DOORS: Schüco ROOF: Radmat TERRA-COTTA AND FAIENCE: Shaws of Darwen TILE: Swedecor ACOUSTICAL CEILINGS:

Topakustik, Knauf LIGHTING: Zumtobel, Bega, Mike Stoane Lighting PAINT: Little Greene



Chicago Athletic Association Hotel | Chicago Hartshorne Plunkard Architecture, Roman and Williams Buildings and Interiors

THE SPORTING LIFE

The conversion of an athletic club into a hotel imaginatively combines modern and historic architectural flourishes for an updated approach to play and respite.

BY JAMES N. GAUER



LA SERENISSIMA The restored rosy brick and delicate screen of limestone columns and pointed arches signal the main entrance to a hotel bearing Henry Ives Cobb's 1893 Chicago Athletic Association's name (above). The Venetian Gothic style extends through the main lobby on the second floor (opposite).

n Chicago's stately Michigan Avenue, steps from the Art Institute, in a classically ordered ground-floor lobby with elaborate mosaic floors, Corinthian columns, and two grand marble stairs, office workers in "business casual" line up for burgers at Shake Shack. On the grand piano nobile above, amid the plutocratic splendor of a plushly furnished lounge with intricate paneling, monumental fireplaces, and leaded-glass windows overlooking Millennium Park, twentysomethings in T-shirts and jeans tap away at laptops and smartphones. In an adjacent game room, they down local craft beers while playing pool and bocce. This is not your grandfather's Chicago Athletic Association (CAA), where Cyrus McCormick and Marshall Field used to exercise, dine, and dance. No, it's the new CAA Hotel, for which the home of an august but defunct institution has been rescued, repurposed, and rebranded for a more diverse demographic.

A casual knowledge of Chicago's architectural history might suggest that, as the 20th century approached, new buildings fell neatly into two stylistic camps: the muscular structural expressionism of the Chicago School and the Beaux Arts classicism of the World's Columbian Exposition of 1893. Among the notable exceptions were buildings in fanciful period styles such as the 11-story CAA, Henry Ives Cobb's sumptuous Venetian Gothic palazzo. Completed the same year as the exposition, its facade of rosy brick with a delicate screen of creamy limestone columns and pointed arches recalls the Doge's Palace. In 1906, Schmidt, Garden & Martin added a 12th-story annex for a second ballroom and women's dining; in 1926 the firm extended the height to 19 stories to add more guest rooms.







SIXTH-FLOOR PLAN



SECOND-FLOOR PLAN





The CAA served the city's elite for over a century, but in 2007, dwindling membership forced it to close. Developers proposed to save the front third of the building but destroy the annexes; the recession mercifully killed this scheme. In 2012, John Pritzker, son of Hyatt Hotels founder Jay Pritzker, spearheaded a purchase by AJ Capital Partners, Agman Partners, and Geolo Capital for \$13 million. The goal was to reinvent the venerable landmarked L-shaped structure as a 241-room luxury hotel under the Commune Hotels + Resorts brand, of which Pritzker is chairman.

BALLROOM

LOBBY LOUNGE

7

In renovating the club as a hotel, Hartshorne Plunkard Architecture (HPA) and New York–based designers Roman and Williams (RW) eschewed the kind of makeover that strives to restore to a fixed date, with any new elements suppressed in a simulacrum of the original. Neither did they want to create modernist interventions in which original elements are preserved as artifacts and new elements assert themselves in a contemporary style. For the CAA, the team carefully developed a nuanced approach: they opted for discreet insertions that tie together many previous alterations and additions, stressing evolution over time.

"This is an approach to renovating and reinvigorating historic buildings that we have developed and refined over the years," explains RW principal Stephen Alesch. "The project was not envisioned as a museum restoration," seconds HPA principal Paul Alessandro, who found the building to be "an embarrassment of riches," adding, "It was clear from the outset that we could never do something better than the original, and inserting something aggressively modern felt like cheating. We had to be very careful."

And careful they were. The exhaustive rehabilitation included the restoration of 18,000 square feet of ornamental plaster, 26,500 square

CHICAGO



feet of marble and mosaic flooring, 32,000 square feet of paneling and bas-reliefs, and 82 art glass windows, along with the recreation of 151 plaster stalactites in the ceiling of the White City Ballroom on the eighth floor of the original building. The Michigan Avenue entrance canopy is a reproduction based on original 1890 drawings.

A tour of the second (main) floor offers a timeline of the club's history. Teams of craftsmen restored the 1893 grandeur of the Lobby Lounge by removing, refinishing, and reinstalling every piece of millwork and recreating original light fixtures from old photos. The reception desk is one of several new pieces designed to evoke the layered, lacquered, and leather-embellished construction of vintage athletic equipment. The adjacent Game Room is a lively hybrid of old and new, in which the original 1893 Billiard Room has been left more or less intact, but its walls have been fitted with sport-themed cartoon sketches on chalkboard, salvaged wood gymnasium flooring, and a back bar decorated with a surprisingly elegant pool cue rack. The eclectic space provides an artful transition to the refurbished midcentury swank of the 1954 Cherry Circle Room, sheathed in flush oak paneling and tufted leather banquettes.

Guest rooms recall the club's sporting past with masculine-looking armoires, desks, and bars derived from wooden stretching racks and leather benches that resemble gymnasts'

MAN CAVE The reception desk (above) is one of several new millwork pieces designed to evoke the lavered, lacquered, and leather-embellished vintage athletic equipment. The mural over the desk depicts the elevated train tracks that encircle Chicago's Loop. The original stair of marble, cast bronze, and gilded cast iron (right) has been impeccably restored.



pommel horses. Vintage oriental rugs, a modern twist on the brass bed, and national-parks blankets add a layer of richness and comfort. Bathrooms are crisp and classic, combining white porcelain tile and fixtures with Carrara marble vanities and nickel fittings.

HPA added two floors to the 1893 Cobb design, including a 12th floor for mechanical space and a 6,000-square-foot rooftop aerie for drinking and dining. Crowned by a vaulted skylight, it required additional structural muscle: new cantilevered trusses rest on original columns that were reinforced throughout the building and then underpinned at their foundations. The design team drew inspiration for the new steel and glass pavilion from the late 19th-century train sheds that once occupied the ravine across Michigan Avenue, now covered by Millennium Park. The result is nonetheless a thoroughly modern, light, and airy bar and restaurant, named Cindy's, after Mr. Pritzker's mother. It opens to a terrace with postcard views that include Frank Gehry's music pavilion, named after Cindy's husband, Jay. In Cindy's portrait, which overlooks a private dining room, she appears to be smiling−and with good reason. ■

James Gauer, based in Victoria, British Columbia, and Chicago, is an architect and the author of The New American Dream: Living Well in Small Homes.

credits

ARCHITECT: Hartshorne Plunkard Architecture – Jim Plunkard, partner; Paul Alessandro, partner in charge; Jason Walejeski, project manager; Krista Weir, Michael Hines, project architects

INTERIOR DESIGNER: Roman and Williams Buildings and Interiors – Robin Standefer and Stephen Alesch, principals

ENGINEERS: Forefront Structural Engineers (structural); KJWW Engineering Consultants (m/e/p/fp); Wiss Janney Elstener Associates (exterior restoration and structural facade)

CONSULTANTS: MacRostie Historic Advisors (historic); Schuler Shook (lighting)

CLIENT: AJ Capital Partners, Agman Partners, Geolo Capital partnership

SIZE: 249,000 square feet

COST: withheld

COMPLETION DATE: May 2015

SOURCES

GLASS: Oldcastle BuildingEnvelope: glass handrail on rooftop, vertical walls of insulating glass, shower doors in guest rooms

DIMMERS/LIGHTING CONTROLS: Lutron PAINTS AND STAINS: Sherwin Williams

SKYLIGHTS: Super Sky Products Enterprises







LIGHTEN UP

The newly added rootop bar and restaurant (opposite, top) features a steel and glass pavilion that draws inspiration from 19th-century train sheds. The guest rooms have a masculine look that recalls the hotel's origins as a club for men (opposite, bottom), including a leather bench resembling a gymnasts' pommel horse. The restored original millwork in the Lobby Lounge (left) includes fligree screens that separate the central space from more intimate alcoves.

National Gallery Singapore | Singapore | studioMilou architecture

SINGAPORE SLING

With a light hand and a sweeping canopy, designers unify and restore two colonial-era buildings to create a state-of-the-art museum.

BY ALEXANDRA A. SENO

PHOTOGRAPHY BY FERNANDO JAVIER URQUIJO

erched on the Padang–a large, open playing field in downtown Singapore best known for hosting National Day parades–the new, 690,000-squarefoot National Gallery Singapore stands as a dignified presence among the neighborhood's British-colonial-era buildings and the business district's sparkling modern skyscrapers. Created out of a pair of adjacent buildings–the former City Hall and Supreme Court–the Singapore government funded the \$370 million museum complex, which opened in November 2015 as a highlight of the island-nation's 50th anniversary as an independent republic.

"The guiding principle was to give the impression that the two buildings were largely untouched and returned to the public as they were, even though extensive technical work had been carried out below and above," says Jean-François Milou, who led the project's design team. In 2007, his Paris-based practice, studioMilou, won the international competition to design the museum, in partnership with Singapore firm CPG Consultants. After nearly nine years of

GOLDEN TOUCH To unite two historic buildings and create a home for the National Gallery Singapore, studioMilou covered both structures with a canopy of golden cut-aluminum panels (right). The canopy extends out over the main entrance (opposite) to welcome visitors into the museum's lobby.



careful engineering, construction, and preservation, the result is a contemporary museum of intimate galleries connected by vast indoor plazas and sky bridges and set within two lovingly restored buildings.

The museum is intended for art from around Southeast Asia, mid-1800s to the present, and aims to be a state-of-theart showcase. This goal was a difficult one, since the heritage status of the neoclassical City Hall and Supreme Court buildings, completed in 1929 and 1939 respectively, meant that there were many restrictions. "All external facades and entrances had to be preserved. And some of the rooms could not really be touched," says Sushma Goh, the museum's director of project and facilities management.

The architects' solution entailed joining the two buildings with an atrium covered by a stylized canopy made of cut-aluminum panels and glass that suggests the design of palm-leaf thatching common in villages around the region. This new roof assembly, which is supported by tree-like steel columns, stretches across both buildings, letting in daylight while serving as a screen against the harsh tropical sun. The futuristic yet familiar roof is a contemporary gesture that unifies the complex and establishes its new identity.

From the front of the museum, an awning-like section of the roof swoops out to welcomes visitors into the dramatic main lobby. From there, a grand minimalist stone stair leads down to a lower level for ticketing and other visitor services.

The most difficult technical challenges in connecting the buildings lay underground. Milou's plan called for four new below-grade levels for circulation, moving and storing art, and for parking. Inserting the new floors under the existing buildings required extensive computer modeling, geotechnical testing, and a delicate underpinning operation made more complex by the differing heights of the two structures' existing foundations.

Aboveground, many of the most historically sensitive rooms—like City Hall's "surrender chamber," where the Japanese occupation of Southeast Asia was officially ended after World War II, and the offices of the Supreme Court's chief justice, both paneled in teak—had to be kept as they were. But in other rooms, new, non-load-bearing walls project out from the existing walls to accommodate airconditioning and other systems necessary for an appropriately climate-controlled modern museum.

