

Metal Mastery

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Steel frame revolution

Unique metal ceiling systems

Surprising truths behind metal plates

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Photo ©2022 Kevin C Korczyk

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Leave No
Space
Untouched

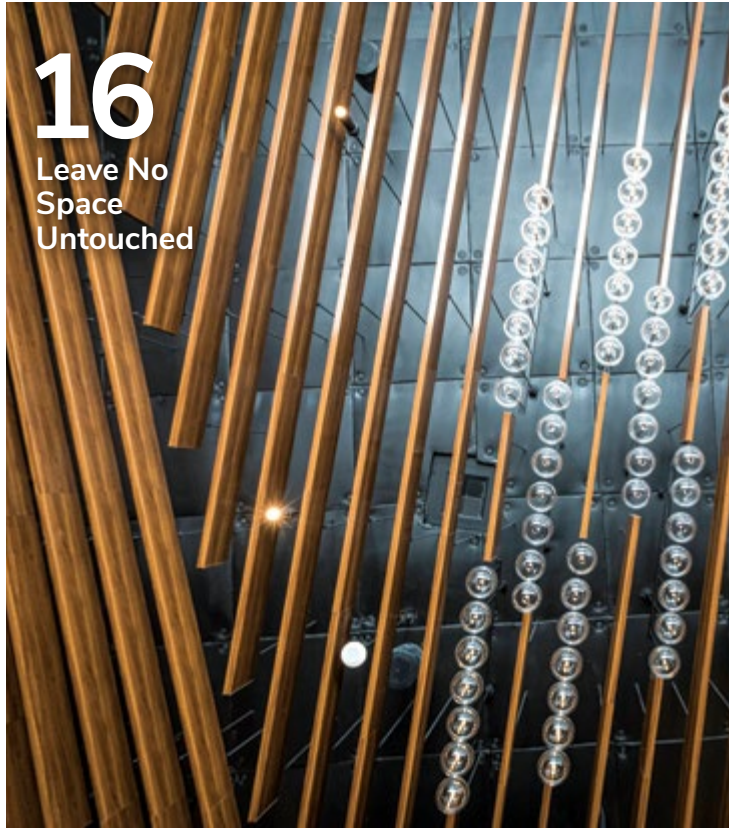


Photo courtesy Matix Inc.

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Shaping
a Skyline



Photo courtesy Ed Wonsek

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On The Cover

In Boston, MA sits Raffles Hotel. Upon entering, hotel guests ascend to the 17th floor Sky Lobby, and its Grand Stair which spirals through the three-story area.

Photo courtesy Ed Wonsek

Reflecting on Metal



Stacy Rinella
EDITOR-IN-CHIEF


Recently I was at my sons' school for an event, and at one point I was chatting with a few of my son's classmates. They were telling me how my son had shown them my editor's letter in the magazine (how sweet is that) and were very curious to know more about my job. When I told them I was the editor of a magazine called *Metal Architecture*, once boy enthusiastically said, "I want to be an architect!"

I would have loved to learn more about his 11-year-old career aspirations, but due to the hustle and bustle of the science fair, our conversation ended there. But our brief chat had me going back to the office and reflecting on the day-to-day aspects of my role at MA.

If I had to pick, I think my most favorite part of the job is reviewing the projects that come my way. As I type, we are mere moments away from the deadline for the 2024 *Metal Architecture* Design Awards. I'm on the edge of my seat in anticipation, as I cannot wait to pore through the entries and see the variety of projects (winners will be announced in the July issue) and visualize which photos will make a great cover, which will look great splashed across two pages and which ones tell a compelling story we cannot wait to share with you. This is how Natiivo in Austin, TX (p.8) and Florida's Pineapple Park (p. 16) came to fruition in this issue.

The same goes for my email inbox. Every time a new submission appears, I can't wait to download the files and review the project for its new-content potential. Residential, commercial, industrial, recreational, the list goes on. Case in point, Boston's Raffles Hotel, featured on the cover of this issue and corresponding article on page 25. As soon as I glimpsed the lobby's steel staircase and living wall, I couldn't wait to send to our design team to see how it would look as a cover photo. As predicted, it was "the one".

In addition to this month's page-turning projects, we have a ton of industry insights. Check out what guest columnist Jacquie Meiluta (p. 41) and our regular columnist Alan Scott (p. 44) have to say.

As usual, there is a lot to enjoy in the issue, and even more on our LinkedIn page: www.linkedin.com/company/metalarchitecture. See you there! 

Stacy Rinella

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Photo ©2022 Kevin C. Korczyk



Metallic Rhythm

With music in mind, angled aluminum plates conceal a nine-story parking structure

By Stacy Rinella

Photos courtesy Jeremiah Jhass and ©2022 Kevin C Korczyk

In Austin, live music is not just a pastime; it is a way of life. Musicians and music lovers alike flock to the city known as the “Live Music Capital of the World.” From intimate venues to iconic festivals like SXSW, the city is a backdrop for every genre. In a city renowned for its vibrant and eclectic culture, architectural expectations are high.

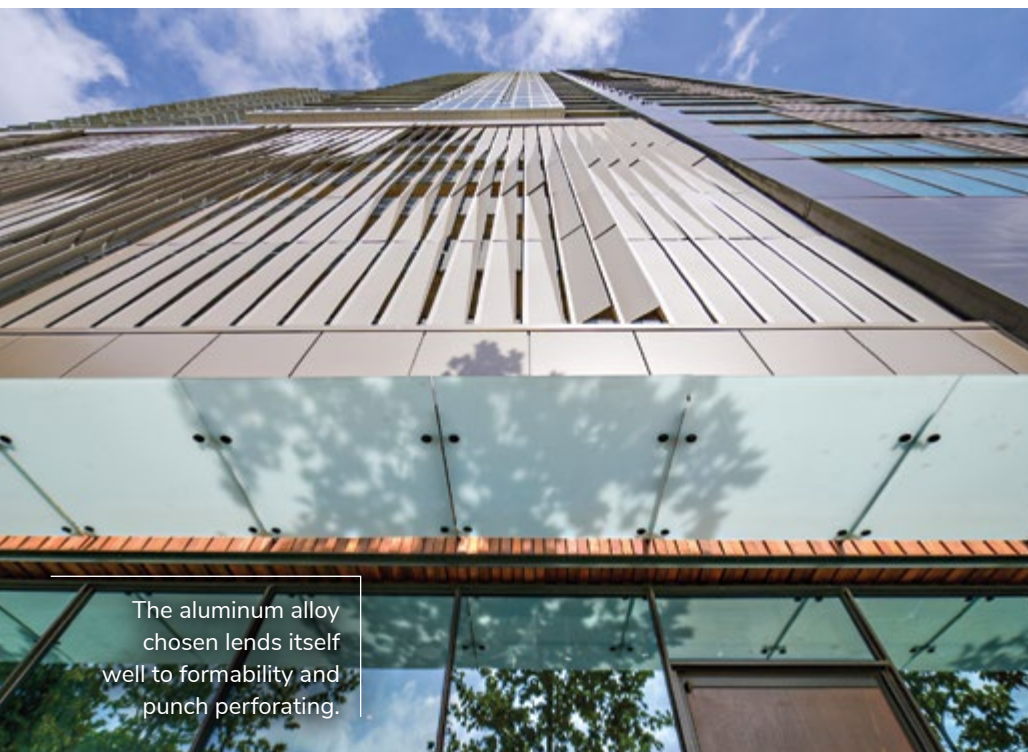
Born from the desire for an authentic, immersive experience, Natiivo is a home-sharing-based owners’ concept, offering owners the ability to list their unit on any home-sharing platform. By combining the local atmosphere of a homestay with the hotel-type amenities, Natiivo provides an option for people with a flexible, modern lifestyle.

With locations in lively cities such as Fort Lauderdale, Miami, Tennessee, and Denver, each Natiivo location embodies the quintessential character of its city, assimilating to become part of them. Unique touches spark curiosity and delight.

As a new hospitality concept launching in Austin, Natiivo aimed to make a splash with the first-of-its kind, 33-story residential/hotel condo building. The plan was for the project to reflect its surroundings, comfortably speaking the language of the city, built with premium materials, and outfitted with upscale fixtures. Guests could enjoy round-the-clock concierge service, co-working spaces as well as a 1,672 m² (18,000 sf) terrace and garden on the 10th floor. Natiivo also would offer guests and residents a rooftop swimming pool, lounge seating complete with a fireplace, and stunning views of the area.

Each Natiivo location embodies the quintessential character of each city, assimilating to become part of them.

Photo ©2022
Kevin C Korczyk



The aluminum alloy chosen lends itself well to formability and punch perforating.

Situated right in the popular Rainey Street area of downtown, the city of Austin was chosen for this new venture due to its high standards for embracing innovation, driving change, and constant growth.

Working closely with project partners STG Design and AECOM Hunt, KSC helped bring to life a design philosophy which would bridge Austin's urban environment with the city's natural surroundings. The result? An exterior featuring a rippling metal art wall that KSC fabricated and installed to disguise the building's parking garage behind it.

Illusions in color

With incredibly lofty expectations, the building design could not disappoint. The Natiivo exterior project was not without challenges, though. The first nine levels



The fins were installed in a predetermined sequence and the effect was sound waves being created by a guitar.



of the building would be dedicated to parking yet still needed to be eye-catching. According to Vince Neault, business development manager at KSC Inc., the outcome was a garage screen made of individual .125 aluminum fins. Each fin perforated in a different pattern and then bent askew at different intervals. “When installed in a predetermined sequence, the effect was sound waves being created by a guitar,” says Neault, which was appropriate for this live music destination.

The design also needed to draw inspiration from the modernness of Austin while still paying tribute to its natural surroundings, including Lady Bird Lake, which is only steps away. Neault says the cool colors lend themselves well with the surroundings. The lack of hue and saturation allowed the screen to blend well with the area.

The KSC team helped craft completely custom finishes for both the uniquely textured garage screen and aluminum composite paneling used throughout the exterior of the project.

The 2,230 m² (24,000 sf) .125 aluminum perforated and formed post-painted aluminum plate and aluminum composite products were chosen for this project due to their light weight, formability, and durability—making them the perfect solution for a garage screen. “The aluminum alloy chosen lends itself well to formability and punch perforating,” says Neault. In addition to a spirited music scene, Austin is also home to some active weather, like extreme heat, humidity, high wind, and hail. Neault says, “This heavy gauge aluminum sheet weathers well, especially when treated, to resist the elements.”

The radio wave inspiration to the screen comfortably speaks to the language of Austin, reflecting the vibrancy of the area.



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Techo Tile in Mission Red

ARCHITECT: JOHN M. SENKARIK & ASSOCIATES | CONTRACTOR: ROOFING PLUS, INC.
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2 THE WHARF - PARCEL 9 | WASHINGTON, D.C.

2" Field-Lok in White Custom Color

ARCHITECT: RAFAEL VIÑOLY ARCHITECTS
CONTRACTOR: PROSPECT WATERPROOFING CO
DISTRIBUTOR: BROCK ASSOCIATES



3 ROBERT HOLLEY CENTER | ITHACA, NY

1" Field-Lok in Copper

ARCHITECT: LEO J ROTH CORPORATION
DISTRIBUTOR: B&L WHOLESALE SUPPLY

COMMERCIAL WALLS WINNERS



1 CANELMI E-COMMERCE | BETHLEHEM, PA

Grand C in Black, Belvedere Grand R in Black

ARCHITECT: 4/4 ARCHITECTURE
INSTALLER: ALAN KUNSMAN ROOFING AND SIDING, INC.



