# PROJECT PROFILE

## UNIVERSITY OF IOWA VISUAL ARTS BUILDING IOWA CITY, IA

**40%** reduction in water use

**48%** energy cost savings

**68%** open green space

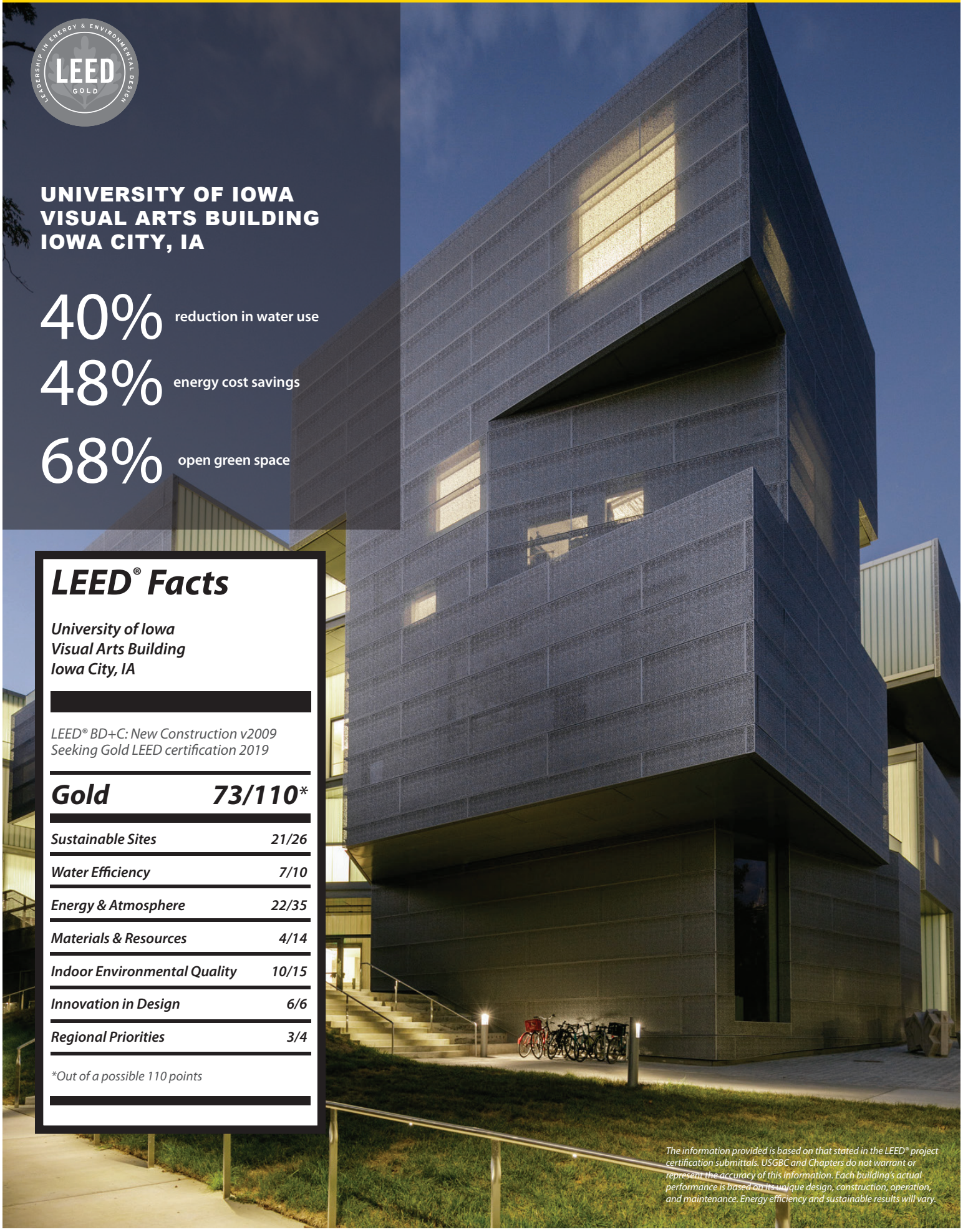
## *LEED® Facts*

***University of Iowa***
***Visual Arts Building***
***Iowa City, IA***

*LEED® BD+C: New Construction v2009*
*Seeking Gold LEED certification 2019*

| ***Gold*** | ***73/110**** |
|---|---|
| *Sustainable Sites* | *21/26* |
| *Water Efficiency* | *7/10* |
| *Energy & Atmosphere* | *22/35* |
| *Materials & Resources* | *4/14* |
| *Indoor Environmental Quality* | *10/15* |
| *Innovation in Design* | *6/6* |
| *Regional Priorities* | *3/4* |

