

LICENSED ARCHITECT

A Publication of the Association of Licensed Architects

Winter 2018



Association of
Licensed Architects

2018 ALA Design Awards

Architectural Outlook for 2019

O Romeo, Romeo!
Accessibility Requirements for Balconies

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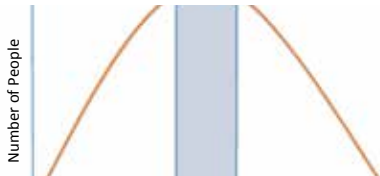
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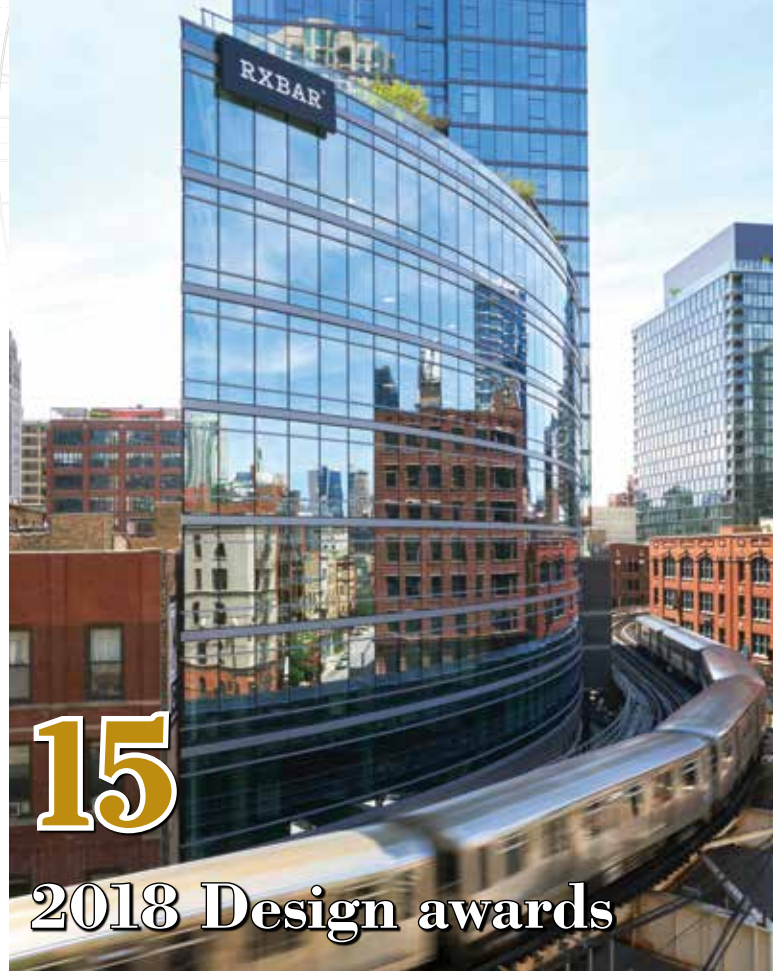
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Congratulations, happy holidays, and a happy New Year to all! Congratulations on the 20th anniversary of ALA's Midwest Architecture Conference. This last ALA conference (in October) was ALA's 20th and our most successful! This year's show was extremely well received, as has become the norm thanks to the hard work of Executive Director Joanne Sullivan and the entire ALA staff. The seminars were on-topic, highly interesting, and useful to everyday practice. Our Keynote speaker John Cuningham was outstanding! Truly one of our best speakers. Thank you to all our members, exhibitors, sponsors, and attendees for making this happen time and again!

This issue of Licensed Architect is filled cover-to-cover with useful, practical information. Sustainable Design, one of our industry's most discussed topics, is the focus of this issue. Additionally, this issue includes an Economic Outlook for 2019 by Lou Weinzalbaum of MB Financial. The 2018 ALA Design Award Winners are showcased in this issue as well.

Congratulations to all the winners of the 2018 ALA Design Awards! Of course, our regular features including insurance, legal issues, firm management, ADA, and second chances are included as well.

I would like to welcome Andrew Pattison and A to B Publishing as our new publishing company for Licensed Architect magazine. This is our maiden issue of Licensed Architect with our new publisher and we are excited for what the future holds. Welcome aboard Andrew!

Last, but certainly not least, have you renewed your membership investment in the Association of Licensed Architects? If you have not, please do so right away. You can mail in your renewal or go online and renew at ALAToday.org. ALA is an investment in your career and the profession that pays dividends in so many ways. Thank you for your continued membership, and I look forward to seeing you at an upcoming ALA event.

The Chapter & National Board of Directors and the entire ALA Staff wish everyone happy holidays and a safe, prosperous New Year! 

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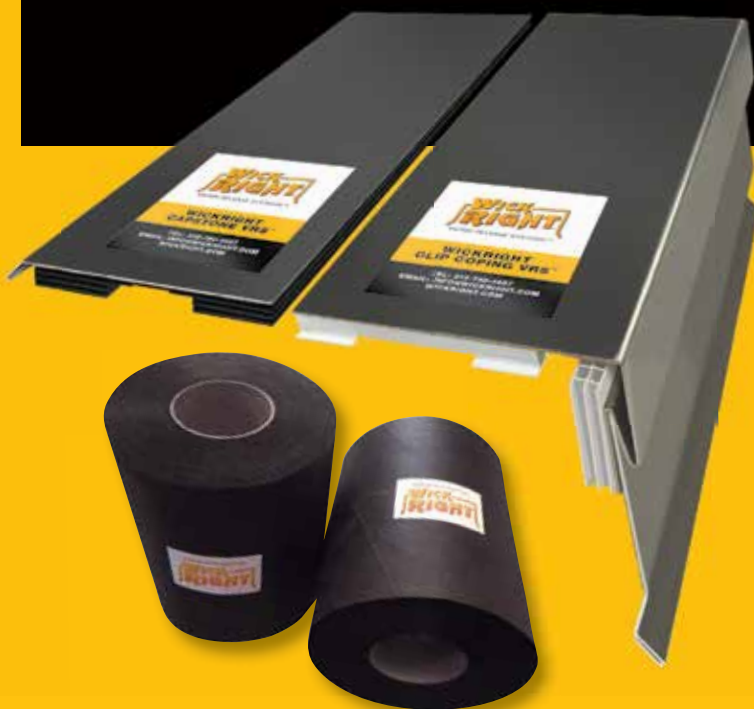
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Correction:

The Continuing Education article “2018 International Energy Conservation Code: A Preview” in the Fall issue was written by Christopher Chwedyk, Director – The Code Group, Burnham Nationwide, Inc.



Architectural Outlook for 2019

BY: LOU WEINZELBAUM, MB FINANCIAL BANK GROUP PRESIDENT, PROFESSIONAL SERVICES

From drones to interactive wall paint, technology is transforming the architecture, engineering and construction (AEC) industry – bringing new efficiencies and cost savings, as well as altering the landscape of residential design. As we look ahead to 2019, let's take a closer look at how these trends are impacting the sector.

Drones are changing how AEC professionals design and operate

Drone usage in both architectural and construction firms is on the upswing. According to a 2016 Goldman Sachs report, businesses and civil governments expect to spend \$13 billion on drones between now and 2020. Because of their ease in accessing difficult-to-reach places,

drones have proven to be a useful tool in architectural surveying, providing a new way for architects and clients to visualize how the finished product will look in the landscape. Mapping, which used to take a month or more, can now be done in minutes, making projects more efficient and accurate. According to weblog ArchDaily, data collected by drones can completely eliminate the need for hiring land

surveyors to do topographic surveys. Instead, architects can use this information to build precise 3D models of the landscape and site and import them directly into drafting and modeling software. For construction firms, drones offer a bird's-eye view of job sites, helping them to monitor the sites, report progress and conduct safety inspections, while providing real-time information that allows



companies to troubleshoot issues. While drones have not yet been used to build actual buildings, some experimentation has already taken place. In 2012, Swiss architecture firm Gramazio Kohler Architects, roboticist Raffaello D'Andrea, and ETH Zurich came together to program a fleet of drones to lift and stack thousands of polystyrene bricks at the FRAC Centre in Orléans, France.

One obstacle to drone use in the AEC industry has been government regulation. However, a collaboration between the Federal Aviation Administration (FAA) and a private industry called Low Altitude Authorization and Notification Capability (LAANC) has been beta-testing throughout 2018. A milestone in the development of commercial drone applications, LAANC directly supports the integration of drones into the airspace. With LAANC, commercial drone operators who have a Part 107 license will be able to get FAA approval for their flights in near real-time – in essence, opening 99 percent of the national airspace for drone business.

Smart homes are on the rise

Consumer acceptance of smart homes – those that use control and automation of lighting, heating, ventilation, air conditioning, security, home appliances and

communications – is on the rise. According to Statista, revenue in the smart home market is expected to show a Compound Annual Growth Rate (CAGR) between 2018 and 2022 of about 16 percent, resulting in a market volume of \$37,262m by 2022. The smart home influence allows architects more flexibility to incorporate transformative housing features. Architecture, Art and Design reports that since smart homes are based on wireless infrastructures, architects are adapting by reducing the visibility of outlets and switches, making their designs less dependent on wiring restrictions. Rather than one room being the focal point, the ability for home features to be controlled from any location with mobile devices also allows architects to make spaces more open and accessible, providing more room-to-room integration. New developments continue to expand the smart home space and its implications for the AEC industry. For example, researchers from Carnegie Mellon University (CMU) and Disney are using conductive paint to transform walls into smart surfaces that can sense human touch, detect gestures and detect when appliances are used. Using the paint and an electromagnetic sensor, users will be able to adjust room brightness or track use of electric appliances, changing any room into an interactive space. According

to CMU assistant professor Chris Harrison, “As the Internet of things and ubiquitous computing become reality, it is tempting to think that walls can become active parts of our living and work environments.”

Forecast for 2019

The American Institute of Architects (AIA) predicts that nonresidential construction spending will continue to grow in 2019. Their forecasts have been marked up to a 4.7 percent growth in spending for this year and an additional 4.0 percent in 2019. According to AIA's chief economist, Kermit Baker, “if these projections materialize, by the end of next year the industry will have seen nine years of consecutive growth, and total spending on nonresidential buildings will be 5 percent greater – ignoring inflationary adjustments – than the last market peak of 2008.”

