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Welcome to our tenth round of 40 under 40s. Discover why these 40 young professionals truly represent the emerging superstars of the AEC industry.

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26 5 WAYS HIGH-FLYIN’ AIRPORTS ARE DESIGNING FOR RAPID GROWTH
Nimble designs, and technology that humanizes the passenger experience, are letting airports concentrate on providing service and generating revenue.

59 HOW AEC TEAMS ARE BENEFITTING FROM THE COMMERCIALIZATION OF VIRTUAL REALITY TOOLS
Not too long ago, utilizing virtual reality was a labor-intensive operation that required custom-built software. Today, VR can be as simple as a touch of a button.

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65 WHAT WENT WRONG? DIAGNOSING BUILDING ENVELOPE DISTRESS
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ON THE COVER
Members of the 40 under 40 Class of 2015, clockwise from top left: Benjamin Kasdan, Rachel Sowards, Brian McCarthy, Melissa R. Daniel, and Monika Thadhani. To learn more about them and their 35 classmates, turn to page U40/1.

ABOVE
Michael J. Kisch recently took up a new post as Design Project Manager for the University of Minnesota, where he is responsible for the execution of capital projects across the five-campus UMN system. Like his counterparts among this year’s “U40s,” Kisch is active in community work and service to his professional organizations, yet he still manages to squeeze in time for beach volleyball with his family. Read more about Kisch and 39 other young AEC industry dynamos, starting at page U40/1.
The world's longest ski slope will be built in one of the world's hottest cities. Dubai, where temperatures top 113°F, will include the slope in a massive project with a shopping mall, sports arena, and residential tower. www.BDCnetwork.com/DubaiSkiSlope

Zaha Hadid’s latest museum project is built into a mountain. The museum, dedicated to legendary mountaineer Reinhold Messner, is embedded within Mount Kronplatz in northern Italy. www.BDCnetwork.com/MessnerMuseum

ThyssenKrupp’s maglev elevator test tower almost ready. The 761-foot concrete tower will enable the manufacturer to test its maglev elevator prototypes. The new elevators will be moved by magnets, allowing for vertical and horizontal movement of multiple cars in one shaft. www.BDCnetwork.com/MaglevElevator

Jerusalem to get a high-rise pyramid by Daniel Libeskind. The mixed-use, 26-story building will have a height of around 345 feet, just 53 feet shorter than the city’s tallest, Holyland Tower 1. www.BDCnetwork.com/LibeskindPyramid

Design unveiled for Apple HQ visitor center. A glass-walled single-story building alongside the main office building in Cupertino, Calif., will be used as a visitor center. www.BDCnetwork.com/AppleVisitorCtr
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COMPETENCY-BASED LEARNING: a glimpse into the future of higher ed?

Last year, I had the pleasure of visiting the campus of my alma mater, Eastern Illinois University, in rural Charleston, about 55 miles south of Urbana-Champaign. My wife, an adjunct professor at EIU, had business meetings there. I could not pass up the opportunity to tag along.

Not much had changed since I last walked the university’s lush quad more than 17 years ago. Both Tony Romo and Jimmy Garoppolo came and went—the NFL QBs are among several prominent EIU grads to make their mark in the NFL, including Saints head coach Sean Payton—and the school added a sleek fine arts center designed by Antoine Predock.

But other than the starchitect’s contemporary creation, the campus looked virtually untouched. In a nostalgic mood, this put a smile on my face. My wisest spirit shifted, though, when I learned about the cost of today’s EIU experience. More accurately, my jaw hit the floor. In less than two decades since I graduated, the annual in-state tuition had ballooned 192% to $8,490. Room and board: up 155%, to $8,996. Tack on books, fees, and other expenses, and the average on-campus, four-year degree runs students in excess of $85,000—and EIU remains one of the least-expensive state schools in Illinois.

As professionals working in an industry that requires an advanced degree—in some cases multiple degrees—I’m sure you’ve experienced a similar sticker-shock moment when discussing your alma mater. For those with kids, you’ve probably wondered, as I have: If the buy-in for four-year schools continues to escalate at its current pace, how can I possibly be expected to foot the bill for my child’s higher education? Even worse, how can I sit back and watch my kid take on six figures’ worth of student loan debt?

For better or worse, the higher education experience that we enjoyed—it’s just too costly. Community colleges and commuter schools will play a larger role, as will distance learning. Furthermore, as we wrote about in our August 2015 report on innovation districts (tinyurl.com/InnovationDist), a number of schools are establishing satellite campuses near city centers, to be closer to research and tech firms, and a larger student base.

We’re also likely to see the development of new education models that cater to the masses. A recent article in The Atlantic (tinyurl.com/Cut-CollegeLectures) details an alternative that’s gaining momentum: competency-based education. Introduced in the late 1990s by nonprofit Western Governors University, the model has since been adopted by dozens of schools, including Purdue, the University of Michigan, DePaul, and the University of Maryland. It breaks the butts-in-seats mold to teaching by moving the process online, where faculty “mentors” guide students, one-on-one, at their own pace, through a series of competencies for a given degree program. Once a student feels they have mastered a subject, they earn credits by passing an exam.

If the competency-based model does not disrupt higher education, then something else likely will. Does it mean the demise of the traditional school? Certainly not. As a prominent university architect told me recently, “For every American student who can’t afford or chooses not to pay to attend a four-year university, there are two or three foreign students ready to take their place.”

The traditional model is not going anywhere, but new approaches will emerge.

—David Barista, Editorial Director
ARCHITECTURE STAFF COMPENSATION UP 3.5% SINCE 2013: AIA REPORT

Though U.S. architecture firms are still recovering from the Great Recession, overall business conditions have improved, which has led to an overall increase in compensation for architecture positions.

Compensation across the profession increased an average of 1.8% per year over the 2013–14 period, with growth occurring in every architectural staff category, according to the American Institute of Architects (AIA) 2015 Compensation Survey. At the beginning of 2015, the average annual compensation for architectural staff positions was slightly below $80,000, 3.5% higher compared to early 2013 levels, or 1.75% per year.

Despite the gains, the pace of increases is still well below averages for the profession over the past two decades, when annual compensation increases were generally 4–5%, according to AIA. Yet it outpaces the gains seen between 2008 to 2013, when they averaged less than 1% per year.

In early 2015, the average compensation for senior design/project management staff

### RSMEANS COSTS COMPARISONS:

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<th>Factory, Three-Story</th>
<th>Auto Sales Garage</th>
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was $103,400, up from $99,400 in 2013 and $94,900 in 2011. For staff architects/designers it was $77,100, versus $73,000 and $71,600 in ’13 and ’11; for interns: $48,900, up from $47,300 and $47,000.

Other findings from the AIA report:

• The average compensation for a CEO position at an architecture firm ($192,200) was only 4.5 times the average compensation for an Intern 1 ($42,900).

• Larger firms typically offer higher compensation levels on average, and are more likely to offer a comprehensive benefits package to their employees.

• Base salary accounts for 91-95% of total compensation for junior-level positions (intern, architect/designer, project designer/project manager) versus 69-78% for senior-level titles.

More at: www.BDCnetwork.com/2015AIACompSurvey

AT AN 18-YEAR HIGH, MULTIFAMILY CONSTRUCTION CONTINUES TO DRIVE THE HOUSING SECTOR

Predictions that multifamily housing construction would taper off in 2015 may have underestimated the ongoing demand for this kind of housing, the vast majority of which is being marketed as rentals.

Seasonally adjusted annualized starts for structures with five or more units rose to 476,000 in June, an 18-year high, according to Commerce Department estimates. That number was 28.6% higher than the annualized multifamily starts rate in May, and 55% higher than the comparable number in June 2014.

Perhaps more significant is the fact that multifamily continues to propel most of the housing sector’s current growth. While annualized single-family starts in June, at 685,000 units, were 14.7% ahead of June 2014, they actually declined by 0.9% compared to May 2015.

“The multifamily gains this month are encouraging and show that the Millennial generation continues to be drawn to the rental market,” said Tom Woods, a home builder from Blue Springs, Mo., who is Chairman of the National Home Builders Association (NAHB).

All told, the year-over-year annualized rate for all starts was up 26.6% in June to 1,174,000 units.

The NAHB/Wells Fargo Housing Market Index, which tracks Builder

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NEWS BRIEFS

MALMÖ, SWEDEN'S TURNING TORSO is this year’s winner of the 10 Year Award from The Council on Tall Buildings and Urban Habitat. Designed by SANTIAGO CALA- TRAVA, the 623-foot, 57-story tower was the world’s first twisting skyscraper. www.BDCnetwork.com/TurningTorsso

THE NATIONAL COUNCIL OF ARCHITECTURAL REGISTRATION BOARDS (NCARB) has accepted proposals from more than a dozen architecture schools to implement an integrated path to licensure within academic programs accredited by the National Architectural Accrediting Board. This initiative allows students enrolled in an NCARB-ACCEPTED PATH to complete the requirements for architectural licensure at the time of graduation. www.BDCnetwork.com/NCARBIntegratedPath

HDR has joined forces with CEI ARCHITECTURE, a Vancouver, B.C.-based firm with about 70 employees. The merger, which went into effect on July 26, is HDR’s first foray into western Canada. www.BDCnetwork.com/HDR_CEI

JAPAN’S OLYMPIC STADIUM PROJECT, a venue designed by Zaha Hadid Architects that was to be built and ready for the 2020 OLYMPICS IN TOKYO, has been scrapped due to rising costs, among several other concerns. A new construction plan has been set in motion, and Hadid recently released a response to the controversy. www.BDCnetwork.com/OlympicStadium_Hadid

The United States is primed for the WORST DROUGHTS RECORDED in the last 1,000 years, according to data from NASA and projections by climate scientists at Columbia University. NASA SCIENTISTS said the current likelihood of a mega-drought is about 12%. www.BDCnetwork.com/NASAdrought

THE AMERICAN INSTITUTE OF ARCHITECTS’ (AIA) semi-annual Consensus Construction Forecast, a survey of the nation’s leading construction forecasters, is projecting that SPENDING WILL SEE AN 8.9% INCREASE in 2015, and 8.2% next year. www.BDCnetwork.com/AIAConsensusJuly2015

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HOSPITAL DESIGNERS GET THE SCOOP ON ROLE OF INNOVATION IN HEALTHCARE

‘Innovation’ was the byword as 175 healthcare designers gathered in Chicago recently for the American College of Healthcare Architects/AIA Academy of Architecture for Health Summer Leadership Summit.

Experts from Kaiser Permanente, Cleveland Clinic, Mayo Clinic, Massachusetts General Hospital, and other healthcare institutions and think tanks described various models they’re using to spur innovation and improve the quality of care for their patients.

That’s a topic of mounting importance under the Affordable Care Act, which can penalize a hospital with a poor record of patient satisfaction and outcomes.

Kaiser Permanente. Jennifer Liebermann, Co-founder of Kaiser Permanente’s 37,000-sf Garfield Innovation Center, described a typical problem such in-house innovation facilities tackle: how to reduce medication errors. “Nurses get interrupted all the time when they’re trying to give patients their meds,” she said. That leads to medication errors and injury to patients.

The Garfield Center team tried several ideas, even something that looked like a hazmat suit (“We tested it on nurses, and they said they’d never wear that thing,” said Liebermann). The solution: a bright yellow sash that the nurse wears over her shoulder when dispensing prescriptions. “That sash lets everyone know, ‘Don’t interrupt me, I’m dispensing meds,’” said Liebermann. A simple and inexpensive solution, but so effective that it’s being rolled out through the entire 32-hospital Kaiser Permanente system.

“We borrow ideas from other healthcare organizations, but some of our most powerful inspiration comes from outside healthcare,” said Liebermann. KP is working with Walmart on telemedicine and with NASA on improving safety in operating rooms. “NASA has a lot of experience with its people working in tight spaces,” she said.

The CFI has 47 projects in the works, most of which have to be completed in 12 months. “There are a lot of things that don’t work out,” Spurrier said. “Sometimes we get all the way to a prototype and it doesn’t work, and we have to put it on the shelf.”

Mayo is looking at developing smartphone apps, such as one that teenage asthma patients could use to monitor their condition without having to go to the clinic.

Video medical visits, perhaps via Skype, are of keen interest to Mayo, especially for use with older patients. “How can we help

HOW TO DESIGN A HEALTHCARE INNOVATION CENTER
Larry Stofko, EVP of the Innovation Institute, provided ACHA/AAH summiters with advice on designing physical spaces to enable innovation:

1. Make the space flexible, with movable walls and furnishings.
2. Make it inspiring, with whimsical artwork and “creative” colors (orange and blue seem to work best).
3. Make it collaborative, with lots of whiteboards, wall space, and glass to write on.
4. Make it social, with a working kitchen, comfy couches, spring-board chairs.
5. Make it hard-working, by providing the right tools and hardware (e.g., 3D printers).
6. Make sure it reflects the institution’s culture and brand.
7. Provide a dedicated showcase to display your innovation successes.
seniors thrive in place?” asked Spurrier. “We know that 85% of them can get their care at home. What conditions need to be in place so that we can serve them right in their homes?”

“The Garage” is another Mayo innovation initiative—an incubator for products and services with commercialization potential. There’s also CoDE, which provides as much as $50,000 each year to up to 10 teams a year for what Spurrier called “open innovation.” Mayo’s “Transform” international symposium recently attracted 850 innovators from 16 countries.

Mayo’s newest project: the 7,000-sf Well Living Lab, in collabor-

BALDRIGE AWARD: ‘WE’VE NEVER HAD AN ARCHITECTURE FIRM APPLY’

Plenty of hospitals have won the prestigious Malcolm Baldrige National Quality Award, but not one architecture firm has ever applied since the program was started by Congress in 1987, said Harry Hertz, former head of the program.

That’s a shame, said Michael Pulido, Chief Administrative Officer at Mosaic Life Care, St. Joseph, Mo., a 2009 winner. Just going through the Baldrige review process “gave us discipline and structure to understand the voice of our customer,” he said.

Hertz said that the Baldrige process can “change your thinking, empower your unique talents, and inspire your organization to be an active innovation partner.”

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BY MICHAEL CHAMERNIK, ASSOCIATE EDITOR

1 PLANS TO MAKE OVER NEW YORK’S AGING LAGUARDIA AIRPORT ARE REVEALED
New York Gov. Andrew Cuomo in late July unveiled LaGuardia Airport’s comprehensive redesign, which calls for transforming the 76-year-old airport into a unified, single terminal with transportation access. The plan, devised by a panel of architects, engineers, planners, and lawmakers that included AECOM, Dattner Architects, Present Architecture, and SHoP Architects, calls for demolishing Terminal B and redeveloping Terminals C and D; building a new unified terminal 600 feet closer to the Grand Central Parkway; and constructing a Marine Air Terminal that will be integrated with the main airport via an automated tram. The first half of this project, which is projected to cost between $3.6 billion and $4 billion, is expected to open to passengers in 2019.

2 MCKINNEY, TEXAS, DIVES INTO A HUGE POOL-AND-FITNESS CENTER PROJECT
Last September, Money magazine ranked McKinney, Texas, as the best place to live in the U.S., based on such factors as economic growth and the quality of its schools. The city is trying to capitalize its newfound status to attract more residents and businesses. To that end, McKinney is scheduled to begin construction on a $34.5 million, 80,000-sf aquatic and fitness center that local officials hope will make the city even more marketable to newcomers. The three-story center will have a gym, fitness rooms, sports courts, water slides, and 10,000 sf of pools, including a 25-meter indoor competitive pool. The center will also offer classes and childcare. The Building Team includes: Brinkley Sargent Wiginton Architects (AoR), Moody Nolan (recreational designer), Counsilman-Hunsaker (aquatics consultant), and Manhattan Construction (CM). The center is scheduled to be completed in December 2016.
MARRIOTT MARQUIS BECOMES PART OF CHICAGO’S CONVENTION STRATEGY

In July, ground was broken for the new Marriott Marquis Chicago Hotel. The hotel will have 40 stories, 1,206 rooms, and 90,000 sf of meeting space. Additionally, the Marquis will have two 25,000-sf ballrooms, a restaurant, bar, and food court. Two pedestrian bridges will connect the hotel with the McCormick Place Event Center, a planned 10,000-seat sports venue. Both venues are key parts of the McCormick Collection master plan. The Marquis will be constructed by the Metropolitan Pier and Exposition Authority for $390 million and is scheduled to be completed by August 2017. Building Team: Gensler (architect) and Prairie District Partners, a design/build team that includes Clark Construction, Bulley & Andrews, Old Veteran Construction, McKissack & McKissack Midwest, Goettsch Partners, and Moody Nolan.

