LICENSED ARCHITECT

Association of Licensed Architects

A Publication of the Association of Licensed Architects

Winter 2023/2024

2023 ALA Design Awards

Napkin Sketch Contest Winners

Metal Composite Materials

Tile Industry in Transition

AI and the Law

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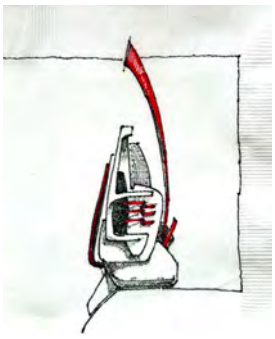

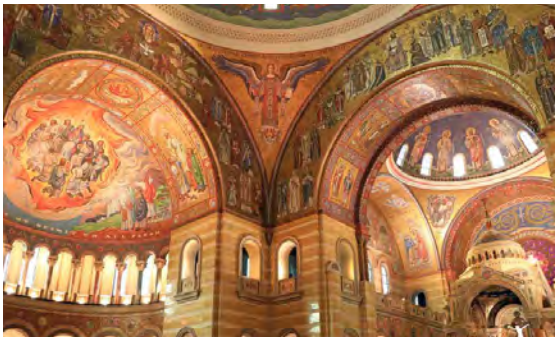

2023 Design Awards

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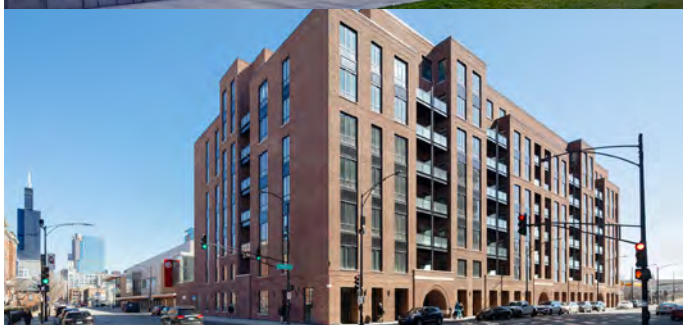

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PRESIDENT'S message

Each year we eagerly anticipate the release of the 2024 Design Awards issue of Licensed Architect magazine. I am thrilled to reflect on another year of exceptional architectural achievements within the ALA community. This issue serves as a celebration of the remarkable talent and ingenuity showcased in the twenty award-winning projects honored through our 2023 Design Awards program.

The Design Awards section beginning on page 8 highlights the innovation, creativity, and dedication of our award-winning architects. The world's tallest timber structure, a mixed-use development in a busy urban location, an energy company training center, a Mississippi River loft, and an Iowa career center are among the projects winning top honors. This year's highest honor, the Don Erickson Presidential Award, was presented to Ascent, the world's tallest timber structure and a Gold Award recipient in the Mixed-Use category.

As we explore the pages of this issue, let us draw inspiration from the visionary design solutions, sustainable practices, and impactful contributions demonstrated by our peers. Their work not only enhances the built environment but also shapes the way we experience and interact with the spaces around us.

This year's awards program also included recognition of the Napkin Sketch winners. The theme was "Architectural Ornamentation: The Art of the Detail." The winning entries were selected in three categories, architects, students, and related professionals, with the First Place Honor being chosen from all the entries regardless of the category.

I extend my heartfelt congratulations to all the award recipients for their outstanding achievements and commend their commitment to excellence in architectural design. Your passion, talent, and dedication continue to elevate our profession and inspire us all to push the boundaries of creativity and innovation.

I also want to express my gratitude to our members for their continued support and participation in the Association of Licensed Architects. Together, we are shaping a future where design excellence, sustainability, and human-centered principles are at the forefront of architectural practice.

We hope you will spend time with this issue to learn more about the interesting award-winning projects and read the excellent articles, as well.

If you have any questions or concerns, please email ala@alatoday.org. We appreciate your membership!

LICENSED ARCHITECT

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ALA 2023 Napkin Sketch Contest Winners

Architectural Ornamentation: The Art of the Detail

For most of history, ornamentation has been a big part of architectural design. With the modern movement, less became more, and ornamentation became secondary. Or did it?

What is architectural ornamentation? What does architectural ornamentation mean to you? What is the art of the detail?

This year's participants, comprised of architects, students, and related professionals submitted 5-inch by 5-inch sketches. A panel of experts judged the sketches based on creativity, originality and technical skill.

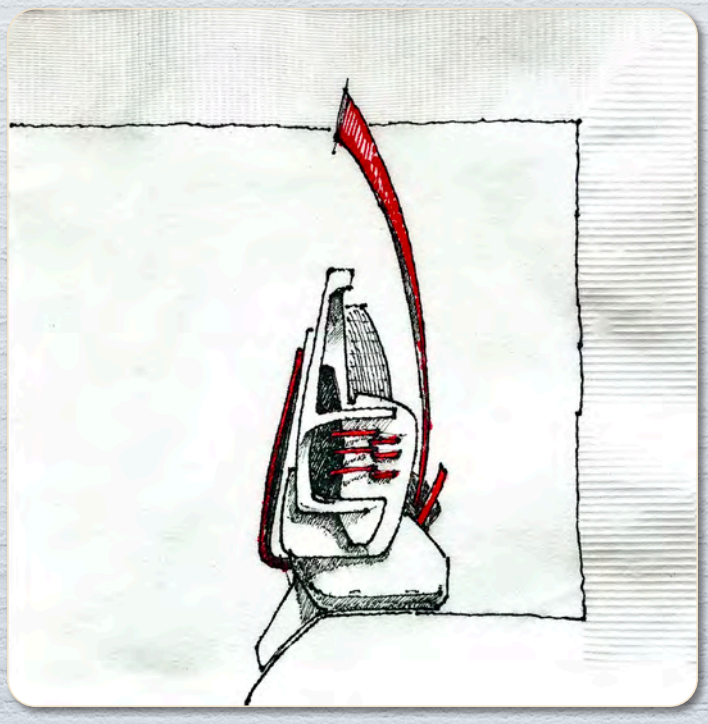
Prizes were awarded and the winning sketch was displayed in an exhibit at the Bridgeport Art Center in Chicago! The exhibit is called: ornament IS – Arguments On Ornament in Design.

2023 PANEL OF JUDGES:

Howard Hirsch, ALA, Principal, Hirsch MPG (Chair)
Joshua Mings, AIA, Founder and Principal, Aggregate Studio
Lenore Weiss, ALA, Founder and Principal, Lenore Weiss Studios
Stephen Wierzbowski, FAIA, Wierzbowski, PLLC

FIRST PLACE HONOR:

(Chosen from all entries regardless of category)



Michael Henning
Pappageorge Haymes Partners

Judges' Comments:

- ***Interesting subject, ambiguity***
- ***Use of negative space and napkin texture as good framework, exceed as dynamic element***
- ***Use of black grey red, Corbusiesque***
- ***Quite creative inventive object***
- ***Graphically lovely, perfectly placed***

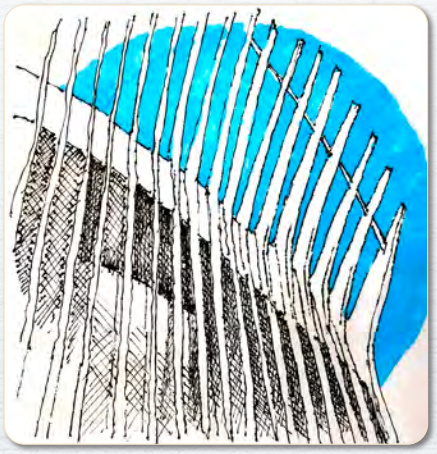
LICENSED ARCHITECTS AWARDS: RUNNERS UP

Runner-Up

Scott Conwell
International Masonry Institute

Judges' Comments:

- *Exceptional analytical sketch*
- *Expressive line work*
- *Takes advantage of medium*
- *Well composed*



Runner-Up

Michael Henning
Pappageorge Haymes Partners

Judges' Comments:

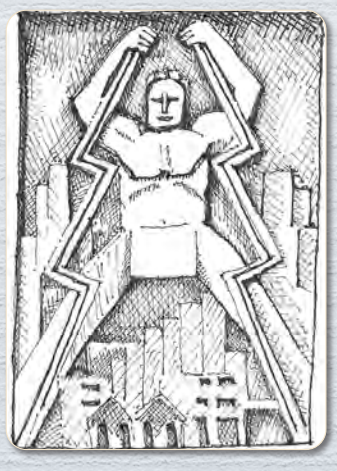
- *Graphically very strong*
- *Dynamic*
- *Sky circle*
- *Good technical skill*
- *Structure Ornament*

Runner-Up

Gregory Klosowski
Pappageorge Haymes Partners

Judges' Comments:

- *Quite elegant*
- *Use of negative space lovely*
- *Great line weight in all the right spots*
- *A great deal of dimension in this little tiny drawing*
- *Captured energy in source material*



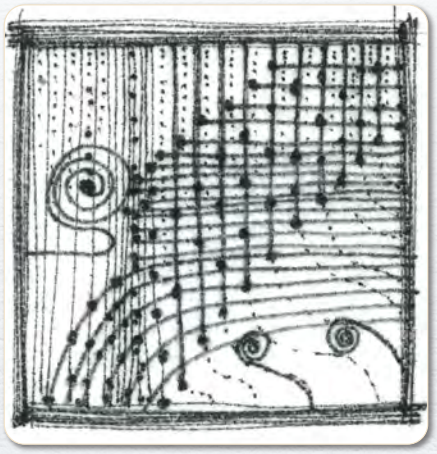
Honorable Mention

Brian Kidd
Gensler

Judges' Comments:

- *Entertaining*
- *Energetic*
- *Nice composition*
- *Nice riff on art deco relief*
- *Creative*

NON PROFESSIONAL AWARDS: RUNNERS UP



Runner-Up
Kristine Anderson
PKA Architecture

Judges' Comments:

- *Graphically so strong*
- *About ornament in terms of shape, line, emphasis, space*
- *A lot going on in this little square*
- *A lot of dimension*
- *A special graphic*

Runner-Up
Jan Clarence Concepcion
HuSarchitecture

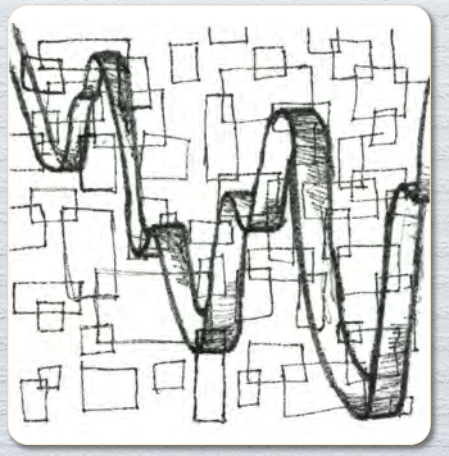
Judges' Comments:

