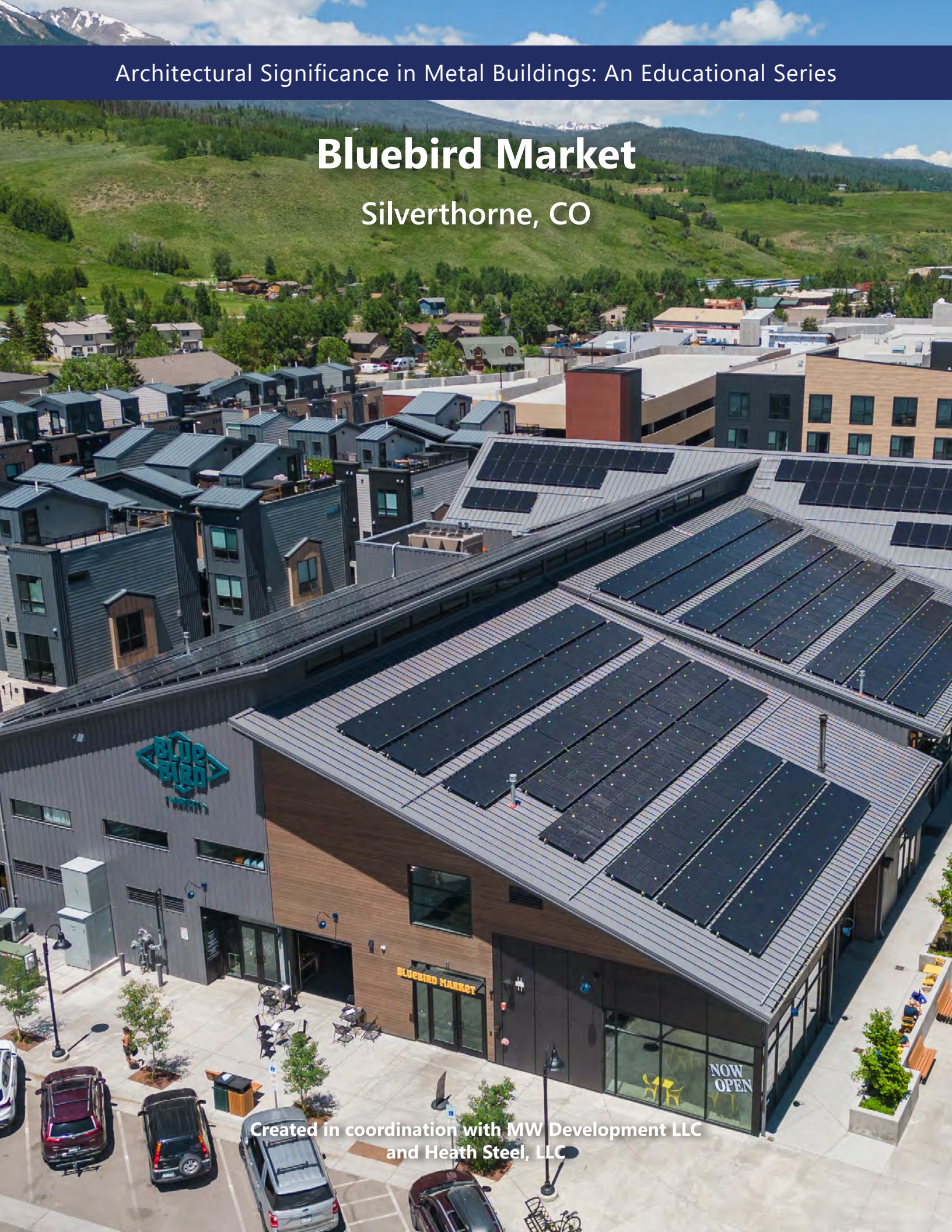
Architectural Significance in Metal Buildings: An Educational Series

Bluebird Market

Silverthorne, CO



Created in coordination with MW Development LLC and Heath Steel, LLC


Sales
Center

Photos courtesy of MW Development LLC

CONTENTS

PROJECT **DETAILS**

Building: Bluebird Market

Location: Silverthorne, Colorado

Owner: MW Development LLC

Operator: MW Development LLC

Size: 29,000 square feet

Construction Cost: Bluebird Market, $10.2 million

Completion: January 2022

Architectural Design: NEOstudio

General Contractor: Milender White, Inc.

Metal Building Contractor: Heath Steel, LLC

Steel Erector: Big Johnson Construction

Civil Engineer: Tetra Tech, Inc.

Landscape Design: DTJ Design

Metal Building Manufacturer: Chief Buildings

Metal Roof and Wall Insulation System: Thermal Design, Inc.

Exterior Doors & Windows: EXPI-DOOR Sytems, Inc.

Storefront Installation/Construction: Pinnacle Glass Co., Inc.

Solar Panel Manufacturer/Installer: SolarEdge modules installed by SunPak Electric, LLC

Solar Panel Attachment Hardware: S-5!

Photo courtesy of MW Development LLC

Photo courtesy of MW Development LLC

PROJECT **DESCRIPTION**

Bluebird Market is a $10.2 million, 29,000-square-foot food hall and indoor market designed to serve as the community gathering spot for the 5,000 residents in Silverthorne, Colorado, and to cater to the millions of tourists who travel to Summit County annually.

It is the cornerstone project for Fourth Street Crossing, a $100 million, 3.8 acre mixed-use development that replaced a hodgepodge of aged buildings to create a new town center. The adjacent amenities include condos, townhomes, a parking garage, retail tenant spaces and a hotel.

"We applaud all the designers, suppliers and contractors who helped make the Bluebird Market a wonderful showpiece in downtown Silverthorne."

-Mike Pugach, General Sales Manager
Chief Buildings

History

Incorporated in 1967, Silverthorne is considered to be a "young, determined mountain town with a modern vision." (1) It originated as a mining community, then evolved to serve as a makeshift construction camp for workers building the Dillon Dam/Reservoir and the Eisenhower-Johnson Memorial Tunnel.

Over time, Silverthorne's proximity to the Breckenridge, Copper Mountain, Keystone, Arapahoe Basin, Loveland, Vail and Beaver Creek ski resorts and its prime position along Interstate 70—the highway that connects Maryland to Utah—prompted town leaders to imagine ways to transform what had become a pit stop for travelers into a base camp for tourists.

Discussions about the need for a comprehensive plan began in 2008 and these led to the formation of an urban renewal authority five years later. (2) The results of Silverthorne's planning process are published in a document titled "Blueprint Silverthorne," which provides site and architectural design standards for six distinct districts and calls for the creation of a new town core. (3)

"Since Silverthorne developed much later than most of Summit County, it lacked the historic, mining-era main street of Breckenridge or Frisco, Colorado," said Tim Fredregill, development executive for MW Development. "It had a lot of commercial buildings, but limited food and beverage options. There were outlet and auto parts stores—which are all necessary uses—but Silverthorne's leaders and residents wanted a 'lights-on-18-hours-a-day,' densely developed town core." MW Development later acquired additional land to the north to roughly double the size of this downtown development.

After winning development rights in 2017, MW Development began acquiring the land needed to create the one-block-wide, two-blocks-long planned urban development (PUD) to meet this goal.