2 6 GATES AVENUE | MONTCLAIR, NJ

CastleTop in Ascot White, Ash Grey & Charcoal Grey

ARCHITECT: ARCHITECTURA
CONTRACTOR: DEVINE ROOFING COMPANY
DISTRIBUTOR: BEACON BUILDING PRODUCTS



3 ELDER HOUSE | MAGOG, QC, CANADA

Dutch Seam in Custom Copper PVDF Finish

ARCHITECTS: GROUP A, ESPACE VITAL ARCHITECTURE, PROVECHER_ROY_BBBL
DISTRIBUTOR: TUILLES 3R

RESIDENTIAL ROOFS WINNERS



1 PRIVATE RESIDENCE | LONGPORT, NJ

Dutch Seam in Regal Blue, Curved PC System in Regal Blue

ARCHITECT: OSK DESIGN PARTNERS | CONTRACTOR: D&A HOME IMPROVEMENT LLC
GENERAL CONTRACTOR: VAN DUYN BUILERS | DISTRIBUTOR: ABC SUPPLY COMPANY



2 PRIVATE RESIDENCE | EASTHAMPTON, NY

Dutch Seam in Charcoal Grey

CONTRACTOR: LONG ISLAND METAL WORX
DISTRIBUTOR: RIVERHEAD BUILDING SUPPLY



3 PRIVATE RESIDENCE | HAYWARD, WI

CastleTop in Champagne, Smooth Finish

CONTRACTOR: NATURAL METAL ASSOCIATES
DISTRIBUTOR: SHEET METAL SUPPLY

RESIDENTIAL WALLS WINNERS



PRIVATE RESIDENCE | BUFFALO, NY
1 1/2" Field-Lok in Coppertone, Corrugated Panel in Regal Blue
ARCHITECT: KATHLEEN M. KINAN R.A. | DISTRIBUTOR: B&L WHOLESALE SUPPLY



PRIVATE RESIDENCE | HARSENS ISLAND, MI
Opaline Reveal in Classic Bronze, Design Wall in Classic Bronze
ARCHITECT: DESIGNTEAM PLUS, INC.
CONTRACTOR: ELIOTT GATTENO
DISTRIBUTOR: OAKLAND METAL SALES, INC.

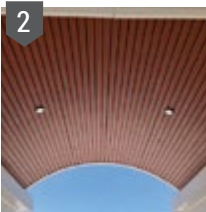


PRIVATE RESIDENCE | WEST NORRITON, PA
Corrugated Panel in Regal Blue & Boysenberry, Multi-Purpose Panel in Black
ARCHITECT: OW3 ARCHITECTS
CONTRACTOR: J. SCHWARTZ, LLC REMODELING & FINE HOME BUILDING
DISTRIBUTOR: MARVIC SUPPLY CO INC.

ACCENTS WINNERS



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Belvedere 7.2" Rib in Black
ARCHITECT: MOODY-NOLAN | CONTRACTOR: WOLFRUM ROOFING EXTERIORS
DISTRIBUTOR: ABC SUPPLY COMPANY



PLEASANT VALLEY ELEMENTARY | SOUTH WINDSOR, CT
Linear Ceiling in Cedar
ARCHITECT: DRA ARCHITECTS
CONTRACTOR: J AND J ACOUSTICS
DISTRIBUTOR: NEW ENGLAND GYPSUM

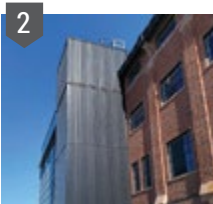


GARDEN HILLS MIXED-USE DEVELOPMENT | ATLANTA, GA
Versa-Line in Charcoal Grey, Corrugated Panel in Charcoal Grey
ARCHITECT: ATLAS COLLABORATIVE
INSTALLER: MILLERCLAPPERTON

SUSTAINABLE WINNERS



THE FAHY COMMONS BUILDING AT MUHLENBERG COLLEGE | ALLENTOWN, PA
2" Field-Lok in Sandstone
ARCHITECT: RE-VISION ARCHITECTURE | CONTRACTOR: WHITING-TURNER
INSTALLER: ALAN KUNSMAN ROOFING & SIDING, INC.

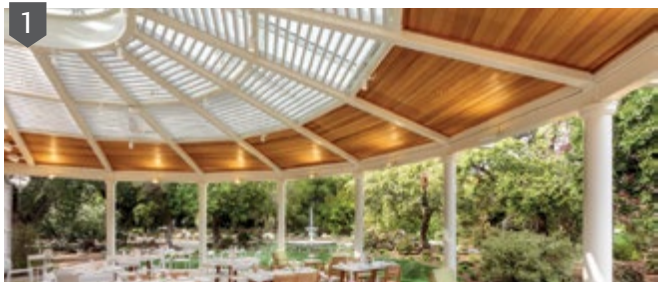


MSU ROMNEY HALL | BOZEMAN, MT
InSpire in Black
ARCHITECT: CUSHING TERRELL
CONTRACTOR: SWANK ENTERPRISES
DISTRIBUTOR: VEMCO, INC.



65 JON BARRETT ROAD | PATTERSON, NY
Isoleren WL in Almond
ARCHITECT: P.W. SCOTT ENGINEERING & ARCHITECTURE, P.C.
CONTRACTOR: HD CARPENTRY
DISTRIBUTOR: NEW CASTLE BUILDING PRODUCTS OF WHITE PLAINS

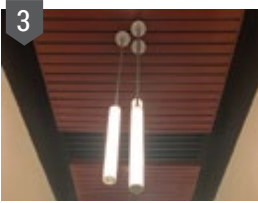
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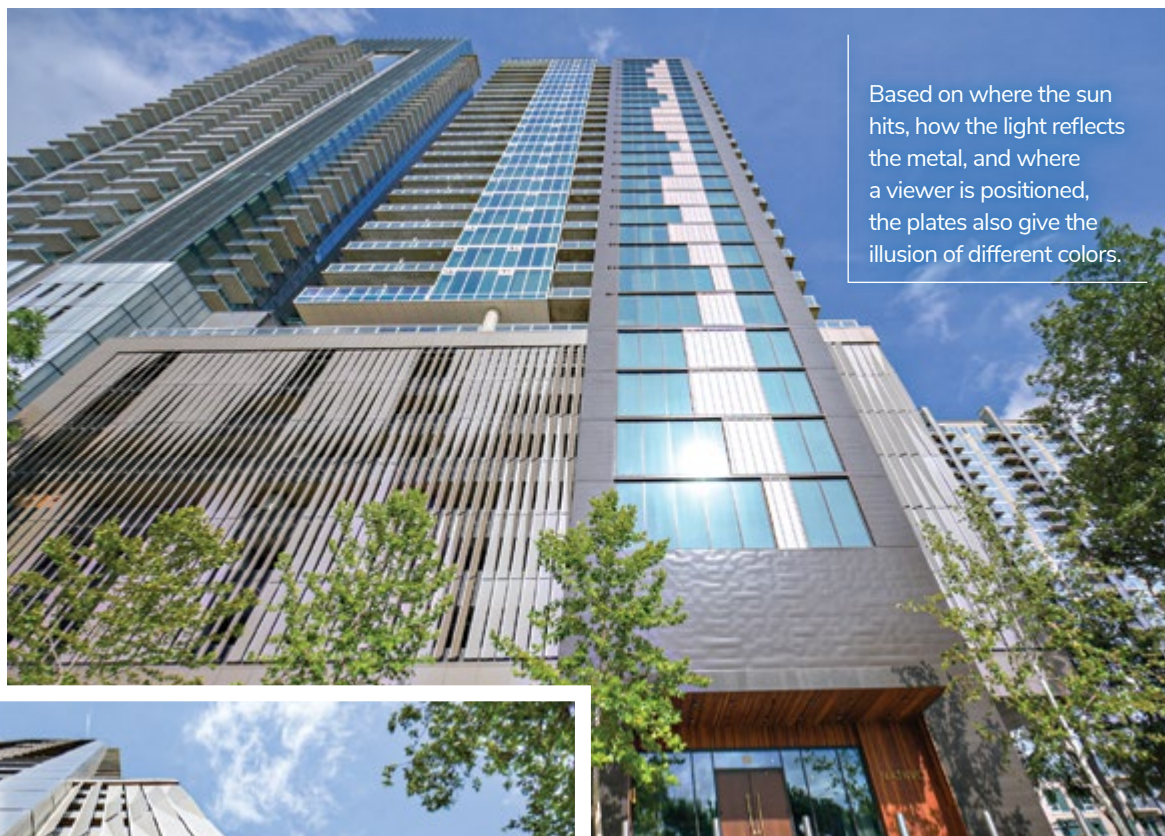
ROSE GARDEN TEA ROOM | SAN MARINO, CA
Linear Plank in White
ARCHITECT: ARCHITECTURAL RESOURCES GROUP | CONTRACTOR: MARTIN BROS.
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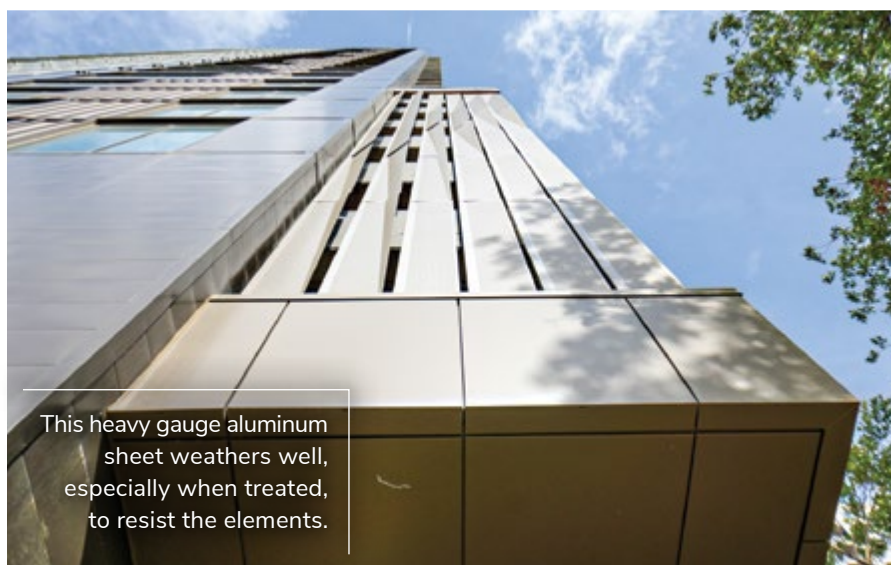
DAVE & BUSTER'S | MARIETTA, GA
Rigid Wall II in Black and Slate Blue
ARCHITECT: ARIA GROUP
CONTRACTOR: ECKINGER CONSTRUCTION CO.
DISTRIBUTOR: NEXGEN METAL DESIGN SYSTEMS



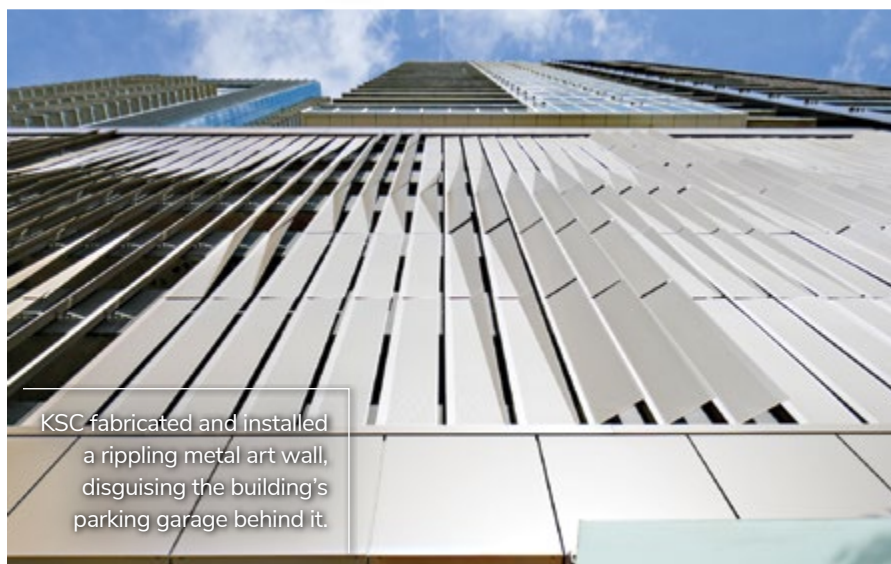
VESTAL FIRE STATION NO. 4 | VESTAL, NY
Linear Linear Ceiling in Redwood
ARCHITECT: COLLIERS ENGINEERING AND DESIGN
CONTRACTOR: ACCURATE ACOUSTICAL INC.
DISTRIBUTOR: L&W SUPPLY



Based on where the sun hits, how the light reflects the metal, and where a viewer is positioned, the plates also give the illusion of different colors.