- *Maximum atmospheric visual communication in minimum space*
- *Very dynamic*
- *Loved use of color towards emotion of sketch*

Runner-Up
David Zentner

Judges' Comments:

- *Illustrative, loves how it tells a little narrative*
- *Sweet in its simplicity*
- *Drawing has nice notational quality, not so literal*



Honorable Mention
Hannah Skistad
PKA Architecture

Judges' Comments:

- *Interesting graphically, dimensionally*
- *Leads eye nicely*

STUDENT AWARDS: RUNNERS UP

Runner-Up
Conell Brandner
University of Maryland College Park

Judges' Comments:

- *Overall texture of ornament in various way*
- *The way it affects the urban landscape*

Runner-Up
Angie Conwell
Illinois Institute of Technology

Judges' Comments:

- *It's brilliant. Great use of color/old school coffee stain*
- *Regulating lines, generating lines, hatching, emphasis of line, greys, blacks, whites*
- *Strong composition, wonderful sense of proportion. Stopping sketch where color exists*
- *Especially extraordinary for a student*
- *Quite sophisticated on so many levels*

Runner-Up
Rae DeFrancesco
University of Maryland

Judges' Comments:

- *Well done, nice line weight, nature a great resource for ornament*
- *Great sense of grace, motion*
- *Insertion of ribbon adds creative interest*

Honorable Mention
Sabrina Morera
Florida International University

Judges' Comments:

- *Good suggestion of interior / expanse beyond*
- *Nice use of color*
- *Tells a lot in a few strokes*

2023 ALA Design Awards

Twenty projects were recognized by our judges in the 2023 ALA Design Award Program for their outstanding achievements as a Gold Medal, Silver Medal, or Award of Merit.

The ALA Design Awards Program is our annual showcase of the power of design by our members. The 2023 ALA Design Awards Celebration was held on October 20th at the Medinah Country Club in Medinah, IL.

Congratulations to all winners and to those who submitted their projects. We hope you enjoy viewing the winning projects on the following pages.

ALA wishes to thank the following judges and Design Awards Committee members for their time and dedication to the program and profession:

Judges:

Patrick Branagan, AIA, SCB Chicago
Patrick Carata, AIA, Epstein
Scott E. Feltheim, ALA, AIA, NCARB, SDG Architecture LLC
Karen Lu, AIA, NOMA, Snow Kreilich Architects
Ryan D. McKichan, ALA, NCARB, Architectural Design Consultants, Inc.

Design Award Committee:

Howard Hirsch, ALA - Chairman
Jeffrey Budgell, FALA - ALA President
LeRoy B. Herbst, III, FALA - Jury Chairperson
Tomoo Fujikawa, ALA - Jury Moderator

Don Erickson Presidential Award

Ascent
Milwaukee, WI

Category: Mixed Use

Firm: Korb and Associates Architects, Milwaukee, WI

Contractor: CD Smith and Catalyst Construction

Owner: New Land Enterprises

Photographer: Nairn Olker

Description: As the tallest mass timber hybrid structure in the world, Ascent is at the forefront of one of the most exciting movements in building technology. The first of its kind, the innovative combination of experiential and biophilic design combine for a project that has brought international attention and hundreds of visitors to downtown Milwaukee and inspired other mass timber projects in Milwaukee and beyond.

Gold Awards

Evanston Gateway
Evanston, IL

Category: Mixed Use

Firm: Level Architecture Incorporated, Chicago, IL

Contractor: LG Construction

Owner: LG Development/ Harrington Brown LLC

Photographer: Scott Shigley

Description: Evanston Gateway is aptly named. Located along an active retail street forming the border between Chicago and Evanston, this mixed-use development replaces a derelict brownfield site and parking lot with 28 residential units of market-rate and affordable rental housing. The extremely long yet narrow site presented some planning challenges in keeping disparate ground floor programs separated. The playful sculptural form, subtle color façade deviations, and angled geometries creates a dynamic sculptural silhouette.

MidAmerican Energy Company Training Center for Excellence
Adel, IA

Category: Commercial / Industrial

Firm: INVISION Architecture, Waterloo, IA

Contractor: Hansen Company, Inc.

Owner: MidAmerican Energy Company

Photographer: Cameron Campbell, Integrated Studio

Description: A celebration of volume, structure, and display: a concept developed for a local utility company training facility. An observational "spine" serves as the organizational strategy for the facility serving as a viewing gallery with portals into different training components including a Pole Training Arena and an Excavation Arena designed to provide training for safely working with buried gas lines and electrical poles. The design encourages transparency and learning opportunities throughout, purposefully placing learning on display.

Gold Awards

Mississippi River Loft
Minneapolis, MN

Category: Interior Architecture

Firm: PKA Architecture, Minneapolis, MN

Contractor: Streeter

Photographer: Spacecrafting

Description: When the clients acquired two raw shells in a historic 1879 building overlooking the Mississippi River in downtown Minneapolis, their design objectives included a luxurious living environment with a balance of public and private spaces and an art gallery/studio. Taking inspiration from the building's rich palette of original industrial textures, including brick, timber, iron and glass, the architecture team re-imagined the expansive space as a dramatic backdrop for breathtaking views of the river.

Waterloo Career Center
Waterloo, IA

Firm: INVISION Architecture, Des Moines, IA

Category: Institutional

Contractor: Larson Construction

Owner: Waterloo Community School District

Photographer: Cameron Campbell, Integrated Studio

Description: The Career Center reimagines an underutilized part of a 1970s era fortress-like school into a modern center for Career and Technical Education. A small addition provides an impactful new entrance to the building. Raising the existing roof structure, skylights, and expansion of existing window openings add needed daylight to the interior that supports 15 training programs. Learning environments are designed with flexibility to support program changes in alignment with community needs and student interests.

Silver Awards

2753 N. Hampden Ct.
Chicago, IL

Category: Multi-Family Homes

Firm: SGW Architecture & Design, Chicago, IL

Contractor: Mc Construction Group

Owner: 2751 Hampden Court, LLC

Photographer: Will Quam

Description: This 15-unit luxury condominium building in the Lincoln Park neighborhood of Chicago was designed as urban infill to replace the parking lot of a failed grocery store, and to complement its simultaneously-designed neighbor at 2773 N. Hampden. Unit sizes range from 2,200 to 4,600 sq. ft., with the 6th and 7th floors devoted to three duplex penthouse units and their spacious roof terraces. The ground floor houses parking for 27 cars.

CA6
Chicago, IL

Category: Multi-Family Homes

Firm: SGW Architecture & Design, Chicago, IL

Contractor: Maris Construction

Owner: Belgravia Group

Photographer: Will Quam

Description: CA6 is a new condominium building in Chicago's West Loop housing 72 luxury units. This eight-story building follows a very successful prototype the firm has refined for the Belgravia Group, in which circulation is organized around multiple lobbies and cores so that each generously-scaled unit spans the full depth of the building with great light and air at each end; an intimate scale is maintained since only 12 units share each elevator core.

Silver Awards

Hotel Fort Des Moines
Des Moines, IA

Category: Commercial / Industrial

Firm: INVISION Architecture, Waterloo, IA

Contractor: Baxter Construction Co.

Owner: Hawkeye Hotels

Photographer: Cameron Campbell, Integrated Studio

Description: Standing as a prominent architectural and cultural destination since 1919, the Hotel Fort Des Moines, over a century later has been renovated into a full-service boutique hotel. Over the course of its lifetime, the building had undergone several renovations including the infill of the two-story lobby space. The reopening of the historic two-story space along with the restoration of remaining historic fabric has restored this hotel to the existing grandeur it once had.

Kinship Brewing Co.
Waukee, IA

Category: Commercial / Industrial

Firm: INVISION Architecture, Waterloo, IA

Contractor: Estes Construction

Owner: Kinship Brewing Company – Zach Dobeck

Photographer: Cameron Campbell, Integrated Studio

Description: A gathering place to build relationships rooted in community, beer, dogs, art, and biking was the mission of the brewery owner. The facility houses a tasting room, private dining, and beer production for the new brewing company. The building form is grounded on a 300-foot-long art wall which acts as an organizing spine and an evolving canvas, framing views, anchoring the building mass, and shielding the service yard from view.

Silver Awards

Walnut Creek Park Shelter
Urbandale, IA

Category: Institutional

Firm: ASK Studio, Des Moines, IA

Contractor: Tom Turner – Allstar Concrete

Owner: City of Urbandale - Parks and Recreation

Photographer: Joseph Kastner

Description: A shelter built of common, natural materials. Identity and gravity are the result of geometry. A common program with an uncommon gravity.

Merit Awards

A House in the Woods
Northbrook, IL

Category: Single Family Homes

Firm: Fraerman Associates Architecture, Highland Park, IL

Contractor: SH Builders

Photographer: Eric Hausman

Description: Nestled into a wooded lot adjacent to a forest preserve, the house's wings weave through the trees to embrace the serenity of the site. The house is largely one-story, with the exception of the primary suite, which is elevated above the forest floor. Each room of the house is endowed with large expanses of windows to bring in the seasonally changing views.