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O Romeo, Romeo! Accessibility Requirements for Balconies

BY: KIMBERLY PAARLBERG, RA, SENIOR ARCHITECT, ICC

Let's consider famous balcony scenes and the important parts they play in stories. Who hasn't seen the famous balcony scene in Shakespeare's *Romeo and Juliet*? Cyrano and Christian under Roxane's balcony in *Cyrano de Bergerac*? Aladdin taking Jasmin from her balcony for a magic carpet ride, or Alan and Denny drinking scotch and smoking cigars on the balcony at the end of *Boston Legal*?



Romeo (Nate Santana) and Juliet (Emma Ladji) in the Chicago Shakespeare in the Parks production of Shakespeare's timeless classic Romeo and Juliet, adapted and directed by Marti Lyons.

Now, how would those balconies have changed if they were required to be accessible? Balconies available for employees or in public spaces are required to be accessible the same as any other room or space (IBC 1104.3). Balconies that may lead to the primary entrances of accessible Type A or Type B units must meet all the same accessible route requirements as shared or public spaces (IBC 1107.3, 1107.4). However, there are some allowances

for private balconies provided for accessible units, Type A units and Type B units. Hotels and apartments often have private balconies.

Let's first discuss balconies within accessible units or Type A units. Accessible units and Type A units both require a turning space within each room (ICC 1002.3.2, 1003.3.2). Balconies are not considered a room, so a turning space



Figure 1 – Example of balcony with no maneuvering clearance on the outside.




Figure 2 – Example of Juliet Balcony.

is not required on the balcony. Doors to the balconies can be side-swinging or sliding doors. Whichever type is chosen, the clear opening width must be 32" minimum (IBC 1010.1.1, ICC 404.2.2, 1002.5, 1003.5). Maneuvering clearance is required on both side of the doors (ICC 404.2.3.2, 404.2.3.3); however, there is an allowance to skip the maneuvering clearance on the outside if the balcony is not large enough to provide that maneuvering clearance (ICC 1002.5, Exp. 6, 1003.5, Exp. 6).

In other words, the balconies for accessible units or Type A units are not required to be enlarged to provide either a turning space or maneuvering clearances. They can stay the same size as the balconies provided in other units in the building (see Figure 1). Balconies can be sloped to drain (IBC 1010.1.5, ICC 404.2.3.1). If a side-swinging door is chosen for access to the balcony, the bottom 10" shall be smooth so someone can use their footplates to push open the door and slide through (ICC 404.2.9). The difference between the inside floor surface and the outside floor surface can be 1/2" maximum (IBC 1010.1.5, Exp. 4). The maximum threshold on top of the inside floor surface is 1/2" for swinging doors, and 3/4" for sliding doors (IBC 1010.1.7, ICC 404.2.4, 1002.5, 1003.5). This change in elevation shall be beveled (ICC 303).

Whichever hardware is chosen, its shape must be easy to grasp with one hand without tight grasping, pinching or twisting the wrist to operate (IBC 1010.9.1, ICC 404.2.6). On an exterior swinging door, that is probably going to be level hardware. Any locks would also be required to be within 34" and 48" above the floor (IBC 1010.1.9.2, ICC 404.2.6). This is not intended to prohibit paddle-type "thumb turns" that allow someone to use the side of their hand or knuckle to operate. Exterior doors do not have a requirement for an opening force (ICC 404.2.8).

In a Type B unit, a turning space is not required anywhere within the unit, and doors within the unit are not required to have maneuvering clearances. The balconies can be any size. The minimum clear width of the door is 31 3/4" instead of 32" (IBC 1010.1.1 Exp. 8, ICC 1004.5.2). The difference in elevation between the inside and outside floor surface is 4 inches maximum (IBC 1010.1.5 Exp. 5, ICC 1004.4.2, Exception). The maximum threshold allowances are the same as the accessible and Type A units (ICC 1004.5.2.2). Within Type B units, there are no requirements for type-of-door hardware. The door hardware and locks must be within 34" and 48" above the floor (IBC 1010.1.9.2).

Now back to the "Romeo and Juliet" balcony where we started. A "Juliet balcony" is an architectural term to describe a false balcony or railing at the outer plane of a window reaching to the floor and having, when the window is open, the appearance of a balcony. If a designer chooses to provide a Juliet balcony, the doors are not intended for user passage, and all the requirements we just covered go away (see Figure 2). 

This article originally appeared in the August 2017 issue of the Building Safety Journal Online, copyright International Code Council, and is reprinted with permission.



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Millennials and Seniors Want Us to Stop Ticking Sustainability Boxes



Greater Atlanta Christian School Before Renovations (Photo credit: Steve Gardiner)

BY: JULIE PITHERS, DIRTTBAG, DIRTTBAG ENVIRONMENTAL SOLUTIONS

With better technology, building green starts on the inside – where the people are. As Vince Lombardi said, “if you’re not keeping score, you’re practicing.” So, if you’re an owner building green, it helps to have a reputable score card. Then you wonder if it’s worth the time and expense of chasing certification compared to the other sustainable things you could do with the money. But without a LEED plaque on the wall, will your employees or tenants believe you did what you said?

The most widely used green building rating system in the world, LEED, was introduced twenty years ago. Rather than continuing to grow, the number of LEED projects going through with certification has plateaued. Getting LEED is no longer newsworthy, and

many employees are more vested in their day-to-day than big-picture environmental sustainability. The great exception is attracting and retaining young employees or tenants. They demand proof you care about them personally and the planet generally.

LEED is one scorecard among many. Other certification systems may reflect your goals more precisely and at less cost. Things like Green Globes®, the web-enabled tool from the Green Building Initiative, or the Centers for Disease Control and Prevention’s fitwel™. They’re

considered “business-friendly” compared to LEED, though less well-known.

All certification is a placebo if everyone isn’t onboard early. The best place to start is an early examination of the values of the people who will inhabit the finished project. Like everything, it’s what’s and who’s inside that counts.

Jerry Yudelson – author of *Reinventing Green Building* – says we need go all the way back and retool architectural school to get it right. “Architectural students aren’t given any psychology courses or input from health professionals or social scientists,” says Yudelson. “When they join a firm they wonder why people aren’t happy and don’t operate the buildings the way they designed them.”

Since the insides are really where the action is, should we work harder to keep existing buildings working? Many believe the greenest building is one you don’t build. “There are a lot of bad buildings out there,” argues Yudelson. “Most buildings



Greater Atlanta Christian School After Renovations (Photo credit: Steve Gardiner)

aren’t classics, especially those thrown up in the mid-to-late 20th century.” He notes the costly labor of love modernizing the Empire State building isn’t likely to be undertaken for a cheaply made box with lousy windows, bad materials, and no human-centered design. His research

indicates the cost to refurbish these are not worth it if you’re just worried about embodied energy.

Some studies, however, show it can take up to 80 years for the embodied energy of a building to equal the operational energy. But it’s hard to measure. The U.S. Department of Energy notes, “Due to the complexity of calculations and the wide range of production methods, transportation distances and other variables for some building products, exact figures for embodied energy vary from study to study.”

But maybe none of that matters. New technology could make all existing buildings – glorious, ugly, and in between – more viable and desirable to keep around. “Whether we’re talking conservation or design,” agrees Yudelson, “less is more.”

Recently the Greater Atlanta Christian School faced a \$20 million bill to tear down a 1980s cinderblock building to create a proper performing arts facility on their campus. They envisioned an Oxford university feel. Time, disruption, safety issues, cost of demolition, and rebuilding, all made



Hudson River Healthcare During Renovations (Photo Credit: Steve Gardiner)

Sustainability

the school leaders look for a way to avoid tearing down and building new.

Brett Harte is the project manager for the school. He knew the existing building couldn't physically support the heavy timbers of old England. "Our initial design was using light-gauge metal studs. Framing and wrapping them with a material that looked like wood."

The project team recently finished renovating the school's interiors using a digital construction company. Everyone was interested when they heard the company was launching a timber division.

Data-rich virtual reality is used to design and manufacture the timber and walls. "It's all fabricated off-site," explains Harte. "Everything is cut and dovetailed in together so it all fits [...] the performing arts center now looks like it's been there for 200 years [...] and could be here for 200 years more," says Harte. The final cost was 20% of what it would cost to tear down and rebuild.

The healthcare industry faces the biggest real estate dilemma. Aging seniors are about to overwhelm available medical facilities. Transwestern, the largest dedicated healthcare real estate firm in the U.S., estimates the population of people aged 65+ in the U.S. will reach 56 million by 2020, comprising 17% of the nation's total population.



Hudson River Healthcare After Renovations (Photo Credit: Steve Gardiner)


Historically, this is a demographic requiring more healthcare services than any other age group.

According to Transwestern's study, *Medical Office Space Gets Tight*, the demand could range from 150.5 million square-feet to 225.8 million square-feet by next year. Meanwhile, as of the second quarter of this year, only 110 million square-feet are available in existing and under-construction buildings in the U.S. Since digital construction translates designs into virtual reality and manufacturing data, it allows for the speed and clean construction of prefab while building mass-custom components. This makes updating old buildings feasible.

Hudson River Healthcare (HRH) in Poughkeepsie, NY is an example of a healthcare group in need of space and facing few building options. The

only building available to them was a longshot. "It was a former IBM punch-card sorting plant, and had all the amenities one could expect from that," explained Benjamin Boltin, the VP for Planning and Sustainability at HRH.

After considering digital construction as their solution, HRH took the old IBM plant down to the shell. "We brought this custom yet manufactured system into the process and we ended up with what's considered the jewel of the HRH system."

Whether it is apps gamifying personal carbon footprints, or software minimizing the use of materials and real estate, technology and early design thinking will lead to the creation of truly green buildings that go far beyond ticking boxes. 



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2018

ALA Design Awards



wenty-five projects were recognized by our judges in the 2018 ALA Design Award Program for their outstanding achievements as a Gold Medal, Silver Medal, or Award of Merit. Leroy Herbst, FALA, of L. B. Herbst & Assoc., chaired the judging with Matthew Kramer, ALA of Matthew Kramer Architects. In addition to the jury's selections, there were two winners of the President's Award of Recognition selected by the ALA President. The top honor, the Don Erickson Presidential Award, was announced at the conclusion of the dinner.