KPF’S ‘FLARED SILHOUETTE’ TOWER IN MANHATTAN GETS UNDER WAY

Construction has commenced on the tapered tower at 111 Murray Street, in Tribeca, near One World Trade Center. Designed by Kohn Pedersen Fox Associates, the 62-story, 157-unit luxury condo tower widens at the 40th floor, resulting in a gently flared silhouette, accented by a sculpted crown. Architect David Rockwell’s plan for the lobby includes anodized steel walls, travertine floors, water fountains, and artistic sculptures. Also on the Building Team: Witkoff Group, Fisher Brothers, and Howard Lorber (developers), Goldstein Hill & West Architects (AOR), MR Architecture & Décor (interior architect), and Edmund Hollander (landscape design).
CONSTRUCTION UNDER WAY FOR 136-ROOM LAS OLAS OCEAN RESORT

Construction began this summer on the Las Olas Ocean Resort in Fort Lauderdale, Fla. The 12-story hotel, designed by Adache Group Architects, will have 136 guest rooms, a VIP lounge, an ocean club pool and pool bar, meeting rooms, and a fitness center. An airy and day-lit breezeway at the pedestrian level will visually connect the Atlantic Ocean to the Intercoastal Waterway. The resort will feature a robotic parking system for 258 vehicles. Cars stored in the building pedestal will be retrieved using an automated building information system. The resort is scheduled to open in 2017, and will have a Señor Frog's restaurant and Juan Valdez Café on the premises.

CORRECTIONAL CENTER GIVES GUARDS AND INMATES SOME WELCOME SPACE

A new 516,000-sf facility in Indio, Calif., will replace an overpopulated jail built in the 1950s. Construction has begun on the East County Detention Center, a four-story building that will increase the center’s capacity to 1,626 beds. The facility, designed by HOK, will include a medical and mental health unit, dental treatment and exam rooms, a clinic, and sheltered care housing, all to provide inmates effective healthcare and support programs to reduce recidivism and foster a rehabilitative environment. An underground passageway will connect the detention center to the courthouse across the civic plaza, decreasing the risks that come with inmate transport.

Perfectly flat floors, delivered.
ADDITION MODERNIZES A CLASSIC MASSACHUSETTS COURTHOUSE

The Franklin County Courthouse in Greenfield, Mass., is getting an addition that will house a new entry, six courtrooms, a law library, detainee circulation, and a jury pool room. The renovation, projected to be completed by 2016, will bring new space to the original building that was built in the 1930s. The layout separates prisoners, judges, and the public, only allowing them to cross paths at the courtroom. The glazed top floor will sit above a three-story limestone block (the same material as the original courthouse’s base), and a roof canopy and glass wall will frame the new entry. Natural light will flood the courthouse’s public spaces. The Building Team includes: Leers Weinzapfel Associates (design architect), Cosentini Associates (MEP/FP), RSE Associates (SE), Green International Affiliates (CE), Richard Burck Associates (landscape design), Gale Associates (building envelope consultant), and Whiting-Turner (GC).
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FIVE WAYS HIGH-FLYIN’ AIRPORTS ARE DESIGNING FOR RAPID GROWTH

Nimble designs, and technology that humanizes the passenger experience, are letting airports concentrate on providing service and generating revenue.

BY JOHN CAULFIELD, SENIOR EDITOR

5 TRENDS IN AIR TERMINAL DESIGN AND CONSTRUCTION

[1] Flexibility must anticipate change and possible future use.
[3] Terminals must be designed for calmness and “enhanced waiting.”
When AEC aviation professionals talk about the work they admire, JetBlue’s Terminal 5 at JFK International Airport in New York stands out as a facility that continues to evolve as market conditions change.

Its chameleon-like nature was evident in the opening last November of a $200 million extension to handle much-coveted international arrivals. A willing mutability could also be seen in the spacious roof deck garden that T5, as it is known, debuted on July 1, which provides a sense of place that other airports are striving to duplicate.

In the early 2000s, as the Gensler-designed T5 was being planned, the security screening area had been programmed to include lots of self-service kiosks for issuing boarding passes. By the time the terminal opened in October 2008, however, JetBlue’s business model had shifted toward leisure destinations, which meant families traveling with loads of luggage.

That same year, the iPhone debuted, and presented a mobile platform for online check-in and digital boarding passes. The area was reprogrammed, at relatively little cost: the kiosks were moved to the side to make room for baggage checking and stanchion queues.

That kind of flexibility is critical today, as airports burst at the seams with passenger traffic. “Airports want sustainability, maintainability, value for their dollar, and flexibility they can grow with,” says Susan Baer, former Director of Aviation for the Port Authority of New York and New Jersey, now Principal and Global Aviation Planning Leader at Arup, a member firm in the T5 Building Team.

Several factors weigh in as airport officials rethink their spaces, starting with how to make security checkpoints less stressful so passengers don’t rush for their gates and bypass revenue-generating retail, food, and beverage concessions.

The growing presence of jumbo jets like Airbus’s 800-plus-seat A380 airliners is having a ripple effect on everything from gate sizes to the capacities of hold rooms and other service facilities within terminals, says Robert Chicas, HOK’s Director of Aviation and Transportation.

He notes that one of HOK’s major projects, a 1.7-million-sf terminal at Salt Lake City International Airport, will have 72 gates, compared to 84

JetBlue’s Terminal 5 at New York’s JFK International gives passengers a sense of place with its new rooftop garden (left). Terminal 2 West at San Diego International includes a “smart curb” with ticket counters and self-serve kiosks (inset). Skanska sees efficiency, flexibility, and customer services as driving construction (right).
in the terminal it replaces. SLC expects to serve 30 million passengers annually by 2034, versus 21 million last year. Bigger planes require taller gates and longer bridges. “It’s not a matter of gate count as much as the gauge of the plane,” explains Chicas.

“Airport design is now demand driven,” confirms Anthony Mosellie, Partner in Kohn Pedersen Fox’s Global Aviation Practice. KPF’s recent projects include the massive 7.6-million-sf Abu Dhabi International Airport Midfield Complex. Design is also a function of do-it-yourself technology that enables passengers to do their own ticketing, luggage check-in, flight tracking, and even pre-board food ordering.

AEC firms identify five trends that could impact what airport terminals look like, how they are built, and how they’ll be operated.

[1] FLEXIBILITY MUST ANTICIPATE CHANGE AND POSSIBLE FUTURE USE.

Airports are looking for new ways to give terminals the ability to respond to market currents. By “flexibility,” Chicas says he means not painting yourself into a corner by laying out a terminal too rigidly. He refers to HOK’s redesign for Indianapolis International Airport, where the concourse will be built without columns. This configuration will admit more natural light into the building and make the space more adaptable to future usage changes.

Dwight Pullen, Director of Skanska’s Aviation Center of Excellence, says he’s seeing airports like Hartsfield-Jackson Atlanta International going with larger, centralized security checkpoints to better handle the passenger crunch during peak periods.

Balfour Beatty Construction, a member of the Building Team working on the $2.69 billion Terminal Renewal Improvement Program at Dallas–Fort Worth International Airport, opened up space for the security checkpoint area within American Airlines’ Terminal A by removing escalators and installing new and faster elevators that can carry up to 20 luggage-lugging travelers.

Karl Joeris, Balfour Beatty’s Vice President of Operations, notes that before 9/11, airports typically had smaller security checkpoints that were often perpendicular to the flow of the building’s traffic. In its DFW redesign Balfour went with smaller checkpoints whose traffic flow matches the flow of the terminal in general, and doesn’t back up into the concourse as much.

[2] TECHNOLOGY PUTS NEW ZIP IN PASSENGER PROCESSING.

With more passengers checking in via mobile devices, and with self-service luggage check-in and boarding around the corner, airports can re-evaluate their space allocations. “Technology is streamlining check-in and bringing self bag-tagging closer to reality,” says Dale Kain, Project Director at PCL Construction, the GC for LAX’s new 800,000-sf Midfield Satellite Concourse.

Designing airports to facilitate “flow-through” ticketing would also make it easier and faster for passengers who already have their documents to reach their gates quicker. Dynamic signage would direct these customers to less-clogged security checkpoints.

Tom Rossbach, Aviation Buildings Market Sector Director for HNTB Architecture, says his firm designed San Diego’s Terminal 2 West with an elevated “smart curb” 80 feet from the terminal. The smart curb has its own tensile fabric canopy with full ticket counters, self-service kiosks for check-in, and baggage conveyors at the curb. Flight and gate information are posted, and group check-in is provided for air passengers connecting to cruise ships. Passengers can proceed across a bridge to the terminal and straight to security.

Jayne O’Donnell, Turner’s Vice President and General Manager, also sees airports moving toward technology-enhanced screening and boarding. She cautions, however, that many passengers, especially
Newer and redesigned airports are focusing their attention on making baggage handling quicker. Some think it’s only a matter of time before passengers will self-tag their bags.

Aging boomers, still want to deal with a human at airports. Several sources point to “common use” gates that are shared by multiple carriers. In Abu Dhabi, Kohn Pedersen Fox designed the airport in an “X” shape that will enable the terminal to extend to 49 gates and accommodate 59 aircraft at any given time. This airport will have the capacity to handle 50 million passengers per year.

In the future, experts say, airline travelers will be able to print out their own luggage stickers—or, better yet, buy luggage embedded with ID bar codes or RFID chips.

[3] TERMINALS ARE BEING DESIGNED FOR CALMNESS AND 'ENHANCED WAITING.'

Turner’s O’Donnell says airports have come to rely on “non-aeronautical” revenue—parking, food service, retail, etc.—to finance operations, upgrades, and expansions. They are trying to create what HOK’s Chicas calls “hospitality-like” environments that put passengers in the right frame of mind to spend money before they board.

“It’s all about ‘enhanced waiting,’” says Chicas. “The thinking is that a relaxed passenger is a happy passenger.”

San Francisco International Airport pumps soothing music into its security checkpoint area. Atlanta’s Hartsfield-Jackson enlarged its “redress” and “composure” areas on the other side of security checkpoints, where passengers can take a deep breath and put on their shoes, belts, and coats.

Airports are being built or remodeled so that customers see planes on the runway as soon as possible; this apparently has a calming effect on travelers, says Kelly Locke, LEED AP, Preconstruction Director for Austin Commercial’s National Aviation Division. Brian Kelley, AIA, Principal with Corgan Associates, adds that effective wayfinding, ample daylighting, and greater proximity to bathrooms and other amenities can help keep passengers calm and collected as they walk to their gates.

Along the way, passengers are likely to encounter higher-end retail shops and restaurants. Mosellie of KPF quips that the Heathrow/LAX model—“a shopping mall that you happen to park planes next to”—is gaining acceptance in Europe, Asia, and, to some degree, at U.S. hubs.

Once passengers get to their gates, they are finding hold rooms—the seating areas near gates—that are larger and more amenable to their needs. Kelley says airports are equipping holding areas with stronger WiFi capability, mobile device chargers, and workstations. They’re also positioning hold rooms closer to food service vendors. At JFK and Minneapolis–St. Paul International, for example, passengers can order food via online and have it delivered to the gate. Mobile apps like AirGrub and B4YouBoard perform similar functions.

Airports are designed to create a sense of place for their “guests.” JetBlue’s roof deck and Great Hall, with stadium seating for concerts and other events, is one example. The new international airport in Queenstown, New Zealand, has gate lounges that offer “stunning floor-to-ceiling alpine vistas,” according to Airport-World.com. Abu Dhabi’s airport will feature a 90,416-sf indoor park with Mediterranean plantings and desert landscapes.

Mountain ranges form the backdrop for Salt Lake City’s airport, whose color scheme and artwork “celebrate the landscape of the place,” says Chicas. The terminal redevelopment for Long Beach, Calif., includes a 21,000-sf garden area with palm trees.

[4] AIRPORTS NEED TO HAVE FAST LINKS TO THEIR DOWNTOWNS.

“Any proper airport plan needs to make connections to the urban core,” asserts KPF’s Mosellie.

In June, Toronto began express rail service between Pearson International airport and Union Station. Construction is under way of a 22.8-mile commuter rail transit corridor that, when it opens next year, will operate between Denver International Airport and that metro’s downtown Union Station. HOK’s plan for Indianapolis’ airport includes securing a right-of-way for rail service to connect to downtown.

Investing in mass transit options is another way airports can burnish their customer service image. “Your flying experience begins when you leave your front door, and ends when you arrive at your destina-

Retail is a critical revenue source for airports. DFW International’s Terminal D includes art and play areas for children. Its Building Team: Corgan and HKS (designers), LA Fuess (SE), and Austin Commercial (CM).
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**FINANCING IS OPENING UP NEW POSSIBILITIES FOR AIR TERMINALS.**

In May, the Port Authority of New York and New Jersey announced plans to get started on a new $3.6 billion main terminal at LaGuardia Airport. That project had been held up for years, as New York had to pay for the multibillion-dollar reconstruction of the World Trade Center and the start of the $5.5 billion replacement for the Tappan Zee Bridge.

Turner Construction’s O’Donnell says that state authorization of airport funding “has really taken a hit” in the past few years. So cities are banking on airlines, which after decades of bankruptcies and consolidation, are raking in cash again. The airlines know they have to get more involved in helping finance airport terminal construction and remodeling. “At least domestically, the airlines are realizing that they are part of the solution,” says Corgan’s Kelley.

The LaGuardia project is financed via a public-private partnership between the Port Authority and a consortium led by Vantage Airport Group called LaGuardia Gateway Partners, which includes Skanska, Walsh Construction, Parsons Brinckerhoff, HOK, and Meridiam Infrastructure. AEC sources say P3s have panned out for some domestic terminals, notably JFK’s Terminal 4, and are gaining popularity.

Pullen notes that airports are demanding more collaboration from their delivery partners to complete projects expeditiously. PCL’s Kain and HNTB’s Rossbach say that, for bonding and political reasons, AEC firms often form joint ventures on airport projects. (PCL, Turner, Corgan, and Gensler have established a joint venture to design and build LAX’s Midfield Satellite Concourse.)

In June, the Metropolitan Washington Airports Authority awarded a multi-year reconstruction and renovation to the joint venture AIR Alliance, comprised of AECOM and PGAL, for Terminals B and C at Ronald Reagan Washington National Airport.

**CLEAR SKIES AHEAD FOR AIRPORT TERMINALS**

AEC firms are uniformly positive about future aviation work. Turner’s O’Donnell sees “huge opportunities” for airport construction going into 2016. She says there are a number of hubs that are discussing capital plans in the billions of dollars.

Much of this work will be renovations and additions. In June, the city of Phoenix awarded Faithful + Gould a contract to perform facility-wide assessments of its three airports, from which it would provide the city with comprehensive capital planning forecasts. Austin Commercial was just awarded a contract for a 300,000-sf expansion of San Francisco’s airport, in addition to its $500 million addition/expansion to Terminal 2 at Phoenix’s Sky Harbor Airport. Skanska and HOK are engaged in the $122 million modernization and expansion of Tampa International Airport. Balfour Beatty is evaluating a $700 million proposal to replace Houston’s Bush International terminal.

Construction opportunities could be even more fertile outside of the U.S., says KPF’s Mosellie, especially among oil-rich Middle East countries looking to supplant hubs in Europe. China and Hong Kong are planning large airport expansions to compete with the Mideast, he says.

Arup’s Baer believes that airports with a mix of international travel are in the best position for success. “It’s a global world and a global economy,” he says, “and the only way you can get to most places is by plane.”