The galleries for older art and artifacts—which include photographs, maps, prints, and paintings—are located in the







suitably dramatic Supreme Court wing, which features rooms with decorative molding and wooden or painted walls. More contemporary works, including video art and installations, are displayed in the white-walled halls of the former City Hall.

The painstaking restoration work was supervised by Goh and her team, including discreet repairs of the historic buildings' elaborate colonnaded facades, both of which were covered in "Shanghai plaster"—a stucco that simulates stone common in major buildings in Asia during the 1920s and '30s. However, in other areas, such as the Supreme Court's old lobby, they opted to not erase evidence of time's passage. Here a near-obsessive effort was made to maintain the cracks in the terrazzo floor, since the team did not want to overrestore the buildings; the goal was to preserve the feeling of buildings that had been around a long time, even if the institution-and the country itself-is relatively new.

After all the meticulous conservation and the technological derring-do, Singaporeans were not disappointed. In the first two weeks, the museum attracted about 170,000 visitors. People came to see the buildings and view the art–and to eat. In food-obsessed Singapore, the mix and variety of a dozen or so dining outlets, including a formal French restaurant, a casual café, and a rooftop bar offering dramatic views



SECTION A - A



THIRD-FLOOR PLAN



Former Supreme Court

FIRST-FLOOR PLAN

- 1 ENTRY
- 2 ATRIUM
- 3 LOBBY
- 4 HISTORICAL LOBBY
- 5 CHIEF JUSTICE'S LOBBY
- 6 TENANT SPACES
 - COURTYARD
 - OFFICES

7

8

- 9 CHILDREN'S EDUCATION CENTER
- 10 SKY BRIDGE
- 11 GALLERY
- 12 ROTUNDA LIBRARY
- 13 ROOF TERRACE
- 50 FT. 0 L ()15 M.
- 14 SURRENDER CHAMBER

15 M.

- 15 ROOF GARDEN
- 16 UNDERGROUND CONCOURSE
- 17 PARKING



TIME TRAVEL The architects have converted an open-air court in the former City Hall into a dramatic skylit space and provided a grand stair that leads to the below-grade concourse.







of the city, have helped make the National Gallery a hit. "Food is, absolutely, very important in Singapore," says the museum's CEO, Siak Ching Chong, who maintains that the modern museum needs to be a lifestyle destination.

Milou embraces this view of a more relaxed and approachable museum—one that appeals to a wide audience. He likes to refer to the building as "a kind of living room of Singapore, dedicated to the arts." ■

Alexandra A. Seno is a Hong Kong–based journalist who contributes regularly to The Wall Street Journal and other publications.

POP TOP By covering the complex with a canopy, the architects have created public space on the roofs of the historic buildings. In one spot atop the former Supreme Court (above), visitors have a closeup view of the smaller of the building's two domes. In a gallery space in the old City Hall (left) new walls extend out from the original walls to enclose mechanical systems.

credits

ARCHITECT: studioMilou architecture – Jean-François Milou, lead architect; Wenmin Ho, Thomas Rouyrre, architectural team managers; Charmaine Boh, Janis Goh, Trung Thanh Nguyen, Jason Tan, Jiarong Goh, May Leong, Eudora Tan, architectural designers

LOCAL ARCHITECT: CPG Consultants

CONSULTANTS: CPG Consultants (structural, m/e/p, quantity surveying); Architectural Restoration Consultants (conservation); Arup (facade); Lighting Planners Associates (lighting)

GENERAL CONTRACTOR:

Takenaka – Singapore Piling Joint Venture CLIENT: Ministry of Communications and Information OWNER: National Gallery Singapore SIZE: 690,000 square feet COST: \$370 million COMPLETION DATE: November 2015

SOURCES

CANOPY AND TREE STRUCTURE: Jangho Group STEEL STRUCTURE: Yongnam Engineering & Construction AUTOMATED DOOR SYSTEM: Dorma Far East

FACADE RESTORATION: Bautec Pacific

SHANGHAI PLASTER RESTORATION: LWC Alliance ELEVATORS AND ESCALATORS: KONE

LIGHTING: Krislite, Modulex UshioSpax, Tokistar Lighting, iGuzzini, Eutrac, ERCO LIGHTING CONTROLS: Lutron

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Moving Masterworks

Three important buildings with new sites demonstrate the challenges and opportunities of relocation. By Michael Cockram

ARCHITECTS SPEND a great deal of time making sure their buildings stay put. But the whims of nature and real-estate development can uproot the best of plans and make relocating an important structure the only way to save it.

Most historic-preservation professionals are loath to sanction the relocation of a significant building except under the most extreme circumstances. "It has to be the last resort," says Xana Peltola, Heritage Preservation Specialist for the state of Minnesota and author of the 2007 study *Moving Historic Buildings*. What follows are three case studies of structures without other viable options.

PIECE BY PIECE

Architects Lawrence and Sharon Tarantino, of Tarantino Studio, served as consultants on the recent relocation of their own Frank Lloyd Wright-designed house from its original site in Millstone, New Jersey, to Crystal Bridges, the American art museum created by Walmart heiress Alice Walton in Bentonville, Arkansas. The Tarantinos bought the 1954 Usonian house in 1988, originally built for Gloria Bachman and Abraham Wilson, after it had suffered from decades of neglect and aesthetically obtrusive changes. They then spent the next 10 years restoring the concrete-block and woodframe structure and its classic Usonian features such as exterior and interior horizontal board and battens, radiant-heated, colored concrete floors, and a generous, light-filled living area.

What the Tarantinos hadn't anticipated were the damaging floods caused by hurricanes Hugo, Floyd, Irene, and a string of lesser storms. By the time superstorm Sandy came roaring up the eastern seaboard in late 2012, the couple had devised an exhausting regimen that entailed removing cabinets, appliances, and furniture and storing them on higher ground before the storm made landfall, though, fortunately, the area missed the brunt of Sandy's wrath.

Before that storm, the couple had begun considering relocating the house. "Around the time Floyd hit in 1999, we started looking at options to move it," Lawrence Tarantino says, pointing to climate change and regional development as causes of the increase in flooding. After their prolonged search for a buyer, Walton agreed in 2014 to purchase the house (the price has not been disclosed) and move it to the grounds of the Moshe Safdie–designed museum in Arkansas. The house opened to the public on its new site in November 2015.

According to Peltola's study, the preferred relocation method is to move a building in one intact piece, since this approach has the least impact on the historic fabric of the structure. Other methods include partial disassembly, and total deconstruction. Building size, construction type, and the logistics of transportation are among the factors that determine the best approach to relocation. Distance is often the prime consideration. The Gordon House, another two-story Usonian that was completed in 1964 (after Wright's death) in Wilsonville, Oregon, was moved about 20 miles to the Oregon Gardens in 2001. As with the Tarantinos' house, the first level was primarily concrete-block construction, so the upper, wood-frame level was sawed off its base, loaded onto a flatbed truck, and moved in one piece. But given that the Tarantinos' house was to travel much farther-almost 1,300 milesthe project team decided to remove the wood surfaces, built-ins, windows, and doors and reinstall them on a new masonry and wood structure at the Arkansas site.

The Tarantinos were in charge of the deconstruction process and served as advisors for the relocation and reassembly. They produced three sets of documents for the project: asbuilt drawings, deconstruction drawings, and reconstruction drawings.

Starting with interior elements in February 2014, disassembly of the house took about four months. Every element, from the Philippine mahogany board and battens to cabinets and furniture, was cataloged, stored, and finally shipped by truck to Bentonville. Upon arrival, the pieces were laid out on the floor of an aircraft hangar according to their position in the house. The construction team made repairs and mocked up elements like pieces in a jigsaw puzzle, before the materials were delivered to the site.

In her study, Peltola emphasizes the concept of replicating the "aesthetic tone" of the original context. The site on the Crystal Bridges campus was modified to simulate the original



conditions as closely as possible. But while the New Jersey lot was relatively flat, the Arkansas site is on a hillside behind the museum, so a stone retaining wall was built to create a level area. Wright had intended the living area to focus on nature, so, in its new location, as with its first one, the house has an outdoor room defined by deciduous trees, with a stream in the distance. The building was laid out with the same orientation as the original, and the entry sequence was recreated as closely as possible.

Even though Wright's Usonian houses were similar to each other, as Frank Lloyd Wright Conservancy preservation architect John Thorpe points out, "They were designed by Wright specifically for their sites." The



Conservancy, an organization dedicated to preserving Wright's work, typically sanctions the relocation of a project only when it saves it from demolition. But Thorpe was convinced that there was no other option for the Tarantinos' house. At his urging, the organization endorsed the move.

Although the original structure was thoroughly documented, inconsistencies were bound to crop up during reconstruction-especially since the original elements were integrated with all new concrete flooring, block walls, and wood framing. For example, the house was built on a four-foot grid that was incised into the concrete floor. But several of the grids were slightly off in the original house, while the new structure was built pre-

MUSEUM PIECE In order to move Frank

Lloyd Wright's Bachman Wilson House from its original site in Millstone, New Jersey, to the grounds of Crystal Bridges in Bentonville, Arkansas (above), the project team deconstructed all wood surfaces, built-ins, and windows (right) and installed them on a new masonry and wood structure.







cisely on Wright's grid. The irregularities were compensated for in areas such as closets as much as possible, according to Scott Eccleston, director of operations for Crystal Bridges.

The reconstruction process also presented opportunities, such as insulating the roof and installing a state-of-the-art HVAC system. "We drew the line at anything that could be seeneven if there was an opportunity to improve the function," says Eccleston. "We wanted to be true to Wright's design."

HOUSE ON THE RUN

Since Frank Gehry's 1987 Winton Guest House was designed as a collection of six distinct, though connected, forms, transporting each volume separately worked well for its first relocation in 2011. The clients had requested that the guesthouse – originally sited adjacent to Mike and Penny Winton's midcentury Philip Johnson house in Wayzata, Minnesota – not compete with Johnson's rigidly rectilinear structure. Gehry's response was to treat the guesthouse as a sculpKIT OF PARTS The Bachman Wilson House's disassembled elements were carefully catalogued (left) before being shipped to Arkansas. In its new location (bottom), as with its first site, the living area looks out onto an outdoor room defined by deciduous trees.

tural object in the landscape based on a three-dimensional interpretation of the still life paintings of Giorgio Morandi. Victoria Young, architectural-history professor at the University of St. Thomas, in Owatonna, Minnesota, considers the design—a montage of diverse volumes clustered around a tall pyramidal living space– to be a seminal work in Gehry's evolution toward exuberant sculptural forms. Each element in the 2,300-square-foot composition is one room with its own shape, material, and function, including the living room, sheathed in sheet metal, and a limestone-clad curvilinear bedroom piece.

When a developer bought the Wintons' property, he donated the guesthouse to the university, some 110 miles away. In 2009, movers began a two-year process of separating the elements of the house, transporting each on trucks, and then reassembling and restoring the house at the university's Gainey Conference Center site. The 60-ton bedroom module presented a particular challenge: once slid on beams to a flatbed truck, it was moved at about walking pace for the entire journey to prevent damage.

The house barely had time to settle into its new site when, last year, the conference center was sold and the school was given until August 2016 to remove the house from the property. Placed on the auction block in May 2015, the house sold for \$750,000 (shipping not included) to an anonymous buyer in New York's Hudson River Valley. Harrison Design is coordinating the move and working directly with Gehry Partners on the restoration work to ensure that the detailing is consistent with the original.