"To clear the site, we demolished a decrepit motel, a restaurant, an asphalt bus turnaround and a dog-shed-style bus shelter as well as some smaller utilitarian structures," Fredregill continued. "Since we proposed constructing different building types within a superblock, obtaining approval for the PUD allowed us to propose variances to local codes when needed."

Image courtesy of MW Development LLC

Community Impact

As Silverthorne's commercial and cultural hub, Bluebird Market plays a pivotal role in the success of the town center. Travelers and residents now enjoy chef-driven dining options prepared by a variety of local eateries and regional restaurants in a single location. The food hall's open dining area has a seating capacity of 650. There is additional seating along the mezzanine and in the adjoining pour-it-yourself beer and snack area that overlooks The PlayGarten, a four-story indoor recreation space which has slides, monkey bars, climbing obstacles, arcade games, and an interactive "multi-ball wall." (4) There are arts and cultural events scheduled in and around Bluebird Market throughout the year—ranging from live music performances, civic festivals and pop-up markets to group gatherings of all sizes.

According to Tony DeMario, president of Heath Steel, LLC, the need for a structure that could serve such a full array of functions made a metal building a good fit. "Typically, food and market hall projects need to be cost efficient and have open, flexible space with tall ceilings, multiple architectural finishes and a minimum of interior columns," he said. "Metal buildings, when properly coordinated and engineered, can meet and exceed these goals—and they can accomplish so much more than ever before. With the use of various exterior wall coverings—single skin metal, insulated metal panels, brick, stucco, wood siding, etc.—a metal building can be designed to meet virtually all architectural needs."

Photos courtesy of MW Development LLC

Planning & Design Priorities

In addition to bringing a food hall, market and recreation/event center together in a single, monumental facility, Bluebird Market's design had to comply with Blueprint Silverthorne's architecture and planning standards. (3) These state that "the Town Core District should develop to be a focal point of pedestrian activity in a village-like setting with a compact form" and require "a diverse mix of uses that creates a magnet of activity and promotes the town's unique identity."

Complying with Local Design Standards

In general, town leaders wanted the height, mass, form, length and proportions of buildings in Silverthorne's downtown to provide visual interest while maintaining a human scale. The maximum building height was set at 45 feet for structures with pitched roofs that have a rise-to-run ratio of no less than 4:12 and 35 feet for buildings with flat roofs. (5) The town core guidelines also state that the bulk of large, multistory buildings should be reduced to achieve a pedestrian scale by:

- Clearly defining a base, a middle and a top.
- Using articulation and materials such as wood, stone, masonry and decorative concrete to create a distinctive base at the ground level.
- Note: articulation of architecture refers to stepping and recessing of external walls to emphasize different parts of the building—such as entrances—and add visual interest by providing changes to the facade at regular intervals.
- Featuring "base" elements, such as windows, canopies, bays and other architectural details.
- Providing variations in building height, profile and roof forms.

Photo courtesy of MW Development LLC

Promoting Silverthorne's Unique Identity

Town leaders, the developer and project team members recognized how important preserving two historic buildings was for the community—the Mint and the Old Dillon Inn. "I ski bummed in Summit County in the 1990s and spent more than my fair share of time with friends enjoying a cold one at the Old Dillon Inn," said Mike Pugach, general sales manager for Chief Buildings. "I appreciate that the developer and designers chose to preserve the history of such an iconic establishment."

Constructed around the time Colorado first became a U.S. territory in the 1860s, the Mint and the Old Dillon Inn were relocated to Silverthorne in 1961 when residents in the Old Town of Dillon had to move to higher ground because the existing townsite was going to be flooded to create a reservoir. The Mint was transformed into a steak house and the Inn thrived as a popular bar, restaurant and music venue until it closed in 2007. (6) (7)

MW Development devised a way to keep these historic structures in their current locations. Fourth Street Crossing was laid out so that its new buildings would be built around the Mint, allowing the Mint to remain as a focal point of a public plaza and adding much-needed historic character to an otherwise newly constructed downtown.

Photo courtesy of MW Development LLC

An especially unique design solution was required for the Old Dillon Inn because it was sitting on the building pad for Bluebird Market. "The Inn had evolved to be several structures cobbled together," Fredregill said. "We determined it wouldn't likely survive another move. I knew about the versatility and efficiency of metal buildings and that we could build over and around the Inn, so that's what we did." (8)

Photo courtesy of MW Development LLC

While Fredregill's technical assessment was accurate, encapsulating the Old Dillon Inn within the new food hall posed an unprecedented challenge for the metal building contractor. "Before this, we had never built around and over the top of an existing building," DeMario recalled.

Architect's Statement

In 2018, NEOstudio was hired to provide conceptual design services, along with DTJ Design, the landscape architecture firm that was the primary consultant for Silverthorne's site plan review process. (9) "We started by creating building footprints to help with the site layout for most of Fourth Street Crossing," said Christin Brandow, former architectural designer for NEOstudio. "Later, we became the architect-of-record for many of the buildings, including the market hall."

Compliance and Complexity

Although the developer provided an approximate building area in square feet, Brandow said she and Michael Noda, a partner at NEOstudio, needed to measure the existing conditions of the Old Dillon Inn to set the maximum height clearances. "Then I used these measurements to

complete some conceptual massing drawings and to make sure everything was tall enough," she said. "When the metal building manufacturer was brought on board, the engineers provided feedback about what was or wasn't possible. Since we had started by meeting local design standards, bringing these two perspectives together created some complexity, although we tried to keep the design solution as simple as possible."

For example, the client wanted to include an event space, which increased Bluebird Market's size. Silverthorne's design standards emphasized the importance of using "shifts in building massing" and other strategies to achieve a pedestrian scale. "We started the conceptual design process by meeting local design standards, then simplified the form a bit to make the steel structure work while maintaining as much architectural interest as possible," Brandow said.

Close Collaboration

"The metal building manufacturer's engineers were awesome, and we worked back and forth to figure things out," Brandow said. "This was my first metal building design, and I was surprised to learn how flexible the placement of the interior columns could be. We used columns at the edges of vendor areas to loosely define space and keep the dining and bar areas as open as possible. This worked out well because the columns provide visual cues that help people sense when they are leaving one space and entering another."

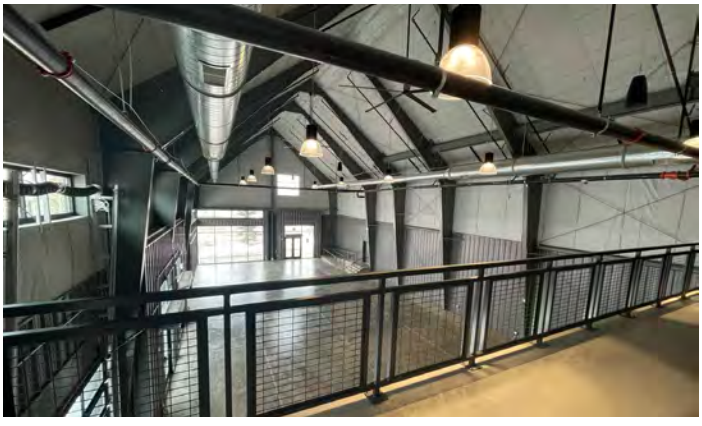


Photo courtesy of MW Development LLC

Articulation

Brandow said the architects quickly realized how difficult it would be to accomplish the articulation requirement given the large scale and tight site constraints for this metal building. "So, we collaborated with the metal building manufacturer's engineers to determine how we could create recessed voids that were site-framed the same way you'd do for steel-stud construction," she explained. "We used glazing and different siding materials to accentuate these architectural elements—particularly on the facade that faces Blue River Parkway, which has a massive storefront wall."