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**THE FUTURE OF AIRPORT TERMINALS...continued**

Check out these additional reports for more on terminal design and construction:

- “Arup experts discuss how airports can manage growth,” www.BDCnetwork.com/ArupSalon
- “Surveys gauge user satisfaction with airports,” www.BDC-network.com/AirportSurveys
- “Rental car facilities expanding at U.S. airports,” www.BDC-network.com/AirportRentals
- “Small and regional airports in a dogfight with mega-hubs,” www.BDCnetwork.com/SmallAirports

*For a list of the technical experts consulted for our report, visit: www.BDCnetwork.com/AirportExperts*
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MEET THE BD+ C “40 UNDER 40” CLASS OF 2015!

BY SUSAN BADY, CONTRIBUTING EDITOR, AND ROBERT CASSIDY, EXECUTIVE EDITOR

Welcome to our tenth round of 40 Under 40s. Once again, these 40 young professionals truly represent the emerging superstars of the A/E/C industry. Many of them come from interesting lineages. Peter Ousley’s grandfather hid a printing press in his basement and churned out posters for the civil rights movement of the 1960s. Rachel Sowards’ paternal grandfather carried the torch at the 1996 Olympics. Now, the members of Building Design+Construction’s “40 Under 40” Class of 2015 are burnishing their own history, one that shows every sign of startling brilliance.

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Influential Intellectual

MONIKA THADHANI, AIA, LEED AP
Senior Associate
VOA Associates, Chicago

AGE: 38
MArch, Illinois Institute of Technology
MArch, University of Technology (Wroclaw, Poland)

ACCOMPLISHMENTS
Leads research-based design approach at VOA. Recently completed the Beijing High End Manufacturing Base New Materials Industry Research Institute (170,000 sf), in China, and North Park University Science and Community Life Building, Chicago (101,000 sf). Adjunct Professor, College of Architecture, Illinois Institute of Technology, and University of Technology, Wroclaw, Poland.

Taught and lectured at IUAV University of Venice during Venice Architecture Biennale (2009, 2013, 2014). Completed her master’s thesis at IIT while working full time and raising two daughters (Reika, now 10, and Maya, now 9), who were babies at the time, while her husband, then a lieutenant commander in the navy, was deployed to Afghanistan. Collaborated with doctoral candidates and U.S. Department of Energy at Argonne National Laboratory on energy-performance modeling and base analysis for the existing 200,000-sf Theory of Computer Science Building.

EXTRACURRICULAR
Leads VOA’s participation in Chicago Architectural Foundation education programs for high school students.

DONATED DESIGN SERVICES FOR A LIBRARY RENOVATION AT AN ELEMENTARY SCHOOL IN EVANSTON, ILL. Led VOA’s participation in AIA 2030 Committee and ACE mentors.

OFF THE CLOCK
Loves hiking, biking, swimming, tennis, drawing, and painting.

Favorite flick: "Stranger than Paradise" (1984). "Reminds me of coming to the U.S. for the first time."

SECRET LIFE
In college, she hitchhiked "numerous times" between Poland and Sicily (>3,000 miles roundtrip).
Structural Superstar

MARCIA ALVARADO, PE  
Senior Structural Engineer  
Atkins, Tampa, Fla.  

AGE: 33  
MS, University of South Florida  
BS, Florida Institute of Technology  

ACCOMPLISHMENTS  
Ten years of structural engineering design experience for multiple projects in the U.S. and internationally. Expertise in structural steel, concrete design, and foundation design for multi-story structures, especially anti-terrorism/force protection and progressive collapse design.  
Structural rehabilitation of Tampa International Airport parking garages won the firm’s Award for Excellence in Bridge Engineering (2014).  
Design-build of air traffic control tower and radar approach control facility for U.S. Army Corps of Engineers Omaha District, Grand Forks Air Force Base, N.D., won Design Award for Facility Design from USAF Air Mobility Command (2011).  
Other key projects: Plum Island Lighthouse preservation and restoration, Suffolk County, N.Y.; Frank Fickett Scout Training and Service Center, Boy Scouts of America—Capital Area Council, Austin, Texas.  

EXTRACURRICULAR  
Member, American Institute of Steel Construction; American Society of Civil Engineers, Structural Engineering Institute; Society of American Military Engineers; Board of Directors/Secretary President, ACE Mentor Program of Greater Tampa Bay; leads Mentor/Membership Committee.  
Industry resource to USF College of Engineering through Atkins’ Corporate Ambassadors Program.  

OFF THE CLOCK  
Volunteer, Habitat for Humanity of Hillsborough County, Fla.; Big Brothers Big Sisters of Tampa Bay. Recently signed a modeling contract with Salient Talent. Will model at Fashion Week in New York this month. “I self-identify as a gay female, but my gender expression is mostly masculine.”  

SECRET LIFE  
Senior guard, Florida Institute of Technology women’s basketball team. Led FIT to 17-12 record and the finals of the Sunshine State Conference in 2004.  

Super Mom/Super Exec

AKILAH W. DARDEN, LEED AP  
BD+C  
Project Executive  
TriVersity Construction Group  
Indianapolis, Ind.  

AGE: 38  
MBA, Marymount University  
BS, North Carolina A&T State University  

ACCOMPLISHMENTS  
Recently joined TriVersity from Gilbane Building Co., where she was a Senior Project Manager in the Laurel, Md., office. Developing new projects and relationships to grow the Indianapolis office of Cincinnati-based TriVersity.  
Active engineer in construction for 15 years at Gilbane and Clark Construction, managing commercial, industrial, hospital, government, religious, and residential projects.  

Within four months of being named Senior Project Manager at Gilbane, she assisted the firm in obtaining two major projects: re-skin of an occupied building in downtown Washington, D.C., and construction of a new school in downtown Baltimore.  
Managed HD Cooke Elementary School modernization, a $30 million LEED Gold school and one of D.C. Public Schools’ first LEED for Schools-certified facilities. Helped lead D.C. Public Schools to utilize a management system that assists in hiring and retaining D.C.-owned businesses and local residents.  
Earned MBA in finance while working full time.  

EXTRACURRICULAR  

SAM ALLEN  
Mechanically Inclined

SAM ALLEN, PE, LEED AP  
BD+C  
Senior Mechanical Engineer  
AECOM, Columbus, Ohio  

AGE: 31  
BS, Ohio State University  

ACCOMPLISHMENTS  
Has worked on >300 projects in his career. With AECOM, concentration in retail, hotels, labs, and data centers.  
Lead Mechanical Engineer for a >1-million-sf, >100 MW prototype data center.
Conqueror of Concrete

AKILAH W. DARDEN

OFF THE CLOCK
Mother of four: Travis (5), Aidan (3), and 10-month-old identical twins Alana and Tiana (she’s a twin herself). Soccer/tennis mom.

SECRET LIFE
Has a patent pending for her own line of children’s apparel.

CRAIG ABBOTT

CRAIG ABBOTT, LEED AP BD+C
Senior Project Manager
Manhattan Construction Co., Dallas

AGE: 38
BS, Oklahoma State University

ACCOMPLISHMENTS
At 26, was Senior Project Engineer for Pier 1 Imports’ 432,000-sf Corporate Headquarters.
Managed the firm’s first two LEED projects: Grand Prairie Public Safety Building and Summit Adult Activity Center, totaling 195,000 sf, $88 million.
Managed concrete structural work on the 2.6 million-sf, $800 million AT&T Stadium (Dallas Cowboys).
Worked on the historic restoration of the Old Red Courthouse in downtown Dallas.
Completed two projects for Southwestern Baptist Theological Seminary, leading to yet another project, a 252-unit student housing expansion.
Currently completing new 360,000-sf FAA Southwest Region Headquarters, Fort Worth, Texas.

EXTRACURRICULAR
Member, TEXO Chapter, Associated General Contractors.
Associate Constructor, American Institute of Constructors (2001-present).
Deacon, Walnut Ridge Baptist Church, Mansfield, Texas (2013);
Sunday school teacher, leader of Celebrate Recovery ministry.
Volunteer, A Carpenter’s Touch (ACT), doing small projects for widows, single mothers, and elderly in Mansfield; member, Texas Baptist Men Disaster Relief.
Pro bono work for Hearts and Hammers, restoring homes for low-income Dallas residents.
Secretary, Villages at Spring Lake Homeowner’s Association Board of Directors (2012-2014); led successful campaign to halt unwanted commercial development.

OFF THE CLOCK
Coaches 11-year-old daughter Bri-anne’s Little League team and Manhattan Construction softball team.
Passions: bird hunting, fishing, skiing, four-wheeling, snowmobiling, whitewater rafting (Estes Park, Colo., and Red River, N.M.)
Plays piano and saxophone; currently learning guitar.

SECRET LIFE
Paid for college working at a building materials supplier and erecting metal buildings.

At 25, as a Business Development Manager at KLH Engineers, quintupled revenue of Columbus office to nearly $1 million. Promoted to Senior Associate at 29. Handled mechanical engineering for one of the largest geothermal fields in central Ohio for Heapy Engineering shortly after graduating from OSU.

EXTRACURRICULAR
Vice President, Columbus chapter of ASHRAE. As Membership Chair, doubled chapter membership from 160 to >330 members. As Research Promotions Chair, his team exceeded its national fundraising goal.
Board of Directors, Communications Chair, Advancement Co-Chair, USGBC Central Ohio Chapter.
HVAC Advisor/Project Manager, OSU Solar Decathlon team.

OFF THE CLOCK
Organized a community soccer league.
Cycles 150 miles a week; has ridden the Pelotonia, a fundraiser for the James Cancer Hospital at Ohio State.
Loves hiking with his wife, Christin, and children: Bennett (14), Camden (12), Hayden (9), and Garrett (7).

SECRET LIFE
Invented rhythm instruments at age 6; built his own boat at age 8; started a business making musical-instrument accessories at age 12.
Finished high school in three years.
Grandmother survived the London blitz as a teenager.

www.BDCuniversity.com
Windy City Wonder

MICK METZGER

MICK METZGER, LEED AP
Project Director
Pepper Construction Co., Chicago

AGE: 39
BS, Purdue University

ACCOMPLISHMENTS
Supervises 10 project managers, performing $60-70 million of work a year.

EXTRACURRICULAR
Member, Executive Advisory Board, Purdue University Construction Management program. Teaches a seminar or participates in a roundtable every semester.

OFF THE CLOCK
Passions: golf, and taking daughters Mya (6) and Kayla (4) to swim and dance lessons.
Likes tooling around in his Harley Davidson Screamin’ Eagle Road King with his wife, Gina (who rides a Harley Dyna Glide).

SECRET LIFE
Won "Booklit" reading prize in elementary school (award: free meals at Pizza Hut).
Reads two hours of SF every night; loves The Horus Heresy series.

Architects’ Advocate

MELISSA R. DANIEL

MELISSA R. DANIEL, ASSOC. AIA, LEED GA, NOMA
Senior Designer
KCCT Architects, Washington, D.C.

AGE: 37
BA, University of the District of Columbia

ACCOMPLISHMENTS
Assists in design development, construction documentation, and coordination on government buildings, including U.S. Embassy compounds and diplomatic facilities worldwide. Named to 2014 Maryland’s Leading Women Under 40 by The Daily Record. Young Architect of the Year Recipient, District of Columbia Council of Engineering and Architectural Societies (2013); Emerging Architect Award, AIA | DC Chapter (2012).

EXTRACURRICULAR
Developed the Women in Architecture Series, which is offered during Women’s History Month. Historian/Treasurer, D.C. chapter of National Organization of Minority Architects. Steering Committee Member, She Should Run Front-runners (national organization dedicated to increasing the involvement of women in public leadership). Member, AIA Potomac Valley Chapter; Past Member, AIA | DC Emerging Architects Committee. Chair, Pipeline Committee, National AIA Diversity & Inclusion Council.

OFF THE CLOCK

SECRET LIFE
Her mother, Marilyn, was once photographed for a Washington Post story by Pulitzer Prize-winner Carol Guzy.

Dexterous Biz Builder

DANIEL J. FILER, PE
Vice President of Business Development
Ferrovia Agroman, US Corp., Austin, Texas

AGE: 38
BS, Louisiana Tech University
MS, Southern Methodist University

ACCOMPLISHMENTS
Responsible for strategic planning, identification of new business, deal assessment, and partnering for major infrastructure projects (>200 million): highways, airports, rail systems, and water treatment plants. Leads the firm’s business development in North American operations. Revenues for U.S. entity increased 300% from 2010 to 2014. Won the firm’s 2014 Innovation Award for creating a project and pipeline assessment tool that integrates the company’s business development efforts globally.

Served 11 years as reserve engineer officer with the Louisiana Army National Guard. Supervised heavy construction projects stateside and in hostile environments abroad, including Afghanistan (2003). Led team as Army National Guard officer in Louisiana Superdome in 2005 following Hurricane Katrina; later became a civilian consultant to FEMA. Licensed general contractor in California.

EXTRACURRICULAR
Member, American Road & Transportation Builders Association; Design Build Institute of America; International Bridge Tunnel and Turnpike Association; The Beavers; Austin Chamber of Commerce; American Society of Civil Engineers.

OFF THE CLOCK
Passions: golf, snow skiing, and cooking, especially jumbling up a jambalaya at an LSU tailgate party. Connoisseur of Reuben sandwiches. Favorite vacation spot: Santorini, Greece.

SECRET LIFE
Self-taught computer coder; wrote a video poker program using Excel. Can turn doorknobs with his feet.
Compelling Conversations.
Essential Resources.
Endless Inspiration.

Join the Designers Circle community for wood design and engineering solutions, continuing education credits, and project profiles at apawood.org/DesignersCircle-BDC
ELLEN MITCHELL KOZACK, AIA, LEED AP BD+C, NCARB
Vice President/Director of Sustainability
HKS, Dallas

AGE: 37
MArch, University of Texas at Arlington
BFA, University of Puget Sound

ACCOMPLISHMENTS
In seven years at HKS, has managed certification of >40 LEED projects worldwide, totaling $2.8 billion in construction, including 50 United Nations Plaza; JW Marriott Austin (Texas) Convention Center, Walter Reed National Military Medical Center, Bethesda, Md. Oversaw certification for Salt River Fields at Talking Stick, the Arizona Diamondbacks/Colorado Rockies LEED Gold spring training facility—the first such facility to be built on Native American tribal land. Leads six-person HKS Design-Green studio, which provides sustainability guidance and LEED administration for HKS projects. Emerging Leader Awards: AIA Dallas (2012), Design Futures Council (2013). Registered Architect in Texas.

EXTRACURRICULAR
Worked with a team of AIA Emerging Leaders to raise funds and build a playground for CityWalk at Akard, a rehabbed downtown office building providing repurposed housing for low-income Dallas residents. Founder/Director, Citizen HKS, a public-interest initiative that provides design services for underserved communities. First project (under construction): a maternity ward in Kachumbala, Uganda.

OFF THE CLOCK
New mom: daughter Elizabeth born last May. Loves to cook with her husband, Dave, but won’t turn down Asian barbecued pork bahn mi from Nammi, a favorite Dallas food truck.

SECRET LIFE
Tended bar in Tacoma, Wash., and Austin, Texas, for most of her 20s; specialty: her joltin’ Bloody Mary (secret: “lots of horseradish, olive juice, and lime”). Punk rock enthusiast in college (fave band: Bad Religion): fire-engine red hair, nearly 20 piercings (including eyebrow and tongue). Her great-great-uncle, Beauford of Texas to die in office (heart attack at age 56).

Dispute Resolver

JASON HART, Esq.
General Counsel
Vidaris, Inc., New York, N.Y.

AGE: 36
JD, Brooklyn Law School
BS, Babson College

ACCOMPLISHMENTS
Recently joined Vidaris, a building-envelope, sustainability, and code consultant, as General Counsel. Previously served as Construction Attorney with Peckar & Abramson (2011-2015), where he handled dispute avoidance, commercial litigation, and internal investigations. Involved in >$400 million worth of construction disputes on >100 cases. Started career as a project engineer for Lend Lease. Promoted to project manager within three years. Top project: the award-winning Hess Center for Science and Medicine, Icahn School of Medicine at Mount Sinai, New York, a 14-story, LEED Silver project. Selected by Thomson Reuters as a New York Metro Superlawyer Rising Star for construction litigation.