Carlyle Loft
Minneapolis, MN

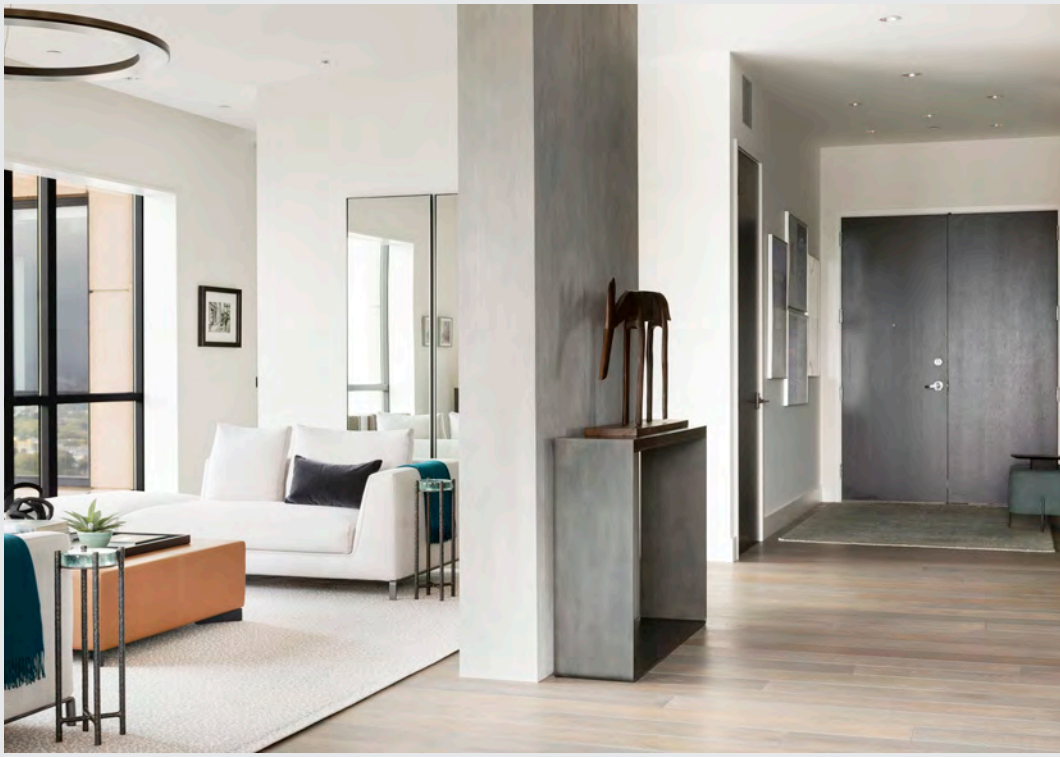
Category: Interior Architecture

Firm: PKA Architecture, Minneapolis, MN

Contractor: Streeter

Photographer: Spacecrafting

Description: When the clients sold their family home in the suburbs and bought a condo on the top floor of a building in downtown Minneapolis, they commissioned the architecture firm to transform the traditional layout into a clean, contemporary living environment with high quality finishes, expansive views of the Mississippi River and the surrounding cityscape, and space for entertaining, working from home, and spending time with their children and grandchildren.



Merit Awards

Copper Mountain Residence
Copper Mountain, CO

Category: Single Family Homes

Firm: PLAAD, LLC, Minneapolis, MN

Contractor: Pinnacle Mountain Homes

Photograher: VONDELINDE

Description: Working within strict local design covenants, the firm was interested in defining a nuanced balance between modern and traditional while challenging the locally accepted conventions of "mountain modern." Of the many programmatic requirements of the home, two of the most important were to capitalize on the site's on-mountain location with ski-in and ski-out capabilities, as well as comfortably host large family gatherings.

General Motors, Wallace Battery Cell Innovation Center
Warren, MI

Category: Commercial / Industrial

Firm: Ghafari Associates, Dearborn, MI

Contractor: Barton Malow

Owner: General Motors

Photographer: Jason Keen

Description: The Wallace Battery Cell Innovation Center is a best-in-class research and development facility located on General Motors' Global Tech Center campus in Warren, Michigan. The two-story, 300,800-SF facility was completed in October 2022. The facility strengthens GM's battery cell technology operations and accelerates the development of longer range, more affordable EV batteries. The site and facility are master planned and designed for strategic modular expansion, supporting growth of at least three times the initial footprint.

Merit Awards

Gerald R. Ford International Airport, Airport Operations Center Grand Rapids, MI

Category: Institutional

Firm: DLZ Michigan, St. Joseph, MI

Contractor: Pioneer Construction

Owner: International Airport Authority

Photographer: Jason C Vetne, AIA – DLZ Michigan Inc

Description: The Airport Operations Center (AOC) is a new 12,000-sf facility that serves as the Primary Communications Center and Emergency Operations Center for the Gerald R. Ford International Airport. The facility was constructed in compliance with ICC 500 storm shelter requirements including enhanced wind loads, missile-impact ratings, and redundant infrastructure. The project is the result of a highly collaborative and coordinated effort that enhances the safety and efficiency of the airport and the region.

Isles Pavilions Minneapolis, MN

Category: Single Family Homes

Firm: PKA Architecture, Minneapolis, MN

Contractor: John Kraemer & Sons

Photographer: Spacecrafting

Description: When the clients acquired an unusually wide site overlooking an urban lake, they commissioned the architecture firm to design a modern home with a sense of history and character. The architects responded to the clients' vision with a collection of pavilions inspired by traditional country homes in Belgium, Holland and England. The interiors reflect a timeless European aesthetic with stone and wide plank wood floors, plaster walls, floor-to-ceiling bookshelves and other traditional details.

Merit Awards

Jackson Hole Residence
Jackson, WY

Category: Single Family Homes

Firm: PLAAD, LLC, Minneapolis, MN

Contractor: Jackson Hole Contracting

Photographer: Carrie Patterson Photography

Description: Located on a one-acre site with unobstructed views north towards the Teton mountain range in northwestern Wyoming, the project consists of two traditional gable volumes housing the bedrooms, office, kitchen, dining, and garage, linked together by a single-level living link. While honoring the vernacular farmhouse formal qualities, the fenestration and exterior detailing is quite minimal in concept and execution.

Lakeview Residence
Tonka Bay, MN

Category: Single Family Homes

Firm: PKA Architecture, Minneapolis, MN

Contractor: Streeter

Photographer: Spacecrafting

Description: When the clients decided to sell their suburban home and acreage and build a right-sized modern home on a smaller, south-facing lake lot, the architecture team responded to their objectives with a simple yet sophisticated design that combines local lake cottage vernacular with modern elements. Finished with durable cedar siding, a cedar roof and copper gutters, the home plays well with the neighboring homes while bringing a fresh, modern sensibility to the shoreline.

Merit Awards

The Tapestry / El Tapiz
Chicago, IL

Category: Unbuilt Design

Firm: UrbanWorks, Ltd., Chicago, IL

Owner: Lawndale Christian Development Corporation / The NHP Foundation

Description: The Tapestry/El Tapiz is a four-story-tall structure on Chicago's West Side comprised of three levels of affordable housing above a mixed-use podium with a food hall, community office, and retail space. The structure fills most of the trapezoidal site facing Ogden Avenue with parking located at the rear along the alley. The 67 apartments comprise 24 1-bedroom units at 600 SF, 30 2-bedroom units at 875 SF, and 13 3-bedroom units at 1,100 SF.

The Wilmore
Chicago, IL

Category: Mixed Use

Firm: Level Architecture Incorporated, Chicago, IL

Contractor: Method Construction

Owner: Cedar Street Properties

Photographer: Scott Shigley

Description: The Wilmore is a mixed-use building located in Chicago's historic Uptown neighborhood. It comprises 62 residential units and spans five stories, offering considerable amenities, as well as a sizable lobby, two commercial tenant spaces, and a 16-car parking garage. The project's multi-dimensional façade features subtly folded aluminum composite panels that catch and reflect light dynamically throughout the course of the day. This Transit Oriented Development facilitates easy access to all Chicago has to offer.

Understanding Metal Composite Material, Installation, and Systems

Distinguishing quality and understanding warranties

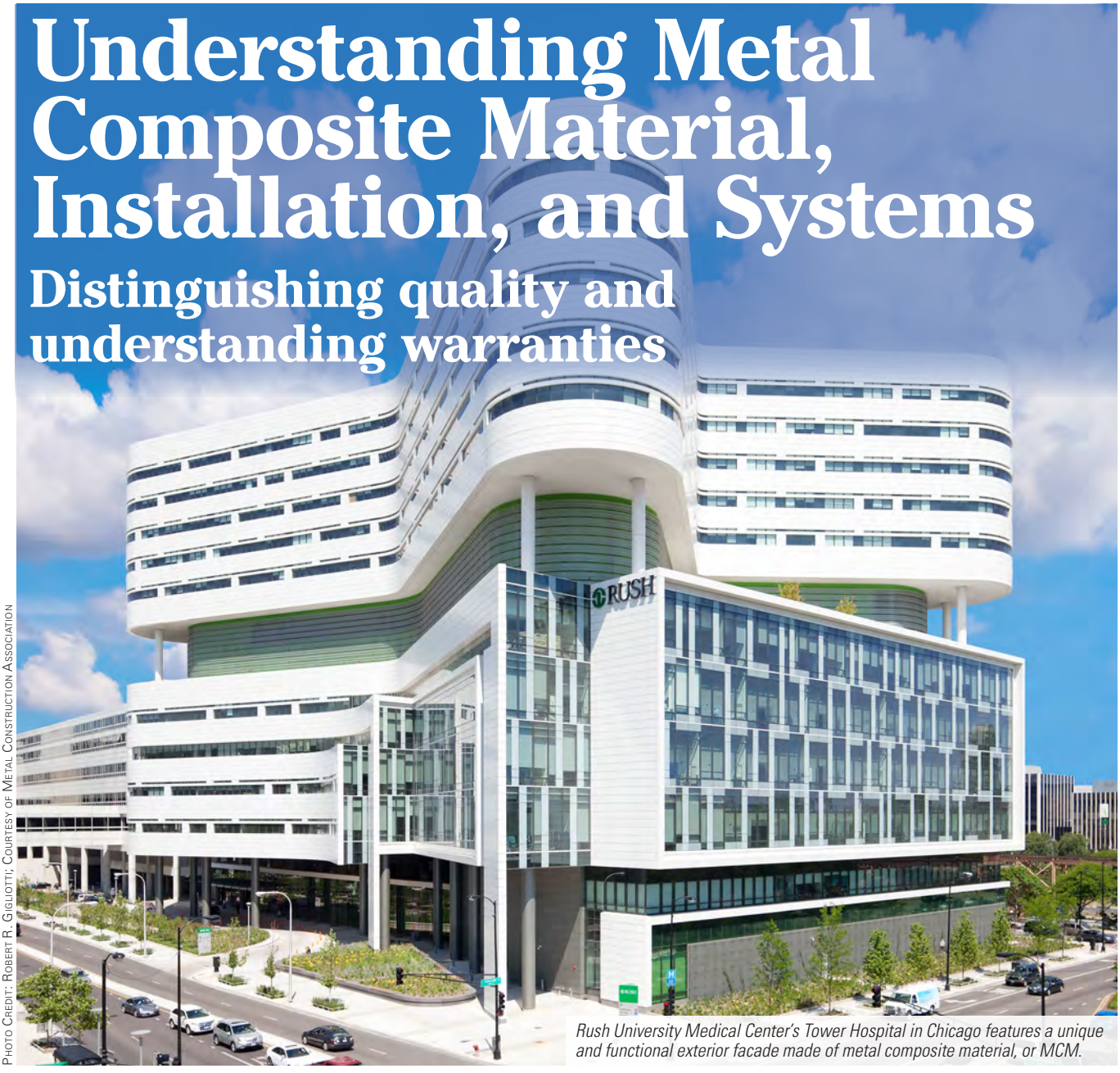


Photo Credit: Robert R. Gigliotti; Courtesy of Metal Construction Association

Rush University Medical Center's Tower Hospital in Chicago features a unique and functional exterior facade made of metal composite material, or MCM.

