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At 177 years "old," Chicago is less than half the age of New York City and a newborn in comparison with millennials Paris and Rome. In fact, Chicago is not really even 177: Only a handful of buildings predate the 1871 Chicago Fire, and most of the post-fire reconstruction has been replaced in subsequent building boom.

In the lead up to the 1893 World's Columbian Exposition, this lack of history fueled a distinct sense of inferiority in our city's fathers. Big-name architects were brought from the East Coast and classical styles were imported from Europe to create a veneer of sophistication. Louis Sullivan famously noted that the Fair "had set back modern American architecture by forty years," but the crowd seemed to like it.

While history was troweled on at the fairgrounds, it was being made just a few miles north. In the Loop, where the seeds of modernism had been planted in the ashes of the Chicago Fire, the world's earliest skyscrapers were already standing: Jenney's Home Insurance, Holabird & Roche's Tacoma, and Burnham & Root's Rand McNally, Rookery and Monadnock buildings. While of little interest to most World's Fair attendees, architects and engineers around the country began to take note of the upstart city.

These innovative tall buildings formed the foundation of the First Chicago School and established Chicago's bona fides as a leader in architectural thought. Fifty years later in the turmoil of World War II, the Second Chicago School was born and Chicago became the epicenter of modernism. The structural innovations of the Second Chicago School continue to inform the design of supertall buildings throughout the world today.

A few months ago the Chicago-based Council on Tall Buildings and Urban Habitat ruled that New York City's Freedom Tower had topped the height of the Sears Tower (as Chicagoans continue to call what is now Willis Tower). Chicago architects were nonplussed by the flurry of press coverage that followed. After all, bragging rights for the 'world's tallest building' had bounced between NYC and Chicago for more than a century; we were not about to start scrapping over the title of tallest building in North America.

Unlike our Victorian predecessors, contemporary Chicagoans are quite confident of our city's place on the world stage. With so much to offer, Chicago no longer has to define itself with superlatives like "home of the world's tallest building."

Today, Chicago architects are quite content to simply design them for other cities.

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Broad Shoulders

CAROL ROSS BARNEY REFLECTS ON WHAT IT MEANS TO BELONG TO THE ELITE GROUP OF WOMEN AIA CHICAGO FAIA MEMBERS

"Only Girl Architect Lonely. Wanted – to meet all the women architects in Chicago to form a club."

Elizabeth Martini was the only registered woman architect in the state of Illinois when she placed the above want ad in a Chicago newspaper in 1921.

Nearly a century later, we aren’t lonely anymore. Women architects are deeply involved in the professional scene and important contributors to the architectural heritage of Chicago (and in architecture, as Chicago goes, so goes the world).

Look at this photograph of today’s Chicago women architects, who are members of the AIA College of Fellows. They are designers of hospitals, high-rises, interiors, hotels, jails, restaurants, houses, office buildings, places of worship, schools, laboratories, museums, bridges, airports, harbors, train stations, courthouses, theaters and arenas.

They are planners of new cities, new landscapes and new transportation systems.

They are deans of architecture schools, writers, teachers and critics.

They are the winners of national and international awards for their work.

They are architectural thought leaders.

They are experts in acoustics, sustainability and information management.

They are facility managers and university architects.

They are civic leaders guiding Chicago into the future.

They are chapter and national officers of AIA.

They work for big offices and important clients around the world. They work in small ateliers and fight for good design for grassroots communities in struggling neighborhoods.

They are advocates and volunteers for a myriad of important causes.

They are daughters, mothers, grandmothers, sisters and aunts. They are young and old and of all backgrounds. They are trailblazers whether they like it or not.

They are friends, advisors and confidants to each other—not a bad club to belong to!

But it would be too easy to look at this group of distinguished professionals and forget the struggle. There is one aspect of club membership that has not changed since 1921. Each member has at some point incurred glass ceiling-induced bruising.

Each woman bumps the ceiling a little higher.

> Carol Ross Barney, FAIA, principal, Ross Barney Architects
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Seven AIA Chicago Members Elevated to the College of Fellows

The AIA Fellowship program was developed to honor architects who have made a significant contribution to architecture and society. Election to Fellowship not only recognizes the achievements of the architect as an individual, but also honors before the public and the profession a model architect who has made a significant contribution to architecture and society on a national level.

Seven AIA Chicago members were elevated to the College of Fellows this year. The 2014 Fellows will be honored at an investiture ceremony at the 2014 AIA National Convention in Chicago.

Jonathan Boyer, FAIA
Jonathan Boyer, FAIA, has been designing, researching, building and testing buildings to continually “raise the bar” of ecologically sensitive design since the 1970s. As a principal with Farr Associates, Boyer has been integral to the completion of projects such as the award-winning Shaw Technology and Learning Center, the urban sustainability hub Center for Neighborhood Technology, and the Yannell Residence, the first net-zero energy project in the Midwest.

Carl D’Silva, FAIA
Carl D’Silva, FAIA, is a principal architect at JAHN. D’Silva’s involvement on mega-projects such as Bangkok’s Suvarnabhumi Airport, O’Hare’s FACE Expansion, the Doha Convention Center & Tower, and Sony Center in Berlin established him as an industry leader in applying technical proficiency beyond traditional architectural concerns. D’Silva is a strong believer in personal civic responsibility, serving as president of the non-profit North Side Housing and Supportive Services and as a mentor for the Chicago Studio, a program of his alma mater, Virginia Tech.

Doug Farr, FAIA
Doug Farr, FAIA, is a pioneer in sustainable place-making. The president and CEO of Farr Associates, Farr’s book, Sustainable Urbanism: Urban Design with Nature, is the leading text of a design movement that integrates urbanism, infrastructure, architecture and behavior. Notable projects for which Farr was honored include the Chicago Center for Green Technology, a pilgrimage site for sustainability advocates, and the Uptown Normal Redevelopment Plan, a vibrant plaza and commercial and recreational corridor that transformed a wilting historic Midwestern downtown.

Robert Forest, FAIA
Robert Forest, FAIA, excels in the 21st century global arena, managing complex projects while bridging cultures, building interdisciplinary teams while balancing budgets, and driving measurable de-carbonization as the best evidence of groundbreaking architectural and urban design. A co-founding partner in his own firm, Adrian Smith + Gordon Gill Architecture, Forest has led 40 large-scale projects worldwide, including in Africa, Australia, Canada, China, India, the Middle East, Russia and Southeast Asia since 2006. Forest currently serves on the AIA Chicago board of directors.

John Ronan, FAIA
John Ronan, FAIA, is one of Chicago’s leading architectural voices. His abstract yet sensuous work in buildings such as the award-winning Poetry Foundation and Gary Comer Youth Center is recognized for its conceptual innovation, investigation of materiality and attention to detail. In addition to owning his firm, John Ronan Architects, founded in 1997, Ronan is a tenured professor in the College of Architecture at the Illinois Institute of Technology, where he has mentored countless students over his 20-year academic career.
Dawn Schuette, FAIA
Dawn Schuette, FAIA, LEED AP, is a partner at Threshold Acoustics. Schuette's projects include the Gratz Center, Fourth Presbyterian Church; the Kimmel Center for the Performing Arts, Verizon Hall in Philadelphia; and the Cobb Energy Performing Arts Centre in Atlanta, among others. Schuette has published articles and book chapters in numerous publications and lectured at acoustic conferences worldwide. Schuette currently serves on the AIA Chicago board of directors and is a past chair of the National AIA Advisory Group for the Interfaith Forum on Religion, Art and Architecture (IFRAA).

Anne T. Sullivan, FAIA
Anne T. Sullivan, FAIA, has dedicated her career to interpreting the historic built environment by developing and sharing best practices and viable solutions for the preservation of our built heritage. For more than 25 years, as an instructor at the School of the Art Institute of Chicago (SAIC) and president of the Association for Preservation Technology International (APT), she has guided students, clients and peers to investigate and protect historic architecture nationwide. Sullivan has donated her leadership skills and expertise to numerous nonprofits and historic properties, including the Frank Lloyd Wright Trust, Pleasant Home and Garfield Park Conservatory. CA

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Goettsch Partners announced the promotion of both Scott Seyer, AIA, LEED AP, and Elias Vavaroutsos, AIA, to principals.