EXTRACURRICULAR
Member, Construction Committee, World Cares Center, a disaster recovery nonprofit organization. Founding Board Member, Stupid Cancer (formerly, Steps for Living). Member, Building Trades and Employers Association.

OFF THE CLOCK
Favorite vacations: Masai Mara, Kenya, and Bora Bora. Passions: scuba diving, running, splitting firewood, and keeping up with daughters Luna, Mila, and Ayla.

SECRET LIFE
Hart and his wife, Heather, won a Caribbean vacation on “The Newlywed Game.” Completed NYC marathon while working full time at Lend Lease and attending law school at night. Goalie, Babson College men’s varsity hockey team; played one season in the U.S. Hockey League. Father played clarinet and saxophone for the Metropolitan Opera; mother played classical music on Broadway and with her siblings in her native Colombia.
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LUCAS TRYGGESTAD, AIA, LEED AP
Associate Director, Studio Head and Senior Technical Architect
Skidmore, Owings & Merrill LLP
Chicago

AGE: 39
BArch, MArch, MSCEE, University of Illinois at Urbana-Champaign

ACCOMPLISHMENTS
Work spans five continents, ranging in scale from tall towers and entire city plans to small, regional bank prototypes.
Leader in High Performance Design, SOM’s integrated approach to planning, architecture, and engineering. Expert in design, testing, and refinement of high-performance curtain walls.
Representative projects: Trump International Hotel & Tower, Chicago (2.6 million-sf, 92-story mixed-use tower); OKO Tower, Moscow (4.6-million-sf mixed-use development); FBI Denver Field Office (190,000 sf); Manulife Financial Corp. Office Center, Washington, D.C. (1 million sf); Lakeside Master Plan, Chicago (redevelopment of 589-acre abandoned industrial site into mixed use); Canary Wharf, London (one of world’s largest master-planned developments).

EXTRACURRICULAR
Mentor/resource on SOM’s IDP/ARE Committee for 15 years, helping junior architects move through licensing process.
Active in Retrofit Chicago, which challenges building owners and managers to reduce energy consumption 20% by 2017.

Member, Chicago 2016 Next Generation Leadership Advisory Council.

OFF THE CLOCK
Passions: hiking, biking, fishing, canoeing, Jeeps, coaching Little League.
Manager, Hamlin Park Baseball Association and Welles Park Parent Association, nonprofit competitive leagues for boys and girls.

He and his wife, Heather, converted their >100-year-old duplex into a single-family for their growing household: six-year-old twins Maggie and Olivia and son Joseph (3).

SECRET LIFE
Triathlete.
His Cherry Valley (Ill.) Little League team made it to the Little League World Series tournament in 1986.

Mighty Mentor

BENJAMIN KASDAN, AIA, LEED AP, NCARB
Design Director/Senior Designer
KTGY Architecture + Planning, Irvine, Calif.

AGE: 35
BArch, California Polytechnic State University

ACCOMPLISHMENTS
Leads team of 15 designers on sustainably designed affordable housing, market-rate apartments and condominiums, townhomes, student housing, senior housing, and commercial buildings.
Representative projects: Diamond Apartments, Anaheim, Calif.; 2125 Franklin, Eugene, Ore. (735 beds for college students); West Covina (Calif.) Mixed Use (412 condos, 20,000 sf of retail); and Fairfax (Va.) Circle (407 residential units, 38,210 sf of retail, and 53,813-sf grocery store).
Licensed architect in California, the District of Columbia, and Oregon.

EXTRACURRICULAR
Design critic, Cal Poly San Luis Obispo and Orange Coast College.

Contributor, Builder News, Green Home Builder.
Chair, KTGY Licensure Committee.
Member, AIA California Council Academy of Emerging Professionals.
Regional Director (SoCal), AIA Young Architects Forum. Member, advisory council representing young architects on the AIA California Council Academy of Emerging Professionals.
Has held leadership positions with American Institute of Architecture Students at Cal Poly San Luis Obispo, AIA Orange County, AIA California Council, and AIA National.

OFF THE CLOCK
Passions: baseball, softball, and bass guitar.
He owns an Ernie Ball MusicMan Stingray five-string with HH pickups and a honeyburst finish.
Favorite dish: barbecue tri-tip sandwich from Firestone Grill, San Luis Obispo, Calif.

SECRET LIFE
Can draw a not-to-scale map of the United States from memory.
His grandfather was an aeronautical engineer who helped design the B-1 bomber and the Space Shuttle.
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for high-profile projects: New York–Presbyterian Hospital; White Plains Hospital modernization; and a pharmaceutical company complex in Tarrytown, N.Y. Has managed healthcare projects totaling >$1 billion and completed 1.8 million sf of new construction and renovation work. Has managed large mission-critical projects where he was responsible for MEP and infrastructure components for such clients as MasterCard Worldwide, Loews Corp., and Avon. Advocate for greater use of construction technology such as BIM, Latista, and Trimble; his ultimate goal: a zero-punch-list job.

EXTRACURRICULAR

Has volunteered with AmeriCares since high school, doing construction projects for financially strapped families. Traveled to Rwanda, Congo, and Burundi in support of World Relief over a six-year period. Helped build orphanages and worked with a microfinance planning group that provided start-up loans for micro-businesses. Member, American Society of Civil Engineers and Connecticut Building Congress.

OFF THE CLOCK

Loves long meals with friends and family at his 18-seat homemade dining-room table.

SECRET LIFE

Once played 126 holes of golf in a single weekend. Renovating his 300-year-old farmhouse in New Canaan, Conn., from framing, MEP rough-in, and tile work to making his own cabinets and furniture.

AGE: 34

ACCOMPLISHMENTS

Joined Gilbane in 2012. Leads a 48-member team supporting Gilbane’s healthcare business in New York City. Responsible

Verdant Engineer

BRIDGET S. HENK, PE, LEED AP BD+C, ENV SP
GRAEF, Milwaukee

AGE: 32

BS, University of Wisconsin–Milwaukee

ACCOMPLISHMENTS

Member, GRAEF Sustainability Committee; leader, Stormwater Group. Earned Envision Sustainability Professional credentials for green infrastructure; first to earn Envision Sustainability Trainer designation in Wisconsin.

Key projects: drainage analysis for the Lakefront Gateway and State Highway 165 Expansion; engineering for the Milwaukee Avenue Utility and Street Reconstruction, Wauwatosa, Wis.; Kinnickinnic River Restoration; Community Memorial Hospital Expansion, Menomonee Falls, Wis.

OFF THE CLOCK

Loves long meals with friends and family at his 18-seat homemade dining-room table.

SECRET LIFE

Once played 126 holes of golf in a single weekend. Renovating his 300-year-old farmhouse in New Canaan, Conn., from framing, MEP rough-in, and tile work to making his own cabinets and furniture.

AGE: 39

BS, Tennessee State University
MS, Southern Polytechnic State University

ACCOMPLISHMENTS

Has 19 years of construction experience. In five years at Choate, rose from Project Engineer to Assistant Project Manager to Project Manager. Representative projects (all at Hartsfield-Jackson Atlanta International Airport): Concourse B concessions and Delta South Terminal Lobby; AATC Fire Alarm/Fire Suppression/HVAC upgrade; Robert A. Dayton Detention Facility renovation; reconfiguration of TSA security lanes; addition of 11 advanced image technology/body imaging devices to security checkpoints. Completed master’s degree in construction management at night while working full time.

EXTRACURRICULAR

Proponent of careers in construction with children’s groups. Guest speaker at G.I.R.L.S. summer camp and local middle school career week; served on Architecture, Construction and Engineering Advisory Board at local charter school; volunteer and coordinator at Construction Education Foundation of Georgia Career Expo & Skills USA Competitions. Recipient, Georgia Black Contractors Association Award for women in construction (2011). Vice President, National Association of Women in Construction, Atlanta chapter. Received 2004 NAWIC Rookie of the Year award. Developed and chairs NAWIC Atlanta Building Design and

CAD Competition programs. Committee Chair, NAWIC Trades Women Outreach Program. Active in Delta Sigma Theta Sorority. Member, Toastmasters International. Education and safety volunteer, AGC Georgia branch. Mentor, ACE Atlanta. Volunteer, Atlanta Tool Bank.

OFF THE CLOCK

Plays saxophone and flute. She and her husband, Derrick, rescued a cocker spaniel six years ago. “Hogan [the dog] seems to be jealous of the baby that’s on the way.”

SECRET LIFE

Was the drum major in her high school band, in Huntsville, Ala.
LEEDing Man

BLAKE JACKSON, AIA, NCARB, LEED Faculty Associate/Sustainability Practice Leader

ACCOMPLISHMENTS
Sustainability Director for 70-person firm. Responsible for projects in healthcare, commercial, higher education, and science + technology sectors. Has worked on five Gold and two Silver LEED-certified projects that save 2.3 million gallons of water and $858,520 in energy per year.

EXTRACURRICULAR

OFF THE CLOCK
Has traveled to 34 U.S. states, two Canadian provinces, 22 countries, three continents. Passions: hiking, swimming, kayaking, distance running (completed the Silver Comet Half-Marathon, Mableton, Ga., in 1:29:45). Renewable-powered water-taxi system to serve Rhode Island won second place in Resilient Cities competition (2010); his indoor/outdoor urban farm staffed by local youth was a finalist in A Better World by Design (2013).

SECRET LIFE
Least favorite college class: building sciences. His band, Mark of the Least (he was the drummer), won a Battle of the Bands in Marietta, Ga., in 2004.

Healthcare Integrator

JULIE FRAZIER, AIA, ACHA, LEED AP BD+C
Senior Associate, Medical Planner Perkins+Will, Dallas

AGE: 36
BArch, University of Texas at Arlington

ACCOMPLISHMENTS
Responsible for planning and client-team integration of major hospital and clinic projects. Has placed >5,000 inpatient beds in service. Top projects: Everett Building and Cancer Center, OU Medical Center, Oklahoma City, Okla.; Baylor All Saints Center, Dallas; Medical Center of Aurora (Colo.); Good Samaritan Hospital, San Jose, Calif. International Health Project Award, International Academy for Health & Design; Outstanding Construction Award in Healthcare ($10-30 million) from AGC, Austin Chapter, for Reliant Austin (Texas) Rehabilitation Hospital.

EXTRACURRICULAR
Sustainability Co-Leader, P+W Texas Practice. Leads training for staff seeking LEED accreditation. Created Associate Development Series, which pairs associates with principals to present programs on leadership. Represented P+W in AIA Emerging Leaders Program (2014); provided design services to Bonton Farms, an urban farming organization in the poorest area of Dallas. Member, P+W Resiliency Task Force. ACE Mentor (2005-present); Habitat for Humanity (1995-present).

OFF THE CLOCK
Created Women in Leadership group (2014).

SECRET LIFE
Husband’s name is Buck; sons’ middle names are Bear and Colt. “Some call me the zookeeper.”
Virtuoso Engineer

CARL NEIMEYER, PE
Director of Operations
Sabree Inc., Columbia, Md.

AGE: 31
BS, Carnegie Mellon University

ACCOMPLISHMENTS
Joined Sabree, a small-business general contractor, in mid-2015. Previously, Construction Manager, Public Works Department, U.S. Naval Academy, Annapolis, Md. Provided supervisory construction oversight of $34.7 million annual capital improvements program executed by 14 part-time personnel. Significant project: $9 million renovation and modernization of the U.S. Naval Academy administration building, which entailed relocating the Academy superintendent — a three-star Admiral — and his entire staff, and meticulously restoring or recreating every historic detail. Navy career includes service as Ensign in elite Civil Engineer Corps. First assignment: managing $51.2 million in construction spread over 21 projects in Jacksonville, Fla. Did a 22-month tour with the Seabees at Naval Mobile Construction Battalion FIVE in Port Hueneme, Calif., that included two deployments in Afghanistan. Communications Officer and Assistant Training Officer for Pacific Fleet Naval Construction Force at Naval Construction Group ONE; supervised a staff of 120 civilians and military. Led the standup of new training department.

EXTRACURRICULAR
American Society of Refrigeration Air Conditioning Engineers; Society of American Military Engineers. Officer in Charge, Seabee Summer Engineering and Construction Camp. Chair of his church building committee. Sings in the choir.

OFF THE CLOCK
Passions: golf, roasting coffee, repairing cars, making craft cocktails.

SECRET LIFE
Formed Gregorian Chant Schola musical group, which he leads on Sundays at his church. Long-time organist. Got to know Monte Maxwell, the Naval Academy organist, while restoring the Academy’s admin building; now he gets to play the instrument (shown here) on a regular basis.

Healthcare Devotee

LUCAS M. KONGER
President
Vintage Archonics, Fort Wayne, Ind.

AGE: 32
BArch, University of Kentucky

ACCOMPLISHMENTS
Within two months of hire, managed a new catheterization lab installation at an existing hospital. Three months later, led team as Project Manager for a new $25 million replacement hospital in LaGrange, Ind. At 30, he became the youngest member of the executive team. Principal in charge of design for the firm’s healthcare business. Has grown market share by >30% in the last two years. In 2014, procured the largest single contract in the firm’s history ($55 million in construction).

Representative projects: Parkview Whitley Hospital, Columbia City, Ind. (110,000-sf replacement facility); Rochester (Ind.) Learning Center (LEED Silver).

Awards: Hagerman Group Designer of the Year (2014); Whitley County Heart of Gold Award (2010); International Masonry Institute design competition (first runner-up, 2004).

NCARB IDP mentor for graduate-level employees and interns.

Company liaison to Builder’s and Contractor’s Association.

Member, AIA/AAH Codes & Standards Committee.

EXTRACURRICULAR
Member, Parkview Whitley Foundation Board (2014–present). Has helped raise >$200,000 for the hospital foundation.

OFF THE CLOCK
Raises livestock and manages thoroughbred breeding and racing farm with his wife, Jennifer, and their three children: Olivia (6), Owen (4), and Addie (2). 4-H volunteer.

Committee member, Indiana Ducks Unlimited Sponsor Chapter. In 2014, the group raised enough money to save 155 acres of wetlands.

SECRET LIFE
Avid duck/turkey hunter, outdoorsman, conservationist; can shoot a bow with either hand.

Youth Booster

VIRGINIA E. MARQUARDT
Award-Winning PM

CJ HARVEY, LEED AP
Project Manager
Haselden Construction, Centennial, Colo.

AGE: 32
BS, Colorado State University
MBA, University of Colorado Denver

ACCOMPLISHMENTS
Major projects: the 725,000-sf University of Colorado Hospital Leprino Office Building, completed in <15 months during a brutal Denver winter; Steele Creek, a 446,000-sf luxury apartment tower in Denver's Cherry Creek neighborhood. University of Colorado Hospital Expansion project received the Haselden Excellence in Safety Award, the 2013 AGC Project of the Year for Construction Excellence, and the 2013 AGC ACE Award for Best Building Project Over $70 Million. Received Purpose Recognition & Achievement Award from his firm for managing the 188,000-sf, LEED Gold Frederick (Colo.) High School. Project Manager for the last three projects selected for the annual AGC/OSHA CHASE Partnership on-site qualifying inspection. Haselden achieved a top BLUE rating.

EXTRACURRICULAR
Mentor/sponsor, CM Cares, an exclusive class at Colorado State University for construction management students. Remodeled a home to make it ADA compliant for a paralyzed individual. Chair-elect (2016), AGC Colorado Future Leaders Steering Committee. Youngest member of AGC Colorado Board of Directors.

OFF THE CLOCK
Volunteers for community projects through his church. Passions: golf, softball, yard work. “I look forward to mowing the grass.” He and his wife, Christen, are parents of Braela (7), Stella (3), and Ryker (2).