BY: JESSICA JARRARD, (SPONSORED BY METAL CONSTRUCTION ASSOCIATION'S METAL COMPOSITE MATERIAL ALLIANCE)

While many products are marketed as metal composite materials, a significant number are not actually metal composite materials at all. Metal composite material (MCM) is made from several different components. It is a factory-manufactured panel consisting of metal skins bonded to both faces of a solid plastic core.

Metal Composite Material (MCM) History And Background

The term metal composite material is a more general and inclusive term than its predecessor, aluminum composite material (ACM). The first ACM was developed in Europe in 1969. It was not until 1979 that the first ACM was produced in North America.

In the early 1980s, there were a number of companies worldwide producing ACM and shipping to North America for architectural projects. By the 1990s, there were several ACM manufacturers producing products in North America. In addition, several other countries around the world were also manufacturing and providing ACM for North American import.

While the name ACM originally referred to products primarily made using aluminum coil, innovations and technological advances led to the use of alternate skin materials, such as copper, zinc, steel, stainless steel, and even titanium. With all these new skin material options, the common name of this material was changed to metal composite material (MCM).

Incorporating additional metals did not only provide more variety in function and cost, but it also provided more options when specifying aesthetically pleasing facades. MCM is often used in exterior cladding or rainscreens to help protect the building envelope from unwanted air and water intrusion. MCM products are available in many colors and finishes, allowing specifiers to provide unique facades while also providing health, safety, and occupant comfort. Today, the number of MCM manufacturers continues to grow worldwide, and the amount of variation in product offerings and quality continues to expand along with it.

Image courtesy of: Metal Construction Association

This illustration shows the layers of an MCM panel

MCM Materials

MCMs are comprised of “skins” on both sides of the core. Skins often have finishes that enhance the appearance of the facade.

Skins

Skins can be a variety of metals, including stainless steel, zinc, copper, and even titanium just to name a few. Variations in metal, metal thickness, and finish are now much more common than they were just a few years ago.

When specifying materials, one should consider skin thickness first and foremost. A minimum thickness of 0.019 inch (0.5 millimeter) is required as a weather covering by the International Building Code (IBC). This thickness provides an acceptable protection layer for the material that resists normal exposure without significant visual damage.

Skins have three main purposes: to provide a substrate that can be painted or left in its natural state, providing a visually appealing product for a long period of time; to transfer the wind loading from the surface of the panel to the anchorage system; and to play a role in the overall fire performance of the panel.

Together, the panel limits unwanted air and moisture intrusion that impacts the facade performance, causes costly damage to building materials, and affects occupant safety and comfort.

Finishes

The metal skins provide a surface for the application of finishes. These skins will not expand or contract excessively due to temperature and will not negatively impact the finish.

There are many finish options and colors available for aluminum skins. Skins are typically painted with any one of a variety of finishes meeting the performance requirements of American Architectural Manufacturer’s Association (AAMA) 2605. These finishes are available in everything from earth tones with low-gloss finishes to rich, vibrant colors with high-gloss finishes. Other options include finishes imitating wood, marble, granite, and other natural materials. Some finishes also have an additional clear coat added to protect the finishes and enhance the look to be metallic, prismatic, brushed, polished, or anodized.

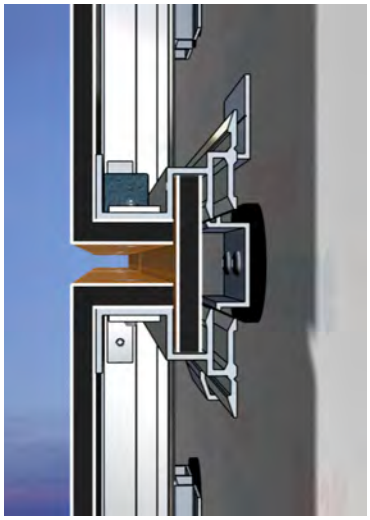
Other sold metal plates, such as copper, zinc, stainless steel, and titanium, which would otherwise be very expensive for an architectural facade, could also be utilized at a fraction of the cost.

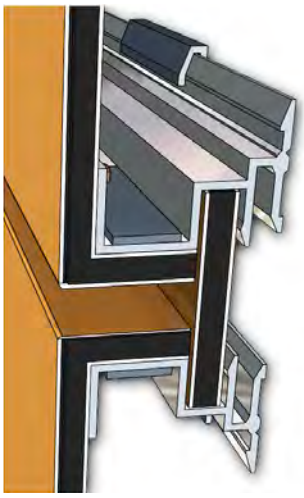
Structural Performance

MCM panels not only provide aesthetically pleasing facades but also protect buildings from the elements. Weather is uncontrollable. From high winds to ice and snow to excessive rainfall, the exterior cladding must protect the building from the overall impact of severe weather. Durability, long-lasting building materials and installation systems that perform over many years are critical for both new construction and retrofit.

Due to the extreme flexibility of MCM panels, with metal skins on both the interior and exterior sides, excessive wind loads generally do not create a permanent problem with the visual appearance of the panels. While the MCM does deflect in high winds, the panel returns back to the flat appearance that was originally fabricated and installed on the building.

To meet certain code requirements, aluminum profiles may be adhered to the backside of the panel using structural





Images courtesy of: Metal Construction Association

This illustration shows the back skin and a portion of the MCM core

adhesive. These profiles limit the deflection of the panel; however, MCM panels have been known to deflect 3 inches or more and return to flat with no permanent negative effect on the panel's visual appearance. The engineering completed by the panel fabricators determines if stiffener extrusions are required and how the final panels are designed.

Having been in use for more than 50 years, MCM panels have shown resilience to excessive wind load without compromising the high-quality paint finishes or the metal skins used in the manufactured products.

The images above illustrate the tight radius that can be achieved using MCM panels. While there is a maximum limit to how far the finish layer can be stretched without "whitening," if fabricated correctly, this point of flexure can perform through many years of wind loading.

To form this tight return, the interior skin and a significant thickness of the core material are removed, leaving the exterior skin to act as a hinge and allowing attachment of the panel to the anchor profiles

Fire Performance

MCM panels are defined as a metal skins bonded to each side of a solid plastic core. This "composite" panel serves a number of functions when the building is exposed to fire. The metal skins deflect the heat and fire away from the combustible core of the panel. While this is not a permanent condition, and the metal skins eventually melt, when the metal skins are in place, the skins serve to limit both the amount of combustible core available to the fire and the spread of flame.

Concern for fire performance of MCM systems is a major issue in today's construction world. Several high-rise projects around the world have shown significant flame spread of the exterior cladding when an untested assembly is misapplied on a high-rise structure. Many of today's MCM panels contain fire-retardant chemistry that limits the amount of available fuel and potential for flame spread. In every reported case of high-rise fires around the world, the MCM panel and installation system have not been manufactured with the newer fire-retardant chemistry, and the overall assembly has not been tested to the rigid standards applicable in North America. In the United States, the NFPA 285 multistory test is a benchmark test for the performance of exterior cladding when exposed to fire. The IBC requires that when MCM is used above 40 feet or when foam plastic insulation is a component of the wall assembly, the MCM cladding systems must successfully meet the NFPA 285 test criteria. These code requirements have existed since the 1990s in various code documents and have successfully limited significant high-rise fires.

Simply put, the cladding systems involved in the significant high-rise fires around the world would not be considered code compliant in North America. It is important to note that there have been no high-rise fire experiences in more than 30 years where the MCM panels with fireresistant core materials have been used in construction. Compliance with the local building codes is critical to the overall performance of MCM systems.

Manufacturing And The Production Process

The MCM production process is fairly basic regardless of where the product is manufactured. Skin material is bonded to both sides of a solid plastic core. The main challenge is that the different materials do not want to stick to each other (and this only gets worse over time). The other issue is that the manufacturer is taking three individual components that want to move in different directions and trying to make them into a single element that will start off completely

flat and stay that way when manufactured, after fabrication, and when exposed to changing temperatures and environmental conditions. However, there are some manufacturing variations that can significantly reduce quality and performance if not implemented correctly.

Typically, in a quality manufacturing process, an extruded core material is produced, followed by the application of metal coil. These components are bonded together through the controlled application of heat, pressure, and tension. The metal skin provides structural stability and a medium that can be finished in a number of colors and finish types. The last stage of the production process is

controlled cooling of the bonded sheet to maintain the bond integrity and flatness.

While this process may sound simple, many complex interactions are taking place inside the MCM. The semi-soft malleable core is becoming more rigid as it cools between the two metal skins. The skins are generally aluminum and at a high temperature during the bonding process. Controlled cooling is essential as the process continues. Metal has a high expansion rate and contracts as it cools, making the entire assembly susceptible to moving, twisting, and bowing until the completed panel reaches ambient temperature. Without the controlled addition of heat and pressure, the required bond strength is generally not attained. It is this controlled cooling process that creates a flat panel.

This "continuous process" is vital to ensuring consistency in the quality manufactured products. This is why selecting a quality manufacturer is integral to securing the building envelope against the elements and ensuring the building's longevity.

The Fabricator's Systems Approach

The second important element in this process is the fabricator's MCM system, providing a comprehensive solution to building exteriors and envelopes to not only improve the appearance and performance of the facade, but also prevent unwanted air and water intrusion. Undetected moisture intrusion causes costly and catastrophic damage to underlying building materials. Mold and contaminants can not only damage building materials but also create air-quality concerns that can endanger occupants.

While manufacturers can provide superior MCM products, a comprehensive solution will not be successful without a systems approach that includes fabrication and installation. "MCM is a state-of-the-art building material," says Tom Seitz, executive director of the Metal Construction Association's (MCA's) MCM Alliance. "This article is all about understanding the complete MCM package for quality materials, fabrication, and installation. All three of these factors are important for not only a great-looking MCM project but also a quality engineered architectural facade."