In other firm news, GP designed a resort and meeting center on Hainan Island in Haitang Bay, China. The project includes a 45-story hotel and serviced apartment tower that serves as a lighthouse with a glowing beacon at 764 feet tall. A floating lobby on the 14th floor separates 229 guestrooms below and 500 serviced apartments above. There is also an International Finance Forum convention center with a 3,000-square-meter exhibition hall, a 1,500-square-meter ballroom, a forum and rooftop garden. Additionally, GP designed 61 corporate villas just east of the convention center and tower.

Harboe Architects was selected by the Frank Lloyd Wright Foundation to preserve, restore and conserve Taliesin West, Wright’s winter home and studio in Scottsdale, Ariz. The project will address wear and environmental damages to the 77-year-old structure, which is the main campus of the Frank Lloyd Wright School of Architecture. Harboe previously worked on Wright buildings such as Beth Sholom Synagogue, Chicago’s Unity Temple and the Frederick C. Robie House.

RTKL is designing an $81 million, 28-story residential tower on the site of Indianapolis’ former Market Square Arena. The curvilinear glass tower will feature 300 luxury apartments, 500 parking spaces and 43,600 square feet of ground floor retail space. RTKL’s design includes a rooftop pool, floor-to-ceiling windows and panoramic views and a green sky window on the roof.

VOA Associates added two new members to its team:
- Laura Parisi, AIA, LEED BD+C, is now project manager for the healthcare practice.
- Angie Lee, FAIA, IIDA, LEED AP, is now principal, global market leader for the firm’s workplace projects.

Jennifer McGregor, IIDA, LEED AP, was named vice president of interiors and business strategy at Legat Architects. Her duties will include brand development and relationship building for the firm.

In other firm news, Legat’s Hyde Park Hyatt Place, an 84,000-square-foot LEED Silver hotel, part of the Harper Court Project, won a Project of the Year award in Construction Industry Service Corp. (CISCO)’s 2013 Pride in Construction Awards.
Italian architect Pier Carlo Bontempi was honored as the 2014 Richard H. Driehaus Prize Laureate at a March ceremony in Chicago hosted by Richard H. Driehaus and the University of Notre Dame School of Architecture. Established in 2003 by the Notre Dame School of Architecture, the $200,000 Richard H. Driehaus Prize is awarded to a living architect whose work embodies ideals of traditional and classical architecture in contemporary society and creates a positive cultural, environmental and artistic impact. Bontempi was selected by a jury that included Adele Chatfield-Taylor, Paul Goldberger, Léon Krier, Demetri Porphyrios and Witold Rybczynski.

JGMA won a 2014 Richard H. Driehaus Foundation Award for Architectural Excellence in Community Design. Its Instituto Health Sciences Career Academy in Pilsen came in second place for incorporating community needs and architectural heritage. A three-story abandoned industrial building on Western Avenue was repurposed to house the charter high school focused on health sciences. The project is now pursuing LEED Silver certification.

Skidmore, Owings & Merrill’s Nanjing Xiaguan Riverfront master plan won a 2013 WAN Urban Design Award. The project, situated along three kilometers of the Yangtze River in Nanjing, China, was recognized in the Future Scheme category. SOM’s design incorporates the city’s built environment and modernizes colonial-era buildings into commercial spaces, restaurants and dwellings.

Landon Bone Baker Architects placed first and third in the 2014 Richard H. Driehaus Foundation Awards for Architectural Excellence in Community Design. First place recognized the Harvest Commons Apartments rehabilitation, which transformed a six-story landmark into 89 single-occupancy residences while maintaining its historic aesthetics. Third place went to LBBA’s The Jackson at Woodlawn Park, a mixed-income housing development of 67 three-bedroom apartments that replaced Grove Parc Plaza, a former Section 8 development.

Krueck+Sexton Architects expanded its team with two new hires:
> Nicolas Caulliez is a project architect who formerly worked for Arquitectonica, Paris.
> Juan M. Villafaña, RA, LEED AP is an associate and was previously with Safdie Architects.

Adrian Smith + Gordon Gill promoted Marc Cerone, AIA, IIDA, LEED AP to director. Cerone’s focus is the interiors group and has worked on fitouts for projects such as Chengdu Greenland Tower, Kingdom Tower and Wuhan Greenland Center. Before AS+GG, Cerone worked at Marvin Herman & Associates on residential and corporate projects around Chicago.
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Gregg Garmisa joined Studio G Architects as principal and general counsel. A board member of AIA Chicago, Garmisa was formerly a trustee of the Chicago Architecture Foundation. He is also the founder and president of Chicago Design Matters Foundation, which supports Chicago architects working around the world.

Terence Houlihan, ACHE, joined Planning Group as associate principal. The group specializes in upgrading healthcare facilities to optimize operations.

Jim Prendergast, FAIA, LEED AP, joined GE Hyphen Design as design director in the Professional Services Division. Prendergast won a Young Architect of the Year Award and became a member of the College of Fellows.

The winners of the 2014 Emerging Visions competition were announced as Christopher Marcinkoski and Andrew Moddrell, PORT Architecture + Urbanism, and Grant Gibson, CAMES/gibson. The Chicago Architectural Club, in partnership this year with the Graham Foundation and AIA Chicago, administers the Emerging Visions competition to recognize significant architectural endeavors by promising young architects and designers based in Chicago.
bKL welcomed new associates:
> Srdjan Avram, AIA, LEED AP
> Audry Grill
> Simon Juska
> Jayshree Kacholiya, AIA, LEED AP BD+C
> Angela Spadoni

John Ronan Architects is working with Shepley Bulfinch to design the Ed Kaplan Family Institute for Innovation and Technology for the Illinois Institute of Technology. The 100,000-square-foot building will be on the university's main campus in Bronzeville. It will include classrooms, collaborative spaces, media labs and offices. John Ronan, FAIA, will lead the design team for the $40 million project. Renderings were unavailable as of press time.

Weese Langley Weese Architects served as architect of record for the renovation and construction of Grove Apartments in Oak Park. McShane Construction Co. performed the work to develop affordable housing with 51 LEED-registered units. The mixed-use building has three floors of housing atop a ground level community room, storage area and 5,230 square feet of retail space. The project restored an original Albert Kahn design with brick and precast façade.
BUILDING Chicago/Greening the Heartland, now in its second year, is the major conference and trade expo serving architects, engineers, contractors, property owners, real estate developers, government officials, and community organizations in the Midwest.

The inaugural event, with more than 70 accredited education courses, drew more than 600 attendees and more than 40 exhibitors last October at the LEED Gold-certified Holiday Inn Mart Plaza.

BUILDING Chicago/Greening the Heartland is produced by Building Design+Construction and Scranton Gillette Communications/SGC Horizon, in conjunction with USGBC-Illinois, the Greening the Heartland Committee, AIA Chicago, the Chicagoland Chamber of Commerce, and the Building Alliance (AGC).

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The Wave

**LOCATION** / Chicago

**ARCHITECT OF RECORD** / dSPACE Studio

**CLIENT** / Lakeview Chamber of Commerce

**CONTRACTOR** / n/a

The Wave is three-dimensional art that is simultaneously a bench, chaise lounge, picnic table, laptop station and playground. Part of the City of Chicago’s “Make Way for People” initiative, wherein parking spots are taken over as “People Spots” for pedestrians, the structure invites social interaction from passersby with its undulating form. Nine aluminum planters with cable rail infill evoke a park-like setting and enclose the area from street traffic. Made from 316 unique “fins,” cut from 4-by-8-foot sheets of marine-grade mahogany plywood, the object is fastened together by stainless steel rods with concealed bolts. “It is refreshing to see something so expressive with the space,” a juror said. “It’s good design which animates the heart of the city,” another juror added.
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Two Barns

LOCATION / Denver, Colo. ARCHITECT OF RECORD / Paul Preissner Architects CLIENT / Biennial of the Americas CONTRACTOR / Powalski and Associates

A temporary structure that served as a stage for the Music for Animals festival—part of the 2013 Biennial of the Americas—these two “barns” existed for just six hours. The two barns played host to a performance by Nick Cave, an opera for dogs and an art installation of edible plants by artist Viviane Le Courtois. The odd orientation of the pop-up structures created eight architectural spaces in all, revealing a depth and understanding of “light, space and composition and how it all works together,” a juror said. The $12,500 structure was composed of only two elements—simple Galvalume-coated prefabricated steel panels and distinctive “pink kimono” paint for the interiors. “Exceptional use of off-the-shelf products,” a juror said, before adding, “and, wow, what a cool space to see Nick Cave.”
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The Kimmel Center’s Hamilton Garden Terrace was always in high demand for events, especially weddings. But a mix of intense heat and no shade created by the Center’s vaulted glass roof made the temperature impossible to control. The venue was unusable in the summer. And couples had to settle on another site for their big day.