ALA wishes to thank the following judges for their time and dedication to the program and profession:

Michael Flynn, ALA, AIA, NCARB, Vice President of Byce & Associates, Kalamazoo, MI.

Todd Halamka, AIA, LEED AP, Founding Principal of Todd Halamka + Partners, Chicago, IL.

Kristin Jones, Ph.D., R.A., Founder of Studio Integra Ltd., Oak Park, IL and adjunct professor at Illinois Institute of Technology.

Elizabeth McNicholas, ALA, AIA, LEED AP, Co-Founder and Principal at MGLM Architects, Chicago, IL

Jeffrey Roberts, ALA, NCARB, Founding Principal at New World Design, Chicago, IL.

The awards dinner was held at Drury Lane in Oakbrook Terrace, IL on October 1st where

Howard Hirsch, ALA, AIA, LEED AP, Chairman of the Committee, welcomed over 110

attendees. Our emcee **Anthony Costello, FAIA**, *Irving Distinguished Professor Emeritus of Architecture*, gave a lively and insightful presentation of the awards. To conclude the evening,

ALA President Jeff Budgell, FALA, LEED AP announced the top honor, the **Don Erickson Presidential Award**, to 412 N. Wells, Chicago by Hirsch MPG, LLC.

All boards were on display during the cocktail reception showcasing the talent and diversity of our members. Congratulations to all the winners and to those who submitted their projects.

Don Erickson Presidential Award - 412 N. Wells



412 N. Wells Chicago, IL

Category: Commercial

Designer/s: Hirsch MPG LLC -
Andrew Myren and David Genc

Owner: Hubbard Street Group and
Centrum Real Estate and Development

Contractor: Linn Mathes Inc.

Photographer: Mike Schwartz,
Hirsch MPG LLG

Add'l Designers: Harkens Interiors

Organization: Hirsch MPG, LLC

Description: Defined by the curve of the "L" tracks which extend over the site, this 9-story office building creates a symbiotic relationship between building and tracks. Its curved reflective glass façade reflecting both the neighborhood and the trains rumbling by, while establishing a new landscaped and illuminated pedestrian path directly below.



Gold Awards



Asplundh Cancer Pavilion Willow Grove, PA

Category: Institutional

Designer/s: Saul Jabbawy

Owner: Abington -
Jefferson Health

Contractor: L. F. Driscoll

Photographer: Barry Halkin,
Halkin/Mason Photography, LLC

Organization: EwingCole

Description: The design of the new Asplundh Cancer Pavilion was driven by "healing within the natural environment" and created an opportunity to treat cancer recovery as a holistic process rather than the usual approach of addressing it as a medical problem only.

Christian Dior Chicago, IL

Category: Commercial

Designer/s: Christian Dior
and Myefski Architects

Owner: Christian Dior

Contractor: Crane
Construction Co.

Photographer: Also Sperber

Organization: Myefski
Architects, Inc.

Description: This iconic couture fashion house sought a 6,759 sf space in Chicago's Gold Coast neighborhood to serve as their flagship boutique. Myefski Architects served as Executive Architect working in collaboration with the Christian Dior Architecture Department.



Silver Awards



3Eleven Tower Chicago, IL

Category: Interior Architecture

Designer/s: JGMA

Owner: The John Buck Company

Contractor: Power Construction

Developer: The John Buck Company

Photographer: James Steinkamp

Photography + JGMA

Organization: JGMA

Description: 3Eleven Tower's interior architecture was designed in tandem with the branding architecture and serves to compliment, enhance and playfully identify specific spaces within the building. The design components weave through the major common area spaces from the ground floor to the rooftop to thoughtfully create continuity and add whimsy to the building.

A Safe Haven: Affordable Veterans Housing Melrose Park, IL

Category: Residential 2

Designer/s: Urban Works: Patricia Saldana Natke,
Robert Natke, Erick Roldan and Jose Esquinca

Owner: A Safe Haven

Contractor: Skender Construction

Developer: West Suburban Housing Development Corp.

Photographer: Barbara Karant and A Safe Haven

Organization: UrbanWorks, Ltd.

Description: Bold, contemporary forms mark these 35 infill units which provide housing preference to military veterans and their families. Each boxy brick, wood and glass front provides a contrast to an overall gabled form that compliments the existing neighborhood and gives a literal safe haven to its residents.



Silver Awards



Atlas Financial Corporate Headquarters Schaumburg, IL

Category: Interior Architecture
 Designer/s: Shive-Hattery
 Owner: Atlas Financial
 Contractor: Power Construction
 Photographer: James Steinkamp
 Organization: Shive-Hattery
Description: Unique branding features and a subtle color palette bring Atlas Financial's vision of a culture centric workplace to life. From the library to the flex meeting area, there are plenty of opportunities for employees to build community and collaborate.

M.C. Machinery Elk Grove Village, IL

Category: Commercial
 Designer/s: Karl Heitman
 Owner: M.C. Machinery (Mitsubishi)
 Contractor: Opus
 Photographer: Mark Ballogg
 Organization: Heitman Architects, Inc.
Description: MC Machinery, a subsidiary of Mitsubishi, recently completed this new 175,000 SF headquarters and technology center in Elk Grove Village, Illinois. Combining office, showroom, R&D, warehouse and distribution, MC Machinery is a world class customer center highly visible from I-90.



Silver Awards



Sunfish Lake Residence Minneapolis, MN

Category: Residential 1

Designer/s: Gabriel Keller,
Lars Peterssen, Bob LeMoine,
Cynthia Burns, Ted Martin

Contractor: Elevation Homes

Photographer: Exterior: Paul
Crosby; Interior: Space Crafting

Add'l Designers: Interiors: Lucy
Interior Design, Landscape:
Southview Design

Organization: Peterssen/Keller
Architecture

Description: Challenged to bring a sophisticated design sensibility to an established suburban neighborhood, the architects designed a modern, one-story home and nestled it deep into the sloping, wooded site to create long views across a quiet lake.

Sanctuary Covenant Church Minneapolis, MN

Category: Religious

Designer/s: Nicole Thompson, ALA

Owner: Sanctuary Covenant Church

Contractor: Watson-Forsberg

Photographer: Saari & Forrai
Architectural Photography

Add'l Designers: Mandy McCulley,
Project Manager

Organization: Station 19 Architects, Inc.

Description: Intentionally cultivating theology of place to reflect values of community identity, connection, revitalization, sustainability, economic and ethnic harmony in a rough urban neighborhood, Sanctuary's design transforms an abandoned half city block and empty warehouse into a bright, beautiful and open canvas for the community.



Merit Awards



3400 N. Lincoln (Centrum Lakeview) - Chicago, IL

Category: Residential 2

Designer/s: Hirsch MPG LLC -
David Genc and Andrew Myren

Owner: Hubbard Street Group and
Centrum Real Estate and Development

Contractor: Arco-Murrally Design-Build

Developer: Centrum Properties

Photographer: Anthony May Photography

Organization: Hirsch MPG, , LLC

Description: A true Transit Oriented Development (TOD), it accentuates the angle of the site with a corner switchback design created by an exposed, cantilevered slab edge and balconies, alternately framing the glassy corner expression and defining the building's top, further emphasized by a triangular glass bay which cantilevers from the façade.

7954 Harwood Avenue Building Wauwatosa, WI

Category: Commercial

Designer/s: Mike Groth, AIA

Owner: Luther Group, LLC

Contractor: Beeler Construction

Developer: Luther Group, LLC

Photographer: Josh Groth & Core 4 Engineering

Organization: Groth Design Group

Description: Once a worn and vacant building on a prominent corner, this building was renovated to become a vibrant, multi-tenant nexus for the community. This renovation included a façade update, small addition, new public space, and improved site circulation.



Animal Care Center of Downers Grove Downers Grove, IL

Category: Institutional

Designer/s: Linden Group Architects

Owner: Anthony Kremer, DVM

Contractor: RWE Construction

Developer: RWE Management

Photographer: Paul Strabbing

Organization: Linden Group Architects, Inc.

Description: The Animal Care Center of Downers Grove represents a new image for animal services aimed at representing a modern clinic with state of the art care. A façade designed with masonry, metal panel, and glass resembles regional human health facilities.

Merit Awards



Artspace Hastings River Lofts Hastings, MN

Category: Residential 2

Designer/s: David Miller, ALA, AIA, LEED AP

Owner: Artspace Projects, Inc.

Contractor: Loeffler Construction

Developer: Artspace Projects, Inc.

Photographer: Farm Kid Studios, Brandon Stengel

Organization: UrbanWorks Architecture LLC

Description: Artspace Hastings River Lofts offers 37 live/work affordable housing units for artists and their families. The design draws upon cues from its historic neighbors in a contemporary way, acting as a bridge – connecting both the old with new and commerce with living.

Barone Addition St. Charles, IL

Category: Residential 1

Designer/s: Christopher Walsh

Owner: Chris Barone

Photographer: Christopher Walsh

Organization: Tandem Architecture and Construction

Description: We designed the addition to make this 1950's ranch more contemporary. The new Kitchen and Family room look through floor to ceiling windows onto the wrap around concrete floating terrace. A monolithic stone wall cuts through the spaces separating the Master Suite.



Blue Line Visioning Chicago, IL

Category: Unbuilt

Designer/s: David A. Steele

Owner: Chicago Transit Authority

Developer: Chicago Transit Authority

Organization: Muller & Muller, Ltd.

Description: Blue Line Visioning is an effort to utilize research and design to create a path forward for the redevelopment of the Chicago Transit Authority's Blue Line through the design of a new station prototype focusing on passenger experience and sustainable design.

Merit Awards



Cristo Rey St. Martin College Prep Waukegan, IL

Category: Institutional

Designer/s: JGMA

Owner: Cristo Rey St. Martin

Contractor: McShane Construction

Photographer: Brian Fritz Photography + JGMA

Organization: JGMA

Description: This state-of-the-art educational facility is a brightly-colored triumph of adaptive reuse for underprivileged students. Looking past the stigma of an abandoned Kmart store, JGMA transformed a perceived eye-sore of the blighted retail strip into a beacon for the Waukegan community.