Now that we understand the manufacturing processes and structural performance benefits of MCM, we will outline ways to not only distinguish the differences between MCM manufacturers and MCM fabricators, but highlight characteristics to look for when selecting each for a project.

ESPERANZA HEALTH CENTER

Project: Esperanza Health Center
Location: Chicago
Contractor: Skender
Manufacturers: East Coast Metal Systems, 3A Composites USA, and Tuschall Engineering Company
Completion Date: Spring 2019

In Spring 2019, Esperanza Health Centers expanded its operations and building capacity to provide additional services to an underserved area. Located in southwest Chicago, this project provides critical services to a community that is lacking basic health-care services. Esperanza Health Brighton Park, a JGMA: Juan Gabriel Moreno Architects and Skender project, was built with the intent to reach and serve the community in a new, welcoming, 26,000-square-foot facility.

When presented with the project, JGMA envisioned a facility centered around community interaction, with a hopeful eye to the future. With this vision in mind, the goal of this project was to transform an empty lot into a new and hospitable clinic with outdoor walking, community garden spaces, and multipurpose communal spaces for educational programs.

Photo courtesy of East Coast Metals

Chicago's Esperanza Health Center features an MCM exterior with a prismatic finish

The design intent was to liberate the typical definitions of interior and exterior applications, which was achieved by utilizing metal composite material (MCM) with a prismatic finish. The prismatic finish allows for the color to shift with the angle of the light, enabling the metal panels to appear to have fluidity or movement to them.

Esperanza Brighton Park is a unique type of architecture, bringing modernity and a pop of color to a historic, notable city. "For us, this represents a continuation of a long line of projects where we are challenging paradigms in architecture in our communities of color," says Juan Gabriel Moreno, JGMA founder and president, in a statement to Curbed Chicago.

East Coast Metal Systems utilized a joint rainscreen system and fabricated more than 10,400 square feet of metal composite material (MCM) wall panels for the exterior of the facility. To achieve the prismatic vision of the project, a warm and unique finish was selected to cover the 4-millimeter, fire-resistant-core MCM. The building also utilized around 1,200 square feet of custom mica-finished MCM.

Since opening on May 20, 2019, Esperanza Brighton Park is the fourth site for Esperanza Health Centers in the greater Chicago area. Thanks to all parties involved, Esperanza Brighton Park provides bilingual, high-quality primary care, behavioral health, and wellness services to the community, regardless of immigration status, insurance status, or ability to pay.

Distinguishing Between A Manufacturer And Fabricator

In the industry, the terms MCM manufacturer and MCM fabricator are often confused. There are, however, distinct differences between the two.

The MCM manufacturer is responsible for the process of bonding the skins and core together in a continuous process, creating the flat sheet.

The MCM fabricator is responsible for cutting, routing, folding, and otherwise processing the MCM to fabricate panels to be installed on the building. These fabricators can either have a proprietary installation system using aluminum extrusions or use a third party's extrusion system.

In the manufacturing, fabrication, and installation process, there are many testing requirements that must be met along the way. Some pertain to the manufacturer, some to the fabricator, and certain tests can only be accomplished by a cooperation and coordination of the two. The manufacturer is responsible for anything related directly to the MCM sheet, including surface finishes and material fire performance. Testing pertaining to wind loads and water penetration generally applies to the fabricator, as the MCM is simply a transfer component moving wind load from one location to another. Some of the more extensive fire testing is a combination of manufacturer and fabricator performance since the MCM is a primary combustible element. The installation system allows the panel to maintain its position and has an impact on the direction of the flames.

Securing a Quality MCM Sheet Manufacturer

There are many MCM manufacturers across the globe, offering varying levels of quality and pricing options. When specifying MCM products, it is important to choose a quality manufacturer to ensure the health, safety, and welfare of occupants while also providing a long life for the building.

As previously discussed, the typical MCM manufacturing process is to extrude or place a core material between two skins of metal with some type of continuous bonding technology to keep the components together. These components are run through a series of heated rolls under a considerable amount of pressure, then each panel is cut to length. Various manufacturers have tried to create composite panels in a batch process; however, consistent visual appearance and bond strength between the core and the skins has generally been a limiting factor in production. Continuous panel production in a controlled factory environment has proven to be the most common practice to ensure a high-quality, consistent panel product. For the best results when specifying a manufacturer, ensure that the materials produced are manufactured using a continuous production process. Manufacturers should provide warranties on the finish quality, bond integrity, and appearance (flatness). Warranties will be discussed in more detail later in this article.

Characteristics of a High-Quality, Tested MCM Sheet Manufacturer

Throughout the manufacturing process, a quality manufacturer must regularly and consistently test the product to ensure that it meets certification requirements, as well as perform quality checks on features pertaining to both performance and appearance. Quality sheet manufacturers provide products and materials that meet a variety of standards, including those released by ASTM, American Architectural Manufacturer's Association (AAMA), National Fire Protection Association (NFPA), and the International Code Council (ICC).

Look for a manufacturer that meets the performance requirements of the International Code Council Evaluation Service (ICC-ES) Acceptance Criteria (AC) 25 and provides a valid product evaluation report including a third-party inspection agency. It is important to ensure that product performance provides a minimum bond integrity when tested in accordance with ASTM D1781. Other criteria such as continuous core density, panel thickness, and flatness are also important and identified in the manufacturer's production standards or AC25. When anodized coil is used, the anodizing must meet the requirements of C-22, A-41, Class 1 (per the Aluminum Association), and the aluminum coil quality must meet ASTM B-209.

Due to MCM's longevity and prevalence in the market, the IBC has dedicated a specific code section (1407) to the requirements for MCM in construction. IBC Section 1407.14 defines labeling requirements that show manufacturing and performance compliance for an installed panel and also serves to ensure future material traceability. IBC 1407.14 refers to Section 1703.5, which requires all materials and/or assemblies to be labeled in accordance with procedures in Section 1703.5.1 through 1703.5.4.

After deciding on a quality manufacturer, next you will need to work with a quality MCM fabricator.

Securing a Quality MCM Fabricator

MCM fabricators design, engineer, and fabricate panel systems meeting the defined project performance requirements in the areas of water penetration and structural performance.

Fabricators are responsible for creating project and shop drawings while also providing engineering calculations

showing the adequacy of the panel system design to meet the load requirements, including wind, gravity, and (in certain cases) impact loads. After the material specification phase is complete, the fabricator helps in the determination of material choice, including structural components such as extruded aluminum profiles, fasteners, and engineered clips required to fabricate MCM sheets into cladding panels.

Fabricators are responsible for tests of the cladding systems that include wind-load resistance and water penetration. The fabricator is also heavily involved in fire-performance testing to meet the specification and local code requirements. Warranties for system performance are also provided by the MCM fabricator who is often responsible for the installation.

Characteristics of a Quality MCM Fabricator

Quality fabricators will not only fabricate the MCM, but they will also test and thoroughly engineer all of the systems. When selecting a quality fabricator, confirm that it will provide project shop drawings and engineering calculations stamped by a registered design professional to show the adequacy of the panel system design for the project. Ensure that your fabricator is using materials from quality sheet manufacturers and provides the specified warranties on products as well as installation.

The MCA also has a MCM Systems Fabricator Certification Program through which fabricators maintain their qualifications, ensuring that they are current on the latest codes and technological advances.

Ensuring Quality Installation

The installer, whether the MCM fabricator or an independent project manager, is responsible for safeguarding that each step of the installation process is properly completed. As part of the installation process, MCM fabricators are responsible for the coordination of material deliveries to the job site. They are also responsible for coordinating with individuals and companies from other trades regarding installation of the cladding system, and providing the materials and labor required to provide weathertightness for the designed system.

Final field measurements including framing/substrate tolerances and the "field" fabrication of panel components must be completed on-site. Final project closeout items are typically a joint effort between the MCM installer and the fabricator. The MCM installer typically provides warranties for the workmanship and installation, which we will discuss in more detail later in this article.

MARRIOTT RESIDENCE INN

Project: Marriott Residence Inn
Location: Watertown, Massachusetts Building Owner: Boylston Properties
Contractor: PROCON
Architect: Stantec
Manufacturer and Fabricator: CEI Materials
Materials: Arconic Architectural Products/Reynobond
Completion Date: September 2018

The Marriott Residence Inn located in Watertown, Massachusetts, is the first hotel built in the area in 50 years. The hotel is the joint venture between developers Boylston Properties in Boston and Stonebridge Companies in Denver.

The Marriott Residence Inn is located in Watertown's East End. William McQuillan, principal of Boylston Properties, says, "We built a contemporary building on purpose that has a 24/7 life to it. It is about the future of Watertown, and it is one of a number of projects going on in the East End that are all about the future of Watertown."

The LEED Silver hotel was designed by Stantec and sits in the location of the former Charles River Saab, the oldest Saab dealership in the United States. The 108,000-square-foot hotel features an abundance of sustainable amenities that contributed to its LEED certification, including energy-saving HVAC, lighting, and groundwater systems. Additionally, a range of sustainable construction processes was also adopted.

According to the general contractors at PROCON, "The building's exterior was a combination of color-reflective masonry and panels with lighter-toned upper floors highlighted by recessed faux wood accents."

CEI Materials, using the R4000 Drained Rear-Ventilated Rainscreen System, fabricated the metal composite and aluminum plate components of the facade. This system offers rainscreen technology with varying joint widths as well as color versatility. According to CEI Materials' Project Manager Nick Sodt, "With 10 different colors on the project, joint colors and color layout of the panels required special attention in the final design and also fabrication and installation."

PHOTO COURTESY OF CEI MATERIALS

Shown is the MCM exterior and faux wood finish of the Marriott Residence Inn located in Waterton, Massachusetts

He adds, "CEI fabricated 45,000 square feet of metal components for the project and saw a few challenges along the way, such as the site access on Arsenal Street due to existing power line layouts. Additionally, we fabricated large 14- to 16-foot-long panels for the exterior, which created some challenges in terms of shipping and installation that were overcome."

The 6-story hotel was a welcomed addition to the area, offering 150 spacious accommodations ranging from studios to two-bedroom suites with fully equipped kitchens. Guests can enjoy an array of modern conveniences, including an indoor saltwater pool. Watertown, located in Greater Boston, is becoming highly popular, with new sustainable developments breathing new life into the area.