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LOCATION / Chicago
ARCHITECT OF RECORD / Johnson & Lee Architects and Planners
CLIENT / Chicago Park District
CONTRACTOR / F.H. Paschen, S.N. Nielsen

This Chinatown riverside project is the first boathouse in Mayor Rahm Emanuel's plan to promote recreation on the Chicago River. Distinct components of the facility include a storage shed for kayaks and canoes; a comfort station and vending area; a porte-cochère resting ground; and a landscape path from the boathouse to the river. "Wonderfully sited and reflects the city's desire to engage the river," a juror said. Each part of the design employs a color and detailing all its own: The deep red steel storage shed enclosed with decorative screens and rolling shutters doors; the black masonry of the comfort station; the white steel canopy of the porte-cochère. The colors are intended to complement one another yet signal the functionality of each part on its own. "Everything is relational and in dialogue with each other, including the river," a juror said.
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Harbert Cottage

LOCATION / Harbert, Mich. ARCHITECT
OF RECORD / Searl Lamaster Howe
Architects CLIENT / Withheld
CONTRACTOR / Estkowski Construction

This project was an opportunity to reengineer and reinvigorate a classic American ranch house. The 1974 home was showing signs of its age with the roof caving in and a slowly-sinking slab. Its renovation was shaped by principles of simplicity, ease, durability and environmental responsiveness to the site. The architects designed a rehabilitation that revealed the building’s construction, crafting a new roof formed using basic mass-produced trusses, and adding clerestories to flood the interior with light. "This is just an excellent use of prefab materials," a juror said. "The place explodes with light," added another. Coupled with generous overhangs, the detailing of the roof minimizes the need for air conditioning and a new geothermal system further minimizes energy consumption.
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This decidedly quirky design by Chicago architect Marcel Freides had not been updated since its completion in 1978. In crafting a complete overhaul of the interior, the architects took their lead from the home's literal centerpiece, an atrium that had acted as little more than an enclosed lightwell. By hanging a sleek new staircase within the atrium space, enlarging the glass opening at its top and removing some walls to open it into the surrounding rooms, they "made it more of a focal point," a judge said. "It's a great space and it suffuses the home with natural light, which is always a problem in these urban environments."

Formerly somewhat barren, the atrium's ground level became a lively family space, surrounded by a rock garden in a custom blackened steel planter and with its staircase morphing into banquette seating. The detailing, one juror said, "is not about demonstrating detail but about bringing things together very simply."

The cell patterns and structures found in coral reefs provided the model for this table, designed for the dining space in a client's home. Because of the complexity of the design, the base was fabricated as extruded "tubes" of quartered ash. Then a five-axis computer-controlled router followed the dictates of a 3-D digital model to machine the tubes into their ultimate forms. "There's a lot of discipline that went into that," one juror said. "Because of the way they carved into the sides of the honeycomb, they ultimately get a very sinuous profile." The jurors also noted that the visible wood grain reinforces the cellular imagery. "It's very organic, but made precisely," a juror said.
When Division1 Architects undertook the design of The Lacey building in Washington, DC, they turned to Vectorworks software to move their ideas from concept to completion.
The Club For Modern Fashions

LOCATION / Chicago  ARCHITECT OF RECORD / Vinci Hamp Architects
CLIENT / The Arts Club of Chicago  CONTRACTOR / n/a

A temporary Miesian pavilion inserted within the Arts Club of Chicago in 2013 was a hit with jurors, one of whom dubbed it “an expressive vitrine.” Conceived as a container for an exhibit on modernist style called “Two Clubs at the Arts Club of Chicago,” the 12-by-16-foot demountable wood and glass structure stood near an authentic Mies structure, the club’s staircase, and looked like an isolated bay in one of his buildings. Stocked with modernist furniture, the box helped visitors appreciate the fashions being shown in their vintage context, as if in a stylish living room of the day. The pavilion framed the exhibit expertly by blending with its subject, jurors agreed. In addition, one juror applauded the fact that the pavilion was elevated on a recessed, unseen base “to reinforce the lightness of the Miesian box.”

Grace

LOCATION / Chicago  ARCHITECT OF RECORD / Lawton Stanley Architects
CLIENT / Grace Restaurant
CONTRACTOR / SAP Design

This restaurant interior distinguished itself by the restraint that guided selections of color and materials. “There was a command of the palette throughout the restaurant,” one juror noted. “This kind of follow-through creates an excellent atmosphere for dining.” The cuisine at the West Loop restaurant focuses on an honest expression of each ingredient’s natural flavor. The architects attempted to reflect that authenticity by using materials in a minimally finished state—brown ash, honed stone, un-dyed wool and leather, oil-rubbed bronze, and patinated steel. “It’s a demonstration of high design mirroring the personality of the work that’s being done in the space,” a juror said. The jury singled out the integration of columns into the furnishings for special attention.
Little You

LOCATION / Chicago ARCHITECT OF RECORD / Bureau of Architecture and Design CLIENT / Little You Inc. CONTRACTOR / LG Development + Construction

For a street corner site on Chicago’s Southwest Side, the architects created an inviting and sunny home for an organization that provides speech, occupational and developmental therapy services for children. Their budget was modest—$154 per square foot—but their results impressive. The entrance, where the facade peels back, has a tactile sense that comes from its board-formed concrete construction that children will want to touch, as do the oversized toy blocks that make up a corner column. Once inside, children and their parents find “transparency and light, a place that children will enjoy being in,” a juror said. Resilient, kid-proof spaces with clean, modern lines and splashes of color that don’t go crazy gave Little You “a grown-up presence on a budget,” as one juror put it.

Onward Reception Wall

LOCATION / Chicago ARCHITECT OF RECORD / Longo Park Design Workshop CLIENT / Onward Coworking CONTRACTOR / n/a

Jurors were smitten with the designers’ “clever use of exceptionally inexpensive materials” in this wall designed to have the names of participating firms in a coworking space inserted and removed cheaply. Coworking, a contemporary version of shared office space, can be a transitory setup for small enterprises. As they come and go by Onward Coworking, their logos can be traded into and out of the reception area’s main wall on interchangeable laser cut from typical mat board. Designed by the architects when they were tenants at Onward Coworking and completed for $2,500, the wall “sets the right tone,” a juror said. “These don’t read as cardboard elements, but they’re low-cost and appropriate for an environment that changes frequently.”
Woodland Dune Home

LOCATION / Bridgman, Mich. ARCHITECT OF RECORD / Kuklinski + Rappe Architects CLIENT / Withheld CONTRACTOR / Olson Brothers Construction

This weekend home built on a steep, forested dune drew the jurors in with the architects’ skillful use of what one called “off-the-shelf products” such as windows and doors in a design that “pulls together coherently without the [expense] of everything being made custom.” It was completed for $245/square feet, and the design also minimized cost of another kind: the cost to the site. To reduce disturbance of the fragile site, the design has three overlapping pavilions that all cantilever from a retaining wall that runs along the uphill side of the house. Sustainable strategies include siting that maximizes sun exposure in winter, preservation of deciduous trees on the site for shade in summer, recycled metal siding and a thermally modified domestic wood rainscreen. “There’s a high level of respect for the environment,” a juror said, “and it must be a very nice place to spend the weekend.”