SECRET LIFE
Originally from Odessa, the West Texas town of “Friday Night Lights” fame.

TROY OGDEN, CSP, CHST
Corporate Safety Director
Brasfield & Gorrie, Birmingham, Ala.

AGE: 38
BS/MS, Indiana University

ACCOMPLISHMENTS
Oversees team of 60 safety professionals working across 17 states and eight regional offices. Under his leadership, the company’s safety performance has experienced a >40% decline in Recordable Incident Rate, a nearly 75% reduction in Lost-Time Incident Rate, and a >25% decline in Experience Modification Rate. These efforts have cut the firm’s injury-related expenses in half. In 2014, ABC’s Alabama Chapter recognized his team with two Innovation Awards honoring recent safety initiatives, one for its crew work plan, another for its safety captain program. Currently leading company efforts to host safety summits for electrical subcontractors across the Southeast.

Representative projects: Grandview Medical Center, Birmingham, Ala. ($180 million); Orlando (Fla.) Veterans Affairs Medical Center Hospital ($321 million); South Wastewater Treatment Plant (Phase I-II), Baton Rouge, La. ($220 million).

EXTRACURRICULAR
Vice President, American Society of Safety Engineers, Alabama Chapter. Member, AGC; ABC Alabama; National Association of Safety Professionals; National Safety Council. Volunteer, Big Brothers Big Sisters, ACE Mentor program.

Actively involved in the firm’s charitable efforts, notably its annual BBQ Cook-Off for Charities, which has raised >$640,000 since 2007. Board of Trustees for his church.

OFF THE CLOCK
Tee ball coach. He and wife, Kara, have three children: Claire (7), Andrew (5), and Chloe (2). Passions: DIY home projects, running, hunting, fishing, golf.

SECRET LIFE
Closet chess nerd. Podcast junkie; favorites: Andy Stanley and Dave Ramsey.

Virginia E. Marquardt, AIA, LEED AP
Senior Associate
DLR Group, Santa Monica, Calif.

AGE: 39
BArch, Louisiana Tech University

ACCOMPLISHMENTS
Senior Associate, DLR K-12 Studio. Member, DLR Group K-12 Forum. Launched DLR Group’s Internship Development Program. Significant projects: Beverly Hills (Calif.) USD, Hawthorne School modernization (education planner); Manhattan Beach (Calif.) USD facilities master plan (PM); Kingman (Ariz.) USD (project architect, assist-
tant PM); Santa Cruz County Criminal Justice facilities, Nogales, Ariz.; County of Kings Superior Court, New Handbook (Calif.) Courthouse (detention project architect). Licensed architect in Arizona and California.

EXTRACURRICULAR
2015 National Chair, AIA Young Architects Forum. 2013 AIA National’s Young Architects Award; 2009 AIA Arizona Young Architects Citation Award; 2006 AIA/Western Mountain Region’s Jason Pettigrew Associate AIA Memorial Leadership Scholarship. Guest lecturer/design critic, Louisiana Tech architecture program. Member, AIA Education Committee (2010-present). Board of Directors, AIA/Phoenix Metro (2006-2011). Mentored English language learners students at Coronado High School, Scottsdale, Ariz. ACE Mentor program, Los Angeles.

OFF THE CLOCK
Favorite vacation spot: Washington, D.C. “The history of the city, and the planning and architecture, fascinate me.”

SECRET LIFE
Loves roller coasters; all-time favorite: the Texas Cyclone.
Sound Citizen

RANDY WALDECK, PE, LEED AP
Principal of Acoustics
CSDA Design Group, San Francisco

AGE: 37
BS, California Polytechnic State University

ACCOMPLISHMENTS
Became Principal and Owner of CSDA, a leading California acoustical design firm, at age 35. Expert in environmental, aviation, architectural, and mechanical equipment noise and vibration control. Has consulted on >500 transit and architectural projects. Manages $3 million in project work. Led the growth of the firm's acoustics market revenue by 400% from 2013 to 2014. Significant projects: Universal Studios Sound Monitoring Program; Silicon Valley BART Extension Noise Insulation Program; Ravenswood Family Health Center (serving low-income families in East Palo Alto, Calif.).

EXTRACURRICULAR
Project Manager for FAA-sponsored airport sound-insulation programs; working on a federal research project evaluating acoustical measurement methods. Member, Urban Land Institute; Acoustical Society of America; Institute of Noise Control Engineering. Helped form the Northern California San Francisco Bay Bridge Branch of USGBC. Member, American Association of Airport Executives planning committee; frequent speaker at AAAE annual conferences. Board Member, Real Estate & Construction Networking Group of San Francisco.

OFF THE CLOCK
Passion: fishing, beach days on the Pacific coast, national park visits, camping, hiking with his wife and son, Nicholas (3), and family bike rides through Sonoma's wine country or along the Crystal Springs Reservoir in San Mateo.

SECRET LIFE
Once taught welding at Cal Poly. Fluent in Spanish; taught ESL while studying in Spain. Raftered down Peru’s Urubamba River, then hiked up to Machu Picchu and Wayna Picchu (2001).

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Job Juggler

JOE JOUVENAL, LEED AP BD+C
Vice President of Operations
McCarthy Building Companies, Dallas

AGE: 39
BS, Virginia Polytechnic Institute and State University

ACCOMPLISHMENTS
Promoted five times since joining McCarthy in 1998. Oversees operations in healthcare and higher education sectors. Notable recent project: the $167 million Centers for Disease Control and Prevention Lab, Atlanta. Representative projects: Georgia State University-Parker H. Petit Science Center, Atlanta (370,000 sf); Georgia Institute of Technology Engineered Biosystems Building, Atlanta (223,000 sf); Midland (Texas) Memorial Hospital (316,513 sf); Fort Bliss Hospital Replacement, El Paso, Texas (1.2 million sf). Helped secure more than $700 million in new contracts in the DFW metroplex. Selected for McCarthy's year-long Advanced Leadership Program (limit: 20 employees).

EXTRACURRICULAR
Board Member, TEXO, the association representing the construction industry in North and East Texas. Member, TEXO Safety Initiative Committee and American Association for Laboratory Animal Science. Volunteer, Children’s Healthcare of Atlanta (built ramps for outpatient children's homes); Susan G. Komen Breast Cancer Foundation (2013-2015); painted classrooms at Mi Escuelita Preschool for at-risk children in Dallas. Participant, American Heart Association Heart Walk (2012); McCarthy team captain (2013).

OFF THE CLOCK
Passions: golf, skeet shooting, swimming, and watching cartoons with his sons, Ford (7) and Lawson (4). Favorite spot: Anguilla, where he and his wife, Maryanne, honeymooned.

SECRET LIFE
Excellent juggler.

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Barrier Breaker

ANN TRUAIR
MICHAEL J. KISCH, AIA, NCARB, LEED BD+C
Design Project Manager
University of Minnesota

AGE: 34
BSArch, MArch, MURP, Certificate of Metropolitan Design, University of Minnesota

ACCOMPLISHMENTS
Joined the University of Minnesota in June. Responsible for predesign and design execution of capital improvement projects across the five-campus UMN system. Associate, RSP Architects, Minneapolis (2007-2015). Focus on synthesis of design, planning, and development strategy for large-scale projects. Developed internal career development program for younger members of the firm.

Top RSP projects: Vetluga Fields Towers, Kuala Lumpur, Malaysia (two 60-story towers); Tianjin Wharf, Tianjin, China (pedestrian boardwalk/integral transit system); American Dream Meadowlands, East Rutherford, N.J. (repositioning of 4.8 million-sf retail/entertainment complex). Co-founder of "Here: The Journal of Design" while getting his MArch.

EXTRACURRICULAR
Board of Directors, AIA MN and AIA Minneapolis. Active in AIA MN Convention Program Committee, Evolving Practice Forum, Committee on Design, and Minnesota Design Team. Guest critic, UM College of Design; active in the college's mentorship program, career fair, and portfolio review. Advisory Board, UCLA MIN; Co-chair, ULI Urban Plan Program (2012-present); Young Leaders Group Executive Committee (2007-2008); Program and Education Committee; President, AIAA Minnesota (2001-2002).

OFF THE CLOCK
Chair, Brooklyn Park (Minn.) Citizen Long-Range Improvement Committee. Member, Community Advisory Committee, Bottineau Transitway (proposed light rail extension). Volunteer, Aeon, a nonprofit affordable housing developer in Minneapolis (2005-present); Junior Achievement USA (2001-present); The Minneapolis Foundation (2010-present); Search for Shelter (2002-2008); Habitat for Humanity. Passions: golf, fishing, weightlifting, softball, beach volleyball. He and wife, Kay, have a son, Chase (3).

SECRET LIFE
Played saxophone and tuba in his youth.

ANN TRUAIIR, LEED GA
Co-founder
Above Glass Ceilings, Dallas

AGE: 38
BS, University of Phoenix
MBA, Pepperdine University

ACCOMPLISHMENTS

Notable pursuits: Utah Data Center ($1.2 billion in construction); Carl R. Darnall Medical Center ($530 million in construction); California High Speed Rail ($17 million in design).

EXTRACURRICULAR
Participant, Leading Change Workshop, Executive Coaching Program, Servant Leadership Learning Community. Education Committee Member, Society for Marketing Professional Services. Actively involved with MicroMentor.org, a professional community that connects entrepreneurs with volunteer professional mentors.

OFF THE CLOCK
Volunteer, Valentines for Vets. Helped raise $30,000 in the last two years for the National Brain Tumor Society. Donated marketing/graphics design services for Children’s Medical Center Dallas golf fundraiser. Passions: hiking, swimming.

SECRET LIFE
Can solve Rubik’s Cube in two minutes flat. “I used to rock at old-school games like Age of Empires and Warcraft.”
Holistic Thinker

EVAN WERELEYCHIK, AIA, LEED AP, NCARB
Principal
Perkins Eastman, New York, N.Y.

AGE: 39
BArch, Syracuse University

ACCOMPLISHMENTS
Primary practice focus: healthcare architecture and laboratory facilities, with special interest in translational research facilities.
Believes in taking a holistic approach to his work—design, planning, materials, accounting, consultant trades, community impacts—"from the micro to the macro."
Notable projects: Feinstein Institute for Medical Research Laboratory Addition/North Shore—LIJ Health System, Manhasset, N.Y. (Best of 2008 Design Award from New York Construction); Winthrop-University Hospital Research and Academic Center, Mineola, N.Y. (95,000 sf).
Published articles on new design protocols for research, academic laboratory, and healthcare spaces.
IDP mentor to Perkins Eastman’s junior staff.

EXTRACURRICULAR
Active in local park district (in Westchester County, N.Y.), including hands-on maintenance of park and neighborhood resources.

OFF THE CLOCK
Passion: building and fixing things, whether it’s designing a new lamp or renovating his home for his family: wife Rosiceal and children Arjen (8) and Mateo (3).

SECRET LIFE
Can skate backwards down stairs; has skated the "Rocky" steps in Philadelphia and the Spanish Steps in Rome.

Mile-High Talent

LUCAS MALLORY
Manager of Special Projects
PCL Construction, Denver

AGE: 37
BSME, Colorado State University

ACCOMPLISHMENTS
Joined PCL in 2005 as Project Engineer. Rose to Denver District Preconstruction Manager, Business Development Manager, and now Special Projects Division Manager. In his first year in that role, he increased the division’s annual volume from $14 million to $37 million.
Representative projects: Ball Aerospace building expansion ($18 million); NIST Advanced Laboratory, Boulder, Colo. ($90 million program); Denver Public School Downtown Campus ($32 million); Denver Commuter Rail Maintenance Facility ($64 million).
Robert Stollery Construction Leadership Award (2009), given annually to only two out of more than 4,000 PCL employees.

EXTRACURRICULAR
Spotlighted in Top 25 Most Influential Young Professionals by ColoradoBiz. Participant, Leadership Denver program (2013). Board Member, Design Build Institute of America, Rocky Mountain Region; Mile High Youth Corps (2012-present). Member, NAIOEP Commercial Real Estate Development Association; Metro Denver Economic Development Corp.; UIU Colorado. Member of his church’s facilities committee.

OFF THE CLOCK
Passions: crossfit, and skiing with his wife, Johann, and their five children: Ben (11), Emerson (10), Henry (7), Charlie (5), and Bronwyn (3). Favorite vacation spot: family home on Magnetic Island, Queensland, Australia.

SECRET LIFE
Likes to zone out to Dubstep, Bob Dylan, or country music.
Philanthropic Powerhouse

EMILY BRIDGES
Marketing Director
Choate Construction Co., Atlanta

AGE: 30
BA, Clemson University

ACCOMPLISHMENTS
Joined Choate in 2009; promoted to Marketing Director in 2011. Revamped communications and quality across the firm’s five offices. Involved in procurement of several top Choate projects in 2014: Fiserv, the largest interior project in Atlanta in 2014, and The Inn at Palmetto Bluff Montage hotel, Condé Nast’s #1 U.S. Resort. Executed company’s 25th anniversary marketing campaign and company trip (400 staff and guests to Asheville, N.C.). Revamped Choate’s marketing materials and created a complete protocol of graphic standards. Implementing a consistent tenure-anniversary recognition system, corporate gym, and FUN committee program.

EXTRACURRICULAR
President-elect (2016), Real Estate Group of Atlanta; REGA Young Leader Representative (2011-2012); Mentorship Coordinator (overhauled mentorship program); Programs Chair (2013-2014: planned >20 events). Member, Programs Board, Society of Marketing Professional Services (2009-2011). Member (2013-present) and Treasurer-designate (2016), Clemson University’s Advancement Board for Real Estate Development.

OFF THE CLOCK
Board of Directors, Georgia Cystic Fibrosis Foundation (2010-present). Recipient, national Jena Award from CF Foundation for outstanding lifetime fundraising and volunteer efforts. Has helped Choate colleagues raise >$2 million toward CF research. Founded Cars & Q for the Cause, an annual fundraiser for CF research; raised $176,000 in 2015. Founding Board Member, Andee’s Army, a nonprofit supporting children and youth with brain injuries. Volunteer, Big Brothers Big Sisters (2007-present).

SECRET LIFE
Passions: Belgian beer, Pictionary (“I dominate!”), her ’69 Chevy Camaro.

FUN FACT
JARED KRIEGER’S great-grandfather was an ironworker on the Empire State Building.
SAM ALLEN’S grandmother survived the London blitz.
EMILY BRIDGES’ distant cousin: George S. Patton.
MICHAEL KISCH’S grandpa worked on the “Fargo” set.

Renaissance Guy

ANGUS LEARY
President/General Manager,
Northeast Region
Suffolk Construction Co., Boston

AGE: 39
BA, Amherst College

ACCOMPLISHMENTS
Started at Suffolk as an intern >20 years ago. He was discovered while in high school by company founder John Fish. Youngest president and GM in Suffolk’s history. Played a critical role in some of the largest, most complex projects in New England: Two Financial Center, Boston Opera House, Mandarin-Oriental Boston, and the recently completed Millennium Place, The Victor, and Logan International Airport ConRAC. Has served every key role on a project team—estimator, pre-construction manager, project engineer, superintendent, project manager, project executive, and vice president. Advocates for implementation of cutting-edge processes and technologies, such as Lean Construction and virtual design and construction, at Suffolk.

EXTRACURRICULAR
Board of Trustees, Chair of the Building/Facilities Master Plan Committee, Tabor Academy (his high school). Board Member, AGC Massachusetts. Board Member, Dover Sherborn Education Fund; helped raise more than $3.4 million to support four public schools in the district. Member, NAIOP | Commercial Real Estate Development Association. Works directly with Red & Blue Foundation, Suffolk’s charitable arm, and Scholar Athletes Program.

OFF THE CLOCK
Passions: high-end finish carpentry, restoring old cars, power lifting, raw oysters. He and wife, Shannon (“my high school sweetheart”), have two boys: Angus, Jr. (9), and Finnegan (6). Favorite vacation spot: Mattapoisett, Mass.