Data Strategy Grand Rapids, MI

Category: Interior Architecture

Designer/s: Andrew Eckert and Lynn Hollander

Owner: Data Strategy

Contractor: Pinnacle Construction

Photographer: Ashley Avila Photography

Organization: Ghafari Associates

Description: Data Strategy was originally an outdated 1980's office that was transformed into a dynamic "tech" space. The renovation sought to accommodate their growing staff. The result is a tech driven and inviting space with an industrial edge.



Engine 86 Chicago, IL

Category: Residential 1

Designer/s: Ken Schroeder and Ann Temple

Owner: Ken Schroeder and Ann Temple

Contractor: Intergro Rehab

Photographer: Jim Tschetter

Organization: SMNG A Ltd.

Description: Engine 86 is the sole remaining wooden firehouse in Chicago and is a city landmark. The original 1899 firehouse was converted to a single family condominium residence with an open loft plan that is inspired by the original engine house.

Merit Awards



Illinois High-Speed Rail Carlinville Station Carlinville, IL

Category: Institutional

Designer/s: David A. Steele

Owner: City of Carlinville

Contractor: Plocher Construction

Developer: Illinois Department of Transportation (Project Funding)

Photographer: Tom Harris, Photographer

Organization: Muller & Muller, Ltd.

Description: Carlinville Station was designed to invoke the romance of train travel and reference the vernacular architecture, yet it is firmly rooted in the technology of today. Historic architecture is redefined for contemporary sensibilities using refined details and durable materials to age gracefully.

Hotel EMC2 Chicago, IL

Category: Commercial

Designer/s: KOO LLC

Owner: SMASHotels

Contractor: Pepper Construction

Developer: SMASHotels

Photographer: Tom Rossiter & Michael Kleinberg

Organization: KOO LLC

Description: Hotel EMC2 celebrates the intersection of art and science. The project includes 195 guestrooms, a double height restaurant named the Albert, after Einstein, fitness room and conference space, all on a diminutive 110' by 60' footprint. The building has a dynamic base made of interference coated stainless steel panels, a recessed terrace on the third floor and a tower clad in a metal rainscreen.



Ipsento 606 Chicago, IL

Category: Commercial

Designer/s: William Scholtens -
Elements Architectural Group

Owner: Tim Taylor

Contractor: Wes Oaks

Photographer: Nathan Kirkman

Organization: Elements Architects

Description: A brick walled artist studio is transformed into a café and bar. Large glass garage doors engage the adjacent park, strategic placement of equipment, long views, and rich materiality create a new precedent based on conversation and connection.

Merit Awards



New Area Office - DNR Fish and Wildlife Division Glenwood, MN

Category: Institutional

Designer/s: Peter K. Paulson, ALA with Jancis Curiskis

Owner: Minnesota Department of Natural Resources

Contractor: Kraus Anderson

Photographer: MNDNR; Studio E

Organization: Minnesota Department of Natural Resources

Description: This project provides West-Central Minnesota Fish and Wildlife field staff with modern support facilities and a new base of operations. It is located on a natural site overlooking Lake Minnewaska and is situated to maximize views, solar access, and daylighting opportunities for staff. The project was conceived to be a highly energy efficient, high performance building with a goal of "net-zero" utility costs on an annual basis. The design followed the Minnesota Sustainable Building Guidelines (B3) and LEED V3.

Olive Harvey Math Emporium - Chicago, IL

Category: Interior Architecture

Designer/s: KOO LLC

Owner: City Colleges of Chicago

Photographer: James Steinkamp

Organization: KOO LLC

Description: KOO combined three existing classrooms at the Olive-Harvey campus location of the City Colleges of Chicago into a flexible teaching computer lab space with a separate conference area for group tutoring. The design extended into the corridor to attract students to the math curriculum. The custom design elements were inspired by math concepts.

The project was so successful that City Colleges enlisted KOO to design Math Emporia at the six other City Colleges.



Private Residence Winnetka, IL

Category: Residential 1

Designer/s: John Myefski

Contractor: Fischer Fine Home Building, Inc.

Photographer: Tony Soluri Photography

Organization: Myefski Architects, Inc.

Description: Featuring a traditional / classic shingle style aesthetic, this new 7,500 sf residence accommodates the family's everyday needs within two-stories plus a 4,500 sf finished basement and 400 sf, 2-car garage.

Merit Awards



St. Clement Parish Center Chicago, IL

Category: Religious

Designer/s: Todd Niemiec and Ken Schroeder

Owner: Archdiocese of Chicago

Contractor: Norcon

Photographer: Thomas J. Rossiter

Organization: SMNG A Ltd.

Description: In response to both the Landmark District context and St. Clements mission of inclusiveness, this new accessible entrance employs a 'light touch' approach that maintains the prominence of the original church and architectural features, quietly unifying elements and levels of the 100 year old campus.

Awards of Recognition



Educational Employees Credit Union, Sanger Branch Sanger, CA

Category: Commercial

Designer/s: Arthur Dyson

Owner: Educational Employees Credit Union

Contractor: Target Constructors, Inc.

Photographer: David Swan

Organization: Dyson Janzen Architects, Inc.

Description: This small credit union offers a dynamic, light-filled environment to welcome customers and provide an uplifting atmosphere for employees. The building's interior openness and clerestory glazing offer a high level of transparency creating an energetic, visually interactive banking experience for this small agricultural community.

Harmonic Winds House - Geneva, IL

Category: Residential 1

Designer/s: Stephen Jaskowiak

Owner: Dale & Teresa Muir

Contractor: West Studio Construction Services, Inc.

Photographer: Lane Cameron

Organization: West Studio, Ltd. Architects

Description: Harmonic Winds House is a modern prairie home designed to be in harmony with its surroundings and the lifestyle of the musicians that live there. Wings of the home span outward from a central fireplace extending rooms and terraces out into nature.



Photovoltaics 101: How to Incorporate PV Systems in your Future Designs

BY: MR. MICHAEL GOLDSCHMIDT, ALA, BCAP, ASSOCIATE PROFESSOR OF ARCHITECTURE, UNIVERSITY OF MISSOURI

Are you or your clients thinking about adding a solar energy system to generate electricity in your future building designs, but not sure you understand the benefits and requirements of these systems? If so, this article will assist you in understanding various options, asking important questions during the design process, and making well-informed decisions. Unlike conventional power, photovoltaic systems produce no harmful emissions that hurt the environment. It's a clean, renewable process that uses the most natural of all resources: the sun.

The solar photovoltaic (PV) industry is the fastest growing of all the energy sectors, and it continues to be the best choice for renewable energy systems for buildings in most parts of the US. The US Department of Energy has a program called SunShot that is specially focused on increasing use of solar technology in buildings. Part of this program is a national outreach effort to educate architects and engineers about the basics of PV systems, and how easy it is to integrate into almost all building designs.

What are photovoltaic systems?

Photovoltaic (PV) systems – also referred to as solar electric systems – convert sunlight directly into usable electricity in buildings. A solar panel works by allowing photons or particles of light from the sun to knock electrons free from atoms using semiconductor technology, generating a flow of electricity. Solar panels actually comprise many smaller units called photovoltaic cells. These cells are arranged in a grid-like pattern on a module or panel, and many modules are used to form an array. These arrays can provide some or all of the electricity needs of a building if designed and installed correctly. The most common solar technology is rigid panels with crystalline silicon modules, making up more than 93% of the market. They have the longest track record, over 50 years, and have the highest efficiency ratings. Another option is the newer, thin-film PV modules that are a flexible panel, and can be applied to many different surfaces and materials. The thin-film modules are commonly incorporated into the construction of a building, for instance, as roofing tiles or on the building façade. If either of these panel types are integrated into a building design, in such a way that a common person could not distinguish between the system and the building skin, then the system is identified as Building-Integrated Photovoltaics (BIPV).

Understanding the basic components of PV systems

Although the PV array is the most visible and largest part of the design, a complete system includes the necessary components to convert the electricity generated by the sun into usable electricity by the building. A complete PV system includes the array, the inverter(s), disconnects,



Figure 1: A string inverter (courtesy of Fronius).

service panels, meters, and the connection to the utility grid. The inverter is the component that converts the electricity generated by the array (direct current or DC power) to alternating current (AC) power. There are two types of inverters: string and micro. A string inverter is

a single component that converts the electricity generated by the entire array into alternating current. Micro-inverters are installed on each PV module, and the conversion from DC to AC power happens at each panel. The advantages of string inverters include that they have a long successful track record, and that they are more economical than the alternatives. Micro-inverters are newer to the industry, and their combined cost is more expensive than a comparable string inverter. However, micro-inverters make the array more tolerant to shading, allow for flexibility in design and future additions to the array, and have a built-in rapid shut-down compliance (see below). As a third option, a PV system can include DC optimizers. These components allow a string inverter system to have similar advantages to one with micro-inverters.



Figure 2: A Micro-inverter for a PV module (courtesy of Enphase).

What are the Mounting System Options Recommended for PV Systems?

There are four types of mounting systems for PV arrays: flush, tilt-rack, pole, and ballasted. Flush-mount systems are attached directly to the roof and the modules are installed parallel to, and relatively close to, the roof surface. Flush mount systems (see figure 3) are commonly used when the roof slope is close to or equal to optimum sun



Figure 3: Installing a flush-mounted PV array (courtesy of the National Renewable Energy Laboratory).



Figure 4: Tilt-rack PV array (courtesy of the National Renewable Energy Laboratory).

angles. Tilt-rack systems (see figure 4) use rails and supports to orient the panels to optimum sun angles. Because a solar cell performs the best when its surface is perpendicular to the sun's rays, many PV systems are installed on tilt rack mounting systems, which can help to increase the amount of electricity generated by the PV array. Tilt-racking is commonly used on flat and low-sloped roofs. Pole-mounted systems (see figure 5) are installed on poles or structures on the site (parking lots, open areas) and are used when there is not a lot of space on the building, or the roof slope is not a good orientation for PV arrays. The final mounting system, ballasted (see figure 6), uses masonry or other heavy materials as "ballast" to hold the panels and support system in place. Although ballasted systems are more flexible and require less penetrations to



Figure 6: A ballasted PV array (courtesy of the National Renewable Energy Laboratory).



Figure 5: Pole-mounted PV array with Tracking (courtesy of the National Renewable Energy Laboratory).

the roofing system, they can add between five and seven pounds to the roof dead load on average. All PV mounting systems can include one or two-axis tracking. Tracking allows the panels to tilt in a horizontal and/or vertical direction to maintain good orientation with sun angles.