This heavy gauge aluminum sheet weathers well, especially when treated, to resist the elements.



KSC fabricated and installed a rippling metal art wall, disguising the building's parking garage behind it.

The garage screen was crafted using computer numerical control (CNC) machining technology and eight different types of angles of the same post-painted aluminum metal plate throughout. With the addition of different panel sizes, the team could create a ripple effect. Based on where the sun hits throughout the day, how the light reflects the metal, and where a viewer is positioned in regard to the building, the plates also give the illusion of different colors.

Sound wave inspiration

After original design plans changed from a more abstract-shaped building, the focus shifted to the garage, with KSC playing an integral role in the focal piece of the building—the architectural garage screen and exterior paneling used throughout the exterior. Views to the majority of the other sides of the building would eventually be blocked by other projects in process, yet the project owners still wanted to make a splash on the downtown skyline. With music in mind, the design team came up with the sound wave concept, allowing fresh air movement needed for a parking garage. Neault says the radio wave inspiration to the screen comfortably speaks to the language of Austin, reflects the vibrancy of the area, and added the perfect hint of drama to a groundbreaking project. [Ma](#)



Ask the Expert

Do you have a question regarding the specific use of a product, material, or technique for a project that you are currently working on?

If so, these experts may have the answers you are looking for. These leading manufacturers and suppliers have provided solutions to some of the more common questions asked by the architectural

community. From the simplest questions relating to which product may be best suited for inclusion in specifications to discovering best practices related to installation to ensure product longevity.

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Q: What solar reflective (SR) coatings does Sherwin-Williams offer?

A: Our SR coatings, also known as cool coatings, are available in a variety of formulations for coil and extrusion applications, including Fluorpon® 70% PVDF, WeatherXL™ SMP and polyester. SR coatings offer a large palette of energy efficient colors that meets rigorous LEED and Cool Roof Rating Council (CRRC) requirements.

Q: What are the benefits of SR coatings?

A: SR coatings for metal roofing and siding are one way to mitigate the urban heat island effect. Higher reflectance means lower surface temperatures and reducing ambient air temperatures, resulting in both the coating and the roof or siding to stay cooler and lower energy costs. When used in new construction, cool coatings systems on metal roofing offer opportunities to earn LEED credits such as the Heat Island Reduction Roof Credit and building lifecycle impact reduction. Metal roofing and siding coated with Sherwin-Williams SR coatings offer additional sustainability attributes like durability and recyclability.

Q: How do you help customers with their sustainability goals?

A: Customer partnership is a priority for us. We collaborate directly with our customers to provide resources, data and solutions to help meet project goals for LEED. 



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Lauren Rogers joined Sherwin Williams Coil Coatings Division as a Sustainability Marketing Manager. She graduated with a B.S. in Biology, B.A. in Spanish Language and Culture, and a minor in Sustainability from the University of St. Thomas, St. Paul. She is passionate about creating a more sustainable, equitable environment in both her personal and professional life.





Steel Frame Revolution

Leading the way in structure design

By Stacy Rinella

Photos courtesy Matix Inc.

Every day the benefits of metal are becoming more apparent and the obvious choice as the go-to material in building innovation. From metal walls, roofs, and ceilings, to insulated metal panels (IMPs) and metal composite materials (MCM), metal is leading the charge in architecture. Sustainability, durability, and efficiency are all improved when it comes to metal, and light gauge steel framing is no exception.

Light gauge steel framing offers a multitude of advantages over traditional wood framing, revolutionizing the building and designing of structures. Approximately 30 to 50 percent lighter than wood, and requiring no on-site cutting or welding, the whole process is streamlined, allowing for rapid assembly without the need for heavy tools or equipment. Plus, the inherent strength of steel could result in faster construction times and better budget goals.

As well, steel has made a name for itself as the number one recycled material in North America. Each year, more than 80 million tons of steel are recycled, and these recycling efforts save energy equivalent to powering one-fifth of U.S. households for a year. This practice also helps to reduce greenhouse gases generated by manufacturing waste. This environmental aspect further solidifies its appeal in modern architectural practices. Pineapple Park is a prime example.

Designed for safety and excitement

The story of Pineapple Park begins with Fred Ayres. According to Richard C. Ahrens, president of Ahrens Companies, the design and build construction company on the project, “Fred Ayres was a member of the neighboring community who made strides in giving back to the community. Upon his passing, his family continued to honor his legacy with a generous donation.” Ayres’ memory endures with this Jensen Beach,



Top right: This building is an open structure without full length walls totaling at 328 m² (3,528 sf) of PBR standard galvanized wall panels.

Bottom right: Ceiling fans are necessary to meet positive airflow requirements; a common feature in this type of structure.



Fla. covered playground, a park which was designed with safety and excitement in mind, as well as cost efficiency.

“Pre-engineered building systems prove to be cost effective over the long term.” Ahrens adds, the use of rubber flooring for shock absorbency minimizes injury from falls. The metal covering allows kids to enjoy the playground despite weather elements. “Pre-engineered building systems can withstand category 5 hurricane wind speeds up to 257 km/h (160 mph).”

This playground features a 418 m² (4,500 sf) multi-age play area with metal roofing. This building is an open structure without full length walls totaling at



Top left: The playground follows best practices in youth fitness; covered by a permanent roof structure with, lighting, water fountains, benches, picnic tables, and circulating fans.

Top right: When it comes to the maintenance of Pineapple Park, the materials used have up to 25 years warranty, and the average life span is 50 years or more.

Bottom: The park was designed with safety and excitement in mind, as well as cost efficiency.

328 m² (3,528 sf) of PBR standard galvanized wall panels. The roof is a standard galvanized PBR roof panel system at 615 m² (6,622 sf).

Steel endurance

The first of its kind in Marin County, the use of a pre-engineered metal building system allowed for the clients' goals to be met along with the municipality's growing need for more green efficient commercial buildings. Ahrens says based on the location's proximity to the ocean, materials like wood tend to decay faster from the salt than would a high-grade steel structure.

The playground follows best practices in youth fitness; covered by a permanent roof structure with, lighting, water fountains, benches, picnic tables, and circulating fans. Ahrens says the fans are necessary to meet positive airflow requirements. This is a common feature in this type of structure and attaches very easily.

When it comes to the maintenance of Pineapple Park, Ahrens says the materials used have up to 25 years warranty, and where life expectancy is concerned, and the average life span is 50 years or more. "There are other similar structures we've built going on 30 plus years now with no issues." [Ma](#)



Photo courtesy Lizter Vanorman



Leave No Space Untouched

Functional advantages of unique metal ceiling systems

By Paige Roering

Metal ceiling systems offer unique visual and functional solutions which support bigger design goals. Metal ceilings draw the eye up and finish interestingly designed spaces, leaving no space untouched. With so many options available, which should one choose? Here is an overview of some excellent ceiling systems designed to create unique, eye-catching ceilings.

Baffle Ceiling System

Baffle ceilings are one of the more understood ceiling systems in general, but the range of metal options available is less explored. Aluminum baffles offer acoustical advantage just like polyvinyl chloride (PVC), cloth, wood, and composite baffles, but designs range from wood look to every other metal under the sun.

Whether opting for a natural metal finish or an expertly painted faux-woodgrain aluminum, metal baffle ceilings are sure to stun. Baffles provide visual

interest to tall ceilings, reduce echo, and give a space a finished look. Narrow options feel modern and baffle ceiling arrangement design can range from straight-lined and straight-forward to extremely patterned.

Best uses for metal baffles:

- Spaces where acoustical panels with micro-perforated metal support sound management needs.
- Exterior spaces where baffles mimic indoor design features, but durability of exterior performance is needed.

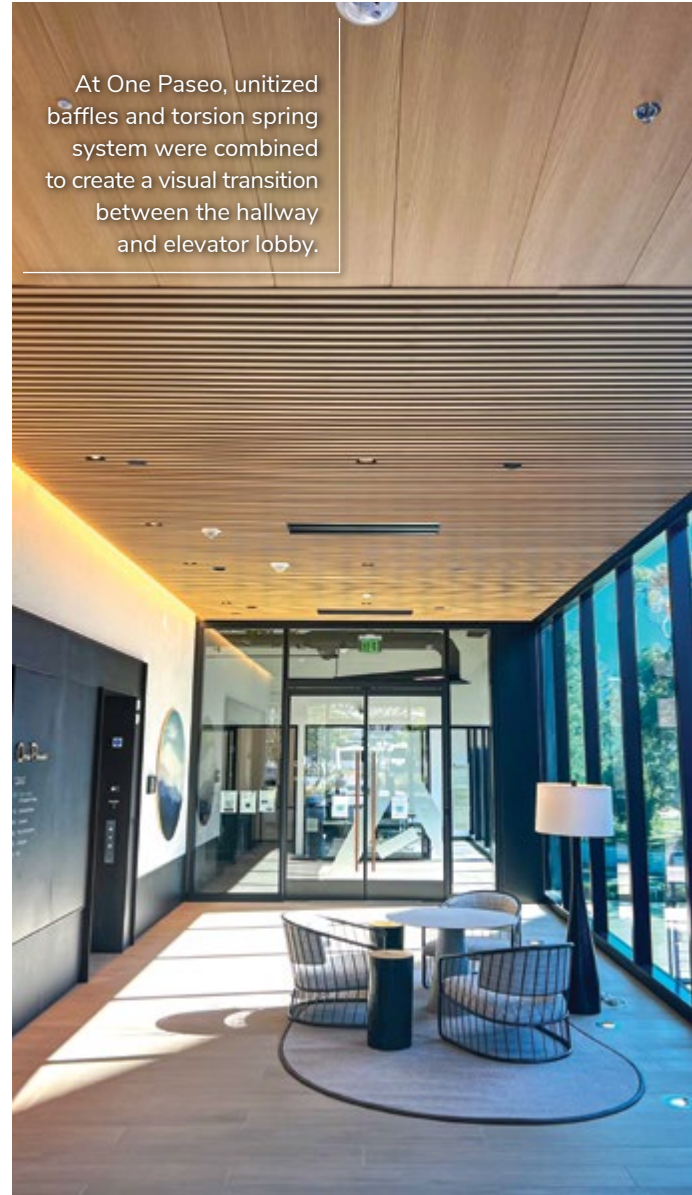
Torsion Spring Ceiling System

Torsion spring systems offer an elegant, streamlined aesthetic. The concealed suspension system ensures that viewers see only the beautiful finish, as opposed to the hanging mechanism, as is the case with flat lay-in ceilings, or the roof structure with a baffle ceiling. Functionally, these metal panels can be equipped with micro-perforations and acoustical backing to meet sound-absorbing needs.



The linear clip strip system seamlessly flows from interior to exterior when the right metal finishes are used.