**Out of a possible 110 points*



*The information provided is based on that stated in the LEED® project certification submittals. USGBC and Chapters do not warrant or represent the accuracy of this information. Each building's actual performance is based on its unique design, construction, operation, and maintenance. Energy efficiency and sustainable results will vary.*

# PROJECT PROFILE

## UNIVERSITY OF IOWA VISUAL ARTS BUILDING

### PROJECT BACKGROUND

Recognized by *Wired* magazine as one of the 25 Masterpieces of Architecture in 2016, The University of Iowa Visual Arts Building replaces the original 1936 Art Building, which was heavily damaged during a significant flood in June 2008. It is located directly adjacent to and northwest of Art Building West, which was completed by Steven Holl Architects in 2006. Inspired by the Fibonacci Sequence, the vertically porous and volumetrically composed 126,000-square-foot, four-story building is designed around a naturally daylit central atrium. The loft-like studio art building interconnects the diverse array of art disciplines, including ceramics, sculpture, metals, photography, printmaking, 3D design, intermedia, animation, and graphic design.

The design of this facility was intended to maximize interaction between all departments and disciplines. The grand staircases are shaped to encourage meeting, interaction, and discussion. Some lead to large landings with chairs and tables for impromptu conversations, while others open to spacious lounge areas. This powerful core permeates light and movement throughout the building, opening up access and views for creative abrasion between all art production activities, graduate student studios, faculty and staff studios and offices. Interconnection is further facilitated by glass partitions along the studio walls adjacent to internal circulation. Seven vertical cutouts encourage interaction between all four levels. The green rooftop studio connects students and faculty to nature, as it is used both as teaching space and gallery space.

### STRATEGIES AND RESULTS

The concrete frame construction is supported on drilled pier foundations. A punched concrete frame structure composed of cast-in-place concrete provides thermal mass at the exterior while the uniquely innovative and cutting-edge floor plate system—poured-in-place biaxial voided slabs, better known as "thermally active bubble deck" slabs—incorporate the Cobiax bubble deck system to provide radiant cooling and heating.

The efficient system places plastic bubble-shaped forms, arranged in a grid, at the center of the slab's depth (where concrete is least effective) to span farther with the same thickness. The system eliminates dead weight from the structural slab by incorporating into the formwork high-density air-filled polyethylene spheres as voids. To achieve this, a small amount of concrete is poured and allowed to set with the bubbles in place, thereby decreasing the amount of material used to construct the slab by up to 30% in comparison to a typical poured structural slab, yielding a much thinner, stronger, and lighter deck. The technique, used for the first time in the US, allows for integrated mechanical systems, including radiant heating and cooling, and creates larger column-free spaces giving the slab a smoother finish uninterrupted by beams.

Building Information Modeling (BIM) was utilized for the entire project, however it was required to design and virtually construct the irregular shape of the "bubble slab" structure in order to coordinate the installation of the complex exposed mechanical pipes and ductwork. Without the use of BIM, the "bubble slab" would have been impossible to construct, and furthermore, the project would have never been able to be constructed within the timeline allotted.

The building envelope is cladded with Rheinzink—perforated stainless/zinc skin panels with stainless steel scrim for sun shade covers at the southwest and southeast building façades, channel glass-wall systems, and operable windows for natural ventilation.

The porous, layered skin on the south and west façades modulates direct sunlight into the studio interiors. A fine-grain, perforated, etched stainless steel screen floats eight inches over a zinc and glass inner skin, creating shifting shadows and depth in relation to the adjacent ravine's trees. The screens, featuring a pattern derived from the elliptical shapes of the building's cutouts, modulate light and reduce solar gain where it is most needed, but also offers abstracted surfaces during the day, as well as an alluring glow at night when the interiors are abuzz with activity.