The second relocation presents opportunities to restore the relationship between the house and its site, according to Greg Palmer, a Harrison Design principal. "At the Owatonna site, it was difficult to see the building the way it was intended to be viewed," he says. The house had been rotated 180 degrees from its original orientation, which made the experience of the approach different from what was intended. Gehry designed the house so that facades facing the Wintons' home were without windows, which emphasized the sculptural quality of the work. On the Hudson Valley site, the new owners also plan to position the house so it has a similar relationship to their primary residence, as it did with the Johnson structure.

The design team considered moving the separate rooms of the house on barges through the Great Lakes, then down the Erie Canal to



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MOBILE HOME Frank Gehry's 1987 Winton Guest House made its first move starting in 2009, from Wayzata, Minnesota, to a conference center site about 110 miles away (above). The two-year process entailed separating the elements of the house and moving each on flatbed trucks (right). The house will soon be relocated again, this time to Upstate New York.



the Hudson River, but the logistics proved too daunting. With Gehry's approval, they opted to disassemble the more cumbersome elements, such as the limestone-clad bedroom module, and transport the structure overland. As with the first relocation, smaller rooms such as the brick fireplace alcove will be moved on flatbed trucks once the masonry chimney is removed. Other elements, such as the wood-framed living room walls, are being separated into wall or ceiling panels. The current relocation will also allow the project team to improve flashing details and to restore the connections between the elements, according to Palmer. (The deconstruction process has begun, but no date has been set for completion.)

ON THE SKIDS

As with the Winton guesthouse, the North Prospect Church in Cambridge, Massachusetts, was destined for multiple moves. The Greek Revival–style wood-framed structure, built in 1845, was moved a mile down Massachusetts Avenue in 1867 by a team of horses. And, just two years ago, the church was moved about 80 feet to the south in order to include it in Lesley University's new Lunder Arts Center, completed in 2015.

The church's corner location didn't work well with the siting for the new building, says Simeon Bruner, a principal at Bruner/Cott Architects, the arts center's designer. The firm decided to slide the church toward the center of the block and couple it with the new building, connecting the two with a glazed atrium.

To prepare the historic building for relocation, the steeple was removed, interior finishes were taken out, and a series of cable X braces were rigged across the interior for lateral stability. Carpenters cut slots in the siding of the lower walls so that steel beams could be installed under the floor structure. Hydraulic jacks capable of a three-foot "throw" then pushed the structure along the beams in 36inch increments. The structure was in place

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Learning Objectives

1 Debate the ethical issues involved in moving significant buildings.

2 Describe different methods for relocating buildings.

3 Describe methods for preventing damage to structure, finishes, and other original fabric when a building is moved.

4 Discuss the challenges presented by moving the Bachman Wilson House, the Winton Guest House, and the North Prospect Church.

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over a new foundation in less than a day.

In the process of the second move, the building was lowered to its original elevation above grade, restoring its intended proportions. Bruner/Cott preserved the church's exterior, restoring the striking stained glass windows and carefully detailing the glass walls and roof of the atrium so that they quietly meet the historic facade. The church had three different steeples over its lifespan, two of which were destroyed in storms. Curiously, the architects chose to replicate the second, 1906 version rather than the original. According to Bruner, it has a more secular character that fits the building's new academic use. The interiors, meanwhile, were changed radically, with an upper floor added above window height to house studios and a library over the nave.

Despite all the modifications, the building, which was listed on the National Registry of Historic Places in 1983 and earned local landmark status in 2009, retained its designations. The interior was not landmarked. "We worked very carefully with the Cambridge Historical Commission to remove elements that were





historically inappropriate and replace original materials that had been removed," Bruner says.

MOVING INTO THE FUTURE

It's likely that relocating important buildings will become even more frequent. Post-Katrina New Orleans has seen a boom in the business of moving houses out of harm's way. In 2015, the entire town of Kiruna, Sweden, began migrating to a nearby site because of subsidence from Europe's largest iron ore mine. Most of the town will be rebuilt, but historic buildings will be moved to the new location. With the world getting more crowded, and with rising sea levels and expanding flood plains, there is no doubt we'll see more historic structures on the move.

Michael Cockram is a freelance writer and director of Bowerbird Design in Fayetteville, Arkansas.

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The National Theatre London Haworth Thompkins Atelier Ten By Chris Foges

FEW LONDON buildings divide opinion so sharply as the National Theatre on the south bank of the Thames. Built by Denys Lasdun and completed in 1976, the Brutalist complex is decried by some as grim and forbidding but loved by many for its spatial and material virtuosity. Its recent \$120 million renovation by architect Haworth Tompkins encompasses the expansion of the back-of-house facilities, the remodeling of an auditorium, and the reorganization

SOUTH BANK HOSPITALITY

From the riverside, new glazing on the main foyer emits a welcoming glow. Preprogrammed lighting controls shift between four "scenes" from morning to late evening in response to external daylight levels.





and enlargement of the front of house. Here, lighting design played a central role in creating a warmer welcome without compromising the building's distinctive aesthetic or protected fabric. (The National Theatre has been Grade II* listed as a particularly important building of more than special interest by the UK since 1994.)

Extending across the building's north side and ranging from single to triple height, the main foyer is an essay in the plastic potential of poured-in-place concrete. Heavily board-marked walls and piers carry deep coffered slabs that jetty out beyond the glazing line to form outdoor terraces. Lasdun made careful use of shadow to reveal the sculptural and textural qualities of the structure, but a 1990s renovation left the spaces overbright and surfaces cluttered with theatrical lighting fixtures.

Haworth Tompkins and lighting designer Atelier Ten aimed to restore the foyer's clarity and intimacy, with a scheme that gives as much weight to darkness as to light. Illumination was introduced in carefully controlled pools and patches, as required to aid orientation or to identify areas for congregation. Café tables might be illuminated to 300 lux, but the average across the floor remains around 100 lux. "We had to learn not to be frightened of the dark," says Jonathan Gittings, director of Atelier Ten.

The unshowy approach belies hidden complexity. A desire to reference the building's material details and a requirement to reuse the existing wiring and lighting points called for the development of 40 types of custom fixtures, in three families: downlights, spotlights, and pendants.

Within the grid of the egg-crate ceiling slabs, bronze-anodized cylindrical downlights are clustered in small, irregular groups. To avoid light spilling into the coffers, which the designers wanted to keep dark, they are fitted with gold reflectors that also add warmth to the light emitted by 2700K LED modules.

LED spotlights with honeycomb louvers that emulate the quality of old PAR lamps are set into floors at the base of walls and columns, "grazing" the concrete surfaces with light to reveal their texture. "The warmth of the light also makes the concrete look friendlier and more alive," says Gittings.

Bright accents are formed by "chandeliers" of red and white pendant lights installed at key points, such as the glazed entrance lobby, where they lend a rouge blush to the béton brut. The pendants are T5 fluorescent tubes with gel sleeves, and these appropriately utilitarian lamps are also deployed in various configurations across other areas of the building, providing a sense of coherence.

In a new café created from a loading bay in the northeast corner and treated largely as found, T5 tubes are suspended horizontally among a tracery of electrical conduit and sprinkler pipes below an exposed concrete ceiling. They appear again as individual pendants in a second remodeled foyer on the building's east side, where they are paired with horizontal strip lights set within a slatted timber ceiling.



From this space, an elevated public route leads through the back-of-house facilities, allowing views into design offices, workshops, and a vast set-painting studio. Industrial light fixtures reflect the architect's characterization of the theater as a "creative factory," but the role of lighting in these large volumes is primarily functional rather than atmospheric. High-performance luminaires are fitted with reflectors that give an even distribution of light at 1,500 lux.

The appreciation of darkness is again evident in the external spaces. On the west-side terraces, open to the public at all hours, Atelier Ten resisted the demands of safety advisors for overhead lighting, demonstrating that knee-high LED strips secreted in the balustrades could give sufficient light. At night, visitors' views of illuminated facades across the river are enhanced by their own position in the halfdark. As in the foyers and bars, the lighting of the public realm eschews dramatic display to carve out intimate, inviting spaces from which to watch the theater of life.

credits

ARCHITECT: Haworth Thompkins LIGHTING DESIGNER: Atelier Ten ENGINEERS: Flint & Neil (structural) CONSULTANTS: Gross. Max. (landscape); Arup (acoustics); Charcoalblue (theater) GENERAL CONTRACTOR:

Lendlease (construction management) CLIENT: Royal National Theatre

SIZE: 176,000 square feet

COST: \$120 million

COMPLETION DATE: May 2015

INNER GLOW To minimize damage to the concrete, the designers reused existing brackets for spotlights (opposite, top), and developed custom fixtures such as the chandelier in the entrance lobby (opposite, bottom). Spotlights wash boardmarked concrete walls in the new Dorfman Theatre foyer (left) and the first-floor House restaurant (below).



SOURCES

LIGHTING: Aether (front-ofhouse spotlights, downlights, and pendants); KKDC (front-of-house bar and restaurant); iGuzzini (meeting rooms); Etap (workshop and event space); Wila (general downlights); Philips (exterior) LIGHTING CONTROLS: Lutron



CITY LIGHTS With its facade aglow, the mixed-use building is friendler than its previous incarnation, a 1920s garage occupying so much of the sidewalk that commuters had to wait for the bus in the street (right).



690 Folsom Street San Francisco Office of Charles F. Bloszies By Lydia Lee

THE PROSAIC city garage at 690 Folsom Street in downtown San Francisco had been neglected for decades, but a recent makeover is attracting attention. Wrapped with a new layer of intricately cut white-painted aluminum and backlit by color-changing LEDs, the building now scintillates with a play of light and shadow that enlivens one of the city's major roads.

The municipality built the two-level, 26,000-square-foot concrete facility in the 1920s to accommodate the newly widespread use of automobiles; when Boston Properties acquired the small structure in 2012, it was part of a much larger site containing two sleek office buildings. The developer commissioned a local firm, the Office of Charles F. Bloszies, to transform it into a mixed-use office building with ground-floor retail.

Spurred by the client's request for something that would provide a dramatic counterpoint to the adjacent glazed complex as well as speak to the growing number of tech startups populating the increasingly sought-after South of Market neighborhood, Bloszies's team focused on the facade, experimenting with parametric modeling software to develop a striking openwork screen. Featuring a seemingly random linear motif—which Bloszies, who is also a structural engineer, refined for structural integrity—the screen is composed of panels cut with a water jet from ¾-inch-thick aluminum sheets and covered with a glossy white resinbased coating. The building's existing concrete surface was painted a light gray for contrast and finished with a highgloss sealer to reflect light.

"Most of what we do blends into the urban fabric," explains Bloszies. "This is a wild neon-like stitch against a dignified background—it's not something that's appropriate very often."

Linear lighting fixtures are discreetly tucked behind the metal screen, one row along the top, one along the bottom. Outfitted with RGB LEDs, its 22-foot-high upper story is washed in the evening with a lighting scheme that can be programmed to any desired color, such as the festive green featured over Christmas and New Year's. "Solid colors silhou-







EXPLODED PERSPECTIVE

credits

designers

(plumbing)

ARCHITECT: Office of Charles F.

Bloszies, FAIA - Charles Bloszies,

principal in charge; Katy Hawkins,

Allie Roberson, project managers;

ENGINEERS: Office of Charles F.