At One Paseo, unitized baffles and torsion spring system were combined to create a visual transition between the hallway and elevator lobby.



Best uses for metal torsion spring systems:

- Ceilings where clean lines are the primary design goal.

Linear Clip Strip Ceiling System

A linear clip strip ceilings system utilizes a grid to create interest with planks, but due to the simplicity of the design is still easy to install. The linear clip strip system seamlessly flows from interior to exterior when the right metal finishes are used. Interior versions have the option for acoustical backing and perforation.

Best uses for linear clip strip ceiling system:

- Plank design element is desired, but easy installation is required.
- Great for matching flush reveal exterior soffits which seek a wooden design feature that stands up to nature's elements.

Torsion spring systems offer an elegant, streamlined aesthetic.

Photo courtesy
Chipper Hatter

Combining systems

For a truly custom look, one can employ different systems to divide open areas into distinct zones. By using the same finish but changing the panel size, system, or orientation, one can add intrigue without overwhelming the space. A great example is One Paseo, where unitized baffles and torsion spring system were combined to create a visual transition between the hallway and the elevator lobby.

Transitional metal

One Paseo also showcases how powerful it is to use the same material on the exterior as the interior. The continuity between exterior soffits and interior areas creates synergy between interior and exterior spaces. This deliberate integration exemplifies the design potential for metal ceilings as a thread between indoor and outdoor design.



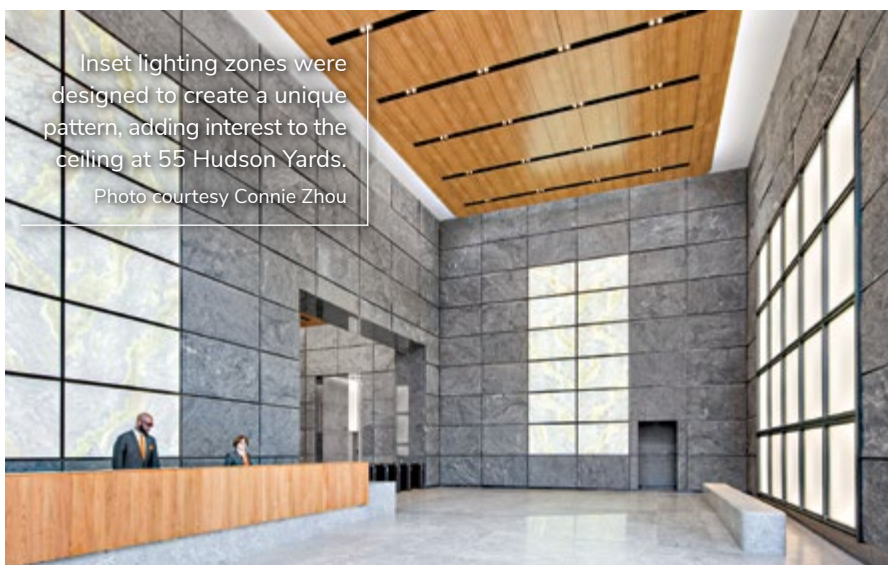
Continuity between exterior soffits and interior areas creates synergy between interior and exterior spaces.

Photo courtesy Gensler



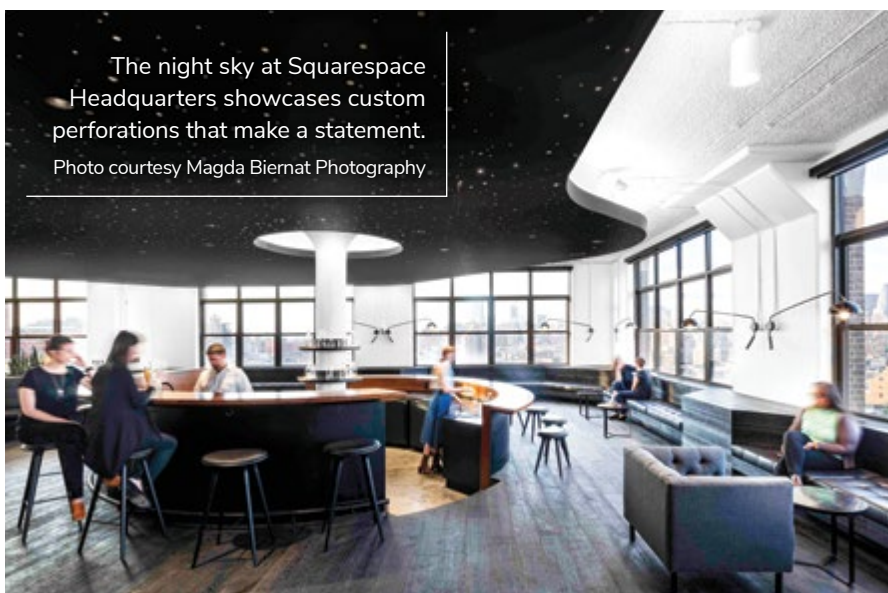
Riverhouse 11 at Port Imperial is an example of how metal ceilings offer endless specialty systems.

Photo courtesy Brennan Photo & Video



Inset lighting zones were designed to create a unique pattern, adding interest to the ceiling at 55 Hudson Yards.

Photo courtesy Connie Zhou



The night sky at Squarespace Headquarters showcases custom perforations that make a statement.

Photo courtesy Magda Biernat Photography

Specialty systems and add-ons

Metal ceilings offer endless specialty systems. This is because the formability of aluminum, corrugations, from standard to shark fin, can be added to catch the light at every angle.

The customization available for metal ceiling systems allows space for unique lighting design. Making overhead lighting a feature, not just a necessity. Inset lighting zones were designed to create a unique pattern, adding interest to the ceiling at 55 Hudson Yards.

Flat panels can be applied at unique angles, like at Hogan Lovells, where wood finish metal panels guide employees down the main corridor to the conference room.

Perforations provide function for interior panels with acoustics, but they also can be utilized as a design element. The night sky at Squarespace Headquarters showcases custom perforations that make a statement. [Met](#)

Paige Roering is the marketing manager at Pure + FreeForm. She leverages her background in content marketing to create contagious brands for high-end products. She is passionate about bespoke design, sustainability, and quality materials.



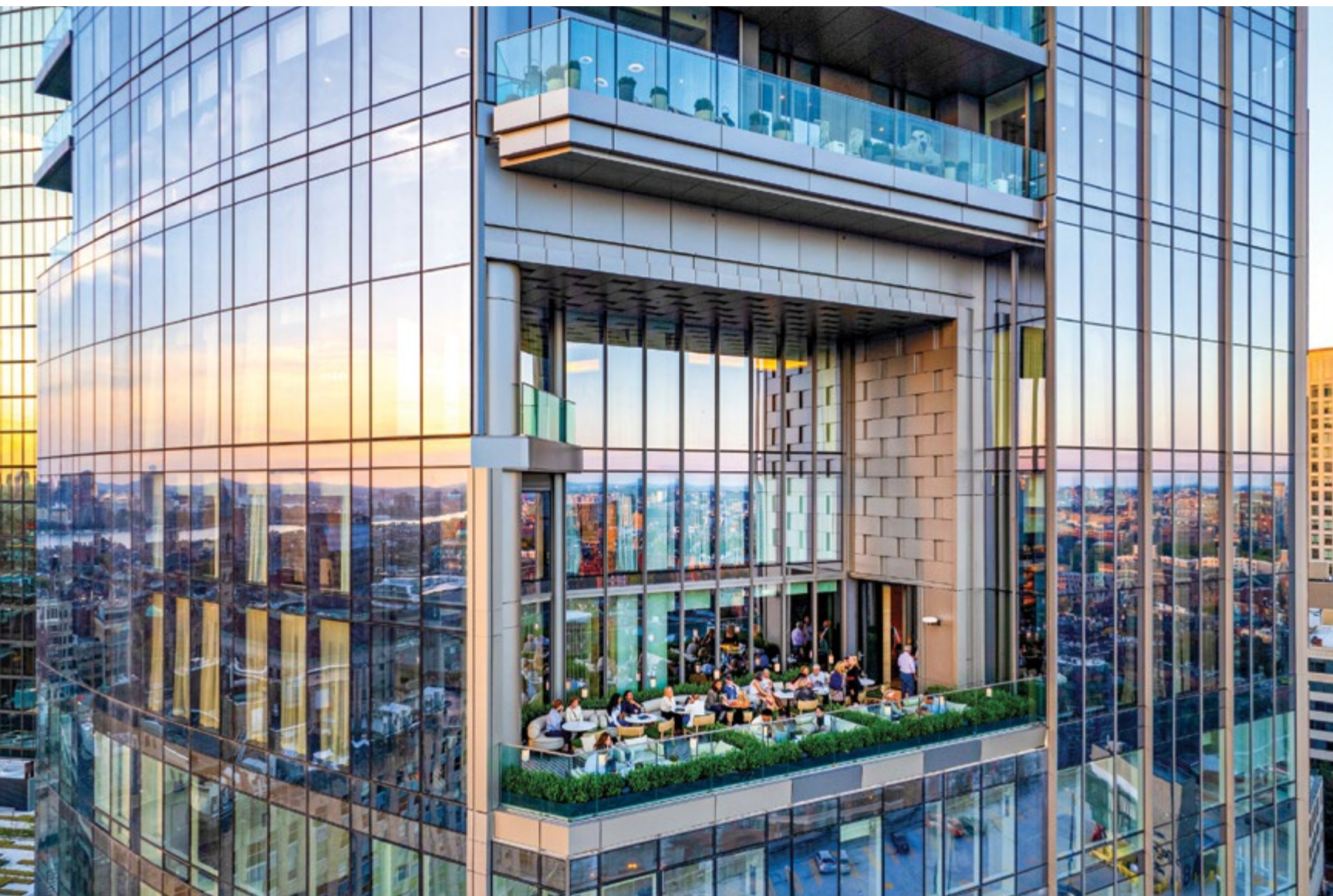
Shaping a Skyline

A grand stair and bold cantilevers support sculptural form

By Stacy Rinella

Photos courtesy Ed Wonsek

When the time came to revamp a narrow urban site into a new standard for urban high-rise architecture, innovative design and engineering strategy were needed. What is considered rare for Boston real estate development, the project team secured air rights over the historic neighborhood, allowing for a creative solution by TAT and structural engineer McNamara Salvia. At the new tower's fourth floor, above the party wall with the University Club, a bold 9-m (30-ft) cantilever now extends overhead and supports the tower's upper 29 stories—another 104 m (340 ft) into the sky, with a second cantilever at the 17th floor. The cantilever approach yielded both programmatic and urban design benefits, granting the tower a contextually scaled street presence while also allowing the building to express itself as a sculptural form on the upper levels.



Above the party wall with the University Club, a bold 9-m (30-ft) cantilever now extends overhead and supports the tower's upper 29 stories—another 104 m (340 ft) into the sky, with a second cantilever at the 17th floor.

Complex cantilever processes

This solution first required demolishing the eight-story Boston Common Hotel and Conference Center and separating its steel structure and walls from the University Club. To support the cantilevered structure, a dense field of 1.8-m (6-ft) wide caissons was drilled approximately 46 m (150 ft) into bedrock, followed by 680,389 kg (1.5 million lbs) of steel plate girders and more than 1,091 m³ (1,428 yd³) of concrete for the building's 2-m (7-ft) thick mat slab.

"The complex process behind the cantilever design serves as a testament to the deeply collaborative approach that defined the entire Raffles project from start to finish," says TAT principal Gary Kane, AIA, NCARB, LEED AP BD+C. "This landmark

development, with a one-of-a-kind hospitality offering, called for unusually complex design and construction techniques—resulting in a design that seamlessly blends the qualities of global and local influences."