Start by making your designs “solar-ready”

A solar-ready building is designed to accommodate a solar PV installation, even if the solar installation does not occur at the time of construction. By making your designs solar-ready, the costs to install a future PV system are significantly less, and allows for a much easier future installation. A good design should include these recommendations, once you realize that most buildings will need to incorporate some type of renewable energy system (preferably solar PV) within their lifetime. The first step is to make the building as efficient as possible, especially when considering the heating and cooling loads for the building. Reducing the energy consumption of the building affects how many panels are needed in the array, and ultimately decreases the total cost of the system. Other important recommendations include:

- Extending the building in an east-west axis to increase southern exposure to the roof and south wall (the areas where buildings receive the best direct sun exposure).
- If roofs will have a slope, consider a south-facing slope that is close to the optimum sun angle for that latitude – see the website PV Panel Tilt (www.news.energysage.com/whats-the-best-angle-for-my-solar-panels) for a

good resource for calculating this angle – or consider a tilt-rack system that is tilted to this angle.

- Maximize open spaces (parking lots, open green spaces) to the south to provide opportunities for pole mounted systems and to reduce shading from buildings, trees, and other structures.
- On tilt-rack PV arrays on low-slope roof installations, provide enough space for the array so that modules do not shade other modules in the array. Also consider the “corridor” spaces between arrays required for roof circulation.
- For roof mounted systems on low-sloped roofs, try to place equipment and vents compact locations as to minimize conflicts with the placement of the PV modules. Also check to make sure these items and parapets will not cast shadows on the array.
- Provide conduits and chases that can be used to install the wiring required for the system, and provide space on the building for disconnects, inverters, and meters.
- Consider using roofing systems that are easier to install PV support racks with minimum penetrations. Also be sure to design the roof structure to support the additional dead loads for the PV array.

A good overall resource for making your designs solar-ready is the Solar-Ready Building Planning Guide from the National Renewable Energy Laboratory (NREL).

What about the codes?

Like many complex building systems, there are significant code requirements for PV system installations. These systems do require an understanding of the applicable provisions of the International Building Code, National Electrical Code, and other life-safety codes and requirements. The good news is that the International Code Council has assembled all of the necessary code requirements for PV systems into a single code book: The International Solar Energy Provisions or ISEP as it is known in the industry (see: ISEP (www.shop.iccsafe.org/2015-isep-code-and-commentary-1.html)). The ISEP guide contains all of the applicable codes for PV systems, culled from all of the other applicable codes. Two essential code provisions concern rapid shutdown and clear access areas. All new systems now require that the array be shut down automatically (no or little electricity generated) if there is a power outage from the electric utility. These provisions keep utility line workers from electrocution while they are repairing lines near the building, and also protects fire officials during firefighting operations on the roof. Another series of requirements require clear space around the arrays and size of groups of arrays (for very large systems),

to allow for roof access and circulation for fire departments if necessary. The best recommendation is to set up a meeting with the project team (architects, engineers), the local code officials, and representatives of the utility company to go over specific needs for the project and to minimize lengthy reviews.

What resources are available to help with the design?

There are three good resources for you to use when considering a PV system for a building design. The first resource is an online app available from the National Renewable Energy Laboratory (NREL) called PVWatts (see PVWatts (www.pvwatts.nrel.gov) here). This program is useful during the schematic design stage to estimate the size of an array, as well as for predicting electricity generated by various tilt angles, module sizes, and other variables based on the project's latitude. The second program, EnergySage (www.energysage.com), is an online program that not only estimates array size and solar potential (based on the project's location), but also looks at various financing or leasing options. It also can generate an approximate payback timeline. It is a good resource during the more advanced design stages. Finally, there is the program System Advisor Model (SAM) (see www.sam.nrel.gov) which is also available from the National Renewable Energy Laboratory. This program is an extensive analysis of a PV system (including financing and specific information on all of the PV components) and is useful during the Construction Documents phase of a project to accurately predict energy generation from the proposed design. In conjunction with these programs, it is always advisable to consult with local or regional PV distributors and installers, especially if you have never incorporated these systems into your projects.


What is Net-Metering?

Although early PV systems were designed to use batteries for excess electricity storage, most modern buildings with photovoltaics are grid-tied. This means that the building uses the utility company for electricity when the PV array cannot supply all of the electricity needs of the building. However, in grid-tied PV systems, any electricity generated that is in excess of the needs of the building is transferred back through the utility grid. Some utility companies and states are required to by statute or voluntarily provide compensation for this excess power, allowing customers to offset the cost of power drawn from the utility. When the compensation is equal to or close to the cost of the electricity purchased from the utility company that is net-metering.

Are there still incentives, rebates, and financing options?

Every residential, commercial, or industrial project in the US can benefit from federal incentives for installations of PV

systems. Many states and cities have additional resources, tax credits, and incentives available for building projects for including photovoltaics in the final design. The best resource to discover the many incentives available for your project is the website Database of State Incentives for Renewables & Efficiency (www.dsireusa.org). In addition to the available rebates and incentives, there are also options for purchasing or leasing the PV system. In a conventional arrangement, your client would include the system as part of the overall construction budget. The system can then be purchased by cash, or included in a construction loan. There are special lower loan rates for some projects, and in some states for buildings that incorporate PV systems. Another option is to lease the system. In this scenario, your client would provide the space for the array (for example on the roof), and then a company would install the system at no cost to your client. In one scenario, the company then charges your client a monthly fixed fee for the electricity, regardless of the amount that is used. In a Purchase Power Agreement (PPA), the electricity is provided to your client as a fixed rate per kilowatt hour (similar to a utility company), and at a much lower cost than the same electricity purchased from the utility company. Some states do have regulations on PPAs and leased systems, so it is appropriate to check on the availability of these options from local PV system companies in your area. However, one benefit of a leased system is that your client can use renewable, clean energy for their building with little or no costs to buy and install the system. Another benefit of leasing the system is that the leasing company is usually responsible for all maintenance and repair to the system. One disadvantage to leasing is that incentives and rebates go to the PV leasing company, not the building owner. It is also important to look at the stability and longevity of a PV system leasing company. The EnergySage calculator (as referenced above) is a good resource to compare system purchase versus lease options for your client.

There are many reasons why you or your clients will want to incorporate PV systems in your projects, but improving the environment and cutting energy costs are the most common. As the solar industry is growing, and your clients are more aware of the need to reduce their building's carbon footprint, this is a good time for you to learn how to incorporate this technology into your future designs. 

Mr. Michael Goldschmidt is an Associate Teaching Professor in the Department of Architectural Studies at the University of Missouri, and a licensed architect. Michael is one of seven subject matter experts and national trainers with the Building Codes Assistance Project (BCAP) outreach project for the SunShot program on photovoltaics for architects.

Quiz

Photovoltaic Systems

1. Which of the following is the approximate additional dead load for a ballasted PV array on a roof:
 - a. 3-5 pounds per square foot
 - b. 4-6 pounds per square foot
 - c. 5-7 pounds per square foot
 - d. 7-9 pounds per square foot
2. Which of the following directions is optimum for facing PV panels?
 - a. South
 - b. Southwest
 - c. Southeast
 - d. East
3. In designing a solar-ready building, which of the following strategies is most important?
 - a. Type of inverter
 - b. Financing options
 - c. Avoiding shading from adjacent buildings or trees
 - d. Type of mounting system
4. Which of the following is an advantage of using a String Inverter in a PV system?
 - a. Lower Cost
 - b. Ability to add future panels or arrays
 - c. Tolerance for shading
 - d. Ability to provide rapid shutdown
5. Which of the following components would provide the highest increase in electricity generation if added to a PV system?
 - a. Micro-Inverter
 - b. DC Optimizer
 - c. PPA
 - d. Two-axis tracking system
6. A good program to use in Schematic Design for estimating the size of a PV array is:
 - a. SAM
 - b. EnergySage
 - c. PVWatts
 - d. DSIRE
7. Which of the following is NOT an advantage of leasing a PV system on a building?
 - a. No or little purchase cost to the building owner
 - b. Use of rebates and tax credits to lower the cost
 - c. No or little maintenance costs
 - d. Reduced rate of electricity
8. The most common solar technology is rigid panel with crystalline silicon modules.
 - a. True
 - b. False
9. Which of the following is a type of inverter:
 - a. Array
 - b. Module
 - c. String
 - d. Rectifier
10. Net-metering is when the compensation is equal to or close to the cost of the electricity purchased from the utility company.
 - a. True
 - b. False

ALA/CEP Credit: This article qualifies for 1.0 LU in HSW of State Required Learning Units and may qualify for other LU requirements. Valid through December 2020.

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An Introduction to the Passive House Idea



BY: ED MAY, PARTNER, BUILDING-TYPE, LLC. CPHC-PHIUS, CPHD-PHI

The Passive House idea offers a solution to architects, contractors, and building owners who are looking to reduce energy consumption while improving health, comfort, and durability.

Intro

As local governments, companies, and building owners seek out new tools to reduce building energy consumption and meet ambitious carbon emission reduction targets, the Passive House idea has steadily risen in popularity in North America. This approach to building design stresses improved envelopes (better insulation, better airtightness, better windows) coupled to high-

performance ventilation, heating, and cooling equipment all within a rigorous quality assurance methodology to deliver the healthiest, most comfortable building possible while at the same time dramatically reducing energy consumption. While many of the individual methods at the core of the Passive House approach have been used in buildings successfully for years, it is the synthesis of these techniques and their careful choreography during the design process which enables Passive House projects to deliver dramatically improved performance.

By following a few simple design strategies, Passive House projects can significantly improve the comfort,

health, and durability of the built space, all while cutting energy consumption and carbon emissions.

The Passive House idea

At heart, the Passive House approach is focused on one basic question: How can we use what we know about the physics of building performance to design and construct a building which will be comfortable, healthy, and durable while also drastically slashing energy consumption? The notion that architectural design can affect energy performance and occupant comfort is of course not new. The Passive House ideas and techniques used today grew out of the ambitious experiments undertaken by builders, architects,

and academics at work during the 1960s, 70s, and 80s. Projects like the “Low-Cal” houses, the Saskatchewan Conservation House and the Leger House in Massachusetts set the tone for the decades to come. These pioneers were clearly moving away from the highly glazed “active” solar homes typical of climates like the desert southwest and towards a more passive approach to solar design appropriate to a wider range of climates; one that stressed a thermos-like building design with reduced heat losses (by improving the envelope) rather than increased heat gains (by adding more glass). This is still the basic template followed by Passive House builders and designers today.