Safe House

LOCATION / Joplin, Mo. ARCHITECT OF RECORD / Wrap Architecture CLIENT / AIA Designing Recovery Competition 2013 CONTRACTOR / n/a

The challenge of designing a house that can withstand disastrous storms—and in particular, high winds—meant providing a form that can maintain a continuous structural load path from the roof to the foundation. The architects determined that building with insulated concrete forms could do that and at the same time cut the end users’ energy bills in half. The design includes a pattern-printed concrete roof, roll-down shutters and fixed stainless steel screens that are rated to wind force of 175 mph. There is also a safe room for secure shelter during a storm event. “It’s a solid plan to combat some of the forces of nature,” a juror said. “It can take any challenges.” Although unbuilt as yet, the design, jurors agreed, is “an ambitious effort on a small budget.”
Barnsworth Exhibition Center

LOCATION / Plano, Ill. ARCHITECT OF RECORD / Students of IIT College of Architecture CLIENT / Farnsworth House CONTRACTOR / n/a

Fourth- and fifth-year architecture students at the Illinois Institute of Technology collaborated to design and build an exhibition and event space for the grounds of the iconic Farnsworth House. Meant to evoke the vernacular architecture in the rural area around the landmark, it is a contemporary take on a round barn, its walls solid to maximize exhibit space inside. Its cap is a lantern-like projection that brings in abundant natural light. The students' zeal for the project extended to such things as collecting lumber scraps from the project to make a handsome end-grain floor. The jurors were charmed by many aspects of the project and the thoughtful use of resources.

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At Jones High School in the city’s South Loop, an expansive, glass-walled lobby is the indoor equivalent of the grassy quad on a suburban campus, where students mix and mingle informally.
The clay red and repeating windows on the building's exterior take their cues from the historical red brick buildings in the old printing house neighborhood.

FOR A GENERATION OR MORE, MOST NEW SCHOOL BUILDINGS WENT ON SUBURBAN OR RURAL SITES AND HAD THE LUXURY OF EXPANSIVE FOOTPRINTS. But as the population becomes increasingly urban, that balance has shifted, as demand has created a draw for schools in the revitalized city core.

In Chicago, the architects of school buildings at all levels—elementary, high school and college—have recently tackled several questions relating to urban school facilities: How do you infuse younger children’s school days with a dose of nature in a built-out city neighborhood? How do you stack the big, blocky, high school gym or swimming pool into a multistory building? And how do you put a farm in the middle of an urban university campus—and in a city that is bitterly cold for much of the year, to boot?

They’re questions that were specific to these schools, but in the future, “as cities densify and more people live downtown, there are going to be more projects like this,” says Brian Schabel, AIA, the Perkins+Will associate principal who was the senior project architect on Chicago Public Schools’ seven-story William Jones College Prep High School. Jones is one of three innovative projects profiled on these pages. The other two are at private institutions, the University of Chicago Lab Schools and Loyola University of Chicago.

Each had its own challenges, but what they have in common is their enthusiastic integration into the city around them.

A High School

“I’ve done a lot of high schools that are stretched out horizontally,” says Ralph Johnson, FAIA, principal and design director at Perkins+Will. “You take all these functions, each of which has a different height, and you spread them out across the land. But what happens when you have no land and you have to stack them?”

What happens if you’re Johnson and the Perkins+Will design team that was headed by Schabel is a sharp, seven-story structure that holds all a city high school’s needs inside and opens out liberally to views of the Chicago skyline.

The new Jones College Prep High School opened in fall 2013 immediately south of its predecessor, the onetime Jones Commercial High School building from 1967 that Perkins+Will’s esteemed Bill Brubaker designed. While the old building was reportedly designed to convert easily into an office building if the shrinking of the city’s population continued, the latter-day Jones came along when the renaissance of city living created a demand for modern, expanded offerings for gifted students.

Chicago Public Schools had a tight site, the former home of the Pacific Garden Mission and a parking lot along State Street in what has become downtown Chicago’s epicenter of student life, the South Loop. Both Schabel and Johnson say that a mercy of the site was its length.

At more than 400 feet long, the site provided for a long, slender
The 1-2-1 configuration of the staircase (left) helps administrators control traffic flow at busy times. Each of its landings showcases a view to the city life that surrounds the school.

The swimming pool (above) is one of the double-story components that had to be stacked inside the single mass of the building, rather than being given their own separate pavilions as they would on a spread-out suburban campus.

footprint. This meant there wouldn’t be too much stacking; that classroom floors could be kept to just two and, placed in the middle at floors four and five, limit the distance and number of student movement between floors during passing periods.

The gym and swimming pool, both of which demand unusual heights, were placed above the classroom floors (along with a rooftop terrace for functions and performances), and office and administrative functions placed below. Three full stories of offices? Is the school bureaucracy that bloated? Nope. About one-third of each of those lower three floors is given over to a broad lobby three stories high. “That’s our plaza,” Schabel says, noting that many suburban schools have a wide-open area for students to spill into when school lets out, but traffic and security needs at Jones dictated keeping it inside. Also here is the auditorium—it’s another high-ceilinged component that might have worked up top, but had to be kept at street level because it will get some public use.

The building is densely packed, says Erin Lavin Cabonargi, executive director of the city’s Public Building Commission, but “despite the density, there’s tremendous grace.” She compliments the architects for bathing the interiors with light and urban views, and is particularly fond of the State Street façade. A composition of columns, color bars and voids, it “shows the vitality of what goes on inside the building,” she says. “It’s not a blank façade, it’s a nice modern interpretation of a high school.” Red used on the outside connects to the historical red brick buildings along Printer’s Row west of Jones, she notes, and the blue of the Chicago flag makes an appearance here and there.

Slimming down the design to fit its site meant, among other things devising a staircase. It was a simple but deft move: Rather than two double-wide stairs next to one another, Schabel put a double-wide in the middle, with a single-wide on either side of it. This makes managing the flow of several hundred excited teenagers easier for adults: They can separate it into one side for down and one for up, or let all four lanes go down at the end of the day. Virtually all students use the stairs, unless they have a disability or a special pass; and of course there are times when everybody needs the stairs all at once.

A daylighting strategy is always nice in staircases; here, it became part of knitting the school into its urban fabric. Large windows in the stairwells frame views of the nearby buildings, connecting students to the larger milieu they will graduate into. “You can look out at the park, at the lake, at the skyline,” Schabel says. “You know you’re here, you’re in downtown Chicago.”
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The swoop of the greenhouse wall derives from its rainwater collection function but at the same time, gives the building a landmark profile on a new, southern portion of Loyola's campus.

Long a fraught issue with the University of Chicago—while at the same time reducing solar gain in an elevated, south-facing glass box that otherwise might have become overheated.

Initially, the architects were designing a new lower school to fit in among the University Gothic buildings of the main campus. This proved a struggle in one key way, Mattheis says—accommodating a neo-Gothic design would have meant shoehorning a new building in between existing ones. That would have dictated a verticality that works against the Lab Schools' educational philosophy of using outdoor time as a complement to instruction time. When the university offered a site at 58th Street and Stony Island Avenue where the shuttered Doctors Hospital had formerly stood, "we could put all the program in a more horizontal plan," Mattheis says.

On the first floor is a large, transparent lobby, adjacent to two parallel bars of classrooms with a bar of common space—both indoor and out—running between them. The second floor repeats the first, only without the outdoor spaces in the middle. The children have one terrace at the end of the floor, but a much larger outdoor play area one flight up.

That immense space—it occupies the same footprint as six classrooms on the floor below—isn't visible from the street, because the building's fenestration and fins continue up, as if wrapping a full third floor. The kids seem to be playing in an upstairs annex of Jackson Park, which lies directly across the street. Mattheis notes that the views aren't only directed outward: Interior glass walls, common spaces that are door-less enlargements of hallways and other designed openness ensure that children, teachers and visitors see one another in action throughout the day.

While the building may be lavish about its transparency, it's relatively modest about its finishes. Except for where steel was needed to support the library’s cantilever, the exterior is precast concrete. Inside, visitors find exposed concrete, perforated metal roof decking used on ceilings and walls, linoleum flooring and painted steel beams. "It wasn't about spending money to bring marble floors in," Mattheis said. "It was about using the resources you have to make space that operates intelligently."

**Farm Living at Loyola**

Loyola University Chicago's main campus, on the lakefront in Rogers Park, is a dense urban setting, with high-rise condo buildings, traffic-heavy Sheridan Road and elevated CTA Red Line tracks all around its edges. Yet into the midst of all this, the university has tucked a small farm, along with dormitory space for students who work that farm (and some who don't).

Completed in summer 2013, the Solomon Cordwell Buenz project is a combination of living and learning spaces that comprises a 4,500-square-foot greenhouse under a glass roof three stories high, where plants and fish crops will be grown and waste products turned into biodiesel; and a 130,000-square-foot dorm, San Francisco Hall. Most of the dorm looks like a neighbor that shares a common wall.
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Some students in the Institute of Environmental Sustainability (IES) program will live and conduct research in the same building. The curved glass roof shelters research and work space, much of it visible from the dorm rooms.

with the greenhouse, but one wing extends up the east side of the greenhouse, its rooms overlooking the farm facility.