High-rising challenges

The appropriate design solution required integrating the contemporary structure into a neighborhood defined by a dense low-rise historic architectural fabric. Another critical design challenge for TAT and its collaborators arose from the Raffles tower's proximity to the Hancock, one of Boston's most infamous skyscrapers. The juxtaposition to the 1976 tower created additional design constraints, resolved by the interdisciplinary team. TAT senior project manager



The cantilever approach yielded both programmatic and urban design benefits, granting the tower a contextually scaled street presence while also allowing the building to express itself.

Alexander Donovan explains, “A key challenge was not just visually differentiating the new structure from the iconic Hancock Tower but also accommodating the extraordinary wind conditions resulting from the Hancock’s scale and orientation.”

To address these considerations, TAT’s designers arrived at the Raffles tower’s profile, with its curves

effectively responding to the intense wind load and distinguishing the design from its famously angular neighbor. “We thoughtfully chose glass curtainwall assemblies whose darker color provided a harmonious contrast to the Hancock while also granting an optimal mix of vision and reflectivity for both residential and hotel uses,” adds Donovan.

The stair is composed of formed steel plates welded into box sections to achieve the curved freestanding aesthetic while providing the required structural rigidity of a 3-story public stair.





Hotel guests ascend to the 17th floor Sky Lobby, and its grand stair—a signifier of the Raffles brand—which spirals through the three-story area.

Next level lobby

With an intricate mixed-use program, the Raffles tower project team deployed an equally creative approach to the building's interiors with the residential palette relies on warm materials, greenery, and a focus on the outdoors. Upon entering, hotel guests ascend to the 17th floor Sky Lobby, and its Grand Stair—a signifier of the Raffles brand—which spirals through the three-story area.


According to Alexander Donovan, TAT's senior project manager. "The design concept for the stair and living garden wall were by Stonehill Taylor, who designed the hospitality interiors." Donovan says the garden wall is intended to be evocative of Frederick Law Olmsted's Emerald Necklace, an 11-km (7-mi) long chain of parks, parkways, and waterways woven throughout Boston. The extents of the wall and plantings work in conjunction with the city-facing glass curtainwall to accentuate the height and proportions of the 3-story grand stair.

Donovan also says the structure of the wall is painted, welded steel, with copper clad shelving for the plantings and copper laced accents at the intersection of horizontal and vertical tubes. "These copper lashing details at the joints as well as the copper shelving are part of a larger historic nod to Paul Revere's copper mill."

Teamwork makes a grand stair work

Michael Liu, AIA, NCARB and TAT senior partner and design principal says, "Approaching the stair, new vistas open up to the 2-story sky terrace to the left. It is constructed of mild steel and concrete, with an ornamental balustrade—with traditional details and yet very contemporary."

The structural analysis and sizing of the steel members for the garden wall was provided by Stone Fleet, Inc. Structural Engineers. The construction and assembly details were developed by TAT. The system was fabricated and installed by McGregor Industries, of Dunmore, Pa. Copper shelving was provided by Provincial Store Fixtures Ltd. The teamwork does not end there.

The structure for the grand stair was developed by McNamara Salvia. Construction details for the stair, steel rails, and finish materials were created by TAT. The stair is composed of formed steel plates welded into box sections to achieve the curved freestanding aesthetic while providing the required structural rigidity of a 3-story public stair. The guardrail balusters are painted steel sections with solid, extruded, oil rubbed bronze rail caps and bronze handrails. Like the garden wall, the steel fabrication and installation were done by McGregor Industries. 



Sealing the Seams

Added protection for roofing applications

By David Delcoma

Photos courtesy MFM Products Corp.

One of the most overlooked items in terms of waterproofing the roof deck is sealing the seams on the substrate boards of steep-slope roofing projects. This has caught the eye of several building code agencies who have already implemented codes to seal these seams with a roof deck flashing tape.

Some general contractors, both residential and commercial, have included sealing the roof deck seams as a general practice on their projects, regardless of whether it is code or not in their locale. Insurance companies are also taking notice of this practice as a good building strategy when it comes to protecting the building structure.



Photo ©bigstockphoto.com

Changes in state and local building codes have already been implemented and more are sure to follow. The following is an overview of how to properly seal these seams for additional waterproofing protection.

The basics

The roof deck is the structural substrate to which the final roofing system will be applied. Typically, these are wood-oriented materials such as plywood or oriented strand board (OSB). When installed, the seams between all these boards are potential leak points for water, moisture, and air to infiltrate the building structure.

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Proper installation is the key to completely and effectively seal out water, air and moisture from entering the building structure.

or, if not code in their locale, seek a suitable flashing membrane that meets ASTM D 1970 at a minimum.

In essence, the code wants the membrane to be self-adhering and self-sealing around common roofing fasteners when the final roof system is installed. The self-sealing aspect is critical in terms of maintaining complete waterproofing protection before, during, and after the roofing system has been installed.

Metal roofing systems

For metal roofing systems specifically, a high-temperature rated deck flashing tape is preferable due to the extreme heat generated beneath the panels. Most roofing contractors will opt for a product that is rated at a minimum of 107 C (225 F) for metal, steel, and aluminum systems. For installation under copper or zinc roofing, contractors should contact the manufacturer due to the higher heat levels generated from these materials.

Most codes will also address what types of underlayments can be used after sealing the deck seams. These include saturated felt, synthetic or self-adhering products. Although more economical, felts and synthetic underlayments offer limited waterproofing protection as compared to self-adhering underlayments. What is interesting to note is, even when using a self-adhering underlayment, the codes still require the use of a flashing tape on the deck panel seams.


The same rules apply for the underlayment in terms of heat rating. The flashing tape and the underlayment must be high temperature rated to prevent the mastic from melting and seeping out. When in doubt, contractors should always contact the manufacturer when using products under metal roofing systems.

Best practices

As with most roofing projects, contractors should start at the eave and work towards the ridge. The same is true when sealing the seams on roof deck panels. Tools required for installation include a sharp utility knife, measuring tape, hand roller, and any necessary safety equipment when working on a pitched roof.

Before using any self-adhering product, contractors should read and understand the manufacturer's complete installation instructions. Most brands indicate a minimum installation temperature and maximum UV-exposure time. Depending on the manufacturer, some surfaces may require priming or there may be warnings about the types of caulks or sealants used in conjunction with the self-adhered membrane.

In general, when working with self-adhering products, it is recommended to roll the entire membrane thoroughly with a hand roller. This ensures maximum contact of the adhesive system to the substrate. Contractors should always pay special attention to any overlaps when rolling the membrane. On long runs, they may need to overlap the membrane to finish a section. On these end laps, the material should overlap by at least 102 to 152 mm (4 to 6 in.) and roll firmly.



Typical roof deck seam tapes come in standard 102 mm (4 in.) wide widths which should always be centered on the roof deck seam to ensure proper contact on each side of the deck seam.


Typically, if water enters these seams during construction, it does not pose any real problems. However, when the roof is completed and interior work begins, this is when a roof deck tape provides the highest value to the contractor and customer.

Membrane types

For the locales that have adopted this code, the general rule is the use of a 102 mm (4 in.) wide, 40-mm, self-adhering waterproofing membrane that meets ASTM D 1970, *Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection*. In some cases, membranes which meet Architectural Manufacturers Association (AAMA) 711 are also accepted. Contractors need to investigate their building code specifics

As with most roofing products, always start at the eave and work upwards toward the roof peak. This allows the water to properly shed off the roof and not against the membrane. It is best to review the manufacturer's installation instructions for proper application steps.

Forward thinking

To some, it may seem like an unnecessary step to seal the roof deck seams. However, if it is a required code, contractors will want to follow the steps above to ensure the job is done right. If it is not required, it may be soon, or other builders may be adding this step as a selling feature to customers. All in all, it is just another step in the never-ending battle against Mother Nature. 

David Delcoma is the operations manager for MFM Building Products Corp. Delcoma joined MFM in 2011 as the product marketing manager after serving more than 20 years with an industrial advertising agency. For more information, visit www.mfmbp.com/roof-deck-tape.



Learning the correct steps of installation at these key highlighted areas greatly reduces the potential for failures before, during and after the final roof system is installed.

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From Flaking to Flourishing

Roof coating corrects years of weather damage and degradation

By Ernie Porco

Photo courtesy APV Engineered Coatings

The damage started to become apparent during a roof inspection in the spring of 2015. After 25 years of service life, the metal roof on Central Middle School in Dobson, N.C., was showing its age. Back-to-back winters with heavier-than-average amounts of snow and ice caused the blue, factory-applied coating on the standing seam roof to flake and peel off, exposing large sections of gray primer and the underlying steel roof panels to the elements.

As snow and ice slid off the roof, they took chunks of paint with them. The coating failure worsened, to the point where the school district's director of construction, planning, and design was concerned the exposed metal panels could rust and create opportunities for leaks.

Eager to avoid the expense and disruption of replacing the roof, the district director reached out to the plant operations division of the North Carolina Department of Public Instruction for advice. The division's engineers inspected the roof and recommended recoating it with a fluoropolymer-based roof coating—a strategy which had been used successfully in other school districts in the state.

Coating removal process: eye on the environment

After a visual inspection of the roof, along with millimeter thickness readings and scratch testing of the existing coating, it became apparent all the existing coating would need to be removed—a process involving more than just simple power washing.

Proper removal of existing coatings is crucial for the ability of a new coating to perform as intended. Without it, the new primer and topcoat will fail. The coating contractor used advanced coating removal methods and a proprietary paint stripping material that are effective and cleaner than other methods such as bead blasting. The stripping material worked quickly; during an initial test, it completely removed a patch of existing coating down to bare metal in under 15 minutes.

As part of its standard waste disposal policy, the contractor took care throughout the removal process to keep the stripping chemical and coating residue from contaminating the environment—a special concern because a farm with a pond was located adjacent to the school property. They set up a series of drainage pipes and collection bins across the 38,100-m (125,000-ft) roof to capture the chemical and solid waste so it would not get into the storm drain system and groundwater. Once captured, all the waste was placed in a dumpster and disposed of according to local waste disposal regulations.

Polyvinylidene fluoride (PVDF)-based coating extends roof lifespan


After stripping the old paint from the roof, the coatings team thoroughly pressure-washed the entire surface to ensure no paint remover or residual materials remained. Then, they sprayed a 1.5 to 2 mm (0.05 to 0.08 in.) thick coat of a bonding primer. The primer is designed to adhere to tough surfaces, including metal and pre-coated metal. Its water-based, low-volatile organic compounds (VOC) chemistry provides early water resistance, protects against corrosion, and applies with a smooth, uniform finish for optimum aesthetics.

Next, they spray-applied two 2.5 to 3 mm (0.1 to 0.12 in.) layers of a PVDF-based metal restoration topcoat in a custom-tinted blue color to perfectly match the roof panels' original factory finish. Engineered for coated or uncoated ferrous and non-ferrous metal surfaces, the topcoat resists the harmful

effects of UV degradation such as fading, erosion, and chalking. It safeguards against salt spray and corrosion, protects against a wide range of abrasions, and has exceptional resistance to algae, mold and fungal growth, dirt pickup, and stains. It also is water-based and low in VOCs, meeting South Coast Air Quality Management District (SCAQMD) Rule 1113 for architectural coatings.

The topcoat's PVDF resin has super-strong carbon-fluorine bonds that do not break down under exposure to the elements, thus resisting the film erosion common with exterior-grade, acrylic-based latex coatings. When exposed to UV energy and environmental stressors, the additives, pigment, and resin in latex coatings break down, creating a chalky residue. Eventually, the chalked coating wears away from the substrate—or is washed away by rain, wind, pressure washing or cleaning—until the coating film is gone and no longer protects the substrate. In addition, the chalky residue changes the coating's surface energy and serves as a food source for mold and mildew growth, which further degrades a building's appearance and creates cleaning and maintenance problems.