Bloszies, FAIA (structural/civil);

Allied Mechanical (mechanical):

Decker Electric (electrical); Allied Fire Protection (fire); DPW

GENERAL CONTRACTOR: Plant Construction Company CLIENT: Boston Properties SIZE: 25,000 square feet PROJECT COST: \$8.9 million COMPLETION DATE: December 2014

Mike Bullman, Melissa Lee,

- 1 EXISTING CONCRETE FACADE
- 2 ALUMINUM SCREEN
- 3 ARCADE

SOURCES

METAL PANELS: MG McGrath

GLAZING: Oldcastle BuildingEnvelope STOREFRONT SYSTEM: Arcadia EXTERIOR LIGHTING: Iluminarc (facade); Gotham Lighting (arcade) LIGHTING CONTROLS: Acuity Brands



IT'S A WRAP Supported by thin steel columns, the second floor appears to float, washed by its colorchanging lighting scheme (top). Linear LED fixtures are installed at the back of the facade's white aluminum screen, along the bottom and top (above). ette the screen pattern crisply; the best scenes are

single-color or two-color, with one on top and another on the bottom," says Bloszies. "Although the building is a bold statement, our approach to the lighting was sophisticated and not at all like Times Square or Las Vegas."

The renovation was much more than skin-deep. The design team pulled the building back at grade to create an 8½-foot-wide arcade on the busy street, easing the pedestrian flow. Slender columns made of 4-inch-diameter steel tubing support this modern-day loggia, and glass window walls render the ground floor transparent to passersby. (The first floor is currently being readied for the San Francisco debut of Spin, a chain of Ping-Pong bars backed by actress Susan Sarandon.) The rehabilitation also included the replacement with steel supports of the aging wood roof structure and second-floor interior columns. The overall project cost was \$8.9 million, which, at approximately \$320 per square foot, is roughly comparable to the cost for new high-rise construction.

The money appears to have been well spent. According to Sharon Heiny, executive assistant at Metromile, the startup that occupies the second floor, it has helped with the company's marketing. It's hard to miss the facade with the random zigzags of a "giant rubber-band ball," the one that glows at night, making it easy for visitors to locate.

"It's very cool," says Heiny of the lighting. "The building creates its own ambience." ■

Lydia Lee is a San Francisco–based journalist who writes on architecture, design, and urban development.

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PG&E Mission Substation

San Francisco TEF Design Illuminosa and Horton Lees Brogden By David Sokol





RELIEF WORK TEF Design repaired and replaced concrete panels on Mission Substation's Hyde Street elevation (above), while Illuminosa spotlighted Robert B. Howard's Power and Light bas-reliefs and illuminated the partly resin-clad ventilation shaft from within (left).

FORTRESSLIKE POWER plants are usually perceived as an intrusion on the visual environment. But the San Francisco utility giant PG&E has long taken exception to that truism, as the developer of landmarks such as the Classical Revival– style Jessie Street Substation or Beaux-Arts Substation J, both of which are listed on the National Register. Now with design consultant Jonathan Manzo, the company has extended this legacy into the current century with sensitive improvements to many of its existing facilities.

The modernization of a series of substations, led by TEF Design, bridges PG&E's historic cultural patronage and its present-day commitment to the urban landscape. The recent upgrades to the Mission Substation are the culmination of the utility's new stewardship effort. Architect William Merchant originally completed this monumental container of electrical transformers in the Mid-Market district in 1948 and accented it with two striking bas-reliefs, *Power* and *Light*, by artist Robert B. Howard.

Anchoring a corner of Mission Street, the building comprises two public elevations. On its northeast face, the *Power* and *Light* reliefs are mounted atop cast-concrete panels and flank a projecting bay—formerly the ventilation shaft which is wrapped in concrete bands. The substation's southeast side, overlooking Mission Street, features nine inwardly curved alcoves framed by pilasters. A black granite base unifies the elevations, though on Mission Street this plinth is articulated as a series of planters whose bowed shapes alternate with the alcoves.

"The building's original proportions are both strong and elegant," says TEF associate principal Paul Cooper. "A lot of thought went into making it." That thoughtfulness extended to the lighting. For example, Merchant embedded lamps within the planters, as well as two granite sidewalk pillars, to uplight the alcoves and sculptures.

Yet the Mission Substation's architect did not foresee the neighborhood's decline, which began in earnest with the 1960s-era construction of the BART subway system. Persistent homeless encampment in the substation planters ultimately prompted security improvements, and in late 2011 PG&E and Manzo invited TEF to join a project team that



MISSION

ACCOMPLISHED The facility's Mission Street elevation is a modern composition of curved volumes framed by classical elements, to which newly installed bent-steel fins add a human scale and texture, Streetscape lighting by HLB complements Illuminosa's treatment of this southeast face. already included the Berkeley, California, lighting design studio Illuminosa.

The security upgrade needed to engage the cityscape in a positive way. "Scale, opacity, and rhythm of materials should strengthen the building without making viewers feel like their movement is being restricted," says Cooper, who devised a fence of 1-inch-thick fins of steel, bent into sine-cosine shapes (curved at the top for bird control), to guard the Mission Street alcoves yet harmonize with their geometry. TEF and Illuminosa amplified the new barrier's form by uplighting it with 3,500-Kelvin (K) linear LEDs at its base. Dimmable narrow-distribution LEDs flood the building's alcoves in 4,000K light that terminates at the parapet for a slightly cooler, yet soaring backdrop. TEF partnered with the San Francisco office of Horton Lees Brogden (HLB) to balance Illuminosa's work on the Mission Street facade. HLB illuminated adjacent trees and service-yard gates at approximately 3,000K.

Perpendicular to the building, on Hyde Street, Illuminosa placed a pair of 30-watt LEDs in each existing sidewalk pillar—one producing 2,700K light in a 14-degree beam spread, and the other washing 4,000K illumination over a 41-degree spread—to shine on the bas-reliefs. "The concept was to have a field of cooler color and a 'punch' of warmth," says principal Alice Prussin. Meanwhile, LED floodlighting reflects off new stainless-steel mesh inside the ventilation shaft for a uniform glow. TEF installed translucent resin between the shaft's three lowest bands to activate the pedestrian realm.

The revisions and additions to the Mission Substation have prevented loitering while also enhancing Merchant's original vision more artistically than the previous metal-halide fixtures, which Prussin says had washed the bas-reliefs without focus and produced uneven bursts of light in the shaft. Besides participating in the revitalization of the Mid-Market area, the project offers further proof that utilitarian structures can, in fact, be civic amenities.

credits

ARCHITECT: TEF Design – Amy Eliot, principal in charge; Paul Cooper, associate principal; Kacper Biogosinski, architect; Nicholas May, designer

LIGHTING DESIGNER: Illuminosa (facade) – Alice Prussin, principal; Horton Lees Brogden (streetscape) – Angela McDonald, senior principal ENGINEERS: Cushing Associates CONSULTANTS: Jonathan Manzo, Urbin (owner's representative) GENERAL CONTRACTOR: Paradigm CLIENT: Pacific Gas and Electric Company PROJECT COST: \$4.4 million COMPLETION DATE: September 2013

SOURCES

LIGHTING: Color Kinetics, Bega (Hyde Street facade); Ecosense, Aion (Mission Street facade); Luminii; BK Lighting; Bega (entry gate and streetscape)





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Switched On

Elegant and energy-efficient, these customizable LED fixtures and light engines suit all illumination needs. By Julie Taraska



Rhonan Grande Pendant

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products lighting

Northern Lights

Custom manufacturer Frandsen Project debuts its collection of plug-and-play fixtures.

By Julie Taraska



FOR 40 YEARS Frandsen Project has been one of the hotel industry's top lighting sources, designing, developing, and manufacturing stylishly classic fixtures for boutique lodgings such as W Paris, CitizenM New York, and Tivoli Hotel Copenhagen. Yet despite such success, few outside a rarefied circle know the Danish company behind these works of light. To remedy that situation-as well as make its designs available to a much wider market-Frandsen Project has launched rewired, a line of readymade fixtures.

"Our goal is to produce contract-quality pieces for both the contract and retail markets," says director Thomas Hansen of the collection, which debuted in Europe in January. (U.S.-compatible fixtures should be available this month.) Initial offerings comprise colorful aluminum pendants, Modernist sconces, and linear floor lamps. The company plans "to continuously introduce new rewired products in all lighting categories," says Hansen, noting that all the components are sourced locally or in neighboring countries.

In addition to in-house talent, designers include Danish architects Friis & Moltke, who



SHINING BRIGHT Initial offerings from the rewired line include FM2014 (far left), a new work by lauded Danish architects Friis & Moltke, shown here with the microphone-like Backbeat. The nature-inspired OOTW (left) is the visual opposite of the minimal metal Pool. Elegant and straightforward, the SL comes as a sconce (below), pendant, or floor lamp.



created new lights for the line and leased to it the rights to their earliest works: the FM1954

Classic series, developed in the mid-'50s. Rewired fixtures are available to the trade and public through select showrooms and stores, including Conran London. "We are

proud to be among the few Danish design brands that actually produce our products in Denmark," says Hansen. "With rewired, we'll be able to introduce them to more consumers worldwide." rewired.dk

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Fenestration: Solving Renovation Issues

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Fenestration: Solving Renovation Issues

Current technology and products improve existing buildings

Sponsored by EXTECH/Exterior Technologies, Inc., Firestone Building Products, Graham Architectural Products, Guardian Industries Corp., Menck Windows, Pella EFCO Commercial Solutions, and Technoform North America *By Peter J. Arsenault, FAIA, NCARB, LEED AP*

enovating existing buildings is often more common than new construction projects in many locations or within many firms. Some renovations are motivated by a change in use or in occupancy requiring new layouts, new materials, and/or new building systems. Others are initiated in response to a maintenance assessment that determines the time has come to repair or replace particular components or systems in a building. Still, others may be a simple desire to update the building whether for public appearance and marketability or for improved energy efficiency and performance. Whatever the reason, building fenestration often becomes a key part of the renovation process since it usually plays a very important role in all of these areas of use, performance, and value of a building. Making design decisions about what fenestration to use in a renovation project involves an understand-

ing of the factors related to performance as well as knowledge of the available choices and options. It also recognizes that the final choice may be based as much on the conditions of the existing building as on the available fenestration technology.

TOTAL FENESTRATION PERFORMANCE

When thinking about fenestration, it is easy to be lured into thinking only about glass and glazing. Certainly, the performance factors of heat loss or solar heat gain in glass are important as well as visible light transmittance for daylighting purposes. But while these are truly important aspects of most fenestration systems, they are not the only things that affect overall performance. The frame supporting the glazing is also a critical component whether in a fixed window unit, a curtain wall system, or a storefront system. Since the frames are often a significant portion of a

CONTINUING EDUCATION

Photo courtesy of Graham Architectural Products/Bryan Becker Photography



Learning Objectives

After reading this article, you should be able to:

- Identify and recognize the energy rating and certification process of window and fenestration systems as defined by national standards and codes suitable for all buildings, including green building design and renovation.
- 2. Assess and compare the energy performance and other attributes of different glazing materials suitable for green buildings, renovations, and other designs.
- Investigate the significance of fenestration components, including frame materials and the spacers between insulating glass units related to optimizing energy performance in green buildings.
- 4. Explore different types of fenestration products that combine multiple components to achieve overall performance and aesthetic results.