Passive Houses are most notable for their high levels of occupant comfort, which results primarily from the airtight, properly-insulated envelope. Well-designed, continuous insulation with reduced thermal bridging results in high interior surface temperatures in winter which is key to the perception of comfort by individuals. The lack of any draftiness (a side effect of rigorous air-sealing) also helps to improve the comfort of the interior space and reduce localized thermal comfort problems. The high quality windows and doors typical of Passive House buildings both improve thermal comfort, but also help to reduce outdoor noise and reduce air infiltration, both of which are particularly important within urban environments.

A thoughtfully designed mechanical ventilation system, which will typically include an energy recovery ventilator (ERV), also contributes to overall occupant comfort by helping to maintain good indoor relative humidity levels all year round. While this comfort improvement is valuable, the primary role of the ERV is to be the “lungs” of the home and to provide fresh, filtered air to all inhabited spaces of the building year-round while simultaneously

extracting stale or contaminated air, 24 hours a day, 365 days a year. This continuous ventilation with energy recovery serves to maintain very high-quality indoor air while also reducing energy consumption.

All of the building blocks outlined above are critical to creating a healthy, durable, and comfortable building but also serve to help reduce building energy consumption by a significant degree. In practice, some Passive House buildings see as much as a 70% reduction in overall energy use – though it should be noted that as the building codes across North America are improved, this difference between a “code minimum” building and a Passive House building closes a little bit more each code cycle.


How to learn more, the certifications

“Passive House” is both an idea and a set of specific techniques, but also a codified green building certification system akin to LEED, Living Building Challenge or EnergyStar. Within North America there are currently two ways to certify a Passive House building – either through the international *Passive House Institute* or through the North-American *Passive House Institute of the US*. Both certification pathways offer designers and builders a variety of options for certification, as well as training and support for both design professionals and tradespeople. The designation Certified Passive House Consultant is available to professionals who successfully pass a rigorous exam offered by PHI or PHIUS. A similar qualification is available for tradespeople, as well as complementary certifications for those involved in the building inspection and verification side. Official Passive House certification is available for virtually any building type including new-construction, retrofits, single-family, multi-family, and non-residential, though the process will be a bit different for each type.

More information on the Passive House certification standards, their rules, software and further training can be found at:

- www.NAPHNetwork.org
- www.PHIUS.org

Conclusion

The Passive House idea, while still very new to the North American market, has a critical role to play if cities, local governments, firms, and individuals truly hope to make meaningful progress on reducing carbon emissions. Across the US some 40% of all the energy consumed is used in building construction and operations which means that architects, builders and owners have a primary responsibility to find ways to reduce this impact. However, it is crucial that as we implement new techniques to improve energy performance we don't lose focus on the experience of the occupants. The methods we employ to reduce energy use must also work to improve the thermal comfort, acoustics, health and durability of the interior environment. Thankfully, the set of techniques employed by Passive House designers and builders today – insulation, air-sealing, thermal-bridge free design, high quality windows and doors, and energy recovery ventilation – are all equally useful in delivering a comfortable, healthy, and durable building but also one which minimizes energy need. We can be hopeful that more and more buildings will seek to meet this ambitious goal in the years to come. 

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Making Diversity Matter in Practice

BY: RENA M. KLEIN, FAIA

It is often said that diversity is good for business. The question is, how good? In particular, how can a diverse workforce be beneficial to architectural practice and to firm success? According to a classic article by David Thomas and Robin Ely, “Making Differences Matter: A New Paradigm for Managing Diversity” (Harvard Business Review, 1998) the benefits of diversity to any business depend on its organizational culture and management approach.

Traditional Approaches

Best ethical practices, as defined by the American Institute of Architects (AIA), require fairness in hiring and promotion. Clearly, it is beneficial to a firm to be perceived as responsible and unbiased. The AIA Code of Ethics and Professional Conduct states, in Rule 1.401, “Members shall not discriminate in their professional activities on the basis of race, religion, gender, national origin, age, disability, or sexual orientation.”

Thomas and Ely name this the Discrimination and Fairness paradigm of workforce diversity. The emphasis is on quantity, counting employment statistics as evidence of equitable practices. While this may serve to increase the number of minorities and women employed, it minimizes the creative possibilities diversity can bring. If the goal is a “color-blind” culture emphasizing conformity, “different” employees will be expected to accept dominant culture norms and attitudes. Employees will not be encouraged to leverage their differences to generate innovation.

On the other side of the coin is the conventional business case for diversity – accessing new markets. This paradigm, called Access and Legitimacy by the researchers, emphasizes minority group identity as a business strategy. Organizations regularly hire minority employees in the hope of gaining increased access to new segments of the

market, accompanied by expanded expertise and profitability. While this may be an effective strategy at times, the minority employees often feel pigeonholed at best, and exploited at worst. The varied perspectives and worldviews of these employees rarely infiltrate the organizational mainstream.

A New Model

Thomas and Ely suggest the benefits of diversity to a business can be much greater than ethical practice or market access. These benefits include increased creativity, organizational flexibility, capacity to see issues from many perspectives, and ability to deal successfully with the challenges of change. Organizations that benefit most from a diverse workforce exhibit management structures that are egalitarian, fostering staff empowerment, continuous learning, and openness to different points of view. Egalitarian management is especially critical in architectural firms, where the main asset is an innovative staff, and the main objective of management is to increase both productivity and creativity.

Because architectural firms depend on the innovation and expertise of their professional staff, flexibility and empowerment prove to be critical factors in increasing productivity. Not surprisingly, flexibility and empowerment are qualities that

also promote diversity and the creative potential it brings. This means productivity and diversity go hand and hand within practice management structures capable of encouraging both.

According to research by Thomas and Ely, these management practices are inseparable from the culture set in place by the organization’s leaders. In order for a diverse workforce to flourish, the leadership must truly welcome differing perspectives and alternative points of view. These leaders will encourage continuous learning and will understand that embracing differences requires skill-building in emotional intelligence and empathy. Organizations with egalitarian structures, where employees feel valued, and where there is a high expectation of excellence have a better chance of maintaining the open dialogue and debate that can result in breakthrough ideas.

The Bell Curve

In any organization there will be what could be called a “range of acceptable behavior” as shown in Figure 1.

The shaded band represents the range of normal appearance and behavior styles exhibited by the majority of people in an organization. This implicit and established culture is created by the organization’s leadership and may be heavily

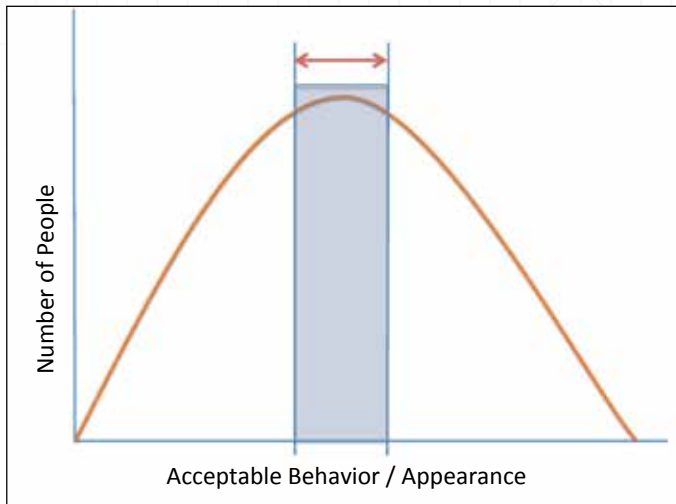


Figure 1: Narrow range of what is acceptable can lead to narrow perspectives

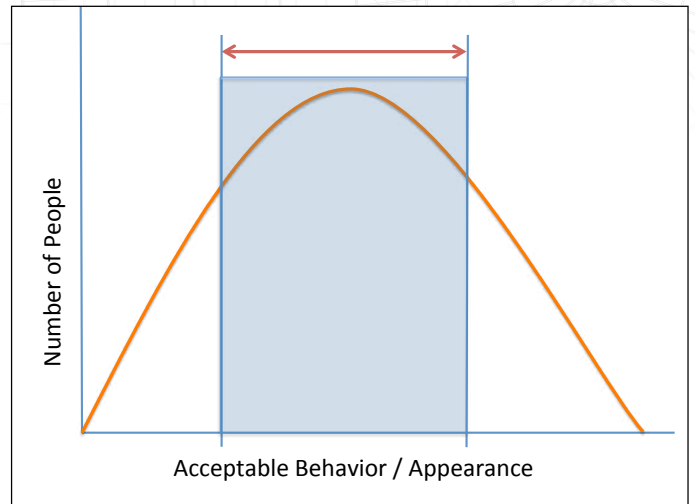


Figure 2: Wide range of what is acceptable encourages diversity of thought

influenced by firm legacy and the culture of an industry, as is the case with architecture. With or without awareness, most firm leaders will perpetuate the narrowness of this acceptable range by always hiring people who “fit in.”

Firms that want to benefit from differing perspectives and points of view must widen the range of what is considered to be acceptable behavior and appearance. People who look and act differently may also think differently. If they are welcomed and fostered, they will bring new ideas and creative perspectives to an organization. For architectural firms, this capacity is critical (Figure 2).

While widening the range of what is acceptable may be challenging, firms that want to succeed in the twenty-first century will have no choice. The next generation of American workers will be significantly more diverse than any that have come before. Having a culture of openness and acceptance will enable firms to attract young talent and retain diverse staff over the long run.


The Organic Approach

To cultivate a culture of openness, a firm must match its management structure to the ever-changing and highly complex nature of today's

architectural workplace. Doing this requires organizations to be adaptive, flexible, resilient and intelligent – qualities of organic self-organizing systems. Other attributes of self-organization include a coherent sense of identity and organization-wide access to information and personnel. This allows all firm members to have alignment of purpose, and gives them the resources and flexibility to get the work done.

More information on self-organizing systems and their application to firm management can be found in the groundbreaking work of author and consultant Margaret Wheatley.