Quality at every step

Quality assurance was top of mind throughout the four-month project, which took place primarily during the school's unoccupied summer months. Even before the job started, the project team conducted multiple installation mockups to test coating adhesion. During installation, the team did adhesion testing and x-cut tests after each coating layer was applied. Since the paint removal process caused some sealant degradation, the team also replaced those sealants, re-waterproofing the entire roof, then coated over the sealant. 

Ernie Porco is a product application engineer at APV Engineered Coatings. He is the subject matter expert for the NeverFade Facade Restoration Coatings with Kynar Aquatec product line, along with the original equipment manufacturer-(OEM-) applied coatings products.



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With fewer components than traditional systems, rail-less solutions make it simple and easy to get all the components into place, which is especially beneficial when working on a steep slope.



Any roofing attachment needs to ensure durability and long-life cycle remain intact.

The Rise of Rooftop Solar

What the metal roofing industry is poised to gain

By Rob Haddock

Photos courtesy Oliver Frazier, Suntuity Solar

Since the introduction of the Inflation Reduction Act (IRA), the U.S. solar market is poised to reach 30 percent of U.S. electricity generation by 2030. Along with a 10-year extension of the solar Investment Tax Credits (ITC), there are additional tax credits for qualifying solar projects, such as projects built with domestic products or in targeted economic geographic areas. These policies are expected to accelerate growth, triggering an avalanche of solar development throughout the United States.

According to a report by The Frontier Group and the Environmental America Research & Policy Center, “Rooftop Solar on the Rise,”¹ rooftop solar is just beginning to scratch the surface of available rooftops in the U.S. The report states, “America could produce the equivalent of 45 percent of the electricity we currently use from rooftop solar, yet, in 2022, rooftop solar provided only 1.5 percent of America’s electricity.” Last year, of the total rooftop space available, only 3.5 percent of the available rooftop space was utilized for solar.

Why is this important for the metal roofing industry?

The metal roofing industry, in particular, is positioned to capitalize on the growth of solar as metal roofing provides an ideal platform for mounting rooftop solar and is the only roof type with a service life (in the range of 50 to 70 years) which actually exceeds the service life of a solar photovoltaic (PV) system (an average of 32.5 years and growing year over year).

Metal roofing is also the most sustainable roofing type and is conducive to lower solar installation costs, which is important to the buyer conscious of both environmental and economic energy efficiencies. Most alternative roofing types will expire long before the life of the PV system, leading to costly disassembly of the PV array, re-roofing, and re-assembly.

Mounting solar PV on metal roofing

Conventional rails have traditionally been the choice for attaching solar modules to all roof types. However,

familiar concepts do not necessarily deliver the best outcomes, and the advantages of rail-less, direct-attach solar mounting to metal roofs are moving the industry norm in a new direction.

Reduces costs

Rail-less solutions leverage a metal roof's existing construction allowing the standing seams of the roof to be utilized as inherent (and cost-free) "rails" for mounting solar PV via reliable mechanical attachments, thereby eliminating the need for a traditional rail system.

Metal roofing is also the most sustainable roofing type and is conducive to lower solar installation costs, which is important to the buyer conscious of both environmental and economic energy efficiencies. Metal roofing is also the most sustainable roofing type and is conducive to lower solar installation costs, which is important to the buyer conscious of both environmental and economic energy efficiencies. So, the weight of mounting components is reduced by up to 85 percent and the cost of hard goods by up to 35 percent.

As every clamping point on a PV module attaches directly to the roof, rail-less racking results in 25 percent better load distribution across the roof and zero penetrations, which preserves both the integrity of the roof and the manufacturer's warranty.

Simplifies logistics

Rail-less makes shipping, storage, and transport simple and much less expensive. Shipping long lengths of rail to a project site, storing, and transporting them up to a rooftop is costly and frequently a logistical nightmare.

Since rail-less solar mounting systems are 15 percent the weight and 90 percent less volume than rail-based solar racking, shipping costs can be 60 percent lower than rail-based systems, with fewer logistical hassles. With rail-less, off-site storage is seldom needed, and costly cranes and forklifts to move racking hardware to the site and up to the roof are often eliminated.

Eases installation

With fewer components than traditional systems, rail-less solutions make it simple and easy to get all the components into place, which is especially beneficial when working on a steep slope. Installers can easily mount around obstacles, removing the awkward field-cutting of rails. Plus, impromptu changes in module layout are easily accommodated when needed.

Labor savings

The key to labor savings (30 to 50 percent) is twofold: the elimination of time traditionally needed to measure, locate, and install rails, and the simplicity of rail-less attachment, which requires 65 to 75 percent fewer components to manage and install. Rail-less is designed so roof clamps can be quickly aligned and installed to modules "on-the-fly" without needing to measure or snap lines, using the module as a spacing jig to locate and install attachments.

Protects the investment

The value of metal roofing lies in its durability, often lasting up to 70 years. Therefore, any roofing attachment needs to ensure that this durability and long-life cycle remain intact. The low profile offered by a rail-less system provides an aesthetically pleasing appearance with its sleek visual appeal and safeguards the array's performance and roof integrity. **Ma**

Notes

¹For more information, visit publicinterestnetwork.org/wp-content/uploads/2024/02/Rooftop-Solar-on-the-Rise-2024.pdf

Rob Haddock is the CEO and founder of S-5! Together with his sons, they co-invented the PVKIT rail-less direct-attach solar solution, providing a simple, secure method to "lay & play" PV modules with tested, engineered, cost-saving, attachment. For more, visit S-5.com.



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The Key to a Building Envelope

Material selection should protect occupants and assets

By Jennifer Annas

Photos courtesy CertainTeed

Extreme weather¹ events have been increasing in frequency and intensity as the climate across the globe continues to rapidly evolve, meaning that now, more than ever, buildings must withstand tremendous environmental pressure. From wildfires to intense winds and extreme rainfall, buildings need to be able to adapt to these weather conditions, whether they are newly constructed or existing dwellings.

Healthy and durable homes begin with how they are built from the inside out while ensuring they are designed for the climate they are in. Each of the interior and exterior building solution should work together to act as a barrier between people and the environment. In fact, when selecting building materials with extreme weather in mind, durability is a top priority² for both consumers (58 percent) and professionals (58 percent).

When it comes time to select exterior building materials, many consider the color of the siding or the shingle style that will give them the most curb appeal in the neighborhood. However, what's underneath the roofing and siding material is another crucial factor to consider. With challenging weather conditions, there is a stronger need for more durable roof underlayment and housewrap in the industry. Choosing the right roof underlayment and housewrap for your project is essential to protecting all building occupants and assets. The proper use of roof underlayment and housewrap will also protect families from environmental events such as hurricanes, snowstorms, and wind-driven rain.

Energy efficiency

Beyond protecting building occupants, housewraps can reduce heating and cooling costs through a systems-



based approach that integrates them with other building materials. This means focusing on how all selected building products, inside and out, work together as a cohesive system rather than on their independent performance. Choosing products that function together helps lower energy consumption for heating and cooling, contributing to a smaller overall carbon footprint.

Additionally, some underlayments and housewraps have specific technologies, such as UV resistance or insulating properties, to further increase energy savings. When used alongside solar-reflective shingles, insulated vinyl plank siding, and solar shingles, building owners can maximize their structure's performance.

The importance of materials

Underlayments and housewraps are typically installed beneath primary roofing and siding materials to provide additional protection and moisture management for the building envelope. If these materials are not used before installing roofing or siding during construction, the building is at a much higher risk of water penetration, mold growth, weather damage, material decay due to rot, structural damage, a shortened lifespan of the other building materials, and decreased energy efficiency. Underlayments and housewraps should be placed on top of plywood sheathing or Oriented Strand Board (OSB) immediately after installation to limit exposure to environmental elements.

Selecting materials

When selecting an underlayment or housewrap, many variables should be considered, such as climate,

location, overall building use, and building codes. Key qualities such as moisture management, weather resistance, durability, strength, ease of installation, and compatibility with other materials are also important.

Roofing underlayments can be felt, synthetic, or self-adhered, each with distinct characteristics and advantages depending on the project's requirements:

Felt

The most traditional roofing underlayment, also known as "tar paper," with asphalt embedded.

Synthetic

Made from polyethylene or polypropylene materials, this underlayment offers enhanced durability, tear resistance, and water resistance compared to felt.

Self-adhered

A "peel-and-stick" underlayment composed of a rubberized asphalt compound, or a butyl adhesive laminated to a protective membrane. It provides superior waterproofing and self-sealing properties, forming tight seals around penetrations.

Similarly, housewraps offer exterior protection against mold, mildew, and water damage while minimizing mold and mildew issues inside. High-performing housewraps should allow the building to breathe, which is crucial for maintaining a healthy, durable, and energy-efficient building envelope. This breathability helps prevent moisture-related problems, preserves indoor air quality (IAQ), protects structural integrity,

When it comes to selecting an underlayment or housewrap there are many variables to consider: climate, location, overall use of the building, and building codes.

Tech Report

Right: Underlayments and housewraps provide a necessary air and moisture barrier to help protect other insulating materials in the roofing and siding systems and ensure the longevity of performance.

Below: These materials protect the home from severe weather and help maintain the integrity of the exterior-finish materials, such as siding.



and improves energy efficiency. Further, the material can reduce future repair costs by providing a protective barrier for interior walls.

Benefits

Underlayments and housewraps provide essential air and moisture barriers to help protect other insulating materials in roofing and siding systems, such as foam board, batt insulation, and blown-in insulation, from damage while ensuring long-term performance. When considering material options, installation methods, moisture management, durability, and strength.

Some benefits of underlayments and housewraps include:

Moisture management

One of their primary functions is to prevent moisture from penetrating the building's interior, thus avoiding potential water damage, mold growth, and structural decay.


Weather resistance

These materials protect homes from severe weather events such as hurricanes, snowstorms, thunderstorms, and tropical rainstorms. They also help maintain the integrity and prolong the lifespan of exterior-finish materials such as siding.

Enhanced thermal performance

Some housewraps can improve the building's energy efficiency by reducing heat transfer. This helps regulate indoor temperatures, leading to lower heating and cooling costs for the property owner.

Signs you need an upgrade

Most roofing solutions can last 25 to 30 years, while siding solutions typically last 30 to 40 years. However, if a building envelope begins to show signs of cracks, tears, punctures, sagging, warping, or soft spots, it may be time for a replacement. Exterior home upgrades often require a large investment, but whether a new structure is being built or an existing dwelling is being upgraded, it is essential to ensure materials work together in a systems-based approach. Choosing housewraps and roofing underlayments that offer flexibility and durability to withstand the expansion and contraction of other building materials without cracking or deteriorating will provide building occupants with peace of mind for many years to come. 

Notes

¹ <https://science.nasa.gov/climate-change/extreme-weather/>

² <https://certainteed.widen.net/s/vmwcwxxwdx/certainteedtrendreport--mobile-1>

Jennifer Annas has been with CertainTeed for nearly 10 years. She started her career in the gypsum business and recently crossed over into the Siding Products Group, where she is currently the product marketing manager. Annas has a passion for driving customer engagement, exploring new digital marketing tools, and sharing product knowledge. For more information on CertainTeed, visit www.certainteed.com.



Distinguish Quality

Change your spec to ensure high performance

Metal building systems are highly engineered, optimized structures, with virtually all elements of the building structure working as an integral system to meet the strength and serviceability requirements for the project. As such, they present unique challenges and require proper assembly and installation to perform as designed. For too long, technical specifications have merely required “an erector with at least three years’ experience” or jobs are simply awarded to the lowest bid; neither of which ensures the most qualified contractor.