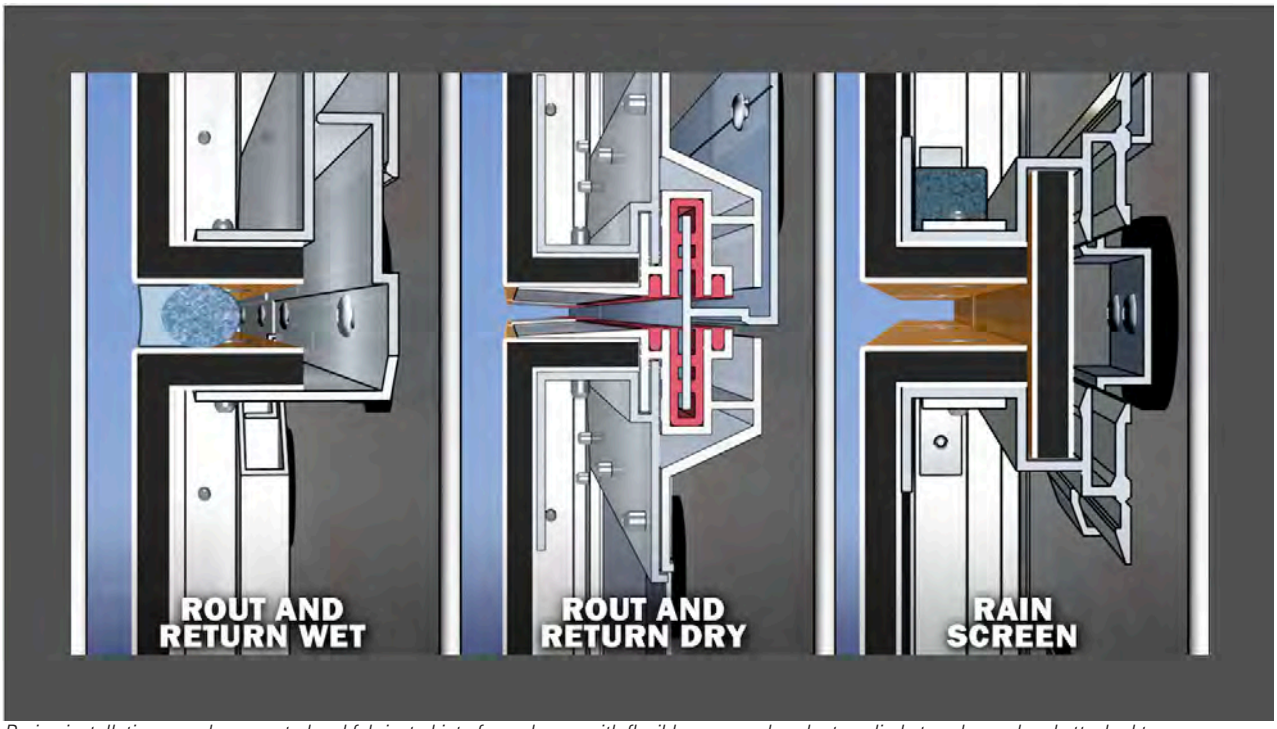


Image courtesy of Metal Construction Association

During installation, panels are routed and fabricated into formed pans with flexible ex- posed sealant applied at each panel and attached to interlocking or clip extrusions to join, thus minimizing air and water infiltration

Wet-Seal, Dry-Seal, And Rainscreen Systems

Since MCM products were introduced to North America, installations have been performed using three different styles: wet-seal, dry-seal, and rainscreen systems. These systems have been utilized on many hundreds of different types of buildings. Variations of these systems are still commonly used today. Regardless of the installation system used, the primary goal is to ensure that exterior cladding and/or rainscreens prevent unwanted air and moisture from breeching the building envelope.

All of these systems are required to meet certain performance requirements, which can include air infiltration (ASTM E 283), water resistance (ASTM E 331), structural performance (ASTM E 330), and specific rainscreen requirements identified in AAMA 508 or 509 for these type of systems. All installations where panels are used in excess of 40 feet must meet the fireprotection requirements of NFPA 285.

Wet-Seal System and Testing

The wet-seal system is also known as a “singleline barrier wall” or “fully sealed wall” because there is a joint located between adjacent panels that is fully sealed with sealant. Silicone or a medium modulus sealant are typically used to fill this joint. These sealant types are used because they are flexible and will remain adhered to the panels as they move due to thermal expansion/contraction.

During this installation process, a single barrier is created between the exterior environment and the cavity behind the panel. Panels are routed and fabricated into formed pans and anchored to the substrate using extrusions. The joints are sealed with exposed sealant to minimize air and water infiltration.

The proper installation of sealant and adhesion to the panel is critical to keeping unwanted air and water out of the building. This installation must be inspected regularly to ensure that the sealant remains flexible and adhered to the panel. This is especially important as the exterior envelope ages. While this system is designed to stop water infiltration at the exterior panel surface, any condensation that makes its way into the panel cavity can still cause issues for the building interior and materials. A properly designed and installed panel system should have openings for cavity moisture to exit via weeping or evaporation without entering the building.

No additional testing is required for wet-seal systems other than the aforementioned air-infiltration requirements tested to ASTM E 283, water-resistance requirements tested to

ASTM E 331, structural performance requirements tested to ASTM E 330, and fire-performance requirements tested to NFPA 285.

Dry-Seal System and Testing

Dry-seal systems do not use exposed wet components, such as sealants, in the panel joint design. The dry-seal system has a few more components when compared to the wet-seal system. MCM panels are formed into pans and joined with aluminum interlocking extrusions and/or gaskets. The infiltration of water is primarily controlled by the interlocking aluminum extrusions. Just like properly designed wet-seal systems, dry-seal systems allow for any water or condensation that finds its way into the panel cavity to drain or evaporate out before penetrating the building envelope. The type and location of an air/water barrier should not have an impact on the panel performance of a dry-seal system.

Dry-seal systems allow for a panel reveal from ½ inch to 12 inches. Joints can be finished with color matched or complementary accent strips to provide a sleek, clean, and aesthetically pleasing exterior.

When hiring a fabricator to provide and/or install a dry-seal system, it is important to ensure that it completes the same basic ASTM E283, ASTM E331, and ASTM E330 testing to ensure proper performance.

Raincreen Systems and Testing

Rainscreen encompasses two basic categories of systems: drain/back ventilated (D/BV) and pressure-equalized rainscreen (PER).

Both systems employ open joinery and allow a controlled amount of water into the wall cavity and between the outer and inner leafs. D/BV systems rely on the ventilation cavity to both drain and dry out any residual water.

PERs also employs a ventilation and drainable cavity but add compartmentalization, limiting the amount and duration of a pressure difference between the exterior environment and the air cavity behind the cladding. Compartmentalization of the wall cavity facilitates rapid pressure equalization.

Rainscreen systems allow for a panel reveal from ½ inch to 12 inches depending on the type of system and the required performance. Joints can be finished with color-matched or complementary accent strips to provide a sleek, clean, and aesthetically pleasing exterior.

The performance of all D/BV and PER systems rely on properly selected, detailed, and installed air/water barrier appropriate for the project's climate zone. Air/water barrier imperfections introduced into the system test (AAMA 508 and 509) create a worst-case assembly that causes reduced pressure equalization.

As materials change and technological advancements are made, we have a better understanding of how exterior cladding and MCM products perform under loads and in severe weather conditions. These new developments are regularly incor porated into design and manufacturing processes as well as building codes.

Warranty Information

Nearly all MCM products and services come with some type of warranty. Not only are warranties available on the manufactured products, but oftentimes a separate warranty is available on the work done by the fabricator and the installer. Warranties vary, so it is important to confirm all material and system warranty information with the manufacturer or fabricator prior to specifying and installing materials. Confirm terms other than the length of the warranty, as different finishes warrant different performance.

Because services and warranties vary by each MCM manufacturer, fabricator, and installer, it is important to review all warranty information early in the planning process.

Conclusion

MCM products produced by a quality sheet manufacturer, engineered and fabricated by a quality fabricator, and installed on the building by a quality erector provides superior building protection, a beautiful architectural facade, and a long-lasting building exterior for many years.

Test Questions

Understanding Metal Composite Material, Installation, and Systems

1. What is the minimum skin thickness required for MCM by the International Building Code?
   a. 0.001 inch (0.254 millimeter)
   b. 0.019 inch (0.5 millimeter)
   c. 0.009 inch (0.2286 millimeter)
   d. 1.0 inch (25.4 millimeter)

2. Which of the following standards provides guidance for MCM specifications to ensure fire protection?
   a. ASTM B-209
   b. NFPA 285
   c. AC-25
   d. C-22

3. Who is responsible for the process of bonding the skins and core together in a continuous process?
   a. MCM fabricator
   b. MCM specifier
   c. MCM installer
   d. MCM manufacturer

4. Who is responsible for the process of cutting, routing, fold- ing, and otherwise processing the MCM to create panels?
   a. MCM fabricator
   b. MCM specifier
   c. MCM inspector
   d. MCM manufacturer

5. Who is responsible for the surface finishes and material fire performance of the MCM?
   a. MCM fabricator
   b. MCM manufacturer
   c. MCM specifier
   d. MCM inspector

6. Which IBC code section pertains to labeling requirements for MCM manufacturers?
   a. IBC Section 1000
   b. IBC Section 1205
   c. IBC Section 1604
   d. IBC Section 1407

7. Who is responsible for the coordination of material deliveries at the job site?
   a. MCM fabricator
   b. MCM manufacturer
   c. MCM inspector
   d. MCM specifier

8. Which system uses silicone or medium modulus sealant to create a barrier?
   a. Dry-seal system
   b. Wet-seal system
   c. Rainscreens
   d. Modular system

9. Which MCM professional provides warranties on the finish quality, bond integrity, and overall appearance (flatness)?
   a. MCM fabricator
   b. MCM inspector
   c. MCM specifier
   d. MCM manufacturer

10. Bond integrity should be tested to meet which standard?
    a. ASTM D1781
    b. NFPA 285
    c. IBC 1701
    d. ASTM B1700

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Tile Industry in Transition: The Evolution of Standards

BY: RYAN MARINO, TILE COUNCIL OF NORTH AMERICA (TCNA)

The tile industry experienced a massive shift with the recent overhaul of the ANSI A108 installation standards. The Tile Council of North America (TCNA), in collaboration with stakeholders from the A108 Committee, led the effort to revise the standards. The primary objectives of this effort included reorganizing the structure, removing repetitive language, and ensuring consistency between standards, all while updating them to reflect current industry practices.