To receive AIA credit, you are required to read the entire article and pass the test. Go to **ce.architecturalrecord.com** for complete text and to take the test for free. Images courtesy of NFRC (used by permission)



The National Fenestration Rating Council (NFRC) has developed an objective series of standards and testing procedures to rate and compare the total performance of different fenestration products.

fenestration product, such frames have direct impacts on thermal performance in regard to energy efficiency, and human comfort. This is particularly evident in frames that do not adequately address heat transfer, but also when they fail to restrict air leakage or condensation on the unit. Looking closer, it has been demonstrated that even the spacers used in double- or triple-paned insulating glass units can make a notable difference in the overall thermal performance of any fenestration product. In light of all this, it is important then to consider the performance of any fenestration product in its totality, not just on a single component.

During the 1980s, many energy-performance issues were being discussed by manufacturers of fenestration products and claims were being made as to the attributes of their different products based on their own testing procedures. The problem with that, of course, was the absence of industry-accepted standards to follow, meaning no real basis existed for a fair comparison between products. That all changed in 1989, when the National Fenestration Rating Council (NFRC) was formed. This not-for-profit trade association is dedicated to identifying the true overall performance of fenestration systems and products. It has championed the process of fairly and comprehensively rating windows, doors, skylights, and similar products for energy performance. As such, it has developed a uniform testing and rating process that quantifies the key elements of fenestration performance including:

- A procedure for determining the total product thermal transmittance (U-factor), not just the U-factor of the glazing
- Solar heat gain coefficient (solar heat gain or SHGC)
- Visible transmittance (VT)
- Air leakage (AL) in residential window units and
- Condensation resistance (CR)

Together, these individual rating procedures are simply known as the NFRC Rating System, which employs both computer simulation and physical testing by NFRC-accredited laboratories. The NFRC Rating System is supplemented by two separate product certification programs, one for residential products and one for commercial (nonresidential) products, where fenestration manufacturers or responsible parties may certify and label fenestration products to indicate the performance ratings achieved. Both of these product certification programs are current as of April 2014 and are generally updated on a two-year cycle.

GLAZING CONSIDERATIONS

As noted, glazing is an important, albeit not the only, component in a fenestration product. When used in renovation projects, it needs to provide a number of different qualities. From a performance standpoint, presumably it will provide an improvement over existing glazing in terms of daylighting, solar heat gain, or thermal energy loss. From a design perspective, it will likely need to blend with an existing visual scheme for a building or contribute to a conscious effort to change the building appearance for the better. If the building is governed by historic preservation guidelines, there may well be restrictions on glass color, thickness, etc. that will need to be assessed and appropriate solutions found. In light of all of this, let's take a closer look at some glazing options.

Glass Choices

Windows, curtain wall systems, skylights, and other fenestration openings most commonly incorporate glass of one type or another, offering a broad range of characteristics. For example, glass used in renovation projects can be clear or tinted, can be used in various thicknesses, and can be produced with a wide range of coatings to both manage energy performance and facilitate different aesthetic objectives. Some of the fundamental and common choices in glass options that are suitable for renovation projects include the following:

- Float glass: The term "float" refers to the manufacturing process in which molten glass is floated atop a pool of liquid tin in order to establish its surface flatness. Float glass is available as clear, low-iron (in which the trace green tint of clear glass is reduced) or a range of tint colors, including a fairly new series of lighter colors (light gray and light blue). Different thicknesses of float glass are available associated with the structural capacity and deflection control requirements of a broad range of fenestration needs.
- Annealed glass: All float glass is initially produced as annealed, meaning that the glass is gradually cooled to room temperature to relieve residual stress in the glass. Annealed glass can be readily cut, machined, drilled, edged, and polished during the fabrication process.
- Heat-strengthened glass: Heat-strengthened glass is produced by a heat treatment process within which the temperature of the glass is gradually elevated to more than 1,000 degrees Fahrenheit, and then the surfaces of the glass are rapidly cooled in order to develop permanent compressive stresses at the glass surfaces. When heat- treated glass is necessary to resist the thermal stresses on a project (and tempered glass is not otherwise necessary), heat-strengthened glass is often the optimal solution. Heat-strengthened glass is approximately twice as strong as annealed glass.
- Tempered glass: Tempered glass is heat-treated in the same manner as heat-strengthened glass, except that the quenching process is intensified in order to develop higher residual compressive stresses. Tempered glass will break into small dicelike pieces with relatively dull edges, and tempered glass qualifies as safety glazing. While tempered glass is approximately four times as strong as annealed glass, heatstrengthened glass is less likely to escape from its frame in the event of breakage.
- Laminated glass: Laminated glass consists of two or more plies of glass bonded with an interlayer material, most commonly polyvinyl butyral (PVB). Because the interlayer serves to retain shards in the event of glass breakage, laminated glass can constitute safety glazing. It can also provide significant acoustic performance, UV protection, and resistance to hurricane impact, blast, and forced entry.

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• Insulating glass units (IGUs): Insulating glass units, consisting of two or more panes of glass separated by a sealed gaseous space, are widely necessary in order to meet energy codes. A low-e coating is commonly implemented on the number-two surface of the unit (the inner surface of the outermost lite of glass) in order to provide energy performance.

In a renovation project, the optimal glass selection will depend upon matching the particular project requirements for performance and aesthetics with the combination of features provided by each glass type. In buildings where increased energy efficiency is sought, then low-e coated insulating glass units can be used to achieve the appropriate level of solar heat gain control as a likely starting point. Aesthetics don't need to be compromised in this case since there are more choices in such treated glass units than ever before, including some that are very lightly colored to achieve the desired effects. If safety or security are motivating the renovation, then heatstrengthened, tempered, or laminated glass can be used in one or more lites of an IGU to achieve those requirements. There are also numerous other options available to design teams, including a range of tint colors, a palette of coatings, acidetched glass, patterned glass, ceramic frit of many colors and configurations, colored interlayers, and digitally-printed glass.

Other Glazing Options

In addition to glass, there are certainly other choices to consider when selecting glazing, such as acrylic or fiberglass reinforced panels. These have been popular in buildings that receive heavy use, such as industrial settings or where vandalism or other abuse needs to be warded off, and have been used in such settings for quite some time. However, there are also other glazing options worth considering.

In renovation projects where vision glazing is not required, but energy efficiency and daylighting are, then translucent, multiwall, cellular polycarbonate sheets have been successfully used as a viable alternative. Multiwall polycarbonate has been commonly used in Europe for some time with growing use in the United States. It is essentially fabricated as an extrusion with two outer sheets of polycarbonate joined together by internal ribs or cellular connectors. As such, it creates a form of insulated double glazing that is available in large sizes to minimize joints-up to 54 feet in length in some cases. Tongue and groove joinery is even available to connect sheets and provide a clean appearance without the need for vertical framing.

The use of cellular polycarbonate glazing has been shown to provide many benefits over other more traditional glazing materials. First of all, it is lighter in weight compared to similarly sized insulated glass units, making handling, installation, and replacement easier to address. It can also provide excellent insulating values on the order of U-0.25 (R-4) for 40-millimeter-thick panels. Polycarbonate as a material provides greater light transmission than other non-vision glazing, such as insulated fiberglass reinforced panels (FRPs). It is also dramatically stronger, demonstrating 250 times more impact resistance than an equivalent thickness of annealed glass. From a code compliance standpoint, polycarbonate is preferred over acrylic because polycarbonate is a cc-1 fire rated material, while acrylic is not. Finally, because of the nature of the product, it can be specified with 100 percent recyclable material, including any framing made from aluminum.

When it comes to installing polycarbonate glazing, it is common for a manufacturer to provide a complete system with glazing, framing, gaskets, etc. that have been tested as an assembly with results available for comparison to other products. The beauty of the system is that it is easily field installed and, when necessary, can be cut on-site into custom shapes and sizes whether to meet the needs of new construction or to cleanly fit into existing openings in renovation projects. It can also be used to create large translucent walls in areas that need daylight but not vision, such as warehouses and aircraft hangars, making it very well suited for retrofitting such buildings.

Polycarbonate glazing systems don't need to be limited to fixed installations. Manufacturers also offer operable systems that can be opened or closed, making them ideally suited to provide natural ventilation while still allowing plenty of daylight in open or closed positions. This can be an ideal solution in many utility and industrial buildings that need both natural light and fresh air. Of course, there is also still the need to protect against rainwater, so at least one manufacturer has developed an innovative solution that allows for an awning-style window arrangement that sheds water while still allowing natural ventilation. Such an operable system provides more control and more fresh air than a louvered system, and it can be applied to fairly large walls in continuous sections up to 150 feet long and 8 feet high.

Photos courtesy of EXTECH/Exterior Technologies, Inc.





Polycarbonate cellular glazing is well suited for high use or industrial buildings that need energy-efficient daylight but not clear vision.

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6

MONUMENTAL OPERABLE WINDOWS

6

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Operable panels of lightweight polycarbonate glazing can provide both daylight and natural ventilation in a variety of settings.

Consistent with energy code requirements and user needs, the operation can be undertaken manually or electrically and tied into a control system for energy, security, or other reasons. With a central operating feed connected to a line of glazing panels, the entire section can be open or closed at will. Such systems are intended for installations that have high demands so they are typically fabricated from durable and robust materials that allow smooth operation over time. The operators and thermally broken glazing can be configured to work on vertical walls or sloped surfaces to provide window or skylight type solutions. The operators obviously need to be sized to carry the weight and operate the panels, but glazing panel heights of between 3 feet and 8 feet are common. Overall, when properly designed and coordinated, the system provides a lightweight, economical, energy-efficient, and code-compliant option for non-vision glazing.

OTHER FENESTRATION COMPONENTS

As noted previously, the NFRC takes into account all components of a fenestration unit, including the frame construction and the spacers between layers of glass in an insulated glass unit (IGU). The reason is that the material used in these frames and spacers can make a notable difference. To achieve optimal performance in the fenestration system, all of the variables (center of glass, frame, and edge of glass) must be optimized to achieve improved u-values and thermal performance. The spacers used will affect the edge of glass and center of glass conditions, while the construction of the frames will directly affect the overall performance.

Glazing Spacers

While the use of spacers is necessary and somewhat dictated by the IGU fabrication process, one of the biggest variables is the selection of spacer material. Typically, aluminum or stainless steel has been used for cost and strength reasons. However, these materials are very good at conducting heat, which means they can create a small "thermal bridge" around the perimeter

of the IGU glazing. That will affect the temperature of the edge of the glass and may cause it to be colder than desired, which can lead to condensation forming along the edges. This thermal bridging around the glass edge can also affect the temperature of the center of the glass, making the whole assembly less energy efficient and less comfortable for people to be near. The preferred condition is to maintain a "warm edge" around the glazing. "Warm edge" refers to the thermal interaction between the panes of glass, window frame, and spacer at the sealed edge of an IGU. The lower the energy loss between the inside and outside of the window, the warmer the edge. Warmer edges also reduce the likelihood of water vapor condensation around the perimeter of the glass.

In the interest of creating a warm edge spacer, manufacturers have developed hybrid products that combine the benefits of highperformance polymers and thin stainless steel.

Images courtesy of Technoform North America



Hybrid spacers in insulated glass units produce notably better thermal performance results than aluminum or stainless steel spacers and are available in a wide range of colors to suit design needs.