Photo courtesy of Heath Steel, LLC

The code officials' flexible interpretation of this design requirement was also important. "Typically, they would want to see these articulations for the entire height of the building," Brandow noted. "But we could only create recessed voids on the first floor before we hit a primary beam."

Aesthetics

Since Silverthorne has historic ties to the mining industry, Brandow said that the local townspeople liked the metal siding used to clad most of Bluebird Market because it "harkened back to mineshafts and mining buildings of the past. The final design also uses other exterior materials, such as wood and cementitious panels to "accomplish a contemporary aesthetic using rustic materials."

Photo courtesy of Heath Steel, LLC

PROJECT **CHALLENGES, GOALS & OBJECTIVES**

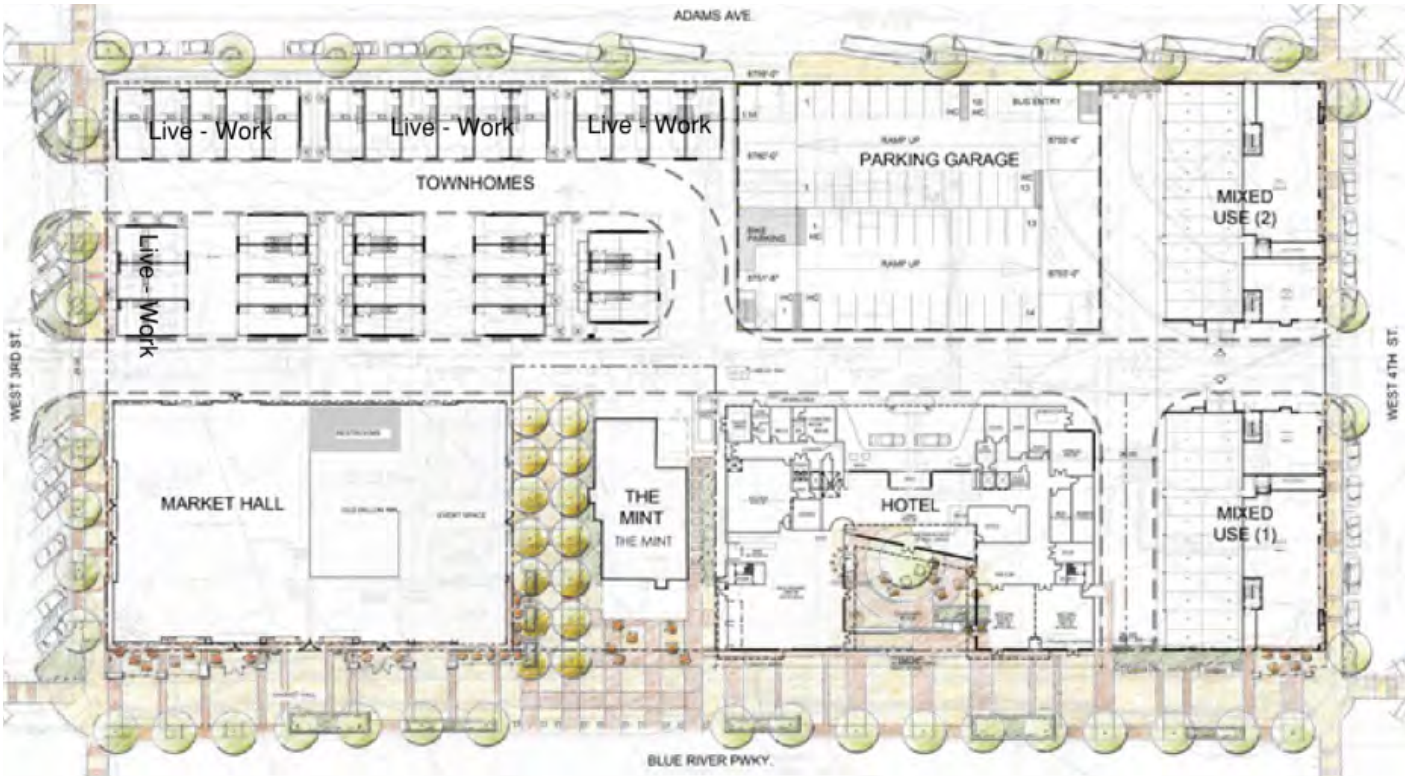


Image courtesy of MW Development LLC

"At the time that Bluebird Market was designed and constructed, this was the most complex, custom-engineered metal building we'd done," DeMario said. "This project had every complicated design element possible for a metal building, including a variety of roof forms and slopes, tight site constraints, logistical challenges and a winter start date for construction."

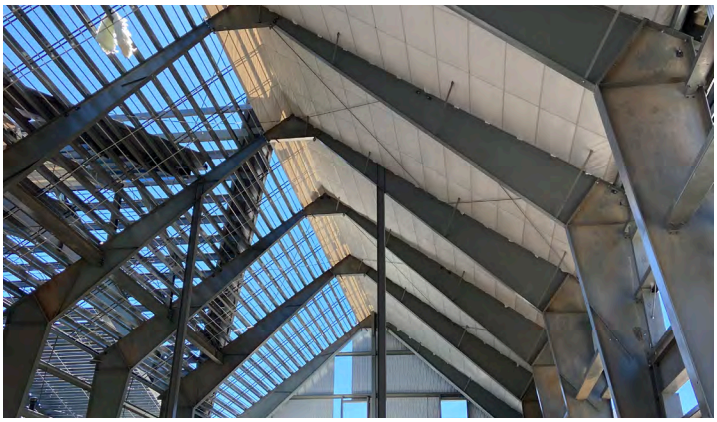
Roof Design

Bluebird Market's roofs had to comply with Town Core Design Standards, which set height limits, stated that rooftop mechanical equipment could not be visible, and recommended that architects vary the roof forms to break down the scale of this massive structure.

According to DeMario, the resulting design had "four separate roof planes, a clerestory, a steeply sloped roof that is unusual for a metal building (9:12), and a screened well for rooftop mechanical equipment." The upper roof's drainage had to be routed around the mechanical well to prevent water from ponding. The roofs also had to be properly insulated, weathertight and designed to meet Colorado's snow load requirements while supporting a full solar array. (10)

"The specified design criteria included the weight of the photovoltaic (PV) panels, which is about two pounds per square foot (PSF), and their potential compounding impact on the substantial snow loads—particularly with respect to a 93 PSF unbalanced (drift) condition," Pugach said. "The layout and attachment methods for the PV panels is also very important. To prevent additional drifting and ice build-up, the panels needed to lay flat just above the metal roof ribs and run parallel with the roof slope. This way, the snow on top of the panels can melt and simply slide off the roof instead of drifting in a gap under or behind the framing."

The PV panels should offset the majority of the common area electric consumption for the building—approximately 300,000 kWh per year. A look-back has not been done to confirm, but that was the original underwriting.