Several years ago, a few contractors and erectors sought a way to differentiate themselves from the less qualified, the underperformers. With the assistance of the Metal Building Contractors and Erectors Association (MBCEA), they crafted a program to distinguish quality; to identify those companies committed to safety, training, and quality builds. This program is now a recognized accreditation program (AC478) administered by the International Accreditation Service (IAS) and complements an existing IAS accreditation program for Manufacturers of Metal Building Systems (AC472). Architects that

specify AC472 and AC478 can be assured of the highest quality commercial buildings.

Specified requirements help accountability

To achieve AC478 accreditation, companies must demonstrate having the personnel, organization, experience, management procedures, and competence to assemble and erect metal building systems in accordance with specified requirements and in accordance with the *International Building Code (IBC)*. IAS-accredited assemblers are required to operate under a documented management system which includes a safety and training program and periodic jobsite inspections to verify continued compliance with the criteria. The early adopters to AC478 are skilled craft entrepreneurs dedicated to their trade.

DJ VanRooyan of Steel Worx Solutions states the AC478 program “made him a better, more accountable erector.” Keith Wentworth of Dutton & Garfield, Inc. acknowledges, “the internal processes required have made his company stronger and they perform better for



By Jacqueline Meiluta

Photos courtesy MBCEA



Architects that specify AC472 and AC478 can be assured of the highest quality commercial buildings.



Top Right: International Accreditation Service (IAS)-accredited assemblers are required to operate under a documented management system which includes a safety and training program and periodic jobsite inspections.

Top Left: The early adopters to AC478 are skilled craft entrepreneurs dedicated to their trade.

their customers as a result.” Both Steel Worx and DGI were successful companies before AC478. They did not need to become accredited. They made this investment to elevate their trade and enhance their overall quality. As Jarrod Turner of TBT Construction Services says, “to prove they were as good as they say they are.”

Thomas Phoenix International was one of the first companies accredited and instrumental in the development of the criteria. They believe accreditation raises the bar for their organization and the industry.

Common values

In full disclosure, the author is employed by MBCEA to promote AC478 and assist their members through the process. Over the years, the author has worked with hundreds of member companies affiliated with the MBCEA. They all share a common set of values: they take their craft seriously and are committed to the safety of their workers and the integrity of their builds.

What are some of the areas that are assessed by IAS?

- Control of project documentation including access to these documents from the field.
- Training program adherence for field personnel.
- Safety program documentation and adherence including jobsite specific plans, job hazard analysis’ (JHA) and program reviews.
- Quality documentation and adherence to manufacturer’s specifications.
- Effective implementation of quality checklists and inspections.
- Confirmation to ensure the plan and documentation set out in the program are adhered to in the field at the jobsite.

At the original IAS hearing to consider approval of this new accreditation program, one of the building code officials on the panel queried why an erector would look for a program to police their quality. He found it odd that erectors were proposing the program rather than a governing body requiring it. The MBCEA, representing their 500-plus members, answered simply, “because it is the right thing to do for our trade.” The contractors and erectors who choose membership in the MBCEA want to differentiate themselves from the competition, and they want to arm the industry with a tool to identify those companies committed to safety, training, and quality.

To ensure a quality project, one should consider a metal building system. There is no other solution as



The contractors and erectors who choose membership in the Metal Building Contractors and Erectors Association (MBCEA) want to differentiate themselves from the competition and they want to arm the industry with a tool to identify those companies committed to safety, training, and quality.

versatile or flexible. However, it is advisable to specify an AC78 accredited erector. Accreditation establishes an industry standard that separates the good from bad. Building owners and architects should require this accreditation in their specifications, and building officials should look for it before issuing permits.

About the IAS

A subsidiary of the International Code Council (ICC), IAS provides an independent assessment and verification that metal building assemblers meet the requirements of a recognized accreditation program. IAS accredits inspection programs for metal building manufacturers, building departments, building department service providers, fire prevention and life safety departments, special inspection agencies, product certification agencies, fabricator inspection programs, testing and calibration laboratories, inspection agencies, training agencies, management system certification bodies, curriculum developers and field evaluation bodies. A recognized accreditation body since 1975, IAS is a nonprofit, public benefit corporation and is one of the leading accreditation bodies in the U.S. and a signatory to several international mutual recognition arrangements (MRAs). [Ma](#)



Jacqueline Meiluta is an independent consultant providing program support to Metal Building Contractors and Erectors Association (MBCEA) initiatives focused on training and quality. She was instrumental in state and federal approval for an open-shop apprenticeship program and International Accreditation Service (IAS) approval of an accreditation program both for Metal Building Assemblers.

Accreditation establishes an industry standard which separates the good from bad.

On the Horizon

Looking ahead to LEED Version 5



By Alan Scott

It's been 11 years since LEED version 4 was released (and five years since the LEED v4.1 option was introduced). The long wait for an update to the world's preeminent green building rating system is almost over. The U.S. Green Building Council (USGBC) unveiled the first draft of LEED version 5 (LEED v5) for public comment in April. If you didn't get a chance to review it, you should have another opportunity later this year during the anticipated second public comment period after comments from the first round are addressed and refinements made to the new version. If all goes to plan, the new and improved LEED will be available for projects early in 2025, with the stage set for regular updates every five years going forward.

As a longtime user of LEED, having first engaged with the v1 pilot in 1998 and certified my first project in 2001, I'm thrilled to see the refresh. While some details are subject to change, it's not too soon to be looking ahead to how the new version may influence project planning and implementation. Here is an overview of some of the new elements we'll see in LEED v5.

One of the most significant proposals is the addition of three new assessments in the Integrative Process, Planning, and Assessments (IP) category to directly address the USGBC's "future of LEED" priorities,

decarbonization, resilience, health, and equity. These prerequisites include Carbon Assessment, Climate Resilience Assessment, and Social Equity Assessment.

Carbon emissions reduction has been an implicit and explicit part of LEED from the beginning, mostly through energy efficiency, renewable energy, and encouragement of transportation alternatives. LEED v5 builds on this precedent and expands on it in several ways. The new Carbon Assessment prerequisite establishes a broad and long-term view by requiring project teams to estimate the embodied, operational, and transportation carbon impacts of projects for the first 25 years of the building's life. Additionally, the proposed baseline for the familiar energy performance prerequisite and credit will be updated to ANSI/ASHRAE/IES Standard 90.1-2019, with an automatic update to the 2022 standard starting in 2028.

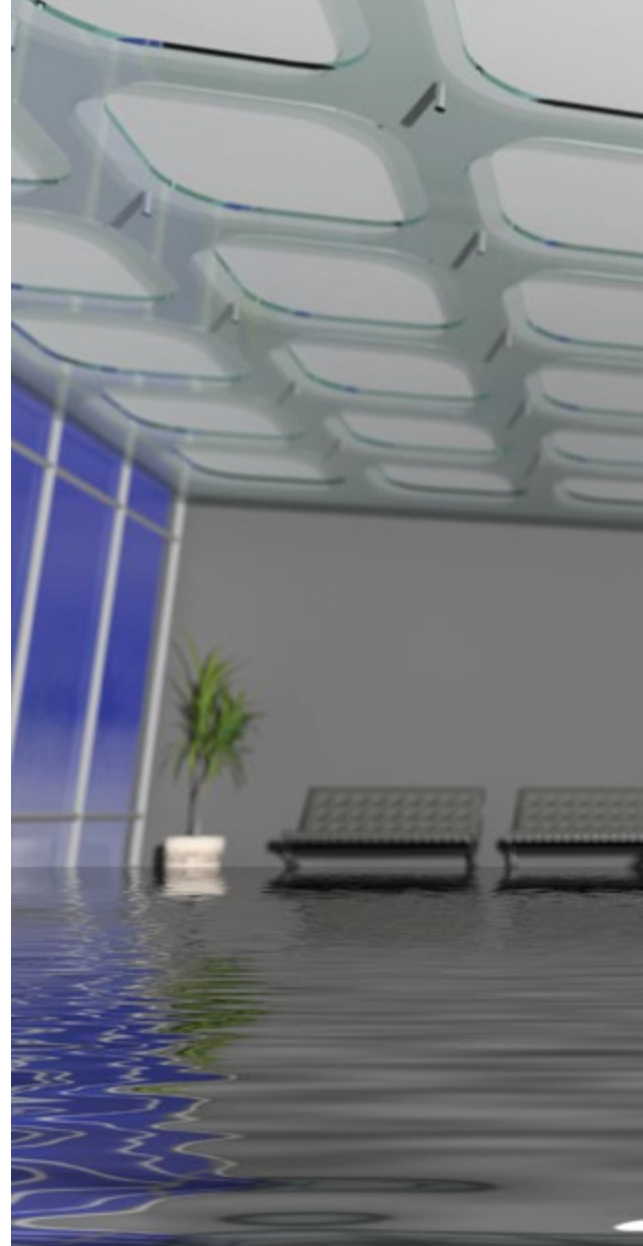




Photo ©bigstockphoto.com

Going further, the new version includes a prerequisite for operational carbon projection and the development of a decarbonization plan, which will help building owners prepare for Building Performance Standards¹ increasingly being adopted by states and municipalities. LEED v5 will also address the trend toward electrification, as well as grid interactivity and demand response. To address both energy performance and resilience, a proposed new credit will encourage peak thermal load reductions with enhanced building enclosures that reduce air infiltration and thermal bridging and with balanced ventilation and heat recovery in HVAC systems. These measures will reduce heating and cooling energy use and support thermal resilience during power outages that frequently coincide with extreme heat and cold events.

In the Materials and Resources category, a proposed credit would add options for reducing embodied carbon in materials, including whole-building life cycle assessment, low-carbon materials procurement, or analysis of environmental product declarations (EPDs) for global warming impact.

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New to LEED v5 is a strong focus on natural hazard and climate change resilience, starting with the proposed Climate Resilience Assessment prerequisite. This assessment is aligned with property resilience assessments² now becoming part of real estate transaction due diligence, and with climate-related financial risk disclosures that governments in Europe, Canada, the U.S. and elsewhere are beginning to mandate. This prerequisite is intended to prompt owners and project teams to assess how current natural hazards, from floods and hurricanes to earthquakes and tsunamis, and the emerging impacts of climate change, including sea level rise and extreme heat, drought, and rainfall, may impact the proposed project, and to consider what mitigations are possible to reduce vulnerabilities over the life of the building.


Building on this assessment prerequisite, LEED v5 proposes a new resilient site design prerequisite focused in protecting utilities from hazard events (e.g. elevating electrical equipment above flood level), an added tree cover requirement based on American Forests Tree Equity Score³ in the heat island reduction credit (addressing resilience and equity), a new water reuse credit to support drought resilience, and post-disaster hydration and sanitation needs. A blanket Resilient Spaces credit has been proposed in the Environmental Quality category with a focus on indoor comfort and occupant safety during significant location specific hazards identified by the resilience assessment prerequisite such as indoor air quality (IAQ) during hazardous outdoor air events (e.g. wildfire smoke), thermal safety during extended power outages, high wind and seismic hazard events, and even times of heightened infection risk from respiratory disease (referencing ASHRAE 241-2023⁴).

Equity is also newly introduced in LEED v5. Like resilience, the new Social Equity Assessment prerequisite will encourage owners and project teams to make pre-design considerations, in this case engaging stakeholders and understanding the unique needs of the members of the community, project team, and supply chain related to diversity, equity, and wellbeing. While some aspects of equity are beyond the reach of the design team, making buildings accessible is well within scope. LEED v5 includes a proposed building accessibility prerequisite requiring the inclusion of basic accessibility measures for building entries, customer service locations, and restrooms that are not yet standard practice globally.