Those rooms have an up-close view of the doings in the university's Institute of Environmental Sustainability (IES), housed in the greenhouse—known as the Ecodome—and adjacent spaces. Work there includes research on urban aquaponics and indoor crop plants, as well as a clean energy lab. But the glass doesn't only shelter the science areas; there's also a large ground-level commons area intended as the major new gathering space for students on a southern expansion of the school's traditional campus.

In cold-climate Chicago, it's smart to put those two things—social space and the plant-growing area—under glass. And Devon Patterson, AIA, a Solomon Cordwell Buenz design principal, says the decisions to pair them as well as to pair the IES with a dorm "turned that portion of Loyola's [campus redesign] into something bigger, a place that could spark excitement about conservation throughout the university."

Patterson and Jim Curtin, AIA, were the design principals on the project, and Monica Willemsen, AIA, was the project designer.

Looking like a gigantic glass iteration of great-grandpa's rolltop desk, the Ecodome is both an inviting contemporary form to mark the new southern chunk of campus and a demo of sustainable functioning. There's a 90-well geothermal field—believed to be the largest in Chicago—that provides more than 700 tons of cooling power, a natural ventilation path of air from low western windows up and out the east, a system for harvesting water off the curved roof for use in irrigation inside the greenhouse. Add to those large-scale sustainable strategies such novelties as students living in the same building as the crop space they tend and a cafe whose menu will incorporate some of what's grown in the building, and "you have this closed-loop mentality," Patterson says. A new generation of students "will see that as a big draw," he believes.

Some concessions had to be made to the site's infill urban locale. The growing space is not a sun-baked south exposure, but a western exposure blocked on the south by the five-story dorm structure. Patterson explains that with multistory apartment buildings around the site, there was no way that the building would be all solar, but partner Transsolar helped devise a plan that maximizes daylight. Some spaces are naturally illuminated on all but dim days. And besides, Patterson notes, Chicago's short winter days meant that long-season indoor growing would require artificial light anyway.

SCB has been involved with an extensive revamp of Loyola's campus starting with the design of the Klarchek Information Commons, completed in 2007 as a lakefront focal point of the historical campus. It's no accident that this latest project bears a resemblance. Klarchek was a first effort to create a new type of public space for Loyola's students in a computerized, highly collaborative era, Patterson reminds, and it also set the tone for the university's embrace of leading-edge sustainability moves. The new IES project builds on that—students can gather in its commons area and be surrounded by portholes into the workings of the building, or they can gather to work on the mini-farm. And then there are those who do both, and also live in the building.

For them, the popular term "connectivity" has a slightly different meaning, Patterson notes: "There's connectivity between living and learning."
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To the right are excerpts* from the Loop chapter of the third edition of the AIA Guide to Chicago, available for sale at the AIA Convention.

333 N. Michigan Ave.

Circa 1960, via Joe+Jeanette Archive. Creative Commons, Flickr

1928, HOLABIRD & ROOT
Its pronounced verticality, spare lines and dramatic setbacks were inspired by Eileen Saarinen's second-prize entry in the 1922 Chicago Tribune Tower Competition. The polished marble base and stylized bands of ornament are the only embellishments on this elegant limestone tower.

Aqua
225 N. Columbus Dr.
2009, STUDIO GANG ARCHITECTS, DESIGN ARCH., LOEWENBERG ARCHITECTS, ARCH. OF RECORD (from an essay by Lynn Becker)
It took nearly half a century, but with the completion of Jeanne Gang's Aqua, the towers of Bertrand Goldberg's Marina City finally have a true rival for the kind of visual audacity that makes a building a symbol of Chicago throughout the world.

Auditorium Building
430 S. Michigan Ave.

1887-89, ADLER & SULLIVAN (from an essay by John Vinci, FAIA)
The Auditorium Building commission was the single most important factor in establishing the internationally recognized role of Dankmar Adler and Louis H. Sullivan in the evolution of modern architectural thought. Adler’s previous successes as a theater designer secured the coveted job, while the publicity generated by the project promulgated Sullivan’s innovative architectural ideals.

Inland Steel Building
30 W. Monroe St.
1954-58, SKIDMORE, OWINGS & MERRILL
Inland Steel’s pioneering attributes are well-known. Its unobstructed floor plate (177 feet by 58 feet) was unprecedented. This was accomplished by placing core services in the adjacent tower to the east. For the first time, steel pilings—driven 85 feet through mud and clay into bedrock—were used to support a high-rise structure. Inland Steel was Chicago’s first fully air-conditioned building, the first with dual glazing and the first to provide indoor below-grade parking. It pioneered the use of stainless steel as a cladding material. Critics and scholars have consistently praised its graceful proportions, the elegance of its detailing and the sophistication of its public art.

Roosevelt University
Wabash Building
425 S. Wabash Ave.

2012, VOA ASSOCs.; JOHNSON & LEE, ASSOC. ARCH.
Brancusi’s Endless Column sculpture inspired the building’s in-and-out form. Inside is a vertical campus that connects at multiple levels with the university’s Auditorium Building, whose buff-colored masonry sets off the tower’s shimmering two-toned blue glass.

Chicago Riverwalk and Wabash Memorial Plaza
South bank of the Chicago River from State St. to Michigan Ave.

Notes: The above are excerpts from the guidebook. For full entries, including all renovation and restoration credits, please consult the third edition of the AIA Guide to Chicago.
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Helmut Jahn, FAIA, Principal, Jahn

You’re in Chicago for just three days. What’s the first sight you see and why?
Experience the city. Go see the lakefront. Walk along Michigan Avenue. You don’t have to tell somebody what to do, just spend as much time out on the street as possible.

The perfect spot for a meal: where do you go?
Blackbird.

Best place for an after-hours drink?
The pool at the Saddle and Cycle Club or Women’s Athletic Club.

Juan Moreno, AIA, LEED AP, President and Founder of JGMA

You’re in Chicago for just three days. What’s the first sight you see and why?
The Art Institute — obviously for the art, but it’s also one of the few buildings whose connective tissue links us to more than a century’s worth of architecture. Shepley, Netsch, Piano and a touch of Sullivan, etc.

The perfect spot for a meal: where do you go?
Mezcalina — Oaxacan cuisine meets Oaxacan art. The chefs and artists converged upon Chicago to create the menu and works of art within the space.

Best place for an after-hours drink?
Near the office, B&B’s Bar Below — the bartender Melina is sure to have a special stash of obscure beer hidden behind the bar.
Near home, D’Noche. I can always count on Esam having a bottle of Flor de Caña 18 Year waiting for me.

You have to pick one museum, gallery or cultural venue. Which one do you choose?
The Loop. It’s an open air museum of architecture.

The one building that every time you see or think of it, screams ‘Chicago’?
The Inland Steel Building. Innovation that transcends time.
You're in Chicago for just three days. What's the first sight you see and why?
The El. Riding through the Loop - it's how I got to know the city. It has a Blade Runner-esque quality, getting to see the architecture from that view. I like the view near the Adams stop. I (of course) like the fact you can see the Art Institute through the buildings.

The perfect spot for a meal: where do you go?
Avec Restaurant at 615 W. Randolph St., next door to Blackbird. Avec offers Mediterranean food. It's a very tiny restaurant with a beautiful design. It's all wood. There's no fuss. It's very minimal. It has really good quality food. I like Avec much more than Blackbird because there's a more informal, casual vibe about it.

Best place for an after-hours drink?
The Signature Lounge at the 96th floor of the John Hancock building. You can sit at the bar, look out the windows and watch the sun go down. You can see all the way up and down the lake. I like moving positions, moving around the lounge to the windows on either side to see more of Lake Michigan. It's a great way to orient yourself when you come to Chicago. It's so built up at [the lake's] edge and then fades away into infinity.

You have to pick one museum, gallery or cultural venue. Which one do you choose?
The Art Institute! Specifically, the architecture design gallery on the second floor, next to Caffe Moderno. The gallery is project-based and features experimental projects by emerging architects and designers. The meditation room [the Ando Gallery] is beautiful. It's a wooden room with these wooden pillars. It's just beautiful.