Photos courtesy of MW Development LLC & Heath Steel, LLC

Photo courtesy of MW Development LLC

Tight Site Constraints

Heath Steel's Vice President Damian Trost said building over and around the Old Dillon Inn required a lot of planning and close coordination. "We couldn't work from the top of the existing building because it couldn't hold any additional weight," he explained. "The buildings in Fourth Street Crossing were placed close to their lot lines to achieve density, leaving very little space to maneuver during construction. So, we used a combination of cranes and boom lifts to erect the steel superstructure and enclose the building."

Logistical Challenges

"The site's location and the climate conditions created substantial logistical challenges," Fredregill said. "Everything had to be transported on treacherous highways that were shut down half the time due to snow, and there was limited space to store and stage construction materials and equipment."

"It took 2½ years from the time design began to the start of construction," DeMario added. "There was a lot of excavation—including blasting through river rock—that needed to be done. So, the developer arranged for the fabricated metal building components to be stored nearby. This was convenient because when Milender White was ready, we were able to quickly mobilize and move forward."

Winter Construction

A short construction season and chronic labor shortages also influenced MW Development's decision to use a metal building. Winters in Silverthorne are long and severe with an average snowfall of 103 inches. (11)

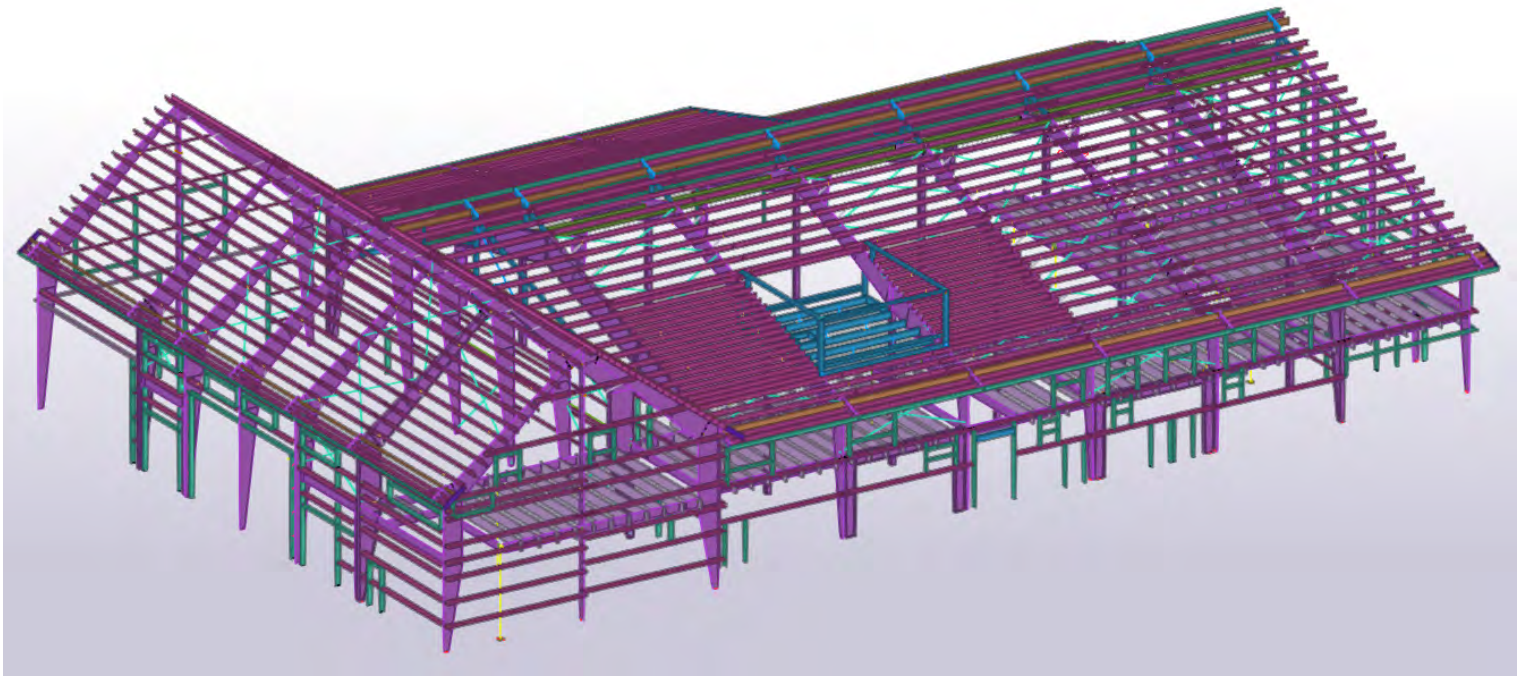
"Most years, it snows from September through April, which limits the construction season to about four months of good weather," Fredregill said. "I believe in 2019 we had our first snow fall at the beginning of September. It's also hard to find skilled construction labor because only 30,000 people live in Summit County year-round and many of them work for the ski resorts or as police officers, snowplow operators, retail store employees, or restaurant staff, etc."

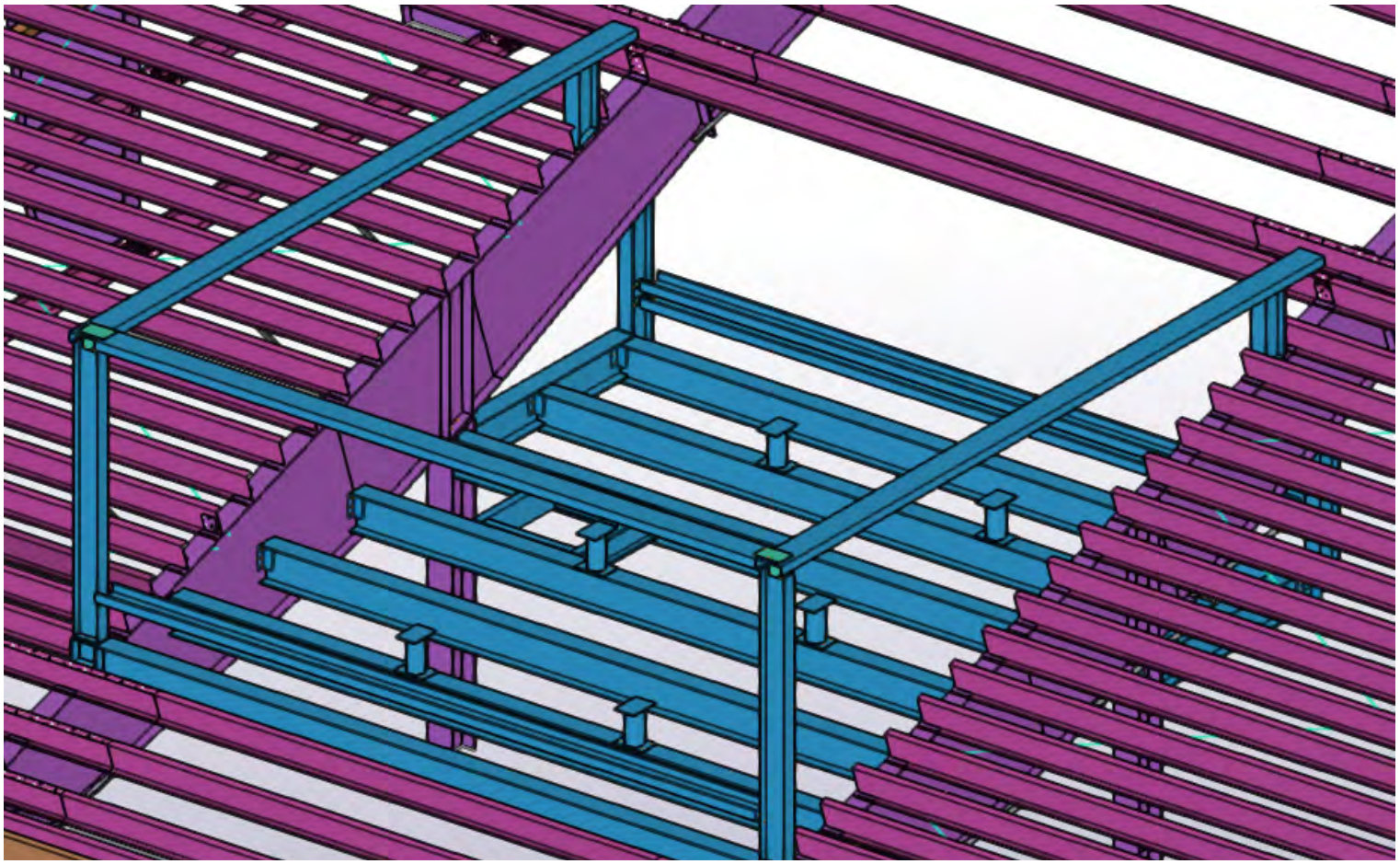
Fortunately, Fredregill said his previous experience working in structural engineering had shown him that metal buildings worked well for constructing a big open building in a tough construction environment. "I knew that a metal building could achieve the openness and industrial appearance, cost efficiency and streamlined construction process we needed for this food hall and market," he said. "The clear-span spaces also provided the flexibility to create food preparation and serving spaces that met the needs of different restaurant tenants."