Firm leadership can further stimulate learning and creativity by seeing diversity as concerning differing

perspectives and approaches to work, rather than different identity-based groups of people. By using the principals of self-organization, these varying perspectives can be allowed to influence the way work in the firm is actually done – its primary tasks, mission, strategic planning, and business practices. In doing so, a firm can increase the depth and richness of its creative resources, as well as its productivity, thereby reaping fully the promised benefits of diversity. 

Rena M. Klein, FAIA is the author of *The Architect's Guide to Small Firm Management* (Wiley, 2010) and VP of Investment Partnerships at Charrette Venture Group.



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Removal of original acoustical tile ceiling.

Second Chances: A New Ceiling for Queen of All Saints

AUTHORS: TIMOTHY M. CROWE, ALA, SE, PE, ELIZABETH R. PUGH; PEWISS JANNEY, ELSTNER ASSOCIATES, INC.

On occasion, even systems within buildings of the recent past require a second chance at serviceability. Constructed in the 1950s, the Queen of All Saints Basilica – a significant structure for the Archdiocese of Chicago – and built at a scale and level of ornamentation of some of the more spectacular churches within the United States, provides an illustration. Common of structures in this era, its construction included a combination of structural systems with timber-trussed roofs carried by load-bearing masonry and interior steel columns, all supported on cast-in-place concrete foundations. The basilica follows the traditional gothic style with a cathedral ceiling comprised of steeply pitched slate roofs (14:12) over the altar, nave, and choir loft. It became apparent that ceiling-material substitutions in the original construction (12-inch-square acoustical tile for plaster) tested serviceability limits, and displaced ceiling tiles motivated the parish to seek remediation approaches.

The steep-pitched acoustical tile of the cathedral ceiling (approximately 45 feet above the floor at the eave and 70 feet above the floor at the ridge) was supported by a concealed spline system secured to rafters and purlins that spanned between the timber trusses. The framing created a coffered panel layout of the ceiling within the rafters and purlins. The tile ceiling, rafters, purlins, and trusses were each hand-painted and gilded in situ. Above, a wood plank roof deck spans parallel to the ridge and bears on the rafters and trusses. The deck was topped with heavy felt (43 pound) underlayment and slate. The assembly was insulated with foil-faced mineral wool insulation above the ceiling tiles, with a small air space (1-1/4 inch +/-) between the insulation and the wood deck, ventilated with top-surface-mounted vents at the upper and lower portions of the roof slope at the center of the truss bays.

Recurring issues of ceiling tiles sliding down the concealed spline support were problematic. Apparent



Exposed wood decking and decoratively painted wood framing.

contributing factors included differential movements of the timber roof framing and tiles that exceeded tolerances of the concealed spline support. Despite maintenance efforts, including supplemental nails and sealant, reliable support of the tiles remained difficult. When it became apparent that tiles were at risk of

falling from the ceiling, the parish proactively retained WJE to work with Daprato Rigali Studios (DRS) to develop an appropriate long-term repair strategy.

Repair approaches sought by the parish necessitated ceiling tile replacement that would provide a



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Painting of prefabricated panels on the scaffold near the ceiling.



Panel installation in progress.


more dimensionally stable system while maintaining the aesthetics of the existing ceiling system. Consequently, a new properly engineered assembly was required, which could be painted and gilded to replicate the original ceiling. Our evaluation included detailed visual and structural examinations of the existing ceiling system, with careful evaluation of the thermal and hygrothermal behaviors of the existing and proposed assemblies. DRS provided important input regarding constructability issues associated with new assemblies, working out color systems, as well as creating stencils for painting and gilding. Kirkegaard Acoustic Design LLC also provided insight and suggestions related to the ceiling modifications in order to maintain acceptable acoustical properties for the space.

Our investigation revealed that the existing ceiling assembly lacked a continuous air barrier. Though the wood deck was in serviceable condition, it was apparent that the assembly was vulnerable to condensation, ice damming, and consequential moisture problems – as evidenced by moisture staining at the ceiling. The poorly sealed foil-faced insulation allowed conditioned interior air to come into contact with the underside of the roof deck. In winter months, the interior air could reach cold surfaces at the metal roof vents and the tongue and groove roof deck which were below the dew point temperature. The surface mounted vents, spaced roughly 18 feet apart, created air flow paths that were disrupted by the rafters. Though some gaps were included in the assembly to facilitate lateral air movement, the installed layout lacked an effective path for ventilation. Consequently, the temperature of the wood deck varied considerably, contributing to ice damming problems. Additional concerns were also voiced by the parish regarding the susceptibility of these vents to wind-driven rain.

Several repair options were considered to maintain aesthetics, address ceiling support deficiencies, and enhance thermal and hygrothermal performance characteristics of the insulated assembly. Initial thoughts leaned toward salvaging the tiles, but the extent of problems necessitated a more full-scale ceiling replacement. Prefabricated metal-clad foam panels were considered but quickly dismissed as they did not satisfy code-prescribed non-combustibility requirements. The use of spray-polyurethane foams enclosed within a new decorative panel showed promise to address non-combustible assembly issues; however, sealing work areas to control spray-foam odors and debris while maintaining church operations made this system impractical. The alternate panel addition also introduced acoustical challenges.

The replacement ceiling system which was ultimately selected introduced a non-vented compact roof assembly. The surface-mounted vents were sealed with custom fabricated copper closures secured in place and packed with mineral wool insulation. The replacement ceiling panels were comprised of a new system of aluminum honeycomb panels fully adhered to rigid Foamglas insulation. The fully bonded insulation, a cellular glass product very impervious to moisture and noncombustible, controlled potential vibration of the aluminum panels, and the surface

(less absorptive than the original acoustical tile) proved to enhance acoustics within the basilica. Supplemental mineral wool insulation was provided to cushion the top of the adhered panel assemblies to the underside of the roof deck to increase R-value and reduce air voids in the system. Panel perimeters were air sealed with a fire-rated foam and the panels were ultimately held in place with continuous gaskets supported by painted wood trim. The dimensionally stable panel system also allowed for a uniform appearance and finish. DRS created a studio atop a scaffold located approximately 42 feet above the church floor amid the gilded roof structure, which allowed them to paint and apply gilding to custom-fabricated panels on site and replicate the design and patterns of the original ceiling.

As part of the assessment of the new compact roof, WJE used THERM to create two-dimensional computer simulations of the original and replacement assemblies to identify temperature gradients and condensation potential. The simulations demonstrated that the replacement ceiling system provided significant improvements with respect to thermal resistance and condensation resistance over the original ceiling assembly. Completion of the ceiling enabled disassembly of the scaffolding and tuning of the organ, allowing the full grandeur of the space to be realized once more. 



Completed installation of ceiling and scaffold removal.

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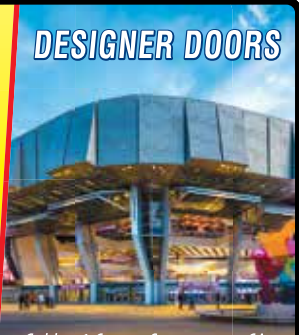
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DO THE “WRITE” THING: Breachlessly Executing Your Projects

BY: JOSHUA LEVY

For this edition of *Licensed Architect*, I am offering some perspective for the membership to consider regarding the necessity of contracts and how they should be viewed during performance of a project. Earlier in my career, I was the General Counsel for a national construction company performing work on commercial projects. One of the exercises the CEO had the executive team perform involved developing our own One-Page Plan to support the company’s strategic vision and mission. As the head of the one-person law department, I sought to determine the best way to have an impact on the company’s operations. Reflecting on the issues that came before me as General Counsel, I determined that our team would benefit from obtaining a better understanding and appreciation for how contracts impacted our level of success. I named the program “Breachless Execution.” In the 16 years since its creation I have had the opportunity to present Breachless Execution to numerous companies through training programs and seminars. I believe the principles behind Breachless Execution will serve our membership as they proceed towards a successful 2019.



The seeds for Breachless Execution were planted when I went to the University of Wisconsin Law School. As a first year law student, we learned “law in action.” That concept was developed by UW professors and became one of the more celebrated legal papers and educational tools in the second half of the twentieth century. Law in action explored the realities of contracts in people’s daily lives. Law in action explained that although clients want clear answers regarding how a certain contract situation would be resolved in court, an empirical look at the legal system shows that the chase for remedies under a contract is, at best, messy. Despite what may seem to be clear contract terms, a lawyer can only really advise a client of the strengths and weaknesses of a particular legal position in a breach of contract claim. In action, legal claims are unpredictable and expensive to pursue. Furthermore, a party may find itself with a judgment or other legal “victory” but no means to collect from the defeated defendant. That is why an enlightened party must have an understanding of how contracts work in action.

When I present Breachless Execution to groups, I explain that it derives from recurring “complex problems.” The first complex problem: there is no contract. It never ceases to amaze me that I regularly see cases that involve situations when two parties in construction do not have a signed agreement. There have been several excellent articles in *Licensed Architect* discussing the types of provisions architects should include in their written agreements. Every project should have an agreement between the architect and its client that covers the scope of work, ownership of drawings, the manner of dispute resolution, the payment terms, and the ability for the architect to recover interest and attorney’s fees if the matter proceeds to collection. Unfortunately, we see many cases where our members do not have a written agreement. Too often, our members proceed on a letter arrangement that doesn’t cover these essential contract terms.

Over the years, lawyers have heard architects (and other clients) boast about never having been sued. We have all

heard old-school parties claim that they have been able to succeed on a handshake. If everything proceeds nicely on a project, those individuals may not need a formal agreement. However, we all know that some projects experience scope disputes, quality questions, unrealistic clients and other circumstances that prevent a successful project and destroy client goodwill. With that reality, there really is no excuse for the failure to have a written agreement.


The second complex problem that led to Breachless Execution is that, despite parties having a contract, one or both parties failed to sign the contract. Our office has at least one case involving the failure of the parties to sign their agreement at any given time. Again, if the project proceeds without incident, that is an error without a consequence. But when problems arise, one party will inevitably claim that the contract was not signed because there was no meeting of the minds. There are arguments available to parties that want to enforce an unsigned contract. However, there is no excuse for needing to resort to those arguments. It is essential for every professional to memorialize their agreement with the client in a written contract and to obtain the other party's signature before commencement.