Initially aimed at revising ANSI A108.01 and ANSI A108.02, the project quickly developed into the largest series of simultaneous revisions in the history of the A108 Committee. This comprehensive effort resulted in the introduction of two new standards and revisions to fourteen existing standards.

In addition, new standards emerged for foam backer board and pre-mixed grout along with the annual updates to the Handbook for Ceramic, Glass, and Stone Tile Installation.

Given that standards are constantly changing and evolving, this collaborative endeavor plays a crucial role in the ongoing refinement and streamlining of industry standards for the benefit of all users.

Updates to A108.01 and A108.02

ANSI A108.01 underwent substantial modifications, particularly a comprehensive review and harmonization of installation requirements for substrates. These revisions also addressed substrate preparation before the tile contractor initiates work, including new language clarifying that if the tile contractor is expected to undertake this preparatory work, such details must be specified in the tile contract documents.

Revisions to ANSI A108.02 were also considerable, with a focus on general installation requirements for tile contractors. Updates were introduced to enhance existing information on crucial aspects such as lippage, grout joints, and modular patterns. Additionally, the revisions included detailed information for inspecting the substrate before the installation process begins.

New Standards A108.M and A108.T

For decades, ANSI A108.02 (and its predecessor A-2) served as a source for a detailed list of reference standards and materials relevant to tile installations. Recognizing that this information extended beyond the domain of tile contractors, it became evident that A108.02 was no longer the ideal location for this information. Consequently, the task group established a stand-alone standard, A108.M, to house this list and incorporate the necessary revisions, ensuring accessibility to a broader audience beyond the tile contractor.

As the tile industry continues to evolve and standards are developed, reviewed, and revised, it is more important than ever to stay informed.

The task group also faced challenges throughout the A108 revision process with terms used interchangeably despite not having clear definitions. To address this, the task group initiated development of a stand-alone document for terms and definitions, A108.T. Knowing the absence of definitions for certain terms within A108, the task group worked toward consensus-based definitions.

This not only contributed to resolving the ambiguity surrounding the terms but also helped in the effort to harmonize standards. By also incorporating existing definitions found in A108, A118, and A137 standards, the committee has created a strong foundation for consistent understanding and application of terms within the tile industry.

Updates to Standards for Adhesive Installation

During the reorganization of A108.01 and A108.02, it was necessary to relocate some information, prompting updates in multiple adhesive installation standards—specifically, A108.1A, A108.4, A108.5, A108.6, A108.9, and A108.12. These revisions aimed to incorporate details removed from A108.01 and A108.02, addressing suitable substrates, substrate preparation, and adhesive-specific information. The November 2021 edition of A108.5 played a crucial role by providing a framework for adhesive installation standards, eliminating repetitive language, and enhancing clarity.

Other ANSI Standards Requiring Updates

As part of the overhaul, several other ANSI standards went through necessary revisions to ensure consistency and coherence.

The titles of A108.1B and A108.1C mortar bed standards were updated to align with the terms for cementitious mortar, unifying terminology across related standards.

The A108.11 cementitious backer units (CBU) standard experienced extensive revisions, integrating information from A108.01 and A108.02 and updated references to reflect the latest industry practices.

Additionally, there were targeted revisions in A118.1, A118.4, and A118.15 terms and definitions to harmonize them with the A108.T document.

Updates to Other Industry Resources

Revisions to so many A108 documents created a ripple-effect across other tile industry resources, requiring updates to crucial standards and references.

To incorporate these updates, the 2024 edition of the Handbook for Ceramic, Glass, and Stone Tile Installation required revisions to 9 guides, 31 tile installation details, and 26 stone installation details.

Likewise, revisions are in progress for the NTCA Reference Manual, where nearly every section will be revised to ensure harmonization with the updated A108 standards.

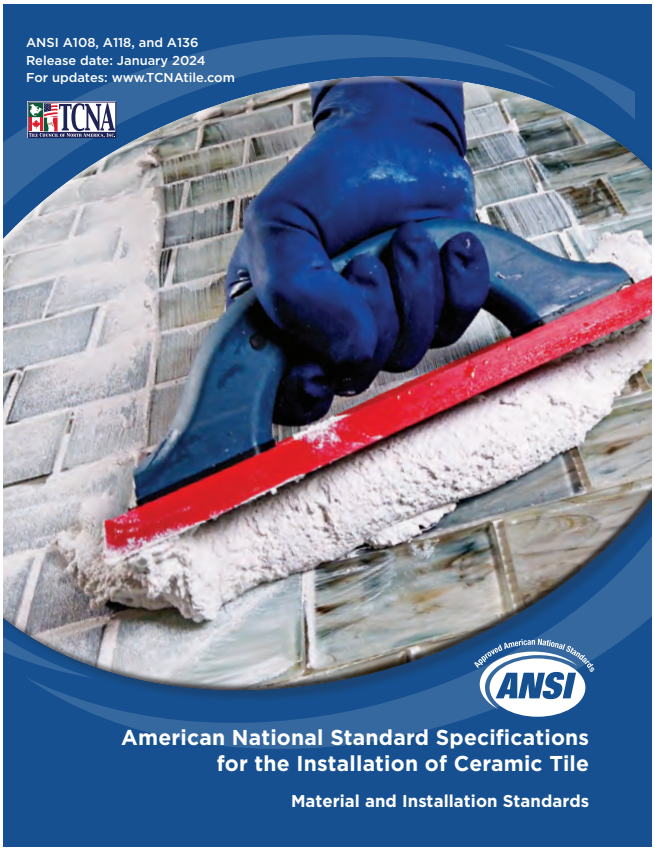
Additional Innovations and Improvements within the A108, A118, and A136 ANSI Publication

Beyond the overhaul efforts, exciting new developments can be found in the recently published A108, A118, and A136 compilation book. These encompass revisions to existing standards and introductions of new standards.

Improvements to Existing Standards

Regarding revisions to existing standards, ANSI A118.9 – Specification for Cementitious Backer Units, was updated. The updates aimed to harmonize the standard with ASTM C1325 – Specification for Fiber-Mat Reinforced Cementitious Backer Units and included modifications to test methods for nail pull strength and flexural strength.

Another significant revision is present in ANSI A118.10 – Specification for Waterproof Membranes, featuring an expanded definitions section. This expansion introduced new definitions describing waterproof membranes, liquid applied waterproof membranes, and sheet applied waterproof membranes. Additionally, an optional criterion for water vapor permeance was added, especially relevant for applications like steam showers.



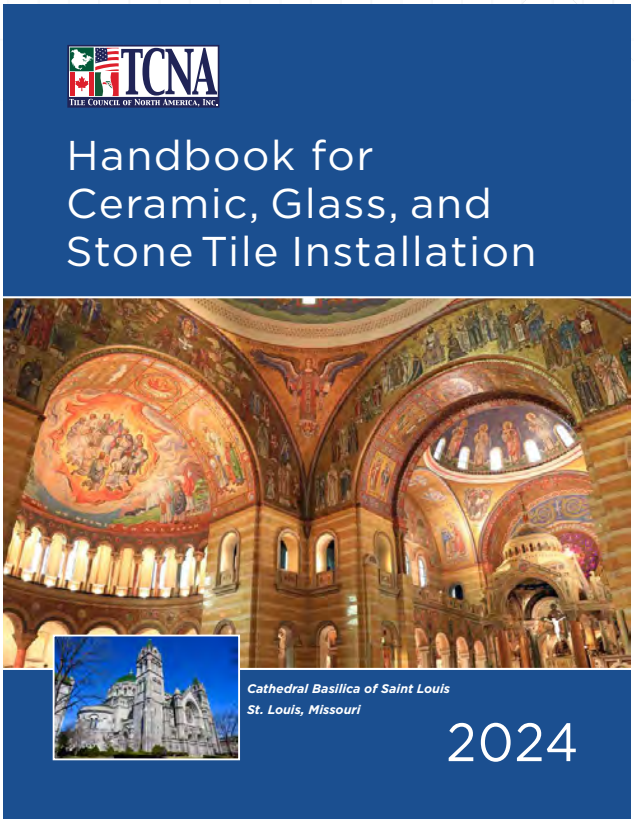
American National Standard Specifcations (ANSI) for the Installation of Ceramic Tile

New Standard for Foam Core Backer Board

A significant addition to the standards for installation materials was ANSI A118.18–Specification for Foam Core Backer Boards. This established the first specification for foam core backer boards in the tile industry. Developed over the past three years, this specification outlines test methods and minimum requirements tailored for foam core boards designed to receive tile or similar surface finish materials in both dry and wet areas. This represents a significant step forward for the quality and performance evaluation of foam core backer boards.

Installation and Product Specifications for Pre-mixed Grout

New for 2024 were two standards focusing on pre-mixed grout, ANSI A108.22–Installation of Pre-mixed Grout in Tilework and ANSI A118.19–Specifications for Organic Pre-mixed Grout for Installation of Ceramic Tile. In development for over a decade, this project involved adapting existing standards, formulating new test procedures, and conducting extensive testing specific to pre-mixed grout, requiring several round robins and thousands of data points.



TCNA Handbook for Ceramic, Glass, and Stone Tile Installation

Annual Updates to The Handbook for Ceramic, Glass, and Stone Tile

In June 2023, experts and stakeholders convened in Washington D.C. to contribute to the ongoing improvement and expansion of the Handbook. With more than 50 participants present, the Handbook Committee approved 11 submissions, impacting 40 details and 5 guides within the Handbook.

Update for Gypsum Boards and Panels

Revisions to the Backer Board Selection Guide included the incorporation of a new section describing gypsum boards. Additionally, several backer board details were updated to align with ASTM and GA-216 standards, with a specific focus on coated glass mat water-resistant gypsum backing panels, glass mat gypsum panels, and fiber-reinforced gypsum panels.

Revisions to Green Building Guide

The Green Building Guide has incorporated two new sections: “Using Industry-Wide Guidance for Ceramic Tile, Mortar, and Grout Ingredient Transparency” and “Choosing Products with the Lowest Cradle-to-Grave Embodied Carbon.” These additions offer users valuable resources for sustainability information and considerations in flooring, facilitating informed choices and alignment with evolving standards.

New Life Cycle Cost Analysis Guide

A new guide was added to the Handbook, offering a summary of the 2023 Life Cycle Cost Analysis (LCCA) study authored by independent consultant Emily Lorenz. Covering 18 flooring types, Lorenz’s study provides insights into installed costs, lifetime costs, reference service life information, and average costs per year, serving as an essential tool for comparing and specifying flooring. The guide also includes sources for users to download the full study.