“This project had every complicated design element possible for a metal building, including a variety of roof forms and slopes, tight site constraints, logistical challenges and a winter start date for construction.”

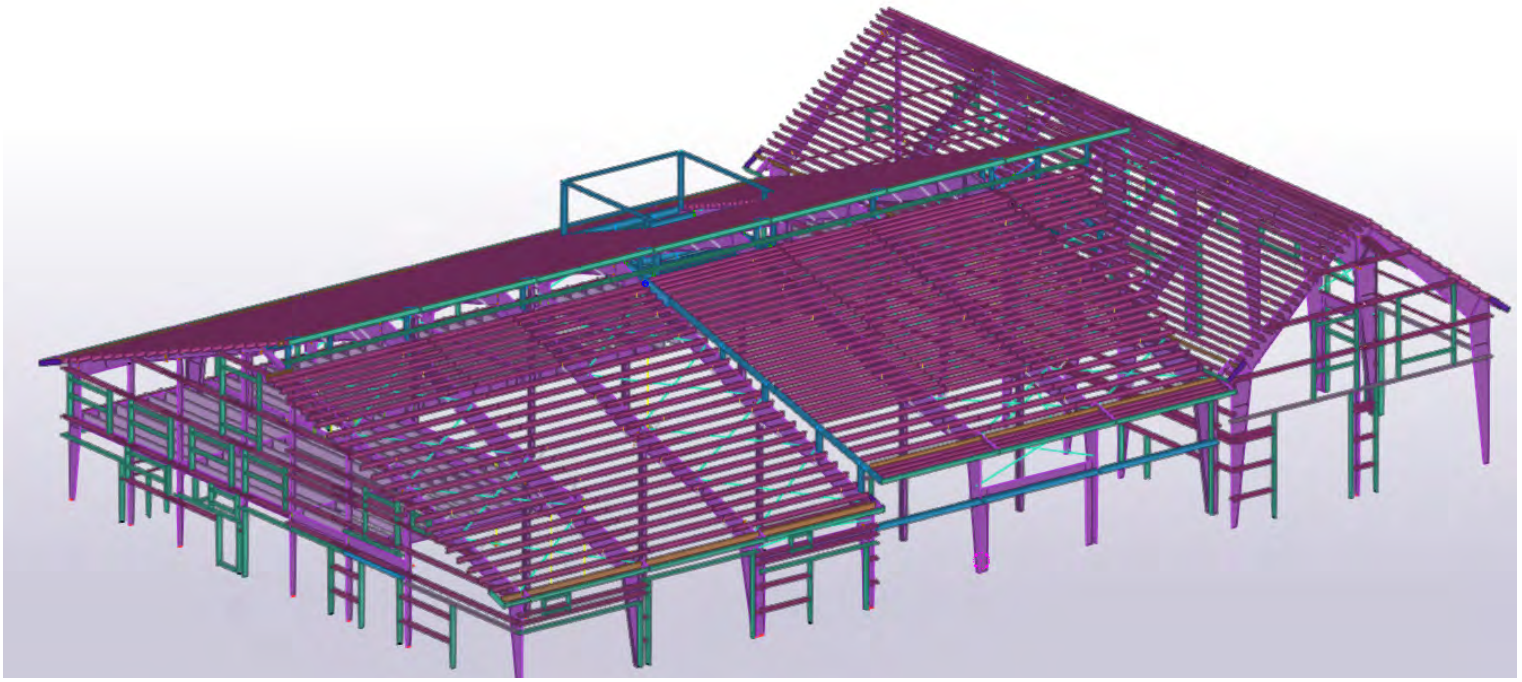
-Tony DeMario, President, Heath Steel, LLC