The one building that every time you see or think of it, screams 'Chicago'?
Marina City on State Street. Wherever you are in Chicago, going back and forth from the museum and going north, you always see it. It speaks of Chicago's legacy of really imaginative and groundbreaking architecture: the circular plan, the multi-function aspect, the different functions from boat parking to offices and residential. It's one of the first live-work high-rises in the city. It always feels very lively.
Ronan Architects
AIA. NCARB. LEED AP
BD+C. Director of
Studio Operations.
Farr Associates

APRIL HUGHES.
AIA. NCARB. LEED AP
BD+C. Director of
Studio Operations.
Farr Associates

BRAD LYNCH. Principal,
Brininstool + Lynch

KATHERINE DARNSTADT,
AIA. LEED AP BD+C,
NCARB. Founder and
Principal. Latent Design

CHARLIE KLECHA,
President of AIAS

ALLI CHAPMAN,
ASSOC. AIA

The perfect spot for a meal:
where do you go?

Ronan: Frontera Grill.
Hughes: Briciola in Ukrainian Village.
Lynch: Sixteen.
Darnstadt: Honey Butter Fried Chicken.
Klecha: I don’t think I’ve ever been
the same place twice; I really like
exploring cultures through food and
we have a great opportunity for that
in Chicago.

Chapman: For lunch, downtown
staples are RL and Henri.

You’re in Chicago for just three
days. What’s the first sight you
see and why?

Ronan: Probably the top of the
Hancock Building or the Sears
(Willis) Tower, because it might
be cloudy tomorrow.

Hughes: Wrigley Field — a
100-year-old-plus stadium to
fit seamlessly into a dense
neighborhood and have the ability
to catalyze new development year
after year is an amazing feat.

Lynch: The Chicago River. You can
see some of the most important
buildings in Chicago in the best
context.

Darnstadt: Wood Pavilion at Lincoln
Park Zoo.

Charlie Klecha: I would spend a
few hours riding the train around,
looking out the windows.

Chapman: An iconic Chicago
treasure is Calder’s Flamingo
in Federal Plaza.
**Best place for an after-hours drink?**

Ronan: The Green Mill or a blues club on Halsted Street.

Hughes: You can get excellent regional ciders on tap at Farmhouse — or my favorite, HopLeaf in Andersonville.

Lynch: Early and simple — Club Lago. Late and complex (mixology) — Analogue.

Darnstadt: The Violet Hour.

Klecha: If I’m downtown, it’s going to be scotch at the Gage.

Chapman: NoMI. Or, keep it real at the Skylark for a beer and tater tots.

---

**You have to pick one museum, gallery or cultural venue. Which one do you choose?**

Ronan: The Poetry Foundation, of course.

Hughes: The Auditorium Theater. You can’t miss when you get to experience the splendor of Sullivan in Chicago.

Lynch: The Poetry Foundation.

Darnstadt: Washington Park Incubator down by University of Chicago, to see how art and community development intersect.

Klecha: I’d have to say the Museum of Science and Industry — it blows my mind every time I go there.

Chapman: The collection of rehabbed houses by Theaster Gates on South Dorchester Street.

---

**The one building that every time you see or think of it screams ‘Chicago’?**

Ronan: Marina City.

Hughes: Chicago has so many obvious options, so I guess I’d have to choose the Winslow House from [the TV show] “Family Matters.”

Lynch: Inland Steel.

Darnstadt: Marina City.

Klecha: The Chicago Theater. 1920s movie palaces are such a hallmark for culture in Chicago at that time.

Chapman: The Santa Fe building (now the Motorola Building) ‘screams’ old and new Chicago to me.

---

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HOPLEAF, 5148 N. Clark St.
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RL, 115 E Chicago Ave.
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SIGNATURE LOUNGE, 875 N. Michigan Ave., 96th Floor
SIXTEEN, Trump Tower, 401 N. Wabash Ave., 16th Floor
SKYLARK, 2149 S. Halsted St.
THE VIOLET HOUR, 1520 N. Damen Ave.
WOMEN’S ATHLETIC CLUB (PRIVATE), 626 N. Michigan Ave.

Must-See Sites and Buildings:
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AUDITORIUM THEATER, 50 E. Congress Pkwy.
CALDER’S FLAMINGO AT FEDERAL PLAZA, Dearborn St. and Adams St.
CHICAGO THEATER, 175 N. State St.
DORCHESTER PROJECTS, 69th St. and S. Dorchester Ave.
INLAND STEEL, 30 W. Monroe St.
JOHN HANCOCK CENTER, 875 N. Michigan Ave.
MARINA CITY, 300 N. State St.
MUSEUM OF SCIENCE AND INDUSTRY, 5700 S. Lake Shore Dr.
THE POETRY FOUNDATION, 61 W. Superior St.
SANTA FE BUILDING, 224 S. Michigan Ave.
WASHINGTON PARK ARTS INCUBATOR, 301 E. Garfield Blvd.
WILLIS TOWER, 233 S. Wacker Dr.
WINSLOW HOUSE FROM “FAMILY MATTERS,” 1516 W. Wrightwood Ave.
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Codes and Costs Push Teams Toward SUSTAINABLE ENCLOSURES

By C.C. Sullivan and Barbara Horwitz-Bennett, BD+C Contributing Editors

Stricter codes and standards, the net-zero energy movement and responsive façade systems are driving change in building envelope design and detailing. Enclosures—the preferred term for exterior walls, roofs and foundations as a system—are receiving an unprecedented level of attention.

Concerns about global climate change,

LEARNING OBJECTIVES
After reading this article, you should be able to:

> Describe how stricter building codes and standards are affecting the design of building enclosures, enhancing energy efficiency and indoor environmental quality.
> Discuss how window-to-wall ratios influence decisions for building enclosure design, with implications for sustainability and occupant well-being.
> Explain net-zero building approaches and their implications for enclosure design, energy efficiency and occupant health.

building energy use and operating costs have coalesced in new construction codes. Façades and fenestration have a major impact on heating, cooling and lighting loads, which account for 57 percent of combined total energy use in commercial buildings, according to the California Energy Commission. Better enclosure design is one of the most significant ways to boost a building's energy efficiency. Façade consultants, building science researchers and activist government jurisdictions are adding momentum to the quest for improved performance.

CODES IMPOSE INSULATION IMPROVEMENTS

With every revision cycle, codes and standards kick energy requirements up a notch, says Sarah K. Flock, Assoc. AIA, senior architect with architectural, structural engineering and building science consultancy Raths, Raths & Johnson (www.rrj.com). “Changes in energy codes and standards continue to dramatically affect enclosure design,” says Flock. “Specifically, ASHRAE 90.1 and the International Energy Conservation Code, or IECC, have increased thermal resistance requirements, lowered U-values for fenestration products and, for example, in 2009, the IECC added a continuous insulation requirement—abbreviated as CI or c.i. in some industry documents—for walls in climate Zones 3 and 4, a temperate band of states across the southern half of the United States. Existing CI values for the more northerly Zones 5 and 6 were increased in the same revision.

As recently as 2009, ASHRAE 90.1 “Energy Standard for Buildings Except Low-Rise Residential Buildings” and the IECC both required minimum R-20 roof insulation in climate Zone 4. Last year, that spec was bumped to R-25, and 2012 updates also require continuous insulation on walls with light-gauge metal framing for most climates.

“The increased insulation requirements for walls and roofs mean that architects must rethink systems that have worked in the past,” says Jonathan Baron, AIA, LEED AP, associate, Shepley Bulfinch (www.shepleybulfinch.com). (The U.S. Department of Energy offers a helpful analysis of nuances both ASHRAE 90-1.2010 and the 2012 IECC at: http://1.usa.gov/XISivr.)

Faced with tougher insulation rules, some owners may contemplate a relatively easy approach: placing a new layer of rigid foam
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www.lafarge-na.com
facadegroup.com): “This creates a double vapor barrier and may trap moisture in wall assemblies, with unforeseen consequences.”

Adding foam insulation also triggers the applicability of NFPA 285, “Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.” This important fire-safety check requires that exterior construction assemblies that could catch fire—including foam insulation boards—demonstrate their ability to limit vertical and lateral flame propagation.