The polymer component provides insulation for the spacer, while the continuous stainless steel back provides an excellent inorganic surface for sealant adhesion, creating a gas/moisture barrier. Such a spacer has also been optimized for fabricating IGUs to be sure they retain commonly used inert gases (e.g. argon) and are fully protected against corrosion. They are even offered in a range of colors to complement the colors of glass and glazing frames, while holding up over time to the effects of ultraviolet (UV) radiation from the sun. The results have paid off since independent testing has shown a marked difference in U-factors in glazing that use hybrid spacers compared to using aluminum or stainless steel. The tested difference can be on the order of 10 to 15 percent or more improvement. In a recent project, the well-known energyefficient Bullit Center in Seattle, Washington, Javier Bonilla, a glazing contractor with Goldfinch Bros. Inc., noted, "We were able to improve the overall U-factor of the window by replacing the aluminum spacer with a hybrid spacer. The overall U-factor of the window unit improved from 0.25 to 0.17."

Fenestration Frame Thermal Breaks

Just as the edge of the glass can be affected by thermal bridging, the frame of an aluminum or other metal window unit can conduct more heat through it than desired if something isn't done to interrupt it. A thermal break is meant to do just that—stop or slow the flow of heat through the frame of a fenestration unit. This is done by separating the inside portion of the metal frame from the outside portion around the entire perimeter of the unit. In order to maintain the integrity of the window unit, the two halves still need to be joined, just not with metal. Rather, a low heat-conductive material is used with enough rigidity to be effective but enough insulation value to reduce heat flow.

The response by manufacturers has been to create structural insulating strips that can be custom extruded to fit window frame profiles and produce highly favorable thermal perforImage courtesy of Technoform North America



Structural insulation strips can be custom extruded to allow window units to maintain thermally separated interior and exterior frames that can also be finished differently.

mance. Some even incorporate leg extensions for sealing against gaskets and screw channels for corner assembly options for example. By improving the thermal performance of the overall system, these insulating strips can help reduce the energy requirements of the building, increase the comfort of the indoor environment, and reduce health concerns associated with condensation on the windows. From a design standpoint, the continuous separation provided by the structural insulating strip also allows for the interior and exterior portions of the windows to be different colors or finishes.

MANUFACTURED FENESTRATION SYSTEMS

Manufactured products used for wall fenestration in renovation projects typically fall into three categories: curtain wall systems, storefront systems, and unit windows. Curtain wall systems can be large or small, field assembled or factory built, but are designed to hang continuously outside of a building structural system. Storefront systems are intended for a first or second floor installation and fit between floor and ceiling structures. Unit windows are fit into openings in a wall system and are available in a full range of sizes and types. All three types can achieve NFRC certification, but only some unit windows will carry an actual label. Curtain wall, storefront, and some specialized windows use standardized computerized ratings for certification. In all cases, though, each manufactured unit or system will be assessed in terms of total performance based on the traits and characteristics of the individual components that go into them.

Storefront and Curtain Wall Systems

These systems are available in a wide range of fully customizable options and choices suitable for renovation projects of all types. Advances in technology and design in recent times have provided flexible installation, improved energy efficiency, and a very favorable return on investment in most cases. While storefront framing has not always been regarded as high performance in the past, current products are capable of reaching U-factors as low as U-0.31 (R-3.2) with common low-e glass combinations and U-0.28 (R-3.57) with dual-coated units. "Architects of retail and mixed-use projects can benefit greatly from these latest storefront products, as the energy efficiency of the entire building envelope will be enhanced from the street up," says Josh Wignall, storefront and curtain wall marketing product manager for EFCO. He points out that such systems are thermally broken and can be used in conjunction with standard entrance systems providing enhanced thermal performance and increasing energy-savings potential. Overall, currently available systems provide thermally efficient curtain wall and storefront systems that have the flexibility and cost-effectiveness for use by architects and glaziers on a wide range of projects. Increasingly known for their superior thermal U-factors and architectural-grade structural performance, these products are widely recognized for their ability to manage hot and cold environmental fluctuations without sacrificing structural capabilities.

Popular Unit Windows

Many renovation and new projects incorporate standard, premanufactured windows in some popular styles. Double-hung and single-hung windows fabricated in wood or metal have historically been used in many residential and commercial buildings. Manufacturers have found ways to keep the classic look of these windows but meet the increasing performance demands of architects and glaziers to provide energy-saving products with U-factors as low as U-0.26 (R-3.8) with 1-inch low-e coated IGUs. They are also meeting increased needs for economical framing systems that achieve higher strength and durability suitable for use in commercial, government, educational, and multifamily housing projects. Some manufacturers offer a fixed mating frame, which allows for transoms, sidelights, and other custom opening configurations to be readily worked into the design.

Other window types and styles are popular in renovation projects as well, including awning and casement styles that can project inward or project outward. These windows typically offer many design options, allowing for custom designs using standard window products. Glazing can be double or triple paned for improved energy savings, and some offer optional integral window blinds for interior light or privacy control capabilities. If fabricated from aluminum, there are multiple anodized or painted-finish solutions to address economic and aesthetic concerns. All use modern window hardware for enhanced operation and maintenance.

Monumental Windows

In many existing buildings the window openings may be very large, thus being referred to as monumental windows. These are commonly historic buildings, but could be fairly recent too simply with proportioned openings that call for larger than typical window units. Manufacturers have responded to this need as well, providing wood and aluminum-clad wood windows suitably rated for commercial projects. According to Stacy Seelye, Pella product

Photo courtesy of Pella EFCO Commercial Solutions



Curtain walls, storefront systems, and unit windows all combine different components to achieve an overall performance rating with many achieving excellent results.

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Photos courtesy of Pella EFCO Commercial Solutions



specialist, "The new monumental hung windows are a welcome addition to the available choices in the market." Architects can now select the full range of sizes from a single manufacturer for virtually any low- to mid-rise commercial project, especially for building retrofits, where historical accuracy and energy efficiency can be equally important. Such windows are available in size range up to 6 feet wide by 12 feet high with optional triple-pane insulated glass for improved thermal performance on the order of a total unit U-factor of 0.28 (R-3.5) in double-glazed units with argon gas and U-0.18 (R-5.5) in triple-glazed units with krypton gas.

Tilt and Turn Windows

An innovative and flexible window type, one that can either tilt open or swing open, has been commonly used in Europe for many years and is becoming more popular in the United States. In fact, at least one company with roots in German engineering has established a manufacturing plant here in the United States to respond to the growing demand for these high-performance windows with a unique form of operation. They rely on a combination of engineering design, custom window hardware, and continuous gasketing to operate successfully. An interior handle rotates the hardware in one of three positions. In the locked position, the movable sash is closed firmly against the gasketed frame to seal the window unit tightly against air and weather infiltration. In the first open position, the window sash tilts inward from a hinge engaged at the bottom. This allows a basic amount of ventilation, while still limiting exposure to the elements-in this position, water just rolls off the slanted sash and drains out. By closing and re-opening



Monumental windows are now available in very large sizes to suit historical conditions and improve energy efficiency.

the window into the second open position, it swings inward like an inward-projecting casement window, allowing for maximum light and natural ventilation.

Beyond the operational aspects of tilt and turn windows, they are also known for the attention to detail to produce a range of beneficial outcomes, including very high thermal performance, enhanced acoustics, ease of use/functionality, security (resistance to forced entry), and interior comfort. Many profiles and configurations are available, including profiles that offer narrow sight-lines such that large areas of glass can be available throughout. While all of this usually translates into additional cost compared to other American windows, the extra investment is generally regarded as small compared to the benefits. Of course, as performance of all windows continues to improve and as manufacturing of tilt and turn products develops further, the price gap between them may well shrink as precision units become more efficiently produced at more competitive prices. In some cases, they are even provided on a factory direct basis to a project, eliminating distributor cost mark-ups.

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Another common attribute of tilt and turn windows is the use of sash frames that are wide enough to accommodate triple glazing. This allows glass U-factor values in the range of 0.12 or 0.13 (R-7.69 to R-8.33) with warm edge technology incorporated to optimize energy performance of the total window unit. That means large areas of glass can be used to bring in the benefits of daylighting, while still balancing thermal heat transfer. It also means building occupants experience greater interior comfort from the warmer interior glass surfaces.

Todd F. Bachelder, chief executive officer of Menck Windows, sums up the high performance and innovative operation of tilt and turn windows this way: "Building owners need fenestration products that will last and keep the building more comfortable, while reducing energy consumption, maintenance costs, and carbon emissions. Architects need to be able to select and specify products based upon the latest building technology from manufacturers that stand behind their products and services. Everyone needs windows that help ensure a long-lasting, energy-efficient, sustainable building—one that's going to appreciate in value over time."

Custom Windows

There are cases where building renovations require windows to fit some pre-existing conditions or incorporate custom features to achieve results that match design, function, or historic needs. In those cases, there are manufacturers available who can provide full-service design support and supply highquality, architectural-grade windows. Of course, these same manufacturers can do this for new construction, too, so architects can call on their experience and support for a full range of building construction projects. Some go beyond unit windows and have a full line of curtain wall, window wall, and storefront

Image courtesy of Menck Windows



Tilt and turn windows allow for an innovative operation as shown in these photos: (left) in the closed and locked position, (middle) in the tilted inward position with the bottom hinges engaged, and (right) in the fully open position with the sash turned inward engaging the side hinges.





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CIRCLE 213







Photos courtesy of Menck Windows



options to help ensure a functional system, regardless of the type of fenestration. For this discussion, let's remain focused on some examples of custom unit windows.

Custom window manufacturers pride themselves in being able to craft windows to meet virtually any need. Dependent on the architectural vision, many times these windows can be an architectural highlight of the overall design, in which case they can be a main building feature. In addition to meeting the aesthetic needs, these custom windows still protect occupants from the elements and allow natural daylight into the building. They can also be specified to provide high thermal performance and can be tested for such. A large percentage of renovation projects require custom shapes that simply may not be available without a custom fabrication. Customization can also include an entire new product, unique panning and trim, or enhancing an existing product to meet specific project performance requirements.

By way of example, consider a situation where double-hung windows are being replaced or installed, but the sash can be quite heavy to operate. Historically, that meant there were counterweights in the wall hung on pulleys to make the operation easier. A modern, custom alternative, however, is to use selfbalanced windows, where both sashes operate simultaneously and counter balance each other. This eliminates the maintenance involved with traditional balance hardware and virtually eliminates sash-weight design issues. It also allows for increased natural ventilation since a greater window area is open at once. Custom systems such as this have been tested and found to meet or exceed industry standards for life-cycle testing.



Custom windows made from cast aluminum were fabricated to replace the original wood windows that had deteriorated in this historically significant school auditorium.



Triple-glazed tilt and turn windows incorporated into a larger timber-based curtain wall system provide high-performance lighting and ventilation.

Conversely, consider a condition where the windows are no longer desired to be operational but the look of a double-hung window still needs to be maintained. In this case, off-set fixed windows can be custom fabricated that simulate a double-hung window but with fixed sashes. This can reduce the overall cost of projects since fixed windows are less costly than operable windows. This approach can also save energy since fixed windows commonly have less air infiltration than operable windows, leading to better thermal performance. Since there are no moving parts or hardware, they also require less maintenance. From a design perspective, this custom approach allows some off-set fixed windows to be used that can seamlessly match adjacent operable hung windows using the same frame depth.

DESIGN SUPPORT SERVICES

In order to fully account for the impact of windows on building performance, they should be looked at as part of an overall envelope analysis with an emphasis on the contributions offered by glazing types, air sealing, occupant comfort, and improved aesthetics. This is an important step on any project but especially on the renovation of existing buildings, particularly if the building is being converted from some other use (i.e. warehouse, school, etc.) into multifamily housing as has become very popular in many areas.