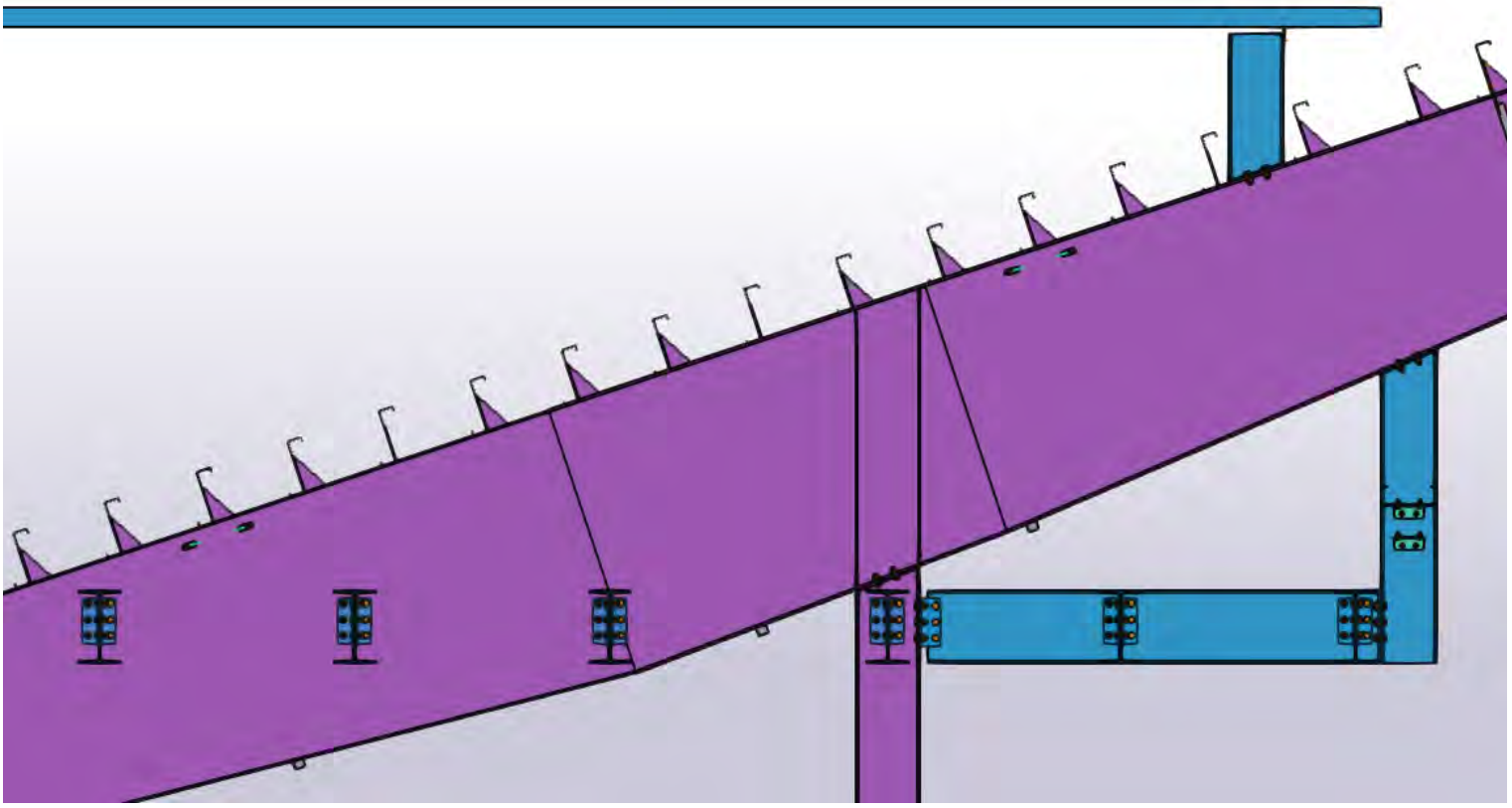
Photo courtesy of MW Development LLC





Drawings courtesy of Chief Buildings





Drawings courtesy of Chief Buildings

1 MARKET HALL_LEVEL 1 FLOOR PLAN

1/8" = 1'-0"

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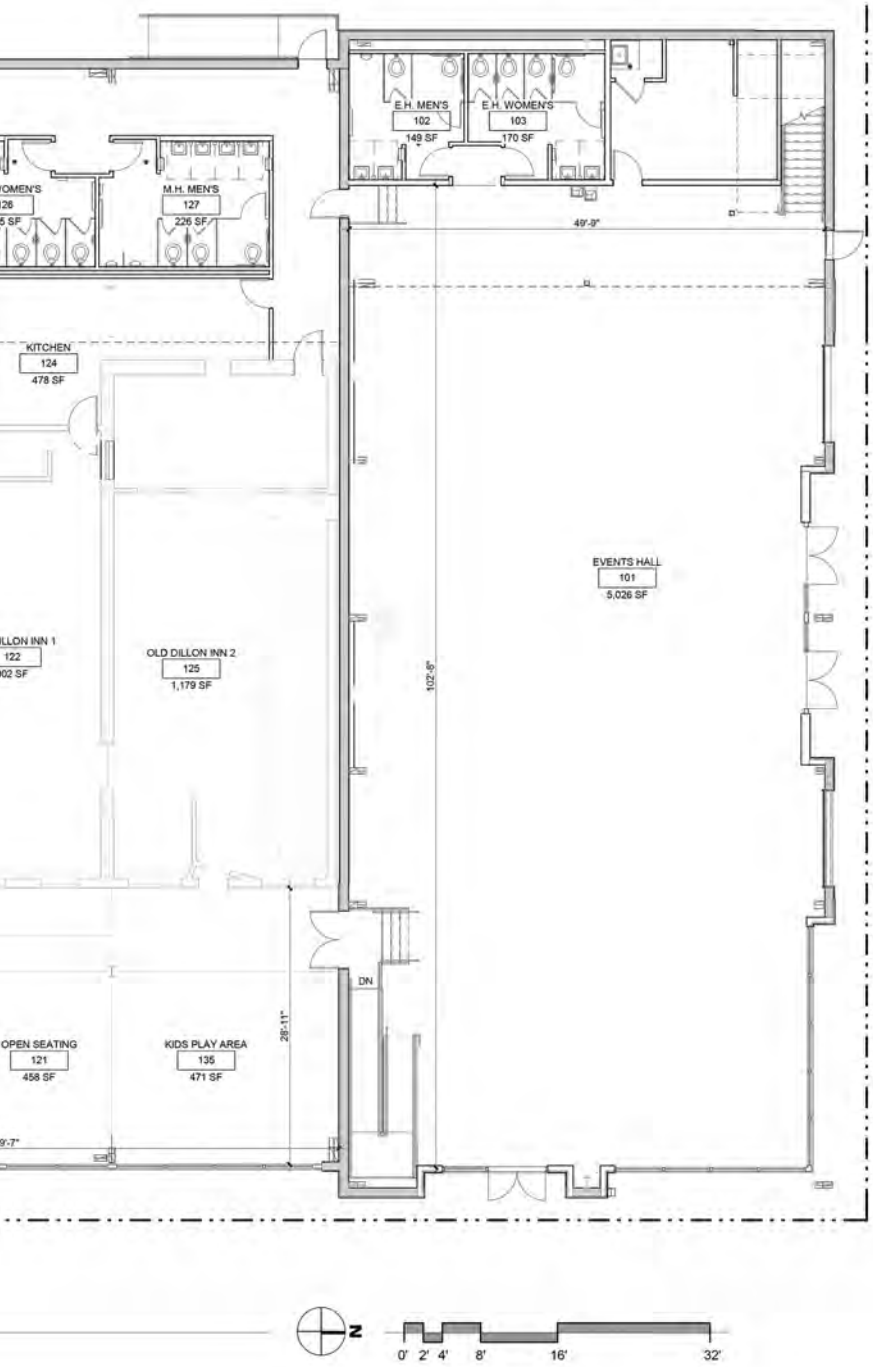