An Enhanced Accessibility credit is also proposed with a prescriptive menu of choices for accessibility, accident prevention and safety, and wayfinding measures to improve equitable access and use.

A new Environmental Quality Occupant Experience credit is also proposed that focuses on the diversity of needs and preferences people have in support of their wellbeing. The credit includes a selection of measures to create customizable environments that give occupants choices relative to a variety of physical and sensory needs. It also combines and updates familiar LEED credits for thermal comfort, lighting quality, daylight, and acoustics into one credit.

Other important updates include the inclusion of bird collision reduction⁵ requirements along with the light pollution reduction, an update to the old prerequisite for storage and collection of recyclables that now requires developing a plan for zero waste in operation, and a new LEED Core and Shell credit encouraging green leases.

The proposed changes in LEED v5 are some of most significant in the rating system's history and represent important updates to meet the evolving and expanding priorities for sustainable built environments. Watch for the next public comment period later this year and prepare to share your opinions on how to make the next version of LEED the best it can be, raising the bar on performance, addressing emerging priorities, and remaining an achievable and globally applicable green building rating system. 

Alan Scott, FAIA, LEED Fellow, LEED AP BD+C, O+M, WELL AP, CEM, is an architect and consultant with more than 35 years of experience in sustainable building design. He is director of sustainability with Intertek Building Science Solutions. To learn more, follow Alan on LinkedIn at www.linkedin.com/in/alanscottfaia/.

Notes

¹ [Nationalbpscoalition.org](https://nationalbpscoalition.org)

² www.astm.org/products-services/standards-and-publications/standards/workitem-wk62996

³ www.americanforests.org/tools-research-reports-and-guides/tree-equity-score/

⁴ www.ashrae.org/about/news/2023/ashrae-publishes-standard-241-control-of-infectious-aerosols

⁵ <https://abcbirds.org/glass-collisions/products-database/>



Skewed Walls, IMPs Elevate Museum Design

Photos: Madison Hartman

A metal building system with skewed walls and insulated metal panels (IMPs) met goals for a design-build project to construct Chesapeake Bay Maritime Museum in St. Michaels, Md.


Brendan Knarr, director of business development at Steel Building Specialists Inc., says, “Sometimes sites have their limitations, and, to maximize square footage, skewed walls are the necessary solution. In the case of the Chesapeake Bay Maritime Museum project, the owners wanted a sail-looking feature, and the skewed wall helped accentuate that design.”

MTD Erectors Inc. erected a 1,084 m² (11,665 sf) metal building system with a jack beam from Nucor Buildings Group, a division of Nucor Corp.

“Clear-span frames and a jack beam provided a clear, open concept,” Knarr says.

On the roof, MTD installed Nucor’s 22-gauge steel standing seam roof system in Kynar Terra Cotta, and insulated it with 1,208 m² (13,000 sf) Bay Insulation Systems Inc.’s Skyliner insulation system.

At walls, MTD installed All Weather Insulated Panels Inc. (AWIP) IMPs with a heavy embossed finish in Adobe. For daylighting, MTD installed AWIP’s translucent polycarbonate, insulated wall panels.

“The mix and match of metal panel profiles, metal trims and finishes provides the curb side appeal the end user had envisioned,” Knarr says. 



Owner: Chesapeake Bay Maritime Museum, St. Michaels, Md.
Architect: Annum Architects, Boston, www.annumarchitects.com
General contractor: Gilbane Building Co., Philadelphia, www.gilbaneco.com
Erector: MTD Erectors Inc., Thurmont, Md., (301) 698-0270
Distributor: Steel Building Specialists Inc., Halethorpe, Md., www.sbsmd.com
Insulation: Bay Insulation Systems Inc., Green Bay, Wis., www.bayinsulation.com
Metal building system: Nucor Buildings Group, a division of Nucor Corp., Charlotte, N.C., www.nucorbuildingsgroup.com
Metal wall panels/translucent wall panels: All Weather Insulated Panels Inc. (AWIP), Vacaville, Calif., www.awipanel.com

Metal Panels Mirror Vietnam's Bamboo Forests

Photos courtesy Dri-Design

At the upper two floors of the Vietnamese American Service Center (VASC) in San Jose, Calif., vertical metal panels in a mixture of green and brown colors create a pattern designed to mimic bamboo forests in Vietnam.

Matthew Puckett, AIA, senior project manager at Aedis Architects, says, "Although the pattern looks random, it does have a very complicated pattern with a bunch of different widths, depths, and colors. So, for the installer, it was a complex puzzle piece," Puckett says.


Pacific Erectors Inc. installed 698 m² (7,510 sf) of Dri-Design's Shadow Series aluminum wall panels in five colors: Buttercup, Genesis Green, Light Brown, Marsh Green, and a clear anodized finish.

Pacific Erectors installed panels on a horizontal girt system with exterior grade polyisocyanurate insulation out-board for a weather barrier. Panels have a vertical running bond pattern, so they were installed in a stair step, from left to right, and bottom to top.

Jason Walters, LEED AP BD+C, CQM, project estimator at Pacific Erectors Inc., says, "The panels were shipped in like-painted colors, so they were organized at the jobsite by panel elevation. We had to figure out the relationship between ins and outs and the colors as they went around the building. Compared to the staging process, the actual panel installation was pretty quick, and the panels fit really well with the system."

Inside, the first floor has registration and information areas, spaces for meetings, recreation, and education. The second floor has spaces for health care and dental services, and a pharmacy. The third floor has meeting rooms.

Sustainability was also a project goal. The building is zero-net-energy ready, all electric, and does not require use of fossil fuels.

Tyler Fowler, national sales director at Dri-Design, says, "The VASC is important for the Vietnamese community, giving them a place to call home in California. With Shadow Series, the building visually welcomes community members into their space while adding to the longevity and sustainability goals of the project." 



Owner: Santa Clara County, Calif., San Jose, Calif.

Architect: Aedis Architects, San Jose, Calif., www.aedisarchitects.com

General contractor: Rodan Builders Inc., Hayward, Calif., rodanbuilders.com

Installer: Pacific Erectors Inc., Rocklin, Calif., www.pacificerectors.com

Metal wall panels: Dri-Design, Holland, Mich., www.dri-design.com



Spread Wings Inspire Bird Center's Roof Design

Photos: James Krause, Pixelfly Creative

Hatch Design Architecture specified metal roofing, and metal soffit and ceiling panels to meet requirements for aesthetics, durability and maintenance for World Center for Birds of Prey's Global Raptor Education Center (GREC) in Boise, Idaho.

Jeff Hatch, AIA, LEED AP, principal at Hatch Design, says, "The project was designed to relate contextually to the campus as a whole, as well as the natural environment and specially the world of birds of prey education and conservation. The roof line was designed to emulate the spread wings of a bird of prey. Also, the ceiling and soffit was designed to emulate the spread wings of a bird of prey."

On the roof, Precision Steel and Gypsum Inc. installed 344 m² (3,700 sf) of Metal Sales Manufacturing Corp.'s 24-gauge steel standing seam roof system in Kynar Colonial Red.


At soffits and continuing into the interior as the ceiling, Precision Steel installed 214 m² (2,300 sf) of Longboard Products' 152 mm (6 in.) wide Tongue and Groove aluminum panels with the V-Groove profile in Light Cherry.

At an interior retail space, Precision Steel installed 299 m² (980 ft) of Longboard Products' 102 mm (4 in.) wide flat aluminum panels in Light Cherry.

"Metal was selected for the ceiling and soffit for an effortless transition from interior to exterior space so the ceiling and roof soar over the visitors," Hatch says. "The metal ceiling adds a warmth to the space, and an engaging ceiling for the retail area. The retail area used metal to maintain a modern, contemporary look, while not

having to worry about the maintenance and warping that can occur with using wood."

The GREC expands the center and functions as the main entrance to the campus. The 196 m² (2,108 sf) building houses a lobby, reception space, retail space, storage space, offices and restrooms.

"It is the landmark entrance building welcoming the public, creating a sense of wonder, curiosity and imagination of flight," Hatch says. "The goal of the project was to expand the site, contribute to enhanced programming, bring increased awareness to the conservation cause that the World Center for Birds of Prey strives for on a daily basis, as well as enliven the spirit of the visitors through the thoughtful use of form, material and space making." 

Owner: The Peregrine Fund, Boise, Idaho

Architect: Hatch Design Architecture, Boise, Idaho, www.hatchda.com

General contractor: Jordan Wilcomb Construction Inc., Boise, Idaho, jordan-wilcomb.com **Installer:** Precision Steel and Gypsum Inc., Boise, Idaho, (208) 375-3166

Metal ceiling/soffit panels: Longboard Products, Abbotsford, British Columbia, Canada, www.longboardproducts.com

Metal roof panels: Metal Sales Manufacturing Corp., Louisville, Ky., www.metalsales.us.com



Reshaping Urban Housing

By Stacy Rinella

Photos courtesy Brooks + Scarpa

In the heart of Santa Monica, Calif., a sustainability haven is redefining community living by challenging conventional notions of urban housing.

Welcome to 1819 Pico, an innovative project in affordable housing, seamlessly integrating cutting-edge design with environmental consciousness.

Situated directly across from Santa Monica College, this \$21.8 million, 49-unit building project not only provides affordable housing but also integrates community spaces and 622 m² (6,700 sf) of ground level retail, representing a holistic approach to sustainable development.

At first glance, the square pickets adorning the front facade extend above and below the hollow structural sections (HSS) frame, creating a visually captivating effect which conceals the underlying structure, lending the building a light, inviting aesthetic. Metal railings were chosen for their lighter appearance compared to solid guardrails. However, this is just the beginning, as functionality and sustainability are at the forefront of this venture.

Rather than a conventional paint finish, the exterior metal of 1819 Pico was galvanized, ensuring low-



maintenance durability, lending to the sustainability factor. This commitment to eco-friendly practices is emphasized by the “Net Zero” designation.

This fully electric, 100 percent affordable housing project is LEED Platinum certified and has an impressive predicted energy use intensity (pEUI) of 6.6, making it eight times more efficient than similar buildings, which average 59 pEUI. Offering shelter and comfort, 1819 Pico eschews the typical neighborhood defensive apartment buildings with solid walls and fences in favor of a carved-out cube, a beacon in the neighborhood that celebrates social space by deemphasizing private space. Strategically placed windows, purposeful exterior circulation and units that wrap the outer-most edges, orient the 48 apartments to social spaces that are spatially apart, yet visually connected to each other and the street below. [Ma](#)

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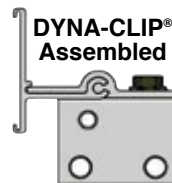
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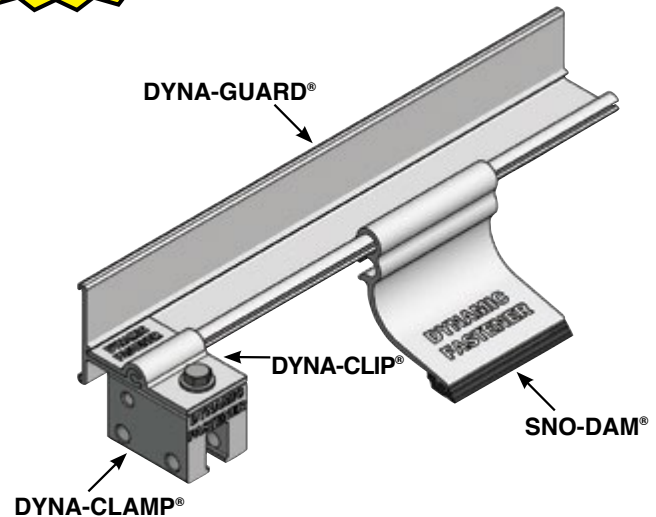
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