SECRET LIFE
One of 11 children. Four-year starter as a running back at Amherst; lost to his younger brother Conan’s Williams team in 1998. While in college, one of his weightlifting partners was future WWE wrestling champion John Cena.
Students’ Advocate

NICK SERFASS, AIA, CAE, LEED AP, PMP
Executive Director
American Institute of Architecture Students, Washington, D.C.

AGE: 36
BA, University of Virginia
MArch, University of Miami
MBA, Auburn University

ACCOMPLISHMENTS
Oversees operations of student organization averaging more than 6,000 active members. Plans and executes multiple conferences, notably AIAS FORUM and AIAS Grassroots Leadership Conference.
Previously, Assistant Director, Internship and Education at NCARB. He visited >70 schools of architecture and dozens of firms, explaining the licensure process and offering career perspective.
At NCARB, co-led a special project team that developed options to streamline and overhaul the Intern Development Program. Initiated and executed the Intern Think Tank, the first NCARB committee made up entirely of interns.

Former Project Architect for Baskervill, doing large-scale hospital campus projects. Led in-house mentoring group, which helped Baskervill earn the AIA/NCARB IDP Outstanding Firm Award (2007).
Earned architect’s license at age 27, less than two years after getting his MArch.
Licensed architect in Florida and Georgia.

EXTRACURRICULAR
Board of Directors, AIA Richmond; Program Advisory Group Member, Architecture Exchange East Conference, AIA Virginia (2008-2009).

OFF THE CLOCK
Has run four 100-mile ultramarathons; next: Hardrock 100, Silverton, Colo. (July).

SECRET LIFE
Commutes >100 miles each way, Richmond, Va., to D.C. “It affords me the opportunity to pursue spectacular jobs while maintaining an enjoyable lifestyle.” Favorite tune: anything by Pitbull, especially “Fireball.”

Galvanizing Force

JARED KRIEGER, AIA, LEED AP
BD+C, RA
Project Architect, Senior Associate
Gensler, Washington, D.C.

AGE: 33
BA, Drexel University

ACCOMPLISHMENTS
Has successfully led and delivered numerous BIM commercial design projects from concept through construction, notably Tysons Tower, Fairfax, Va. (22-story, 555,000-sf office building); Potomac Yard Center, Alexandria, Va. (1.5 million sf); student housing at George Mason University, Fairfax.
Led a team of >50 Genslites from 12 offices on the ultra-fast-track design/delivery of the 37,000-seat La Rinconada Baseball Stadium, Caracas, Venezuela.
Selected to participate in inaugural class (2011) of Gensler’s NextGen program, a leadership institute of 24 young professionals from around the firm.
Launched the Emerge program in Gensler’s Southeast region, to help emerging leaders develop outward-facing skills for building client relationships. Emerge is currently being rolled out globally across the firm.

EXTRACURRICULAR
Speaker, AIA National Convention (2013);
Member, AIA DC Mentoring panel (2012);
NCARB Intern Development Committee (2011-present) and NCARB Education Committee and Practice Analysis Task Force (2012-2013).
Volunteer, Georgetown Jingle (2010-present), which raises money for Georgetown University Hospital Pediatric Oncology program. Since 2010, the group has raised >$2 million.
Led a team of Gensler volunteers to redesign the schoolyard of a D.C. elementary school.

OFF THE CLOCK
Plays in a men’s ice hockey league twice a week.
Passions: running, skiing, home renovation.

SECRET LIFE
Captained the Drexel University club lacrosse team to two national Final Four appearances.
Sustainability Savant

RACHEL SOWARDS, LEED AP
EBO+M
Director
Paladino and Company, Rockville, Md.

AGE: 37
BA, University of Iowa

ACCOMPLISHMENTS
Named Director of Paladino's D.C. metro office in 2013, managing a staff of 12 consultants. Shifted the firm's focus from new construction to existing buildings, which shortened the sales cycle and doubled contract values from $4.8 million to $10.7 million. Increased rate of return customers from 25% to 80% and shattered monthly sales record. Implemented schedule-management system to track flow of >125 active projects. High-profile projects: World Trade Center Towers 1-4 and retail concourse, New York, N.Y.; FedEx Express World Headquarters, Memphis, Tenn.; Founders Square, Arlington, Va.; National Capital Region USGBC Chapter Project of the Year Award (2009) for AAAS Headquarters, her first LEED-EB-certified project.

EXTRACURRICULAR
Co-chair, USGBC National Capital Region Chapter Greenbuild 2015 Host City Committee.
Co-chair, USGBC National Capital Region Chapter (2010-2011).
Habitat for Humanity (2014).

OFF THE CLOCK
Enjoys a game of cribbage with her husband, David. Started singing opera at age 8; sang the role of Dido in "Dido and Aeneas" in high school. Favorite foods: Chiang Mai noodle soup and homemade green juice.

SECRET LIFE
Ran unsuccessfully for city council in Iowa City while in college. Maternal grandmother (now 93) was Mrs. U.S. Savings Bonds in 1964.

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Stephanie Guin, SPHR
The Guin Group
Overland Park, Kan.

AGE: 38
BS, William Jewell College
MBA, Rockhurst University

ACCOMPLISHMENTS
Founded Guin Group in 2015. Former EVP at Faith Technologies, Lenexa, Kan. Has >16 years' experience in human resources, mostly in the construction industry. At Faith Technologies, she oversaw the HR aspects of the integration of two companies with vastly different cultures. Redesigned the unified firm's People Business Unit to better serve 1,900 employees at 15 locations. Aligned Faith Technologies' human resource practices and procedures with corporate goals and objectives. Saved the company $2 million on its self-insured healthcare plan while meeting Affordable Care Act guidelines and increasing wellness outcomes. The firm recently won a Gold Award from the Wellness Council of America. Reduced Faith Technologies' unemployment insurance costs and claims by encouraging employees to take more overtime to smooth out constructionebb and flow. In one month, employees worked 37,000 more hours from prior year with only two more FTEs. Certified Myers Briggs Type Indicator professional.

EXTRACURRICULAR
Member, Argyle Executive Forum; American Society for Training and Development; National Association for Women in Construction; Society for Human Resources Management; Employment Practices Network; Volunteer, Junior Achievement.

OFF THE CLOCK
Member, Parent Advisory Council, Osteogenesis Imperfecta Foundation. Doctors encouraged her not to carry her baby to term, due to this rare genetic condition. Today, her daughter, Harper, is a thriving five-year-old.

SECRET LIFE
Distant cousin was "the coward Robert Ford," who shot Jesse James.

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PETER OUSLEY
Project Executive
Lend Lease, Chicago

AGE: 39
BA, North Park University
MA, Roosevelt University

ACCOMPLISHMENTS
Project Executive supporting public-sector work for Lend Lease's Chicago office and Great Lakes business unit. Provides construction management services for hundreds of properties in the Chicago Public School system. Former COO for Chicago Transit Authority, the nation's second-largest public transit system. Successfully executed revenue service during 2012 NATO conference in Chicago. Prior to CTA, served as Deputy Commissioner of the Department of Aviation and First Deputy Commissioner for the City of Chicago Department of Buildings. At the Chicago Buildings Department he implemented a program that enabled qualified, licensed professionals to self-certify building inspections; also wrote regulations that allowed an active construction site to be safely occupied for residential and commercial purposes while heavy construction was being performed.

EXTRACURRICULAR
Member, City Club of Chicago; BOMA; Mid-Day Club; Hispanic American Construction Industry Association; Beth Hillel Congregation B'nai Emunah.

OFF THE CLOCK
Volunteer youth coach in basketball and tennis. Passions: basketball, softball, gardening.

SECRET LIFE
He buys affordable clothes (shirts excepted) and has them tailored to fit like expensive clothing. Training for a 20K run. His father served on Air Force One during the Nixon Administration.

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Change Agent

USMAN TARIO, PE, LEED AP BD+C, CEM, PMP
Associate Managing Principal

AGE: 35
BSEE, Iowa State University
MEng (mechanical engineering), University of Maryland

ACCOMPLISHMENTS
Oversees design activities and operations for full-service A/E staff of 90. Also acts as M/E engineering principal on key projects.

Has >13 years of design and project management experience in healthcare, science and technology, and mission-critical work.

Conducted yearlong project management training program (2014), covering project cost accounting and finance, earned value analysis, and project scheduling.

Implemented change management initiative to switch to Web-based employee performance appraisal system.

Initiated standardization of project management practices. Created Excel dashboards to determine projected staff utilization and expected backlog.

As HDR’s Senior Electrical Engineer, led successful transition from AutoCAD to Revit MEP in the Alexandria office. Member, HDR Architectural Engineering Services Leadership, promoting engineering best practices across the firm.

Licensed in California, the District of Columbia, Florida, Maryland, and Virginia.

EXTRACURRICULAR
Relaxes by doing mindful meditation. Adjunct faculty, University of Maryland; teaches finance and project management cost accounting.

OFF THE CLOCK
Passions: travel; playing and watching cricket; museum hopping with his wife and three children.

SECRET LIFE
Learned English by watching movies as a teenager.

Cx Specialist Xtraordinaire

ANGELA TEMPLIN, PE, LEED AP BD+C, CPMP, CCP
Associate Commissioning Lead and Project Manager
Glumac, Seattle

AGE: 38
BS, University of Washington

ACCOMPLISHMENTS
Promoted to Associate and Commissioning Authority within 30 months of joining Glumac. Responsible for large infrastructure projects: $1 billion SR-99 Alaskan Way Viaduct tunnel replacement project and four multi-year contracts at Seattle-Tacoma International Airport. Manages >20 projects on a day-to-day basis.

EXTRACURRICULAR
Participated in Leukemia Lymphoma

Quick Study

BRIAN MCCARTHY
Project Executive
Swinerton Builders, San Diego

AGE: 39
BS, Colorado State University

ACCOMPLISHMENTS
Joined Swinerton as a Project Engineer three days after graduating from college.

Led remodel and expansion of Swinerton San Diego’s new LEED Platinum office. Transformed 24,000 sf of warehouse space into 10 office spaces and 22 workstations.

His team developed the GMP for the 224-unit Ariel Suites apartment building during preconstruction, saving millions for the privately funded project in downtown San Diego.

Top projects: Blue Sky, a 480-unit, two-phase, Type 1 apartment tower; Strata, a 256,000 sf, 22-story luxury apartment tower (LEED Silver) with the largest eco-roof in San Diego; Battle of Midway Theater, a 3D, 100-seat movie theater built on an aircraft carrier at the USS Midway Museum.

EXTRACURRICULAR
Serves on committee board, AGC San Diego. Volunteer, Habitat for Humanity; team leader and project manager for the annual Builders Blitz, which helped build two homes in two weeks’ time for needy families. Chair, San Diego Ronald McDonald House (2011-2015). Organizes annual golf tournament.

Has helped raise >$170,000 for the firm’s Swinerton Foundation, which benefits the American Heart Association and other charities.

Master of ceremonies at Swinerton’s 125th shareholders meeting (2014).

OFF THE CLOCK
Enjoys building and refinishing furniture. Recently built or refinished almost everything in his newborn son Dez’s room. He and wife, Ashley, also have a daughter, Sydney (5). Passion: Persian food.

SECRET LIFE
Drummer for more than 20 years; was in Caution Children and other San Diego bands in the 2000s.
**Multifaceted Designer**

**JILL M. DEICHMANN, AIA, NCARB**
Architectural Group Lead
Primera, Chicago

**AGE: 39**
MArch, Washington University in St. Louis
BA, University of Illinois at Chicago

**ACCOMPLISHMENTS**
Named lead architect at Primera three years after joining firm as drafter.
> 17 years' experience in architectural project design, preparation of construction documents, construction administration, building envelope commissioning, code consulting, and construction administration. Representative projects: Navy Pier and North Grant Park/Maggie Daley Park renovation, Chicago; Brookfield (Ill.) Zoo renovations; professional office building study for Rush University Medical Center, Chicago;

O'Hare International Airport modernization plan; Metropolitan Water Reclamation District of Chicago plant master plan; Chicago Housing Authority Emergency Command Center.

**EXTRACURRICULAR**
President-elect (2016), Board Member (2008-present), Rebuilding Together Metro Chicago; as House Captain (2002-present), leads repair efforts on homes in low-income neighborhoods.

Member, Architects/The Society of Hispanic Professional Architects (1994-present). Advisory Board Member, Triton College of Architecture (2005-present).

**OFF THE CLOCK**
Passions: scrapbooking, cooking, and photography. In 2014, she and her husband, Brant, visited eight national parks on a drive from Chicago to California; best memory: hiking Mirror Lake at Yosemite.

**SECRET LIFE**
Took industrial arts (in a class with all boys) in junior high school; designed a house.
Spent senior year of college at École Nationale Supérieure d'Architecture, Versailles. Studied in Buenos Aires while earning her master's degree. Won Design Thesis of the Year for her design of a children's rehabilitation institute in Baraboo, Wis.

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**Sports Venue Visionary**

**BRIAN MIRAKIAN**
Principal
Populous, Kansas City, Mo.

**AGE: 38**
BArch, Kansas State University

**ACCOMPLISHMENTS**
One of the youngest principals at Populous; 14 years' experience designing experiential spaces in world-class sports venues. Promoted three times in less than seven years. Leads Populous Activate, the firm's brand-activation group.

Has worked with >30 clients, including 17 NFL, MLB, NHL, NBA, and Olympic clients, and 12 collegiate clients. Helped bring in >$150 million in new work in the last three years.

Representative projects: Football Training Center at Texas A&M; interiors and hospitality for the new Las Vegas Arena; 500,000-sf Hy-Vee Hot Zone addition at new Arrowhead Stadium; brand activation for Beijing, London, and Sochi Olympic Games; brand activation designer for new Yankee Stadium.

**EXTRACURRICULAR**
Sport innovation jury member, Harvard Graduate School of Design; helped create new Populous internship program for Harvard design students. Chair, Society of Experiential Graphic Design, Kansas City chapter (2009).

**OFF THE CLOCK**
Volunteer, Big Brothers Big Sisters for >10 years. Mentored his Little Brother for eight years through high school graduation and college enrollment.
Volunteer, Boy Scouts of America for >20 years (he's an Eagle Scout). Troop leader, ACE Mentor program.

**SECRET LIFE**
Ran a 5K with his son, Dylan (7), last year. Classically trained pianist.
Passions: tennis, photography.
Radio show host and DJ in college ("Two turntables and a mic!").

Studied design in Tuscan hill town of Castiglione Fiorentino on college year abroad.
His grandfather, an officer in the 104th Infantry, escaped from a German prison camp in 1944.
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VR for all

HOW AEC TEAMS ARE BENEFITING FROM THE COMMERCIALIZATION OF VIRTUAL REALITY TOOLS

BY JEFF YODERS, CONTRIBUTING EDITOR

Back in 2009, BD+C wrote about HKS licensing Epic Games’ Unreal Engine to create a virtual reality environment that could show clients completely rendered views and game-day experiences at the newly christened Dallas Cowboys Stadium (now called AT&T Stadium).

Much has changed in the last six years in the virtual augmented reality world. A half-decade ago, VR was not a consumer product. Creating a VR experience required deep pockets and the help of specialized production companies, such as Epic Games, to build the models. Now, immersive 3D headsets such as Oculus’s Rift 3D are available to consumers for a few hundred bucks, and gaming engines like Unity are available for free, online.

AEC teams are using gaming engines to not just showcase their projects, but to immerse their clients, end users, and Building Team members in highly detailed, fully lit environments that simulate the final structure. VR has advanced from a novelty technology for basic walkthroughs to a true, proof-of-concept tool.

To get a sense of how AEC firms are using VR, let’s explore a couple of recent applications.

GAMING A HIGH-TECH LAB PROJECT

Located in Kendall Square, a biotech-oriented R&D business district in Cambridge, Mass., 75/125 Binney Street is a large-scale, high-tech laboratory project encompassing three buildings with a connecting atrium. Ariad Pharmaceuticals’ new corporate headquarters and lab complex is the anchor tenant.