The panels had to fit the concrete structure building perfectly, requiring all concrete openings and locations to be +/- ¼" tolerance from the theoretical dimension. Due to the perforation process of the panels, there was insufficient time to field-measure the concrete and adjust accordingly, so both the concrete structure and the panels were fabricated according to the coordinated model.







**Owner:** The University of Iowa
**LEED® Project Admin:** BNIM Architects
**Construction Manager:** Miron Construction Co., Inc.
**Architect:** Steven Holl Architects
**Associate/Landscape Architect:** BNIM Architects
**Civil Engineer:** Shive-Hattery, Inc.
**Structural Engineer:** Buro Happold & Structural Engineering Associates, Inc.
**Curtain Wall Consultant:** W.J. Higgins & Associates, Inc.
**Audio/Visual Consultant:** The Sextant Group Inc.
**Lighting Consultant:** L'Observatoire International
**MEP Engineers:** Design Engineers
**Commissioning Agent:** The University of Iowa & SSRCx
**Energy Modeler:** Transolar
**Project Size:** 126,000 SF
**Construction Budget:** $53,339,638
**Photography:** Iwan Baan Photography, Image Studios

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## ABOUT LEED

LEED is the most widely used green building rating system in the world. LEED provides a framework to create healthy, highly efficient and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement. Visit usgbc.org to learn more about LEED.

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In addition to the structure/skin modeling, the interior BIM coordination/design process turned the normally unseen mechanical systems into architectural pieces of art. Without ceilings (due to the active slab), the mechanical systems were arranged according to their architectural impact. The layers of electrical, fire protection, plumbing/hydronic piping, and duct systems were arranged with the ductwork on the bottom layer to conceal the vast majority of the smaller pipe and conduit systems. This density required a custom wall penetration due to the close proximity of all of the penetrations. Multiple layers of sign-offs for inspections and insulation layers had to be coordinated with all trades.

Natural daylight is inserted into the deep floor plates via the "multiple centers of light." A plethora of light pours into the uniquely designed building through dozens of exterior windows—some clear, others semi-transparent. This creates a column of light in the central foyer that reaches up the entire height of the facility. Almost every room in the building receives some amount of direct sunlight, which is by design since natural light is the single most important resource to an artist in process.

The hydronic radiant systems use either warm or cool water, which flows through a network of flexible PEX tubing embedded within the ceiling of the structural slab. The cost of this highly efficient energy system is offset by the elimination of almost half the number of ventilation ducts, as there is no need to heat or cool the air mechanically. Natural ventilation is achieved via operable windows and skylights. The ventilation system utilizes energy recovery to recapture potentially lost thermal energy through the extensive exhaust system that is required to maintain high levels of indoor air quality in foundries and woodcutting studios.

Intended to lift the School of Art and Art History to new levels of enrollment and success, as well as be a destination for students and professionals of art and architecture, this multiple award-winning project is an exemplar collaboration in realizing a functional and exhilarating facility for the School.

## ABOUT THE UNIVERSITY OF IOWA

**The University of Iowa** is a flagship public research university in Iowa City, Iowa. Founded in 1847, it is the oldest university in the state. It is the second-largest university in the state of Iowa, and ranks 78th in the nation with 24,476 students. The University of Iowa is organized into eleven colleges offering more than 200 areas of study and seven professional degrees.

## ABOUT MIRON CONSTRUCTION CO., INC.

**Miron Construction Co., Inc.** is a forward-thinking, fast-growing private company and is the largest building contractor in the state of Wisconsin. Miron, headquartered in Neenah, Wisconsin, with regional offices in Madison, Wausau, Milwaukee, and Eau Claire, Wisconsin, and Cedar Rapids, Iowa, has been providing professional construction services to clients throughout the Midwest, with an expanded geographic reach across the United States, for the past 100 years. Miron has approximately 1,500 employees and posted a 2017 revenue of more than $1 billion. For more information, please visit www.miron-construction.com.