Continues at ce.architecturalrecord.com

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PRODUCT REVIEW

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Technoform specializes in the development and manufacture of components that improve the thermal efficiency of the window system. Technoform Bautec produces high-precision polyamide insulation profiles for aluminum windows, doors, and facades. Technoform Glass Insulation produces a warm-edge spacer to reduce heat transfer and maximize protection against gas leakage and moisture penetration.

Circle 6

Photo courtesy of nora systems, Inc.

New Parkland/Parkland Health & Hospital System, Dallas, Texas

"Rubber is a great fit for healthcare, as it doesn't require the same kind of maintenance that you have for some of the vinyl products; it is wax-free," says Robyn Roleofs, senior interior designer at HDR+Corgan. "It is also naturally antimicrobial and is quieter than a lot of our other floors. Acoustic control and sound transmission are hugely important to help patients heal faster."



Creating Safer Spaces in Healthcare

Impacts, performance, and outcomes of rubber flooring in healthcare and the Affordable Care Act

Sponsored by nora systems, Inc. | By Sandra Soraci, EDAC, LEED AP, NCIDQ, IIDA

he Affordable Care Act (ACA) passed in 2010 is known for its reform of health insurance; the law also redefines how healthcare is delivered. ACA is a transition from volume-based to value-based, patient-centered care. To deliver value, providers must improve the quality of care and deliver it at a lower cost by operating more efficiently, improving patient outcomes, and increasing patient satisfaction.

Healthcare leaders in the C-suite are faced with cultural, operational, and organizational changes that profoundly affect their business models. The drivers and domains of the ACA are focused on patient-centered care, and the ability to improve the quality and reduce the cost of care in the healing environment. ACA has introduced us to a new language of acronyms, terminology, and abbreviations. This language has become the "new normal." In this course, we will address how P4P, VBP, HCAHPS, RRP, and HAC specifically relate to flooring selection, specification, safety, and maintenance in the built-environment.

In healthcare, we have choices. First impressions drive emotional response. As individuals, we want to feel safe in our physical environment, as a patient, caregiver, employee, or family member.

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Learning Objectives

After reading this article, you should be able to:

- Explain how the use of rubber flooring in healthcare environments addresses the drivers of the Affordable Care Act (ACA): Pay-for Performance (P4P), Value-Based Purchasing (VBP), HCAHPS domains, and Hospital-Acquired Conditions (HAC).
- Discuss the value attributes of rubber flooring and how informed product decisions drive product selection in support of clinical efficiency, operational outcomes, and patient satisfaction scores.
- **3.** Review the available tools and resources developed for managing risk and improving the healing environment, such as The FGI Safety Risk Assessment (SRA), The Joint Commission (TJC) Targeted Solutions Tool (TST), The Center for Health Design, and related organizations and initiatives.
- 4. Evaluate goals in flooring selection and design as they relate to evidence-based product attributes that distinguish rubber flooring and P4P drivers of cleanliness and quietness of the healing environment, patient experience, falls and trauma, infection control, and clinical outcomes.

To receive credit, you are required to read the entire article and pass the test. Go to **ce.architecturalrecord.com** for complete text and to take the test for free.

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1250

This course focuses on how the Pay-for Performance (P4P) domains of ACA affect patient-experience, clinical outcomes, operational efficiency, clinical process of care, and safety—the fundamental drivers for reimbursement. As the foundation of the healing environment, flooring encompasses every square inch of the healing environment.

All rubber flooring is not created equal. The materials and production variables produce floors that can and do differ significantly in terms of durability, stain resistance, maintenance, and reparability. Nine widely available commercial rubber floor coverings were selected and put through a series of tests. It was evident that production variables can alter the value attributes for reducing noise, increasing cleanliness, and controlling infection, eliminating exposure to cleaning chemicals, reducing time and expense needed for maintenance, and enhancing both the caregiver and patient-experience.

Investments in the safety and performance of flooring must consider health, safety, and welfare as they pertain to the business decisions healthcare facilities are facing today. The design community—architects, interior designers, and key stakeholders in healthcare—need a clear understanding of the terminology, operational drivers, and tools surrounding the "new normal" as brought about by ACA.

In collaboration, manufacturer partners need to understand healthcare reform and how it affects the analysis of performance characteristics of rubber flooring products, which vary significantly, even within the same general material category.

ACA: NAVIGATING THE ACRONYMS

The following is a brief overview of the key abbreviations of the ACA, and the operational domains and drivers it defines, as a basis for understanding how they relate to creating safer spaces and the value attributes of rubber flooring products. The programs and concepts are discussed in more detail throughout this course.

CMS: Centers for Medicare and Medicaid Services is the government organization within the Department of Health and Human Services (DHS) that manages Medicare and Medicaid and administers Health Insurance Portability and Accountability Act (HIPAA).

HAC: Hospital-Acquired Conditions are illnesses or complications that patients contract during their hospital stays and that are considered highly avoidable. Since 2008, Medicare has not reimbursed hospitals for additional costs for care related to these conditions. In FY15, CMS imposed a 1 percent penalty.





Image courtesy of nora systems, Inc.

HCAHPS: The Hospital Consumer Assessment of Healthcare Providers and Systems survey results produce data about Patient Experience of Care that allows for objective and meaningful comparisons of hospitals in the Value-Based Purchasing program. It encompasses eight domains of hospital quality associated with overall satisfaction.

- 1. Communication with nurses
- 2. Communication with doctors
- 3. Responsiveness of hospital staff
- 4. Pain management
- 5. Cleanliness and quietness of hospital environment
- 6. Communication about medicines
- 7. Discharge information
- 8. Overall rating of hospital

The list of domains is available at https:// www.medicare.gov/HospitalCompare/Data/ Patient-Experience-Domain.html. Survey results are available at www.medicare.gov/ hospitalcompare/search.html.

P4P: Pay-for Performance is a concept that is fundamental to quality improvement and cost control. Payment rewards quality, not volume. It is not a single form of reimbursement, but bases payments on measures of clinical quality, safety, efficiency, and patient satisfaction. P4P reimbursement encompasses: VBP, HCAHPS, HAC, and RRP.

RRP: Readmissions Reduction Program is a Medicare program, implemented under the ACA, that penalizes hospitals for having a high rate of discharged patients readmitted to a hospital within 30 days of a prior acute care stay.

VBP: Value-Based Purchasing is a national Pay-for Performance program for acutecare hospitals. The VBP adjusts Medicare reimbursement up or down, withholding a portion that can be earned back by performing well on a set of four quality metrics: Process of Care, Patient-Experience, Patient Outcomes, and Hospital Efficiency. HCAHPS is a component of VBP. **TPS:** Total Performance Score is a combination of 70 percent scores on CMS Core Quality Measures, a very wide range of process, procedure, and outcome metrics; and 30 percent based on survey results from the HCAHPS, which drives payment redistribution. (See Figure 1.)

CHD: The Center for Health Design is a non-profit organization dedicated to improving the quality of healthcare through design of the built-environment. CHD is a source of extensive research on the value of design to improving health outcomes, patient experience of care, and provider/staff satisfaction and performance.

EBD: Evidence-Based Design is the process of basing decisions about the built-environment on credible research to achieve the best possible outcomes.

FGI: The Facility Guidelines Institute enhances the content and format of Guidelines publications that encourage and improve their application and use. It published the 2014 consensus-based and evidence-based revision to the *Guidelines for Design and Construction of Hospitals and Outpatient Facilities.*

Hospital Safety Score: A letter grade scoring system for consumers, which uses national performance measures from the Leapfrog Hospital Survey that grades hospitals on how safe they keep patients from errors, injuries, accidents, and infections. Searchable hospital scores can be found at www.hospitalsafetyscore.org.

SRA: The new Safety Risk Assessment (SRA) Toolkit for Health Care Facility Environments is a resource created to support the 2014 FGI Guidelines. The SRA was created through extensive review of research, consensus building with industry experts, and pilot testing. Its aim is to help healthcare design teams proactively identify and mitigate built-environment conditions that may impact patient and worker safety in healthcare environments. (A PDF version of the Toolkit is available at https:// www.healthdesign.org/insights-solutions/safetyrisk-assessment-toolkit-pdf-version#sthash. ZNEk4uPD.dpuf.)

There are six safety issues included in the SRA Toolkit: infection control, patient handling, falls, medication safety, behavioral health, and security. The attributes of rubber flooring can be actionable as it relates to infection control, acoustics, and falls.

TJC: The Joint Commission. Created in 2008, TJC Center for Transforming Healthcare aims to solve healthcare's most critical safety and quality problems. In July of 2014, the Targeted Solutions Tool (TST)® became available as an innovative application that guides healthcare organizations to accurately measure their organization's actual performance, identify barriers to excellent performance, and direct them to proven solutions. Flooring affects all aspects of health, safety, and well-being in the healthcare setting. The floor is the most visible component of the space and provides the surface for all activity.

In 2012, CHD, with a number of partners, sponsored the creation of a report and checklist, "Achieving Evidence-Based Design Goals through Flooring Selection and Design," which will be referenced in this course.¹

It explored industry standards and best practices related to flooring. Flooring surfaces were examined using an Evidence-Based Design approach to define how flooring can contribute to the following performance-improvement goals:

- 1. Reduce slips, trips, and falls
- 2. Reduce patient and staff injuries associated with falls
- 3. Reduce noise levels

CONTINUING EDUCATION

- 4. Reduce staff fatigue
- 5. Reduce surface contamination and potential risk of HAIs
- 6. Improve indoor air quality (IAQ)
- 7. Improve patient and family satisfaction
- 8. Represent the best return on investment

Evidence-Based Design is an approach to environmental design (architectural, interior, and landscape) that aspires to base design decisions on documented research and wellestablished best practices, with the aim of improving outcomes. Evidence-Based Design is increasingly common in the design of healthcare facilities, where the approach has found support among healthcare administrators, many of who are familiar with the conceptually comparable notion of evidence-based medicine. Healthcare environments designed on the basis of solid research evidence are intended to improve patient safety, reduce stress, increase care delivery effectiveness, and enhance quality of care—objectives that contribute to the overarching goals of improved patient, staff, and organizational outcomes.ⁱⁱ

The product attributes of specific rubber flooring products offer actionable solutions to P4P drivers in each of these areas as discussed above. In a study conducted by the Florida Hospital - Office of Design, on the perceptions and experiences of users, specifiers, and installers of various common types of healthcare flooring, found that those interviewed for the case studies had "positive experiences to report about rubber flooring, and some of the clinical and maintenance staff had glowing praise for rubber flooring."

As a performance example, if a patient room has to be turned over rapidly between patients, there may only be time to mop the floor, which is not sufficient disinfection protocol for

THE EVIDENCE BASED DESIGN WHEEL:

Environmental Factors that Affect Outcomes



Figure 2: Surface Density of Resilient Flooring



Image courtesy of nora systems, Inc

terminal cleaning. There are specific rubber floor products where the entire patient room can be steam cleaned and dry in less than 15 minutes. Thus, making an actionable impact on clinical efficiency and patient perception as it relates to HCAHPS.

There are significant differences among rubber flooring products. The highest-quality rubber floorings have extremely dense, closed surfaces (see Figure 2) and are inherently dirtrepellent due to a special production process that ensures optimum material cross-linking. The advantages include reduced susceptibility to soiling, improved hygiene properties, and lower outlay for care with no need for cleaning chemicals exposed to patients and caregivers.