In a Breachless world, the architect will sit down with his or her client and review the written agreement before signing. Each phase of the architect's work should be reviewed with specificity. There should be a statement of all services included in the basic scope, and an explanation that any services not listed under the "basic services" section of the agreement shall be considered additional services and shall be compensated accordingly. The "owner's representative" must also be clearly identified. That is necessary so that the architect can receive proper written approval for any changes after the agreement is signed. There should be no hesitation in reviewing the agreement with your client and insisting on an executed agreement before commencing work.

The third complex problem we identified when developing Breachless Execution is that, after a situation on the project arose, no one read the signed contract before taking action. When I receive phone calls from clients asking me to provide advice regarding a project situation, I always ask them, "What does your contract say?" The staggering fact is that an overwhelming majority of those parties tell me they have not reviewed the contract yet. The core principle of Breachless Execution is to follow your contract during performance. For example, being Breachless means that you review the terms for requesting a change order and follow the contract's requirements to secure that change order. In the event there is a situation involving the client's failure to pay, the architect should review the agreement to determine what type of notice must be furnished prior to suspending performance. If the client is asking the architect



to perform additional services, the fact that those tasks will be charged as an "extra," the manner in which the tasks will be priced and any impact to a project's schedule must be clearly identified and furnished in real time. Too often we find that architects (or other parties in the construction process) wait and furnish requests for payment of change orders or additional services towards the end of the project after the work has been performed. It is not surprising in those cases that the client pushes back and challenges the obligation to pay for a variety of reasons. In the field, while performing your work, you should be reviewing your agreement to make sure you are Breachlessly Executing your work.

The discussion of Breachless Execution seems so fundamental. It truly is "low-hanging fruit." However, after 27 years of practice, I can confidently declare that the failure of parties to have a simple written agreement in place and to follow the agreement in practice accounts for more lost profits, aggravation in being involved in a dispute, and damaged relationships than any other aspect of our clients' operations. Challenges are likely to arise during any project. While nobody is perfect in their job, everyone can be Breachless in preparing the project and addressing the situations that arise. 

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Making Sustainability Sustainable

BY: ROBERT G. STANTON, CPCU, ARM, RPLU, RISK CONTROL & CLAIMS ADVOCACY PRACTICE

The focus in the design and construction industry is still squarely aimed at sustainable design and construction. However, what exactly does sustainable design do? For the purposes of this discussion, it is that sustainable design: **“seeks to minimize the negative environmental impact of buildings by efficiency and moderation in the use of materials, energy, and development space and the ecosystem at large.”** – WIKIPEDIA



If one were to ask the average mechanical engineer, he or she would probably tell you that sustainable design has been a focus of their industry for years. The only thing that really seems to have changed is the emphasis on innovation in the creation of even more environmentally-friendly products, components, and materials. Architect and engineer's professional associations have also stepped up in their efforts to address sustainability issues, going so far as to have their standard contract language include

consideration for environmentally-friendly materials and components as standard contract provisions, as well as consideration for alternative materials, building systems and equipment. This requirement seems consistent with the professions' obligation(s) to the general public. The important thing to remember is that if there is such language included in the contract provisions, the designer must perform the consideration of alternatives – even if the client doesn't ultimately ask for it. Otherwise, the designer can be held to be in breach

of contract, since the design fee is based on this work being done as well.

Sustainability is often seen as an element in many association-drafted contracts, which raises the question, “how does the professional liability insurance industry address the topic?” If included in the contract requirements as part of the scope of services, then sustainable design is generally considered as a typical part of providing professional services as an architect or engineer. All that could give rise to coverage issues would be whether the designer contractually committed to a specific Leadership in Energy and Environmental Design (LEED) certification level via some sort of expressed warranty or certification. This issue is further complicated in places like Evanston, IL and Dade County, FL where making LEED Certification is at a specific level a statute or ordinance. In the case of these two examples, it is LEED Silver. In such instances, the designer can actually commit to meeting those standards, because failing to do so is a code violation, which then becomes a standard of care issue.

It should be remembered that most if not all the policies in the marketplace have a specific exclusion for liabilities assumed under contract only. At this point, the performance of sustainable design is considered by the insurance industry to be part and parcel to performing professional services.

It is recommended that the reader take the time to review their own professional liability policies to ensure there is no exclusion or limiting of coverage relative to sustainable design.

The first priority of the design/construction teams is to synthesize the expectations of the client. Specifically, what is the client seeking? If it is a LEED project, do they wish to use the certification level as a marketing tool for prospective tenants, or is it more financially based? Is the client looking for tax incentives, project operation savings, or does the client have a true concern about the continued depletion of the planet's natural resources and environmental quality? Both design and construction need to drill down to determine the client's true desires.

Another pivotal issue in sustainable design is the clarification and documenting of the increased role of all parties involved. For the sake

of brevity, this will be confined to the discussion of the architect, engineer, contractor, and client. Each will have additional roles and duties in the design and construction process. For example, in the context of a LEED certification level, the designer



must familiarize itself with the criteria necessary to reach the desired level, and then design to that standard. This means an emphasis will need to be placed on two vital areas of the design process: specification writing and construction administration.

For sustainable design compliance, the energy usage and life expectancy of the project are of vital importance. Contract documents need to properly coordinate specifications and drawings. For instance, with building envelope design, greater attention must be paid to issues such as proper flashing and thermal management around windows and doors. This can become complicated if the client stresses speed and cost over quality. This often results in pressures being brought to bear on the designer relative to take shortcuts or utilize alternate materials or components, often very late in the project. Any opinions or recommendations the designer makes relative to any such changes should be focused on the

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project, and based on quality of the finished project. The construction administration phase will be addressed after the discussion of the contractor's duties.

Let's take a closer look at this issue of cost savings, since value engineering and substitution of materials and components have become a recurring issue in a great many claims against the design community. First, value engineering is a misnomer – it should be called “cost-cutting.” In this author's experience, clients rarely sacrifice aesthetic appeal, focusing their value engineering efforts in the operating aspects of the project. The designer must forewarn the client of the downsides of any such cuts to the project, and state for the record that the designer does not agree with the changes. Create that paper trail telling the story of how the client overruled the designer's recommendations for when the inevitable problems arise.

Substitution of materials and components is typically a key element of value engineering. What becomes the main point of contention is, “what do the parties consider comparable?” For the designer, performance specifications have been established based on the information provided by the client, as well as overall design in the context of the expected performance of the project as a whole. When third-parties begin making recommendations for “alternative materials or components,” they are doing it without the intimate knowledge the designer has for the design itself. It's normally about cost. That being said, these recommended substitutions may be close, but the margin for deviation on sustainable design makes it more difficult to select a material or component that will meet the performance specifications.

Should the client be the one recommending, or request that the designer accept the recommended

substitution, it is incumbent on the designer to clearly state that firstly, their responsibility is limited to the comparing of materials or components' performance specifications to the project needs, in order to determine if a substitution is acceptable, and that the party recommending the substitution be responsible for the performance of the material or component. Second, they should comment whether substitution meets the performance specifications detailed in the contract documents and lastly, the designer should either accept the substitution or recommend against deviating from the originally specified materials or components. Leave the ultimate decision-making to the client.

An important first step in properly addressing the issue of substitution of materials or components is making sure the design contract clearly defines the designer's responsibilities in the event of a request by a third party for such substitutions. Specifically, the designer's role should be confined for comparing the manufacturer's or supplier's performance specifications of the requested substitution conforms with the requirements of the contract. The contract should include a disclaimer errors, omissions or inconsistencies in the information supplied by the third party presenting the substitution. Any request by the client for the designer to do a more thorough analysis of the requested substitution should be handled as “additional services.”

On the construction side, some studies have declared that in the past construction waste accounted for over one-half of total waste generated on the planet. One of the goals of sustainable design and construction is to address the issue of minimizing construction waste. The contractor now needs to revisit its work processes to reduce waste produced while erecting a project. The old adage “measure twice, cut once” is at the forefront of the sustainable construction movement. From the

execution of the work perspective, it is vital for the contractor to preserve the integrity of the building envelope. There must be smaller and smaller tolerances for errors in fitting together components required to maintain the building envelope. In other words, everything has to fit together more snugly in order to minimize unintended openings in the envelope.


In the construction administration stage, the designer must pay closer attention to the work being performed, and be less tolerant of non-conforming work. Obviously, this becomes a stress point between the designer and the contractor. A well-drafted site report along with proper photographs will be the designer's strongest defense for its actions or decisions made on the jobsite.

Change orders submitted based on client recommended changes or contractor requests should be handled in much the same way as requests for substitutions of material or components.

It should be made clear to the client that they have definite duties before, during, and after the construction process. Criteria provided to the designer by the client for the commencement of the design process becomes essential to minimizing changes to the project. The client will have the final word relative to changes to the project of any kind. While the designer can provide input advice, the ultimate decision must still rest with the client. Given that there are studies indicating "green buildings" only remain "green" for eight years or less, the client needs to understand that maintaining the building envelope and equipment are essential to ensuring optimal performance of the project over its expected life. An operation and maintenance manual should be created and reviewed with the client as part of the post-construction duties. These duties should be communicated and documented to the client that the operational levels of

the project are completely dependent on proper operation of the systems as well as adhering to the maintenance schedule.

Sustainability has been an inevitable step in the design and construction process, and will continue to be part of professional services for the foreseeable future. The key to successfully navigating through the challenges associated with sustainable projects is to go back to

the basics: establish and understand the client's expectations (clearly defining the roles of all parties to the project), negotiating contract language that does not move the designer out of insurance coverage, addressing factors created by third-parties like value engineering or substitution, and effective use of the construction administration and site reports. Proper execution of sustainable projects will be vital to the sustainability of your firm's future. 

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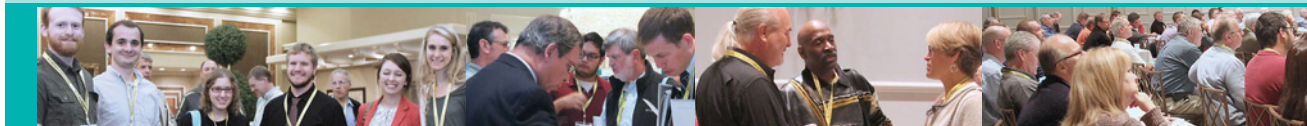
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