neo studio

3560 WALNUT ST. UNIT A
DENVER, CO 80205
PHONE 303.758.3800

4TH ST. CROSSING - MARKET HALL

325 BLUE RIVER PARKWAY
SILVERTHORNE, CO 80498

PROJ. NO. 17-19
DRAWN Author
CHECKED Checker
APPROVED Approver
DATE 02/06/2020

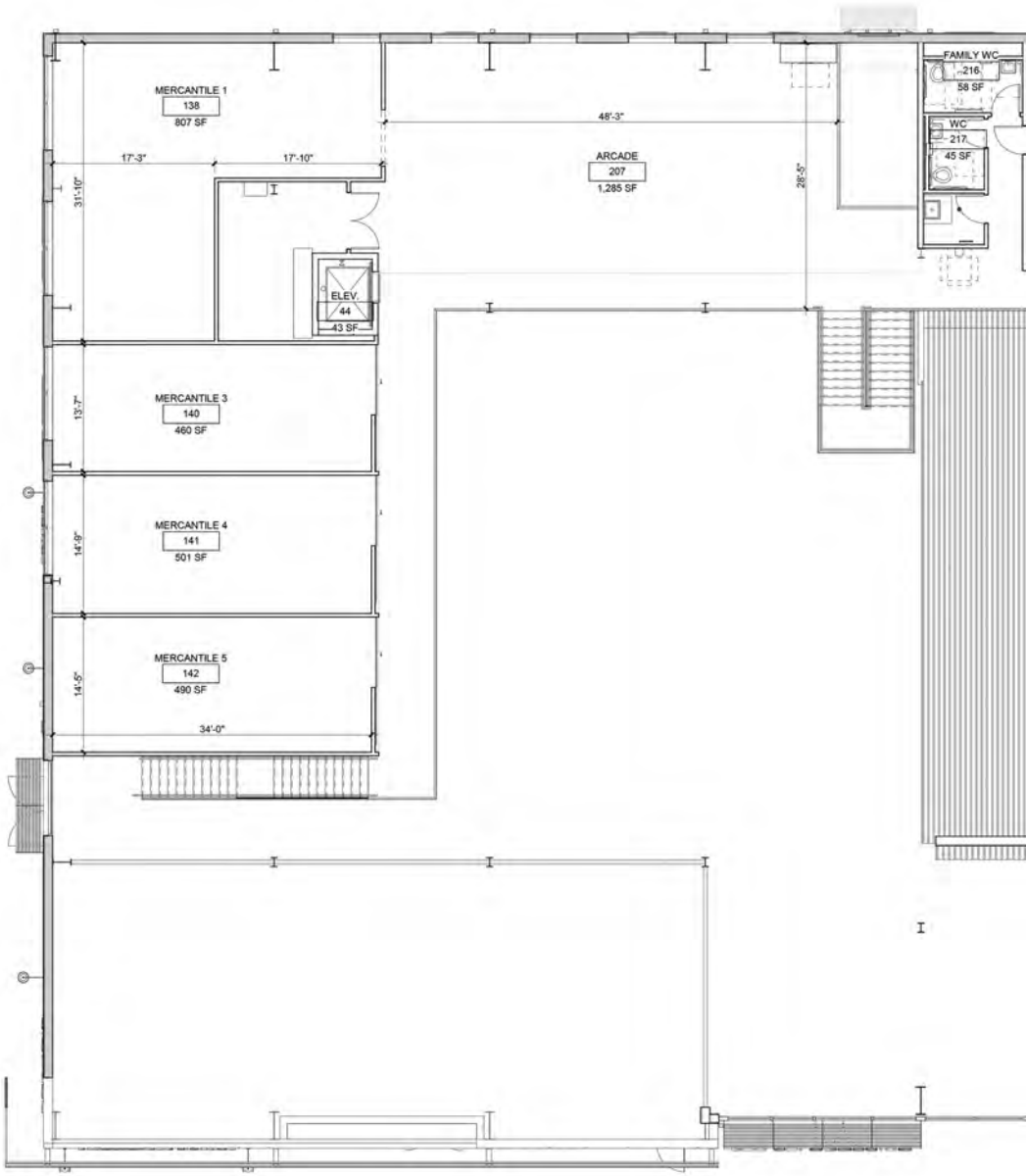
ISSUED
FOR: PERMIT

SCALE: 1/8" = 1'-0"

SHEET TITLE:
MARKET HALL- LEVEL 1

P0.01

Drawing courtesy of MW Development LLC



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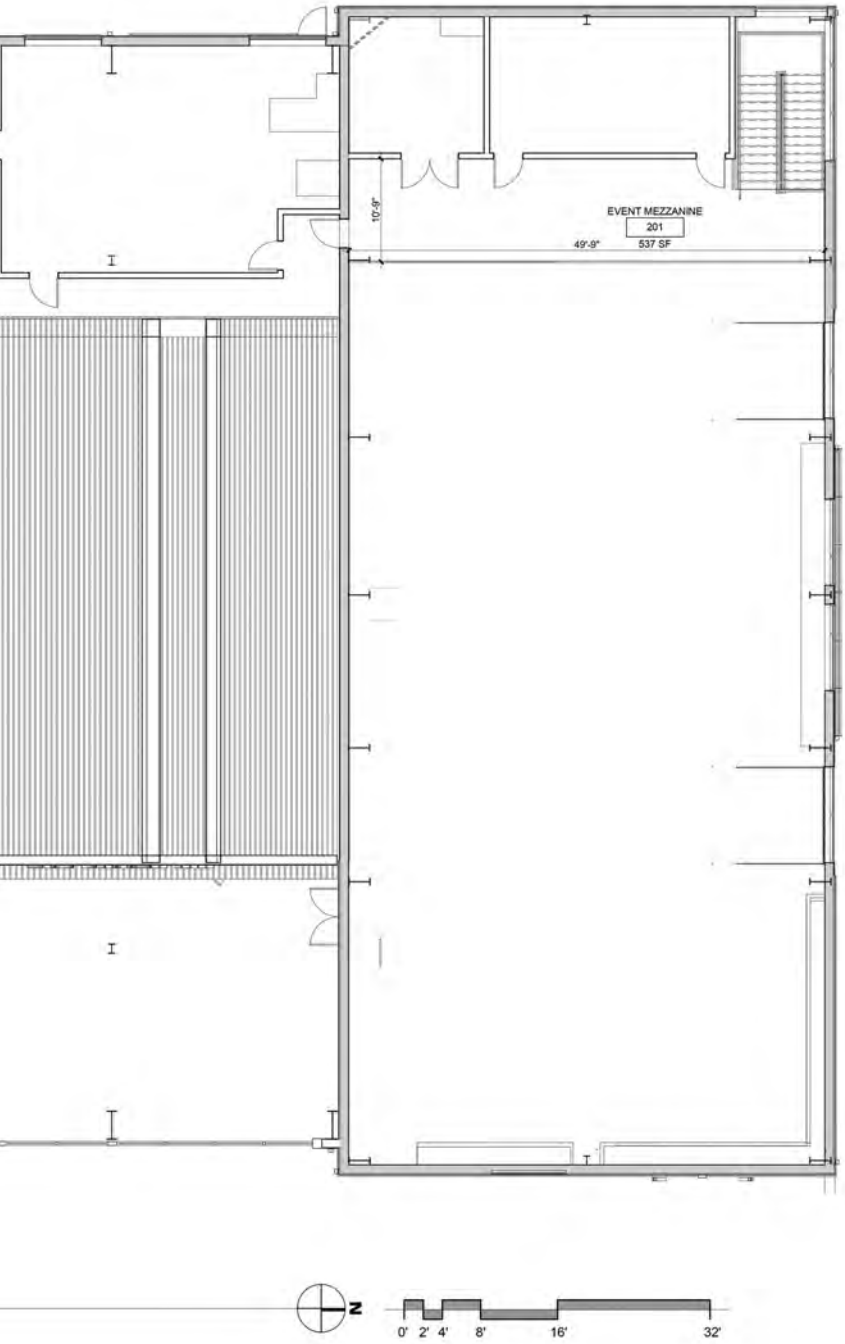

neo studio

3560 WALNUT ST. UNIT A
DENVER, CO 80205
PHONE 303.758.3800

4TH ST. CROSSING - MARKET HALL

325 BLUE RIVER PARKWAY
SILVERTHORNE, CO 80498

PROJ. NO. 17-19
DRAWN: Author
CHECKED: Checker
APPROVED Approver
DATE: 7/15/2020
REVISIONS