The 382,000-sf business park was designed and built using a highly collaborative delivery approach. Construction manager Gilbane Building Co. and architect Payette co-located their teams—along with the project’s mechanical, electrical, plumbing, fire sprinkler, structural steel, and exterior skin trade contractors—to solve the many complex issues that arose during the project.

The five-story atrium posed a number of thorny problems. Designed to function as a vast pocket park in a beehive of activity between the adjacent buildings, the atrium is as much public art...
as it is connective event space, according to Payette. A dramatic three-story, steel- and-thermoformed-plastic spiral staircase is the centerpiece of the public space. It also features a series of structural “asparagus”—stainless steel mesh supports for artistic metal vines—throughout the glass-enclosed atrium.

Creating a physical mockup of the asparagus and the staircase in the space was impossible because, due to a tight construction schedule, the atrium was already filled with scaffolding to support work on other parts of the project.

“The architect was still working with the owner to develop the feel of the space while we were putting scaffolding up,” says John Myers, Senior Virtual Design and Construction Engineer at Gilbane. “We even had 3D sections as part of our drawing set, and it was still difficult for our stakeholders to look at those and understand how the space would be built and how it would feel when it was done.”

The Gilbane team questioned whether the space could physically accommodate all 12 of the asparagus structures called for in the original design.

Myers had purchased an Oculus Rift headset at the beginning of the project, and had used Unity on other projects. His team converted the project’s Revit model to a Unity model and showed the architects and owners what the space would look like with six asparagus configurations rather than 12.

“We said, as the CM, ‘Guys, this might get a little bit cluttered,’” says Myers. “By understanding the scale of the other atrium elements, using virtual reality, we argued for only six.”

The design further called for the bottom encasement of the staircase to be a linear wood soffit. The construction team believed the finish would have been cost-prohibitive, labor-intensive, and incredibly difficult to execute.

“The underside of the staircase was one big Unity item, and the structural asparagus were another one,” says Myers. “In both situations we were able to come to a resolution that was good for the owner, good for the architect, and good for Gilbane. If all you had was a 3D rendering to go on, you couldn’t understand that space.”

Converting the BIM model to the Unity environment was not easy, says Myers. In gaming engines, two triangles are created to represent every visible square. Every solid will have six times as many triangles, or polygons. This is why the early Dire Straits 3D video is so blocky: low polygon count in a pre-mesh era.

“You’re talking millions of triangles,” says Myers. “We tried to limit it to the areas that are necessary. The atrium came about as part of a change order. We had a $20 million change order, and it was done the right way.”

Since Gilbane’s work on 75/125 Binney Street, the firm has expanded its use of gaming engines to include Unreal Engine, Unity, and the Oculus Rift.

VIRTUAL REALITY AT THE VCU HEALTH SYSTEM

DPR Construction was confronted with an unusual set of circumstances on the renovation of the 85,000-sf Virginia Commonwealth University Health System’s main hospital, in Richmond, which is scheduled for completion in early 2018.
Finding building product information is even easier with the ARCAT app. Available for iOS and Android devices. Search ARCAT on the App Store℠, Google Play or Amazon for your free download.
The main floor of the hospital required 18 new operating rooms, an MRI suite, a pre- and post-operative care unit, an expanded waiting and reception area, and associated support spaces. The multi-phase project required the hospital to remain open during the renovation.

Space constraints in the jam-packed hospital precluded the use of physical mockups to show the planned changes to doctors, nurses, hospital administrators, and other stakeholders. Worse yet, there wasn’t ample room within walking distance of the campus or neighboring office buildings to set up a VR CAVE environment. The goal was to get as many end users through the BIM model as possible, but traveling off campus was not a realistic option.

After demoing the Oculus Rift early in the project, Michael Fievet, Senior Project Manager for owner’s representative JLL, suggested the team explore leveraging the technology to provide virtual mockups. “A big advantage [of the Oculus Rift] is its portability,” says Justin Schmidt, BIM Manager at DPR. “Using a setup that can fit inside a backpack, clients can see their work environment in a photorealistic world.”

The Building Team, including architect HKS, was quickly on board, and detailed virtual mockups were created. Using the Oculus Rift, the team was able to address common questions: Where is the light coming from? How will it impact the space? How much space will I have around me to do my work? Such information is difficult to convey with a typical BIM model scenario, even with CAVEs and fly-throughs in translators such as Navisworks.

Ultimately, the project team was able to walk nearly 40 hospital employees through the mockup, while spending a fraction of the project’s original mockup budget.

DPR’s Schmidt says the move from BIM to VR raises a number of problematic issues for Building Teams. “Currently, our BIM models are not constructed to be optimized in a virtual reality environment,” he says. “The more you model, the slower your computer performs.”

The solution, says Schmidt, requires a combination of remodeling certain components while using texture maps to convey details that do not need to be modeled. Since DPR’s use of VR on the VCU hospital project, there have been a number of hardware and software improvements that make the technology more accessible to AEC teams. These include software that directly interfaces with Revit to simplify the conversion process, says Schmidt. “Two years ago, it was a manual process: export from Revit to 3ds Max, optimize, bring it into Unity, add special plug-ins to make it work, and then take it to Oculus,” he says. “Now it’s almost as easy as pressing a button, thanks to software automating those processes.”
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what went wrong?

DIAGNOSING BUILDING ENVELOPE DISTRESS

BY JOHN J. HOFFMANN, FAIA,
AND DEBORAH J. COSTANTINI, AIA
HOFFMANN ARCHITECTS

With so many diverse components contributing to building envelope assemblies, it can be challenging to determine which of these myriad elements was the likely cause of a failure. Even seasoned building owners, managers, and facility professionals may find themselves faced with a confounding problem at the building exterior. These needn’t be catastrophic to be vexing, although sometimes, what began as a small, persistent issue can turn the corner suddenly to become a major fiasco.

Without proper diagnosis, building envelope problems are unlikely to go away. More often than not, superficial repairs actually make the situation worse, usually by trapping water or introducing materials incompatible with the existing construction. In the forensic examples that follow, we explore some of the varied causes of distress and failure in façades, plazas and building entrances, parking structures, and roofs, and look at the systematic, if sometimes complex, process of uncovering—and resolving—the source of the problem.

CASE STUDY #1: THE MASONRY MYSTERY

When our design professionals first visited the building pictured in Fig. 1, they found loose brick and mortar below the windows, failed sealant at jams, aluminum sills bent upward at the front edge (Fig. 1a), and, most notably, significant gaps between the head of the window frame and the opening (Fig. 1b). Concerned that the windows may have fallen into their openings, the project team conducted a follow-up window investigation to find out what had gone wrong.

If the windows were indeed dropping into the wall, we would have expected to see loose, missing, or failed fasteners when we removed windows for testing. We saw none. Moreover, the window manufacturer confirmed that nothing was amiss with the attachment method or installation, both of which followed standard details.

What we found is that rather than the windows falling into the wall, the opposite was true: the wall was moving upward around the windows.

Building materials expand and contract at different rates. Brick expands over time; concrete shrinks. In this typical cavity wall construction, the brick masonry is only a one-brick-thick veneer. Behind the wall material, a layer of expanded polystyrene acts as thermal insulation. When the masonry begins to expand, it pulls upward away from the window. This movement was enough to stretch the sealant at the jamb, causing the sills to bend upward at the front edge.

John J. Hoffmann, FAIA, is President of Hoffmann Architects (www.hoffarch.com), an architecture and engineering firm specializing in the rehabilitation of building exteriors. A nationally recognized expert on the building envelope, he advocates for design detailing to improve construction outcomes. Deborah J. Costantini, AIA, Senior Architect, has extensive experience in the diagnosis and resolution of building exterior distress.

LEARNING OBJECTIVES

After reading this article, you should be able to:

+ APPLY lessons learned from examples of building envelope failures to the correct diagnosis and repair of deterioration, distress, and hazardous conditions at façades, roofs, plazas/terraces, and parking structures.
+ EVALUATE signs of distress and failure to look beyond obvious conditions and uncover underlying sources of the problem, in order to develop remedial recommendations that resolve the problem for the long term.
+ COMPARE observed problems in similar construction types to contrast probable causes and identify the effects of different design flaws and construction errors.
+ ANALYZE catastrophic failure situations, including roof blow-off and façade detachment, to develop appropriate solutions and prevent the same type of problem from occurring in buildings of comparable construction and vintage.
it, an open cavity space allows for drainage, along with insulation and an air/vapor barrier. On the other side of this cavity is concrete masonry back-up, which provides the structure of the wall; unlike historic structures, which use solid brick masonry construction, newer buildings use brick only at the wall surface.

When combining multiple building materials in a single assembly, the design and construction must accommodate for their sometimes contradictory properties and behaviors. In response to moisture and humidity, brick expands slowly over time. The most common way to deal with this tendency is to place shelf or relieving angles at regular intervals along the height of the wall, with expansion joints beneath. By separating the brick masonry into regular segments and allowing those segments room to expand, these joints prevent cracking and failures.

Unfortunately, this building was designed without relieving angles or horizontal expansion joints. Although there are other ways to accommodate movement, these are limited to low-rise buildings, and no such provisions were made here. As a result, the cumulative expansion of all of the brick masonry over the entire four-story building led to substantial differential movement, particularly at the top floor, where the brick had expanded so much that the window sills were now sloped inward, toward the window, allowing water to collect along the frame (Fig. 1a).

With the window units anchored to the concrete back-up (which shrinks over time as it dries out), and no provision for the expansion of the face brick, the window units remained in place while the brick veneer grew, making it appear at first glance that the windows were sinking. Only through a comprehensive masonry and window investigation could the real problem be uncovered.

In the next example (Fig. 2), relieving angles were present, but here we found displaced and spalled brick courses immediately above and below the relieving angle. Why?

A test probe into the distressed brick revealed asphaltic sheet flashing that was lapped but not sealed, which allowed water to travel between the overlapping layers. The flashing also had deteriorated and was no longer providing much protection. As water migrated through the porous brick and lingered in the deteriorating flashing, it led to corrosion of the steel relieving angle. As steel corrodes, it expands, placing outward pressure on the surrounding brick and leading to cracks and spalls.

Someone with a caulk gun had sealed up the open joint at the relieving angle. Unfortunately, this joint was open for a reason: the porous mortar above the relieving angle was there to allow any moisture inside the wall to discharge. Once this escape route was covered over with impervious sealant, water collected inside the cavity wall.

As the outside temperature rose and fell, trapped water underwent successive freeze/thaw cycles. These changes in temperature and pressure forced off pieces of the outer surface of the brick, and led to the displacement visible in Fig. 2a, in which the face brick is nearly detached from the façade. As deterioration worsened, the maintenance staff reapplied sealant to the mortar joint in and around the spalled brick, inadvertently making the problem worse (Fig. 2b).

CASE STUDY #2: THE EERIE ENIGMA OF THE PLAZA/TERRACE

From the outside, the main entrance ramp and plaza (Fig. 3a) looked great: the plaza surface was clean and even, with no heaved pavers or uneven joints. Visitors to the building would have no idea of the horrors within: the spaces one and two levels below the ramp were so riddled with water damage that they became virtually unusable (Fig. 3b and 3c). What was going on?

The corroded steel beam in Fig. 3b sits directly under an expansion joint in the plaza, where the main entrance ramp meets a level
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surface; Fig. 3a shows this expansion joint from above, with the ramp extending upward to the left of the joint. Notice that the trench drain, at the right (red arrow), is downhill from the expansion joint (black arrow). Every time it rains, water runs down the ramp toward the bottom, where it meets the open expansion joint and travels into the occupied space below. With the only drain situated downhill from the expansion joint, much of the water has already found its way into the building before it ever gets there.

The lesson: problems due to faulty waterproofing and drainage design don’t always show up on the surface. The pristine surface of this plaza belies the extensive deterioration below, where water infiltration has led to corrosion, disintegration of fireproofing materials, efflorescence, staining, and severe water damage to finished spaces. That’s why it’s so important to properly investigate the source of leaks, and to address the underlying problem.

CASE STUDY #3:
THE PERPLEXING PUZZLE OF THE PRECAST PARKING GARAGE

Precast, prestressed concrete double-tee construction has become one of the most common ways to build parking garages. Although factory fabrication of the precast members affords improved concrete quality control, the weak point for these garages tends to be the hundreds of steel connections that hold together the prefabricated units. Welded in the field, these connections tend to be the first point of failure, and when they fail, they tend to break not one by one, but catastrophically, in quick succession.

The garage pictured in Fig. 4 is a typical four-level freestanding parking structure constructed of precast concrete units in a double-tee (TT) configuration. The distinctive star-shaped pattern of corrosion and spalling in Fig. 4b occurred at regular intervals along many of the connections between precast members (Fig. 4a). With steel reinforcing present throughout the concrete deck, why was corrosion concentrated at these locations?

An investigation into the garage conditions, including test probes at areas of corrosion and spalling, provided some answers. As moisture penetrated through failed sealant joints at the double-tee connections, it encountered the embedded steel elements that connect one flange to the next. In addition to weld defects that ranged from poor configuration to faulty execution, the garage was constructed with mild carbon steel connections, rather than stainless steel. Despite a coat of anti-rust paint, the connections at this thinnest part of the concrete flange succumbed to corrosion, which extended outward from the welded plate, along the embedded structural steel.

Of greater concern, the fractured welds, combined with the missing concrete and loss of embedment area at the beam flanges, meant that the connection capacity at many of the intersections between precast units was significantly compromised. Although the distinctive reddish-brown rust stains and chipped concrete were obvious indicators of a maintenance problem, they don’t immediately reveal the serious nature of the damage from a structural standpoint.

Previously, a misguided repair attempt applied patching material to the surface (Fig. 4b). Not only were these patches performed poorly, with insufficient surface preparation, they failed to address the source—and ramifications—of the failure.

Precast garages often have some cast-in-place elements, and the way in which these different types of concrete interact can impact the longevity of the garage, particularly at parking surfaces. In Fig. 5, portions of a tri-level precast garage became quite an eyesore—and a hazard to pedestrians—when crumbling concrete led to uneven surfaces. In some locations scaling was so severe that all that remained of the cast-in-place topping was loose aggregate and sand.

Even where the washes—humped concrete areas designed to promote drainage—had been replaced, signs of distress had already recurred, including spalls and cracks. During the condition assessment, we found that the concrete was unusually soft and porous, offering little resistance to chipping.

The freeze/thaw cycling typical of winters in the northern U.S. can pose problems for even the best designed and constructed parking garages, as these open structures are exposed to temperature fluctuations inside and out. As water absorbed by the concrete freezes and expands, it imparts great internal pressures. Repeated cycles of freezing and thawing can weaken the cement matrix and lead to deterioration. To mitigate this condition, concrete manufacturers incorporate microscopic air pockets through a process known as air entrainment, which allows water to expand as it freezes without...
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In this case, however, petrographic testing revealed that air entrainment of the cast-in-place concrete at curbs and washes was insufficient. As freezing moisture in the concrete expanded, it had nowhere to go, so it pressed outward, leading to cracks, spalls, and near total disintegration of the parking deck surface. Previous repair efforts temporarily improved concrete integrity, but even in these new areas, cracks had been left unaddressed, indicating that these locations, too, would likely deteriorate unless the poorly prepared concrete was completely replaced.

**CASE STUDY #4: THE RIDDLE OF THE RUNAWAY ROOF**

In October 2012, during Hurricane Sandy, a catastrophic roof failure occurred at a suburban data center (Fig. 6). Situated on a ridge overlooking a river, the facility’s relatively open terrain left it exposed to the full force of the high storm winds. Although the roof structure and membrane assembly were designed to withstand even the intense wind pressures of a hurricane, the roof succumbed to the storm, the membrane lifting and the insulation becoming displaced below. We were charged with answering two questions: Was this failure due to insufficient design, faulty construction, or both? And how might the damage be repaired, with an eye to preventing similar incidents in future storms?

The first step was to perform calculations for the original assembly, to determine whether the design had been adequate to handle the intense wind load. Reviewing the original drawings, our design professionals determined that the structural roof deck was designed not only to meet the building code in effect at the time of construction, but to withstand loads that were even greater than those mandated by code.