MORE INSULATION CAN LEAD TO MORE COMPLEXITY

Demands for more insulation are chipping away at the concept of the “perfect wall,” where an air and vapor barrier is installed on the sheathing, there is no insulation in the stud cavity and all the insulation outboard of the sheathing is located in a cavity behind the cladding. “The increased levels of insulation required have led to architects putting insulation back into the stud cavity, with the consequent risk of condensation on the inside of the sheathing, unless there is a vapor barrier on the inside of the wall,” says Richard Keleher, AIA, CSI, LEED AP, senior architect, The Thompson & Lichtner Co. (www.thompsonlichtner.com).

However, Keleher says, “The installation of an interior vapor barrier would lead to two vapor barriers, which should be avoided. Consequently, hygrothermal studies need to be done to assess the proper way to design this more complicated wall.”

NFPA 285 not only applies to insulation boards but also to water-resistant barriers. Components must be tested for fire resistance as a full assembly, and many wall types have not undergone testing—except for systems from certain product manufacturers—because the test is costly and time-consuming. “These requirements are limiting the choice of materials and making some of our old standby products obsolete,” says Altenhofen.

According to Keleher, some assemblies that pass NFPA muster may include elements that are not desirable from a weatherproofing standpoint; namely, unreliable membranes and metal fire deflectors that disrupt the membrane flashings. Other assemblies may use inappropriate or less effective insulation “to avoid the need to comply with this test,” says Keleher.

The use of low R-value insulation (some as low as R-3.5) obviously increases energy costs. Substitute insulation materials may be further compromised because they are air- and moisture-permeable, whereas some types of foam plastic insulation have an R-value of 5 and are both airtight and watertight.

Despite the difficulties, national and local standards and codes will undoubtedly continue to demand better enclosure performance, with the likely addition of new rules for measurement and verification (M&V) of energy savings. This trend is already being seen in the latest generation of building certification programs.

“M&V will hold designers more accountable, so there will be more of an incentive to get the massing and orientation of a building optimized from the very start,” says Matt Williams, associate principal and facades practice leader with Arup (www.arup.com).

“It will also encourage teams to select the right glazing and façade systems to minimize heating and cooling loads.”

Some jurisdictions are making concessions that acknowledge the complexities of adding insulation, and providing incentives for compliance. A recent example is New York City, which has updated zoning regulations to allow owners to add up to eight inches to exterior walls, as long the project adds R-value, without including the additional square footage when calculating the building’s maximum footprint or floor area ratio.

Codes and regulations are undeniably powerful, but operating costs and sustainability certification programs could be an even greater goal for owners of commercial and institutional properties. The most progressive owner-developers and building teams tend to view the relevant codes as a foundation rather than an upper limit.

“Although these transformations in building codes will improve building energy performance beyond today’s standards, they are only part of a larger picture,” says green building advocate Blaine E. Brownell, assistant professor in the School of Architecture at the University of Minnesota, Minneapolis. “After all, codes can only do so much, and we must not only seek incremental improvements, but also better holistic design thinking.”

The new Abu Dhabi Investment Council Headquarters is housed in two 29-story towers clad with a dynamic exterior shading system, arguably the world’s largest intelligent shading skin.

WINDOW-TO-WALL RATIOS UNDER SCRUTINY

Window-to-wall ratios (WWRs) are another subject of recent code changes, all of which tend to limit the use of exterior glazing. ASHRAE 90.1-2010’s prescriptive requirements allow up to 40 percent WWR and 5 percent skylights as a percentage of the roof area. The 2012 IECC specifies even more restrictive 30 percent WWR and just 3 percent for skylights.

Experts note that these ratios are not a rigid rule. Building teams can pursue a performance-based approach to enable larger proportions of fenestration. In these cases, teams must use modeling or calculations to show that their designs reduce whole-building energy consumption as much as a prescriptive approach.

“The prescriptive method can simplify the design process, but it may also offer less flexibility than other compliance options,” notes Raths, Raths & Johnson’s Flock, who chairs Chicago’s Building Enclosure Council (BEC) group. (The BEC is an initiative of the National Institute of Building Sciences; 26 chapters exist nationwide, organized by local climate and market.)

Despite code changes, the architectural profession’s love affair with the all-glass enclosure appears as strong as ever. To keep
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¹RSI = 8.8 (m²·K)/W per 50.8 mm thickness; U-value = 0.11 W/(m²·K)
²RSI = 1.73 (m²·K)/W per 25.4 mm thickness; U-value = 0.58 W/(m²·K)
this choice viable, products like high-performance insulating glass units and materials such as low-emissivity glass are becoming standard. The Façade Group’s Altenhofen, who chairs the Building Enclosure Council—National, says, “We rarely see anything but IGUs specified, and they almost always have a low-e coating of some sort. More projects are using high-tech low-e products, and sometimes double low-e coatings on both the number two and three surfaces of the IGU.”

Altenhofen predicts further technological advances. “We’ve seen huge improvements over single glazing and even over IGUs of 20 years ago, but we still need better performance by utilizing triple glazing, electrochromic glass and insulating translucent products such as nanogel-filled glazing.”

Building teams can take advantage of additional thermal-management strategies, including sunshades, light shields, glass tinting, building orientation, and fritting and silk screening of IGUs. Arup often mixes glazing systems with more opaque, insulated elements, according to Williams. When shadowboxes are used with thermally broken frames and external shading, the façade can retain a glass-wall appearance with a lower WWR.

Client preferences are also morphing in specific market sectors. High WWRs are still common for office towers and residential high-rises. Owner-operated facilities such as institutions and public buildings are trending toward lower WWRs, coupled with more sophisticated façade designs and daylighting strategies, according to Susan Hayes, LEED AP, BD+C, senior project engineer with RDH Building Engineering (www.rdhbe.com).

Flock points out that today’s highest-performing glass still offers only a quarter of the insulating value provided by a well-designed opaque wall. Nevertheless, many building owners believe natural light is worth the effort and investment, since it plays such a prominent role in keeping employees happy and productive. According to Sue Klawans, director of operational excellence and planning, Gilbane Building Company (www.gilbaneco.com), “The key is to use a site-specific approach and not a one-size-fits-all mentality.”

 NET-ZERO MOVEMENT PROMPTS TECHNICAL ADVANCEMENTS

In tandem with stricter codes and standards, a growing focus on net-zero energy buildings will undoubtedly improve enclosure design. Shepley Bulfinch’s Baron, who co-chairs Boston’s BEC chapter under the auspices of the Boston Society of Architects, says, “Net-zero will be a huge push to make building enclosures better performing, since the enclosure design is a critical component of energy performance.”

Essentially, net-zero design involves two steps: 1) Reducing a building’s inherent energy demand through design, and 2) generating efficient power so demand and supply reach perfect equilibrium. Because on-site energy generation and storage often come with a hefty price tag, restraining demand is a crucial and potentially more cost-effective strategy. “Building envelope design can make or break a net-zero project,” says RDH’s Hayes, who specializes in mechanical and electrical efficiency.

A net-zero building must be properly sited and oriented, and designed with compact massing, says Altenhofen. The next step is controlling heat gain and loss through well-deployed insulation and a carefully air-sealed enclosure. R-values for walls in net-zero buildings may exceed 60, with roofs approaching an R-value of 100.

To meet such extreme specs, building teams usually opt for windows and doors with very low air-infiltration rates, plus triple-glazed fenestration. “Unfortunately, there are not many U.S. window manufacturers that meet these requirements, so in some cases imported products are needed,” says Altenhofen.

More domestic vendors are gearing up to create appropriate systems. In particular, Hayes is impressed with super-insulating vacuum insulated panels, balcony thermal breaks and thermal clips for exterior walls. “Super-insulating panels are a modern type of insulation that have very low conductivity, which makes them great thermal insulators,” says Hayes. “They typically consist of a low-conductivity core—like a honeycomb—wrapped in a protective barrier, with the air vacuumed out.” Touted as achieving thermal performance values up to 38 times greater than glass wool and about 20 times greater than hard urethane foam, some super-insulating products are claiming R-values of up to 60.

Balcony thermal breaks extend from the floor slab to serve as a bridge to the wall’s insulation. Normally, balconies increase heating demand by about 9 percent, according to a recent RDH study involving high-rise residential buildings in cold climates. Thermal breaks can minimize thermal outflow and energy loss through the balcony slab, and reduce the risk of condensation and mold formation.