ISSUED
FOR: PERMIT

SCALE: 1/8" = 1'-0"

SHEET
MARKET HALL - LEVEL 2

P0.02

Drawing courtesy of MW Development LLC

2 MARKET HALL - ELEVATION 2 - SOUTH
1/8" = 1'-0"

1 MARKET HALL - ELEVATION 1 - EAST
1/8" = 1'-0"

Drawing courtesy of MW Development LLC

2 MARKET HALL - ELEVATION 4 - NORTH
1/8" = 1'-0"

1 MARKET HALL - ELEVATION 3 - WEEST
1/8" = 1'-0"

KEY PLAN - MARKET HALL

MILENDER WHITE
DTJ DESIGN
CO studio
TETRA TECH
RMP
ROCKY MOUNTAIN PRESTRESS

4TH STREET CROSSING
SILVERTHORNE, CO

MARKET HALL - ELEVATIONS

ISSUE
FINAL PLAN APPLICATION

DATE
FEBRUARY 21, 2019

DRAWN BY: CB
PROJECT NO.: 2017301.11
SCALE: AS NOTED

SHEET:
A201

Drawing courtesy of MW Development LLC

RELEVANCE FOR **STUDENTS**

Photo courtesy of MW Development LLC

The project team members interviewed for this folio emphasized the importance of understanding the limits, the creative potential and the delivery-process advantages associated with using metal building technology. The developer ranked buildability, versatility and financial viability as the most crucial considerations for multiuse commercial facilities such as Bluebird Market.

Limitations and Creative Potential

"I think it is very helpful to learn what the limitations of metal buildings are as quickly as possible," Brandow said. "Then you can work within these constraints to be creative. For example, instead of having a traditional roof ridge, we designed an offset ridge that is lined with tall transom windows to bring light into the center of Bluebird Market's interior space. That shape was built into the truss so it might have given the metal building manufacturer a little bit of heartburn, but they were able to do it. This is a fairly wide building so natural light only travels 20 to 30 feet into it from perimeter windows. That would have had to been supplemented with more artificial lighting if we hadn't added the ridge with the windows above."

Design-Build Delivery

For Trost, the integrated design-build process used to deliver a metal building is ideal. "It involves your trade partners early so you can select materials and equipment with input from the people who will be installing these," he said. "This is better than making changes when your construction drawings are complete. At that point, you have to submit requests for information (RFIs) to your trade partners, which can cause delays and increase costs. There also can be times when the design team or owner is not sure which option to choose among those that are available. Having subcontractors and suppliers available to provide additional information—and to be firm about when decisions need to be made—helps keep the decision-making process moving smoothly and keeps the changes happening in the field to a minimum."

Buildability, Versatility and Financial Viability

"The most important thing is for architects to design something that is buildable, versatile and financially viable," Fredregill said. "Otherwise, all you have is pretty pictures. Since metal buildings can achieve all these objectives, designers should keep this technology in their repertoire."

As it turned out, the versatility of Bluebird Market's metal building helped its owner adapt to unforeseen circumstances. "The 7,000-square-foot space on the north side was initially intended to be an event space, but that business didn't really take off," Fredregill said. "We were targeting the wedding market, which shifted dramatically during the pandemic. Big weddings of 200-plus people were common before that. Coming out of COVID, though, small gatherings became the format of choice for engaged couples. When we didn't get great traction for this use, we pivoted. Today, The PlayGarten, which is a parent-owned local business, occupies this space."

Beauty and Civic Pride

"We were honored to work with Heath Steel to construct this beautiful example of what a metal building can be," concluded Pugach. "We applaud all the designers, suppliers, and contractors who helped make the Bluebird Market a wonderful showpiece in downtown Silverthorne." Fourth Street Crossing is now a popular destination for visitors and local residents with Bluebird Market playing a central role in its commercial success.

Practical Application

1. What benefits did using metal building technology offer for Bluebird Market's owner?
2. What characteristics of custom-engineered metal buildings made using this technology especially well-suited for a food hall and market?
3. How does the architectural design of Bluebird Market address aesthetics?

Photo courtesy of MW Development LLC

"The most important thing is for architects to design something that is buildable, versatile and financially viable. Otherwise, all you have is pretty pictures. Since metal buildings can achieve all these objectives, designers should keep this technology in their repertoire."

-Tim Fredregill, Development Executive
MW Development LLC

4. What unique challenges in this specific location (i.e., northern climate, in the mountains, within a town core development) were solved by using metal building technology?
5. What do you consider to be the greatest design challenge for this project? Why? How did the project team tackle this?
6. Are there unique aspects of Bluebird Market's design that you believe might work well for custom-engineered metal buildings you design in the future?
7. What steps must be taken to ensure that a metal roof can accommodate the addition of solar panels after the building has already been constructed?

Review these resources:

- Restaurant & Brewery Gallery | MBMA
- Best Practices for Metal Roof Solar Mounting | Solar Builder
- S-5! Metal Roof Brackets & Clamps | Standing Seam Roof Clamps
- Snow Load Calculator | Colorado Snow Load Regulations | B&M Roofing
- Town Core Design Standards for Silverthorne

RESOURCES/RELATED READING

Related Reading

- Case Studies | MBMA
- Design Resources | MBMA
- Exploring the Dos and Don'ts of Curtainwall Transitions
- MBMA Common Industry Practices
- Solar Powering People's Lives Around the USA | SolarEdge

Video Resources

Over 50 videos highlighting metal building architecture, engineering, design and application can be accessed at www.youtube.com/mbmamedia. We recommend you begin your educational process with the following programs:

- Metal Building Systems 101
- An Introduction to Metal Building Systems
- How It's Made: Metal Building Innovations Are Revolutionizing Low-Rise Commercial Construction
- How It's Built: Metal Building Construction Raises the Bar for Low-Rise Commercial Structures

Additional Videos

- Fourth Street Crossing Groundbreaking
- 4th Street Crossing Groundbreaking, Silverthorne, Colorado
- 4th Street Crossing - Silverthorne's new "main street" - YouTube
- MultiBall Play. Train. Compete

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CREDITS

Managing Editor

W. Lee Shoemaker, PhD, PE
MBMA Director of Research & Engineering

Production Design & Management

TWI Publishing

Photography & Drawings

Chief Buildings
Heath Steel, LLC
MW Development LLC

Information Sources

Christin Brandow, Former Architectural Designer, NEOstudio

Tony DeMario, President, Heath Steel, LLC

Damian Trost, Vice President, Heath Steel, LLC

Mike Pugach, General Sales Manager, Chief Buildings

Tim Fredregill, Development Executive, MW Development LLC

Editorial Advisory Board

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For more information about the educational programs available through the Metal Building Manufacturers Association, visit mbma.com and mbmaeducation.org or speak directly with MBMA General Manager Tony Bouquot at mbma@mbma.com.

Photo courtesy of MW Development LLC

Metal Building Manufacturers Association Educational Series
www.mbmaeducation.org