The roofing assembly, composed of an ethylene propylene diene terpolymer (EPDM) membrane adhered to polyisocyanurate insulation board, also met accepted standards for wind uplift. Our research found that both the roofing assembly and the proprietary metal fascia at the roof edge exceeded even the most restrictive building code requirements set by the state. Beyond the mandates of the code, additional wind analysis based on wind speeds of up to 145 mph found that the roof design should have been sufficient to withstand the wind load.

The project team then looked to workmanship and detailing of the roof installation. Field investigation revealed several factors at play; one was that insulation boards could be easily lifted from the roof deck, and were not fully adhered. In some cases, asphalt adhesive coverage below the boards was a scant 25%. Many of the boards were “cupped,” or warped, which contributed to the poor adhesion. The temperature of the asphalt at the time of installation may also have been a factor.

At the roof edge, the EPDM membrane had been cut off at the top of the parapet, rather than extending over and down the outboard face of the blocking (Fig. 6b). In addition, wood blocking in the areas of failure was of insufficient depth to engage the fasteners. Compounding this lack of securement were voids beneath the edge metal where it extended over split-face concrete masonry units. These openings, along with the disengaged fasteners, allowed positive pressures to penetrate the underside of the edge metal.

Large voids in the concrete roof deck and faulty cricket construction that allowed moist air to accumulate under the membrane also contributed to the roof blow-off. Although any one of these conditions might have caused the problem, the likely source was some combination of all of them. Despite the sound design of the structural deck and roofing assembly, a host of preventable errors during construction led to complete failure of the roof during the storm.

In a similar case, a residential building on a college campus experienced severe ice dams at the roof, leading to leaks at both above-grade levels and the basement ceiling (Fig. 7). During a very cold winter, some ice damming might be expected on older structures, but this was practically new construction. Clearly, more than just bad weather was to blame.

Our investigation uncovered several problems. Unbalanced ridge and soffit venting, combined with thermal penetrations in the attic insulation, allowed warm air to collect at the underside of the eaves, warming the roofing materials sufficiently to melt the snow. Once this snowmelt reached the gutter and drip edge, it re-froze (Fig. 7a). Over time, this repeated thawing and freezing created an accumulation of
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were the absence of an anneal slip, used to prevent galvanic action
connections, which was consistent with fastener loosening.
The investigation, we found enlarged holes on some outrigger clip
uncommon, even when some type of lock-washer was used. During
but in buildings of this vintage, nuts and bolts working loose was not
Newer curtain wall buildings use locking nuts to counteract vibration,
of bolts and clips to secure the framing to the building structure.
The curtain wall system, constructed in 1962, employed a series
manufacturer to complete the picture of the probable cause of fail-
damaged material, our forensic team interviewed the curtain wall
ice damming could have been prevented. As it is, the college will
critically, the intersections between various roof and wall areas, the
ice at the gutter, which allowed water to back up under the roofing
shingles and penetrate to the building interior (Fig. 7b).
Based on notes made on the original drawings, we surmised that the ice and water
barrier failed to meet code requirements, and was insufficient to the demands of
the climate. Given its complexity, most of the roof should have been protected with an ice and water barrier beneath the roofing shingles; according to the drawings, only a small portion actually was safe-guarded.
The original drawings also differed substantially from as-built conditions. By not accurately reflecting the existing roof framing or attic floor, the drawings did not provide sufficient guidance for the installers for ice and water barrier terminations, particularly where roof and wall areas intersect.
The lesson: coordinated drawings are critical to avoiding deficiencies in construction. Had the drawings adequately accounted for roof ventilation, attic insulation, ice and water barrier installation, and, critically, the intersections between various roof and wall areas, the ice damming could have been prevented. As it is, the college will need to disrupt accommodations at its residential facility and devote time and money to reconstructing a roof that is only a few years old.

CASE STUDY #5:
THE CURTAIN WALL CONUNDRUM
Winter weather was also the catalyst for building envelope failure at a very different type of building in a very different type of setting: a glazed curtain wall in the middle of Manhattan (Fig. 8). During a blizzard, a portion of the louver and frame system detached and fell from the building (Fig. 8a and 8b), landing on a roof setback (Fig. 8c), as well as on the roof of an adjacent building and the street below. Fortunately, no one was injured.

After reviewing existing documents and examining fallen and damaged material, our forensic team interviewed the curtain wall manufacturer to complete the picture of the probable cause of failure. The curtain wall system, constructed in 1962, employed a series of bolts and clips to secure the framing to the building structure. Newer curtain wall buildings use locking nuts to counteract vibration, but in buildings of this vintage, nuts and bolts working loose was not uncommon, even when some type of lock-washer was used. During the investigation, we found enlarged holes on some outrigger clip connections, which was consistent with fastener loosening.
Other construction defects that likely contributed to the failure were the absence of an anneal slip, used to prevent galvanic action between dissimilar metals, between steel and aluminum outriggers, as well as failure to weld mullion splice sleeves. The expansion joint in the area of failure was only about a quarter inch wide, yet calculations and manufacturer data predicted an estimated three-quarters to one inch of expansion over the 20-foot aluminum mullion.

Although weather conditions at the time of failure were harsh, they shouldn’t have caused a failure of this magnitude. Instead, a combination of factors, ranging from design errors to construction omissions to limitations in the curtain wall securement system of the time, came together to pose a life-threatening situation. Something as small as a failure to properly account for the material properties of an assembly—in this case, expansion, galvanic action, and seismic forces—can lead to calamity.

THE ONGOING SEARCH FOR SOLUTIONS
With so many components working together to create a weather-resistant, thermally insulating enclosure, compromising just one component can have a disastrous effect on the entire system. Where more than one flaw exists, the probability of failure is compounded.

For historic structures, including Modern-era buildings of the mid-twentieth century, time and exposure can aggravate flaws inherent to the original design or fabrication, increasing the risk of building envelope distress. Older buildings demand diligent maintenance and prompt, appropriate repairs to keep problems at bay.

But beware: newer buildings often fare no better than older structures. Even high-end construction can fall prey to oversights in design or craftsmanship that stem from lack of communication among trades, inexperience with emerging technologies and new building systems, or a failure to account for intersections between building elements.

Although the ideal situation would be to anticipate and prevent building envelope problems before they occur, building exterior distress is often inevitable. The next best thing to “build it right the first time” is “fix it right the first time.” With the correct diagnosis, you’re well on your way to a solution to your building system problem.

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Now in its fifth year, Building Design+Construction’s Under 40 Leadership Summit brings together more than 100 young AEC stars, including current and past BD+C 40 Under 40 winners, for leadership training, professional development, and networking. Here are 10 reasons you (or your staff) need to be there!

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BY DAVID BARISTA, EDITORIAL DIRECTOR

WALGREENS’ FLAGSHIP IN HONOLULU HARKENS BACK TO FISHING CULTURE
When planning its 15th flagship store, located at the corner of one of Honolulu’s busiest intersections, Walgreens envisioned a store that would be sensitive to the host culture and conveyed a sense of place. This area was once wetlands where fishermen and canoe builders toiled. Architects Hawaii Ltd., the project’s lead design firm, suggested that the store resemble a canoe “hale,” or house where the ships were built. The ground floor of the two-story, 35,576-sf building reflects the colors and wave patterns of the ocean, and the ceiling pattern depicts a modern interpretation of fishing nets. Also on the Building Team: Allison-Ide Structural Engineers (SE), Inatsuka Engineering (M/P engineer), Moss Engineering (EE), Hida Okamoto (CE), Monaghan Landscape Architect, and DCK Pacific Construction (GC).

SOLAR ENERGY RESEARCH CENTER OPENS AT LAWRENCE BERKELEY LAB
A Building Team led by design architect SmithGroupJJR and GC McCarthy Building Companies has completed construction on the new Solar Energy Research Center for the Lawrence Berkeley National Laboratory. The three-story, 40,000-sf facility will provide the USDOE lab with laboratories, offices, and interactive spaces devoted to researching and developing transportation fuels from sunlight using nano-scale photovoltaic and electrochemical solar energy systems. Specialized spaces include enhanced floor slab design to reduce any potential vibrations, ensuring precision with research measurement; large reconfigurable lab space that can be easily adapted to evolving science and technology; and dedicated synthetic spaces with high quality filtration fume hoods. The building, dubbed Chu Hall, is on target for LEED Gold certification.
3 HISTORIC POWER PLANT CONVERTED TO MODERN OFFICES IN MINNESOTA
When the Straight River flooded in 2010, 12 feet of water stood in the basement of the Owatonna, Minn., power plant, rendering its generators inoperable. The city of 24,000, located 65 miles south of Minneapolis, commissioned a Building Team led by Leo A Daly to save the landmark structure. The team’s solution: transform the brick Italianate building into the new headquarters of Owatonna Public Utilities. Using the interior steel structure as scaffolding, Leo A Daly laid out a program of atrium spaces and floating offices that cantilever over the ground floor in inventive ways. The total effect is a series of distinct but connected spaces, all flooded by daylight through the building’s monumental windows. In order to prevent future flood damage, flood doors were installed in a conditioned space below the flood line.

4 SWEEPING BROADCAST STUDIO SERVES AS NEW FACE OF SAN ANTONIO TV STATION
After 57 years of continuous operation out of a studio building on the northern edge of downtown San Antonio, KSAT-TV management felt the station needed more space and a stronger presence in the market. Architect LPA Inc. and design-builder Bartlett Cocke General Contractors answered with a plan that involved demolishing the existing newsroom and sales office spaces, renovating the existing studio and support spaces, building a 16,000-sf, two-story building in the existing parking lot, and constructing a new parking lot. The building’s sweeping form and stone-and-metal exterior are meant to engage the neighborhood while meeting the station’s security requirements. “Our goal was to create an energetic, cool, hip, industrial chic workplace,” said Phil Lane, VP and GM of KSAT-TV.
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STANFORD UNIVERSITY’S NEW ENERGY SYSTEM USES WASTE HEAT AND LETS THE WEATHER AND GRID ELECTRICITY PRICES DICTATE USAGE

Johnson Controls developed a central energy facility for Stanford University that will cut the school’s water use by 15% and save it $420 million in operational costs. With heat recovery chillers and hot/cold water thermal energy storage, the plant is 70% more efficient than the cogeneration process Stanford has used since 1987. The York heat-recovery chillers will meet 90% of the heat demands by re-using two-thirds of the waste heat generated by the campus cooling system. Johnson Controls made the Enterprise Optimization System, a software application that optimizes cost and energy use based on upcoming weather forecasts and grid electricity prices.

Johnson Controls
CIRCLE NO. 803 ON READER SERVICE CARD

SOUND PANELS CUT DOWN THE NOISE IN CALIFORNIA NEIGHBORHOOD

Last year, a pump and variable frequency drive motor were installed on a groundwater well in the Three Valleys Municipal Water District in Claremont, Calif. When nearby residents became irritated by the noisy motor, the municipality decided to install Acoustiblok’s All Weather Sound Panels (AWSPs). The sound-absorbing panels have a Sound Transmission Class of 29 and can block low frequency sounds from 100 Hz on down. The result: the noise was reduced from a reading of 89 dB next to the pump to 65 dB behind the panels. The AWSPs are durable and can withstand extreme indoor and outdoor conditions, including the fierce Santa Ana winds.

Acoustiblok
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MIST-BASED DUCT SEALING SLASHES LEAKAGE BY 95% ON DUBAI PROJECT

Two overlapping towers in the Buildings by Daman development in Dubai—a 20-story office/hotel and a 65-floor luxury apartment/hotel—had the same issue: leakage in their massive duct systems lessened HVAC performance and energy efficiency. Duct-sealing experts Firestop Middle East applied Aeroseal to seal the ducts, reducing the air leakage by 95%. Before Aeroseal, the buildings had, on average, 1,000 CFM of leakage per duct; after, just 50 CFM. The non-toxic aerosol mist was applied to 19 ducts over a two-week period.

Aeroseal
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HEATING AND COOLING SYSTEM PRESERVES HOTEL’S HISTORIC LOOK

In May 2015, Hampton by Hilton took over the former Chicago Motor Club, a 17-story Art Deco building that had been unoccupied for more than a decade. The developers needed to update the heating and cooling system without disrupting the building’s architecture. State Mechanical Services, the project’s mechanical contractor, chose air conditioning from LG Electronics, namely the Multi V IV Heat Recovery system, Art Cool Mirror indoor units (pictured), and the AC Smart IV central controller. The Multi V IV’s compressors operate in temperatures as low as -13 F, so heating will not be affected by the city’s frigid winters. The Art Cool Mirror duct-free, wall-mounted, single-zone systems provide heating and cooling to each room, and run as quietly as 23 dB. The AC Smart IV has an Internet-connected 10.2-inch LCD screen to make monitoring the HVAC system simpler.

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PRODUCT solutions

BY MICHAEL CHAMERNIK, ASSOCIATE EDITOR

WATER BOTTLE FILLING STATION GETS EFFICIENCY UPGRADES

Elkay updated its popular ezH2O bottle filling stations with features that save energy and simplify maintenance. A new programmable setting allows facility managers to power down the refrigeration portion of the unit during off-peak hours; the water is dispensed, but without refrigeration. The manufacturer also eliminated several steps from the filter-changing process, thus speeding change-outs by about 15 minutes. Stations will also have self-diagnostic features built in, where sensors can detect if a unit needs service and flash a message on the screen.

Elkay
CIRCLE NO. 812 ON READER SERVICE CARD

UNITIZED CURTAIN WALL OFFERS DESIGN OPTIONS, FASTER ASSEMBLY SPEEDS

Kawneer’s new unitized curtain wall, the 2500 UT Unitwall System, delivers solid thermal performance regardless of climate or location. The high-performance system works well for office buildings and other mid- to high-rise projects. Its one-piece polyamide thermal break reduces fabrication and assembly times by eliminating the need for pressure plates and fasteners. Stacked joints within the system account for building movement, while two-piece verticals allow for a continuous snap engagement, maximizing strength. Its 2½-inch profile and flexible options—from four-sided captured exterior covers to structural silicone glazed (SSG) configurations—present a wide range of design opportunities.

Kawneer
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TIN PANELS CREATE ‘WOW’ CEILINGS WITHOUT NOISE ISSUES

Acoustical Performance Panels from American Tin Ceilings can improve a room’s ambiance by reducing echo and noise pollution while providing the warm, traditional aesthetic of a tin ceiling. The micro-perforated panels, which are available in more than 35 modern and classic patterns in some 50 colors, can work well in bars, restaurants, and other high-traffic spaces. The panels’ 0.7mm micro-perforations allow sound to pass through, where it’s absorbed by a fiberglass pad (85% of sound striking the ceiling is absorbed). The panels come in a 2x2-foot drop-in format and are stamped to fit a 15/16-inch grid.

American Tin Ceilings
CIRCLE NO. 810 ON READER SERVICE CARD
The lighting marketplace is changing more rapidly today than any time in the last 100 years. Much of this change revolves around the innovations that are occurring with LED and solid-state lighting technologies. And the unique characteristics of these technologies are opening up opportunities for designing lighting systems that are more comfortable and more effective for aging eyes. LED and solid-state lighting also enable lighting systems that are healthier and more conducive to positive effects on human behavior. In this free one-hour session, we will discuss these technological changes and analyze applications where LED and solid-state lighting can provide more effective and more comfortable human environments.

WEDNESDAY, OCTOBER 14 • 2 P.M. ET

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ACCREDITATION:

AIA/CES LU (HSW) 1.0 Learning Unit
NKBA 0.1 CEU (self-reporting)
IDCEC (IIDA/ASID/IDC/IDS) 0.1 CEU
NARI 0.1 CEU

SPEAKER  Joseph A. Rey-Barreau, AIA, IES

Joseph A. Rey Barreau, AIA, IES, has worked as the principal lighting designer and/or architect on more than 1,000 residential or commercial projects. He is an Associate Professor with tenure at the University of Kentucky College of Design. He has developed hundreds of lighting education courses and has presented more than 500 continuing education programs.
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