Another source of thermal loss occurs through z-girts, which are commonly used to attach exterior wall assemblies to the structure. By bridging the insulation, conductive fasteners can actually lower the walls’ stated R-value by more than 50 percent, according to Hayes. As an alternative, designers can specify nonconductive spacers or thermal clips, made from fiberglass or similar materials to thermally isolate the cladding from the structure. These products significantly reduce thermal bridging.

ACTIVE FAÇADES BLEND FUNCTION, APPEAL

Building teams that want to create sustainable enclosures have numerous new products to choose from, adding exciting options but also complexity. Components of emerging active façade systems include motorized and automated solar shades, hoppers for venting, and media walls that display entertainment or information.

As an example, the University of Minnesota’s Brownell points to the SolPix media wall system, designed by German architect Simone Giostra: “His latest version integrates a variety of new technologies, such as photovoltaics, LEDs, light sensors and sun-shading capabilities, to create a true high-performance enclosure system.”

Giostra’s most prominent project, the SolPix/GreenPix Zero-Energy Media Wall at Beijing’s Xici Entertainment Complex, is an energy-efficient curtain wall that combines solar power generation, sun shading and a dynamic digital screen. The wall can display videos, interactive performances, and live and user-generated content. It is billed as the “world’s largest LED color display,” with 2,292 RGB LEDs lighting up a 24,000-square-foot surface.

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polycrystalline photovoltaic cells into the glass curtain wall. Strategically placed with varying densities on the building skin, the PV cells function as a shading element and use solar energy to help power the media wall. The enclosure also benefits from a high-performance thermal management system.

Intra-panel sensors measure atmospheric conditions such as wind pressure and solar variation, which are translated into what Giostra calls "animatronic reactivity." The resulting display offers "real-time interactive animations that transform the building façade into a responsive environment."

Another Arup active façade project, in collaboration with the international architecture firm Aedas, is the recently completed Al Bahar Towers, headquarters of the Abu Dhabi Investment Council. The 29-story twin towers feature a dynamic intelligent shading system, which provides a striking aesthetic element. Translucent geometric shade panels cover the south, west and east elevations, forming decorative patterns as they open and close.

The design echoes a mashrabiya, a traditional element of Arabic architecture consisting of a projecting oriel bay window covered with carved wooden latticework.

The intelligent shading system, with each panel driven by a linear actuator, is so effective that the building team was able to specify clear, rather than tinted, glass. Because solar conditions are highly predictable in Abu Dhabi, each shading unit is programmed to open and close at set times.

"The sequencing of opening and closing is calculated to limit the solar energy on the façade to predetermined values," says Peter Chipchase, PE, associate director with Arup. "This is to achieve target reductions in overall cooling loads and energy consumption."

Overall, the assembly reduces solar heat gain by 50 percent, cuts carbon emissions by 40 percent and significantly reduces cooling plant capital costs. The Council on Tall Buildings and Urban Habitat gave the sun-screen its Innovation Award last year.

Creating active façades is a daunting task, says Williams. "Success requires an understanding of complex forms through three-dimensional analysis, an understanding of the uses and limitations of potential cladding materials, and an understanding of cladding systems and their integration with the other building systems to ensure that these systems can be documented and reliably delivered wherever that building may be located."

Not all projects are so massive, however. Small-scale smart shading systems are showing up on public, institutional and corporate buildings around the U.S. For the Carle Heart and Vascular Institute, under construction in Urbana, Ill., Shepley Bulfinch designed a system that adjusts interior shading devices in a double-height lobby. The technology works with roof-mounted radiometers that monitor sky conditions and trigger the appropriate shading response.

Active façade design is still in the formative stages, with building teams working to balance benefits and costs. Ironically, some venerable design strategies may prove just as important as high-tech solutions.

Altenhofen is a fan of giving end-users more control so they can "intelligently" operate their own buildings. "These days, we are looking at going back to the oldest and simplest solution: operable windows controlled by the occupants," he explains. "We are trying to use email and text messaging to suggest to the occupants when it would be good to open or close their windows in response to the current outdoor conditions. I think this is a more realistic approach and reflects a general trend away from hermetically sealed and mechanically controlled buildings."

In fact, façade design must balance a wide range of integrated, multidisciplinary skill sets to truly provide a holistic solution, says Williams. Though energy codes and sustainably minded building owners may push for the highest performing façade solutions, practical concerns are always part of the mix.

PROGRESSIVE OWNERS: A KEY INGREDIENT

In the end, as with many design decisions, a building owner with a firm grasp of life cycle benefits may be the sustainable enclosure’s best advocate. For instance, The Façade Group is working on a new construction project for an anonymous client in which all the glazing, framing and insulation was carefully evaluated to create a high-performance enclosure. Triple-glazed glass with a double low-e coating is installed in high-performance curtain wall frames, with high-quality thermal breaks and low-conductance pressure plates.

"The glass alone approaches R-8, which is nearly as good as what we used to expect from walls with R-19 batts installed between metal studs," says Altenhofen.

The building’s south façade has an extensive curtain wall to maximize daylighting, views and a connection to the surrounding campus, but glass was limited on the other three façades, producing an overall WWR of around 40 percent. "Consequently, the heat gain/heat loss scenario is much better, and indoor occupant comfort is improved, with less radiant loss and reduced convection drafts,” Altenhofen says.

The high cost of the triple glazing was substantially offset by the engineers’ ability to eliminate baseboard fin tube radiation and downsize the HVAC systems. Because the owner grasped the big picture, a highly efficient enclosure was created. Says Altenhofen, "The payback based solely on energy savings is still longer than what developers aim for, but the long-term institutional owner found it to be a preferred solution."
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ADRIAN SMITH, FAIA, and Chicago-based Adrian Smith + Gordon Gill Architecture (AS+GG), have emerged as formidable competitors in international design, recently beating out firms including Coop Himmelb(l)au, Snaøhetta and Zaha Hadid Architects to design Expo 2017 in Astana, Kazakhstan, a 420-acre two-phase project for the 2017 international exhibition. In Smith's career, breaking ground is often followed by breaking records. His design for Kingdom Tower, to rise more than a kilometer over Jeddah, Saudi Arabia, is currently under construction.

Zurich Esposito: Many critics say participation in design competitions has become too onerous to firms. What's your response to architects whose disposition lately is one of skepticism and a little bitterness?

Adrian Smith: When we started AS+GG in 2006, competitions were a great way to get projects as a new firm. But you have to pick the right competitions to enter. We shy away from competitions where we think that the client is having the competition to compare fees, or for a standard office building that's nothing special. We look for interesting, exciting projects that will put us in competition with people like Zaha Hadid, Norman Foster, Morphosis ... top designers trying to get into the scale of projects that we do.

ZE: Still, wouldn't it be simpler just to go after work and skip the competition?

AS: I actually like competitions better than not. If the jury is well-balanced, you have an opportunity to create a project that's more than just commodity-based. In China, for example, the jury often includes educators, international architects, and the mayor; the client is only 10 to 20 percent of the group. And winning competitions has a spin-off effect: The same client will often have you do additional projects. When competitions work well, they push the firm and the client to create great design.

ZE: Your firm is recognized for research on issues like the reduction of carbon emissions of downtown Chicago buildings. What other issues are you looking at?

AS: We are looking at residential density now, and asking what residential typology creates the most effective density for sustainability. We've studied several typologies to determine what's most sustainable and efficient.

ZE: And your conclusion?

AS: The three- to four-story walk-up is the winner.

ZE: That's especially fascinating coming out of the mouth of the architect making history for a building that will be more than a kilometer tall.

AS: Well, that's the research. Basically the bigger and taller your building gets, the less efficient your building becomes from an area perspective. The systems and materials use up space and a lot of energy to produce and operate, which is why we also research ways to make the tall building more efficient.

ZE: So what are your tall building clients hoping to achieve?

AS: The taller buildings we do are almost always the center of attraction for a large community. And if it's a good building and people like to look at it, to come see it, want to live and work around it, the value of all the surrounding property increases. A good piece of architecture can create and increase value for more than its owner. That's what mayors should be looking at.

AIA Chicago is proud to present Adrian Smith as the keynote speaker for NeoCon on Wed., June 11, at the Merchandise Mart. Visit neocon.com for more.
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