Surface density also has an impact on slip/ trip/falls, on transportation over the surface, for example of rolling loads related to moving equipment, and on ergonomics directly related to the comfort of caregivers, staff fatigue, patient comfort and safety, and their positive perception of the environment.

There are differences in maintenance needs, as well. A common perception is that no rubber floor needs to be waxed, but some manufacturers actually require it as part of the regular maintenance cycle. Maintenance on premium rubber flooring products is to simply clean with water as there is no factory-applied finish to maintain.

As noted in the CHD Evidence-Based Design study above: "Rather than using a generalized flooring category, the design team must evaluate individual products based on their performance against each EBD goal before deciding on the right flooring material and design for a particular area. Consider the trade-offs for each product." Operational optimization, clinical efficiency, indoor air quality, and patient satisfaction are all impacted by flooring selection and de-selection. Photo courtesy of nora systems, Inc.



The next sections examine specific attributes of rubber flooring products with impact on noise reduction, infection control, safety, and efficiency during operation and maintenance. Each of these drivers are key considerations when it comes to creating safer spaces in the healing environment with products that provide actionable solutions to the financial drivers surrounding P4P.

WORKING THROUGH THE NOISE

A patient being rolled through a corridor, equipment alarms, caregiver conversations, or environmental services doing routine floor maintenance are all significant contributing factors to sound levels in the healing environment.

Noise levels in hospitals have long been a source of complaints. Evidence-based research studies have shown noise also has a direct, measurable negative impact on healing. For example, noise is an error-provoking condition that causes sleep disruption that affects wound healing, and increases the need for medication and the length of the stay. Noise also has been associated with undue stressors, having negative impacts on caregivers, and can be an error-provoking condition. It is strongly related to stress and annoyance among nurses, increased fatigue, emotional exhaustion and burnout, and difficulty in communication possibly leading to medication errors.

Contributing to the overall Patient Experience of Care domain score, where flooring can be attributed to the score, HCAHPS survey question #9 asks, "During this hospital stay, how often was the area around your room quiet at night?" This question consistently receives the lowest patient scores.

The FGI Guidelines recognize that the builtenvironment has a profound effect on health, productivity, and the natural environment, and requires a minimum standard that healthcare facilities be designed within a framework that recognizes the primary mission of healthcare.

The 2014 FGI Planning and Design Criteria for Acoustic Design:

1. Site Exterior Noise

2. Acoustic Surfaces

3. Room Noise Levels

- 4. Interior Wall and Floor/Ceiling
- Construction
- 5. Speech Privacy
- 6. Building Vibrationⁱⁱⁱ

Clearly, noise is affected by more than the floor. Interior finish selections have a direct correlation to patient well-being, satisfaction, HCAHPS scores, and caregiver retention. Acoustics are related to the noise reduction coefficient (NRC), sound transmission class rating (STC), and ceiling attenuation class (CAC) of ceiling tiles in partnership with the flooring attributes and wall surface finish.

Continues at ce.architecturalrecord.com

Sandra Soraci, EDAC, LEED AP, NCIDQ, IIDA As marketing leader, health care solutions, Sandra supports nora systems, Inc.'s healthcare partners by providing flooring solutions through an informed decision-making process in support of operational optimization, clinical efficiency, patient safety, and cost of ownership.



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dates&events

New and Upcoming Exhibitions

Peter Fischli David Weiss: How to Work Better New York City

February 5–April 20, 2016

For more than three decades, Peter Fischli (b. 1952) and David Weiss (1946–2012) collaborated to exploit humor, banality, and a keen rethinking of the readymade to realign our view of the world. This exhibit, at the Guggenheim, offers a thorough investigation of the artists' joint production, revealing the ways they juxtaposed the spectacular and the ordinary to celebrate the sheer triviality of everyday life. For more information, visit guggenheim.org.

Beauty

New York City

February 12—August 21, 2016 The fifth installment of the Cooper Hewitt's contemporary-design exhibition series, *Beauty* will celebrate design as a creative endeavor that engages the mind, body, and senses. With a focus on aesthetic innovation, the exhibition features more than 250 works by 62 designers from around the globe and is organized around seven themes: extravagant, intricate, ethereal, transgressive, emergent, elemental, and transformative beauty.

A Japanese Constellation: Toyo Ito, SANAA, and Beyond

New York City

March 13–July 4, 2016 A Japanese Constellation focuses on the network of architects and designers that has developed around Pritzker Prize winners Toyo Ito and SANAA. Providing an overview of Ito's career and his influence as a mentor to a new generation of Japanese architects, the exhibition presents recent works by internationally acclaimed designers including Kazuyo Sejima, Ryue Nishizawa, Sou Fujimoto, Akihisa Hirata, and Junya Ishigami. At the Museum of Modern Art. For more information, visit moma.org.

Ongoing Exhibitions

David Adjaye Selects: Works from the Permanent Collection

New York City

Through February 14, 2016

Architect David Adjaye presents 14 West African and Central African textiles from the Cooper Hewitt Museum's permanent collection in the latest installment of the museum's Selects series. On view in the renovated Marks Gallery on the museum's first floor, the exhibition is the 12th in an ongoing series in which prominent designers, artists, and architects are invited to mine and interpret the museum's collection. For more information, visit cooperhewitt.org.

Hippie Modernism: The Struggle for Utopia Minneapolis

Through February 28, 2016

This exhibition at the Walker Art Center examines the intersections of art, architecture, and design with the counterculture of the 1960s and early 1970s. Presenting a broad range of art forms and artifacts of the era, *Hippie Modernism: The Struggle for Utopia* features experimental furniture, alternative living structures, immersive and participatory media environments, alternative publishing and ephemera, and experimental film. For more information, visit walkerart.org.

Lectures, Conferences, and Symposia

SAH 2016 Annual International Conference Los Angeles

April 6-10, 2016

The SAH 2016 Annual International Conference will engage participants from around the world with the rich, evolving legacy of the Pasadena/ Los Angeles region's built environment. With the scheduled completion of the Metro Expo Light-Rail Line west to Santa Monica in early 2016, Pasadena will be connected to downtown L.A. and the rest of Los Angeles County. This infrastructure, building on historic rights-ofway, will provide new methods to see the broad range of the region's architecture and urbanism. At the Pasadena Convention Center. For more information, visit sah.org.

AIA Convention 2016

Philadelphia

May 19–21, 2016

The AIA Convention is one of the largest annual gatherings of architects and design professionals in the United States. This year's iteration will take place at the Pennsylvania Convention Center. For more information, visit convention.aia.org.

NeoCon 2016

Chicago

June 13-15, 2016

NeoCon, the largest commercial interiors show in North America, has been held at the Merchandise Mart in Chicago since 1969. The three-day event attracts nearly 50,000 design professionals and showcases more than 700 leading companies. With more than 1 million square feet of exhibition space, the show launches thousands of new products and covers a spectrum of vertical markets including workplace, health care, hospitality, retail, education, public spaces, and government. For more information, visit neocon.com.

Competitions

Harvard GSD 2016 Wheelwright Prize

Application deadline: February 8, 2016. The Harvard Graduate School of Design's Wheelwright Prize is an open international competition that awards \$100,000 to an earlycareer architect for travel-based research. This annual prize is dedicated to fostering new forms of architectural research informed by cross-cultural engagement. It is open to emerging architects practicing anywhere in the world. Applicants must have received a degree from a professionally accredited architecture program in the past 15 years (after 2001). For more information, visit wheelwrightprize.org.

Il Parco Centrale di Prato

Application deadline: February 15, 2016 The municipality of Prato, Italy, is launching an open, anonymous, international two-phase design competition for a new 3-hectare (7.4 acre) urban park on the former site of a hospital in its historic city center. The winning urban park, to be commissioned in June 2016, will serve a functional and strategic role in city relations. For more information, visit ilparcocentralediprato.it.

The Architectural League Prize for Young Architects + Designers: (im)permanence Submission deadline: February 17, 2016

Young architects and designers are invited to submit work to the annual Architectural League Prize competition. This year's competition asks entrants to consider the form and meaning of impermanence or permanence in their work. The League seeks work that responds to current aspects of society, economics, and policy, or invents its own emergent systems of order, taking a position on the relationship of architecture to time. Projects of all types, either theoretical or real, and executed in any medium, are welcome. For more information, visit archleague.org.

Moscow Circus School

Registration deadline: February 19, 2016 This international competition invites designs for a new circus school in the heart of Moscow to train aspiring performers. The architecture should reflect contemporary design tendencies. The proposal must not only attend to the school's specific function but also take its urban context into consideration. The competition is open to architects, engineers, and students. Interdisciplinary teams are also encouraged to enter. For more information, visit ac-ca.org.

Lighthouse Sea Hotel

Submission deadline: February 29, 2016 From the Colossus of Rhodes to the Pharos of Alexandria, lighthouses have always marked human history, gaining importance beyond the basic function of a warning facility. This competition challenges designers to let the beauty of these remote places fascinate them, to imagine a new future for these abandoned lighthouses by transforming them into outstanding tourism facilities, and to make their protection and possible conservation sustainable. For more information, visit youngarchitectscompetitions.com.

Autism Speaks House to Home Prize

Submission deadline: March 1, 2016 Moving out of the family home is never easy. For those living with autism, however, the challenges and fears surrounding this life stage can be overwhelming—not just for them, but also for their families. Unencumbered creative thinking is needed to create alternative housing and support services. Autism Speaks, a leading autism science and advocacy organization, hopes this competition will bring about these breakthroughs. For more information, visit autismspeaks.org.

Charlie Hebdo Portable Pavilion

Registration deadline: March 9, 2016 Many see freedom of speech as the most fundamental of human rights. Meanwhile, countries around the world deny people this right on a daily basis. This competition calls for designs for a traveling structure that will deconstruct the idea of free speech, reminding visitors that not all can enjoy this luxury. For more information, visit charliehebdoportablepavilion. beebreeders.com.

Robert A.M. Stern Architects Fellowship Submission deadline: April 8, 2016

The RAMSA Travel Fellowship is a \$10,000 prize awarded yearly by Robert A.M. Stern Architects for the purpose of travel and research. This fellowship seeks to promote the perpetuation of tradition through invention, key to the firm's own work. Established to nurture emerging talent, the prize is awarded to an individual who has proven insight and interest in the profession and its future, as well as the ability to conduct in-depth research. For more information, visit ramsa.com.

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t PROJECT LOCATION ARTIST INCIPIT MARINA DI CAMEROTA, ITALY EDOARDO TRESOLDI

IN THE CILENTO region of southern Italy, on the coast of the Tyrrhenian Sea, Edoardo Tresoldi created Incipit from rolls of wire mesh for the 19th annual Meeting del Mare music festival last June. The artist enlisted the help of young men from the community to construct the 440-pound, 18-foot-tall permanent installation. "They learned a lot of things, like in a Renaissance bottega dell'arte"-a workshop-says Antonio Oriente, who, with Simone Pallotta, curated the public art for last year's gathering. At the top of the columnar structure (the name means "it begins" in Latin), a flock of intricately hand-sculpted seagulls passes through and then emerges from the arches, the birds' action seemingly suspended in time. Aiming to explore "the dialogue that exists between a figure and the space around it," says Tresoldi, the transparency of the wire mesh allowed him to "create drawings in the landscape." Miriam Sitz