Membrane Exposure for Exterior Installations

Exterior methods involving membranes were updated to address challenges in bonding when exposed to the elements, UV, and contamination. Users are directed to consult membrane manufacturers for specific limitations before tiling, emphasizing the importance of understanding UV and weather exposure conditions.

Spot Bonding Updates

Spot bonding methods, recommended solely for dry, interior wall applications using suitable epoxy adhesive in W215 and W260, were updated with expanded limitations. These now encompass consideration of traditional coverage methods in lower courses, particularly where impacts are expected.

Steam Showers

Methods SR613 and SR614 for steam rooms and steam showers were revised, incorporating an added drawing that provides a close-up depiction of the slip joint. The language updates specifically address waterproof membranes in continuous use applications, now requiring a vapor permeance rating of <0.5 perms.

Staying Informed: Navigating the Evolving Tile Industry Standards

These revisions reveal the dedication and commitment of tile industry professionals to refine industry practices, foster clarity, and elevate the overall quality of tile installations. As the tile industry continues to evolve and standards are developed, reviewed, and revised, it is more important than ever to stay informed. Access the latest publications, news, and subscribe to receive the latest updates from TCNA at www.tcnatile.com.

About the Author: *Ryan Marino is the Standards Development and Research Manager at the Tile Council of North America. He is involved in the research, development, and revision of ASTM, ANSI, and ISO standards, and serves as the technical content manager for the TCNA Handbook. Ryan earned his Bachelor of Science degree in Ceramic and Materials Engineering from Clemson University in 2007 and has been with TCNA since 2011.*

A.I. and the Law: Can Copyright Protect the Architect's Originality?

**BY: BOB GREENSTREET, PHD FRIBA FRSA DPACSA,
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Much has been written lately about the consequences, mostly dire, of the rapid encroachment of Artificial Intelligence (A.I.) into the art world and beyond. However, the potential impact upon architecture has caused relatively little debate to date, perhaps because of the many inroads already made into practice by technological developments such as CAD and BIM. While these innovations are regarded largely as sophisticated tools that enrich, streamline and facilitate the architect's work[1], a broader concern than daily practice may be looming in possible threats to one of the key tenets of our profession –the originality of design ideas and their legitimate ownership. This article examines the challenges A.I. poses to the architect's rights of ownership of work and the extent of the legal measures currently in place to protect them. It questions the future relationship between A.I. and originality and reflects on how it may affect the profession in the future.

What is Originality?

Broadly speaking, originality can be defined as the creation of an idea that is the first or earliest of its kind. It cannot be derived from a copy, and precedes all comparable examples that were previously developed[2]. In architectural terms, it is legally defined by the United States Library of Congress[3] as 'the first ever embodiment' of an idea, something completely new and unlike anything that has gone before. Originality is prized and rewarded in the architectural profession, and the ownership of original ideas is protected under the Architectural Works Copyright Protection Act (AWCPA) which, among other things, defines original building types and determines which ones are therefore worthy of protection[4]. Copyrightable building types (churches, houses, etc.) and building elements are differentiated from excluded structures (boats, bridges, walkways etc.) and non-protectible elements, such as functional requirements, standard architectural features and traditional arrangements of rooms and spaces are also excluded.

What is Copyright?

Copyright law provides legal protection for the creators/ authors and prevents their original ideas from being reused without permission. In architecture, the AWCPA is relatively new in providing such protection – prior to 1990, there was relatively little protection beyond the blatant reuse of drawings – and despite its shortcomings[5], the Act has been a useful, if flawed, safeguard for the architect's creative security. While the outcome of a number of copyright cases has helped to clarify the parameters of protection for original ideas[6], the rise of A.I. poses new challenges to architectural originality, which are beginning to emerge in the adjacent fields of art and design.

The rise of A.I. poses new challenges to architectural originality, which are beginning to emerge.

The 'Human' element

Artificial Intelligence (A.I.), the machine-based technology which seeks to simulate human thinking, is already well established and expanding its presence in the fields of commerce and industry. It has recently begun to emerge in the arts, where it is raising important issues of authenticity

Originality can only stem from a process where human involvement is the initiating force.

in creativity, which are resolving themselves within the prevailing legal structure. The decisions in recently decided court cases suggest that, thus far, there is resistance to recognizing A.I. generated art as a legitimate recipient of copyright protection. In a 2023 case[7], a court declined to grant copyright protection where the stated author was a machine which was capable of creating artwork, affirming that originality can only stem from a process where human involvement is the initiating force. This stance was reinforced by a similar legal judgment in Colorado, where an image created by A.I. software (which admittedly won a Colorado State Fair art competition) was denied protection by the U.S. Copyright Office for 'lacking human authorship'[8]. This confirmed the prevailing view that, within the current framework of copyright protection for original ideas, there has to be a human author and not a programmed computer as the originating creator. By extension, therefore, it would appear that authorship of design ideas in the architectural realm remains protected by copyright law, and an architect's claim to originality is safe, even if the degree of originality necessary to meet the protectible standard appears to be quite minimal[9].

However, American law is neither absolute nor static; The two cases do not reflect a national ruling on the issue, and will only apply in the two states where the cases were decided. They will, of course, be used as corroborative evidence is any future comparable cases elsewhere in the United States, but will not form a binding precedent. Furthermore, their current position on copyright protection could evolve and change as further arguments likely to be presented in the courts to attempt to legitimize A.I. generated artwork. Law evolves to reflect prevailing societal attitudes, so future law cases involving A.I. will be vulnerable to change. This certainly happened within the art field with regard to photography. It was initially rejected as a legitimate, original art form by the art world as the camera was considered a machine, and not a valid art tool and extension of the artist's creativity. However, as attitudes towards photography softened and evolved, it was subsequently embraced as a legitimate art form in galleries, exhibitions and the art market. Will A.I.-generated work follow the same path to acceptance and eventual legal copyright protection?

A.I. v. Architecture

The issue of legitimacy further complicates the architect's claim to originality. While the idea of creativity is highly prized as a foundation of architectural quality, it has been estimated that, as a percentage of the actual built environment in the United States, only between 5 and 20 percent of buildings (regardless of the legal definition provided by the AWCPA) are actually designed by architects (10). The field of originality for architecturally generated ideas is therefore narrowed, and the role of A.I. further muddled by the current infusion of highly sophisticated computer applications that are currently used in everyday practice. Many feel that the ability of such programs to deploy algorithms to evaluate data and explore functional arrangements and design features can replace many of the architect's basic responsibilities, and moves the profession towards a situation where A.I. decision-making in issues of creativity is a feasible and imminent possibility.

Some are unphased by A.I. expansion and encroachment, believing that the new technologies represent a new generation of useful, timesaving tools rather than heralding the eventual replacement of architects in the design process. However, questions of the validity and protection of originality still remain. A.I. supporters claim that its expanded role in design cannot actually replace the personal interface with clients, nor generate the creative spark and overall insight that each architect brings to the design process. Optimistically, they believe that the potential transfer of workload to new programs will free up the architect to spend more time on design and give greater attention to the client needs. Of course, a more cynical view of the replacement of architect's responsibilities might also suggest a reduced need for the number of architects in the profession, or even a reduction of their fees to match their diminished involvement:

'As machines gain in intelligence, less and less human intervention will be required'[11]

Furthermore, some concerned voices, including University of Illinois Urbana-Champaign Professor Randy Deutsch, have raised the issue that, where technology takes over some of the basic duties currently undertaken by architects, a reduction in these basic roles within the design process will deprive new generations of architects from exposure to them. This lack of training during the formative years of practice undermines the understanding of all aspects of the design process and the traditional comprehensive role and responsibilities of the architect:

'They won't have the opportunity to learn foundational, fundamental steps that all would-be architects have learned in the past in becoming full-fledged design professionals'[12]

Whatever the future holds, computers obviously provide a valuable, necessary and integral part of today's architectural practice. As A.I. technologies advance, we can expect more inroads into services that are currently the sole province of the architect which provide the 'human' element that is a necessary component for copyright protection and the ownership of originality. Current legal thinking supports the author's rights of ownership and therefore the protection of original ideas, although societal attitudes and ultimately the law will inevitably continue to evolve and change. Hopefully, it will continue to respect the sanctity (and ownership) of originality as a key component of the architectural profession.

Questions of the validity and protection of originality still remain.

NOTES

1. Hishan, S. 'Can computers design buildings? What automation means for architecture' (https://www.gepspatialworld.net/article/can-computers-design-buildings-what-automation-means-to-architecture) 11/27/2018.
2. Originality is defined in the Cambridge English Dictionary as 'the quality of being special and interesting and not the same as anything or anyone else', while the Merriam-Webster Dictionary defines original as 'the first of its kind to exist' and 'what has not been known before'.
3. The Architectural Works Copyright Protection Act (AWCPA) 1990, U.S. Copyright Office Circular 41: 'Copyright Registration of Architectural Works' 2019 (www.copyright.gov/circs/circ41.pdf).
4. Building types included for copyright protection in the AWCPA include single and multiple houses, office buildings, churches and museums. Specifically excluded are bridges, cloverleafs, dams, walkways, tents, recreational vehicles and boats. Building elements not covered by the legislation are functional requirements, standard architectural features and traditional configurations of spaces.
5. Greenstreet, R. and Klingaman, R. (2000) 'Architectural copyright: recent developments in protecting originality and the architect's right of ownership'. Architectural Research Quarterly (Cambridge University Press) Vol.4. No.2. pp 177-183.
6. Greenstreet, R. 'The origins and unforeseen implications of the Architectural Works Copyright Protection Act and recent developments in its interpretation and implementation'. Marquette Intellectual Property & Innovation Law Review. Vol 25. Summer 2021. No.2.
7. Thaler v. Perlmuller, No. 1-22-cv-01564, 2023 WL 5333236. (D.D.C. Aug 18 2023).
8. Schrader, A. 'Another A.I.-generated artwork was denied copyright protection, adding a new knot to the complexities of creative ownership'. (https://news.artnet.com/about/adam-schrader-34468). Sept 26 2023.
9. Greenstreet, R. & Greenstreet, K. 'Measuring similarity: a tool for reducing subjectivity in design copyright disputes'. Il Diritto Industriale. 3/2023. pp 181 – 188.
10. Kolata, J. and Zierke, P. 'The decline of architects: can a computer design fine architecture without human input?' Buildings 2021, 11, 338. (https://doi.org/10.3390/buildings11080338).
11. See Note 8.
12. See Note 1.

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