

BALANCING INNOVATION, Collaboration

CannonDesign's Michael Zensen loves solving puzzles, especially the challenging building designs created through innovative leadership

— **Craig A. Shutt**





OAK RIDGE LAB

Cannon's design for the Chemical and Material Sciences Building at the Oak Ridge Research Laboratory features precast concrete architectural panels. See the article later in this issue for more on the project. Photo: CannonDesign.



Michael Zensen, CannonDesign

Michael Zensen has loved the challenges of designing and constructing buildings since his family built their own home in the mid-1970s. Today, as vice president of CannonDesign, he continues that fascination with creative designs and a desire to help others better understand the science of building through educational programs and volunteer groups.

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"You have to love solving complex puzzles to thrive as an architect in a firm committed to design excellence," he says. "Every aspect of the business relates to that." The goal is to understand the client, even beyond their words. "You have to listen to the client express their needs, but owners can't always define all the problems they are trying to solve through the project. It's important to ask pointed, incisive questions to clearly define the problem, so that the solution will really meet their needs."

Zensen thrives on achieving that goal, especially when it involves unspoken or even unknown needs. “The most enjoyable part of the project is discovering the problem to be solved and then defining it in easily articulated terms that resonate with the client mission. Then you can truly partner with the client to identify potential solutions and start tackling the obstacles and challenges associated with each potential solution.”

Every project has challenges, as Zensen has known since he saw his parents’ home being built. “It was a very painful process for my parents,” he laughs. “I wanted to figure out why it was so hard to create something that met people’s needs and expectations, because it didn’t seem like it should be that hard. I was drawn to architecture out of this notion of service for people, while at the same time recognizing that even with that simple basic house, the unclad anatomy of the building was so complex, so fascinating, and so much cooler than the completed project.”

Zensen took those interests, along with a 13-year interest in art, to the University of Kansas, where he received a 5-year Bachelor of Architecture degree and was exposed to the “artful side of building and design.”

BUILDING ENCLOSURE COUNCIL

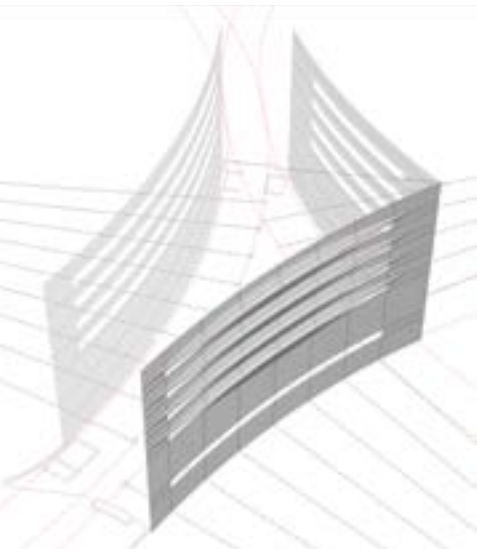
To encourage better understanding of the more technical aspects of architecture, Zensen helped establish the Building Enclosure Council of St. Louis (BEC-STL) in 2006. He worked with George Crow of McCarthy Construction, Matt Ford of Universe Corp., George Everding of CannonDesign-Allegion, and Brian Finnegan of Centria to develop the local chapter for the council, established by the American Institute of Architects and the National Institute of Building Sciences. The program, which now has 26 councils nationwide, promotes discussion of training, education, technology transfer, and other factors impacting building enclosures.

Zensen’s interest was sparked by a seminar on building envelopes by Building Science Corporation. “I realized that mistakes were being made, in both contract documents and on construction sites, that violated key principles of building science,” he says. “As I educated myself, I also realized the younger generation wasn’t being educated in these basic principles of façade dynamics. At the time, there were not a lot of professional journals focusing on the science of building as an integral part of the art of architecture or building.”

His experience with leading the building-envelope design on several of CannonDesign’s projects gave him the opportunity to explore precast as a cladding solution. “The beauty of precast concrete is that it can provide a skin and substructure in one product, and it can contribute to construction schedule acceleration because of this characteristic,” he says.

“The precast concrete industry has really been revolutionized by the emergence of new technologies in design and fabrication. This has been aided by the rise of some precast fabricators seeking to differentiate on quality and design while maintaining competitive price points. These factors expand the ability to express the fluidity of the material. We are truly now beginning to see the potential of the material to be expressive, unique, and complex, while still meeting aggressive schedules and budgets.”

This revolution is being brought about by integrating the latest design and manufacturing technologies, such as 3D modeling and printing, high-tech CNC routers, and other design and modeling aids. “With the entire industry—design, manufacturing, and construction—embracing Building Information Modeling, you can collaborate at a very detailed level with the expertise in each building trade.



PRECAST PROFILE

The diagram for the precast concrete panels at the Mount Sinai Medical Center in Florida shows the sweeping curve of the façade. Photo: CannonDesign.

DAYLIGHT CONNECTION

The design for Mount Sinai will connect users to the views and the sun via low-maintenance precast concrete cladding. Photo: CannonDesign.



Collaborating with contractors and other professionals maximizes success. “True creativity and unique designs result from realizing the potential of systems, materials, and modern manufacturing technologies. Pushing ideas from the design side only gets you so far,” he says. “Collaborating and partnering with an expert in a material or system who wants to work on something extraordinary and challenging allows us both to create something spectacular.”

NEW DELIVERY METHODS

New delivery methods have encouraged more collaboration, and CannonDesign has taken advantage of those with a number of projects. Key projects include several for the Oak Ridge National Laboratory, where CannonDesign has worked with McCarthy Construction using an Integrated Project Delivery format.

“Research laboratories have unique needs that impact their buildings in specific ways,” he says. “The most rewarding part of those projects is that each laboratory is deeply involved in a different science doing amazing things, and we learn a little about those by defining the building’s needs.”

Those needs often required creating versatile and adaptable buildings. “The world is changing very quickly, driving research constantly in new directions. Buildings need to adapt and respond to those changes. We have the opportunity to be brought into those specialized worlds for a while and get a glimpse of emerging science that will potentially change the world.”

One major project for Oak Ridge, operated by the U.S. Department of Energy, was the Chemical and Material Sciences Building, a three-story, 160,000-square-foot research facility. The space features laboratories and offices and was clad with precast concrete architectural panels. The panels were erected in a vertical position, measuring 10 to 12 feet wide and 30 to 45 feet tall. Most of the panels were embedded with thin brick to match existing buildings on campus.

The project was completed on a CM/GC delivery method, with the precaster brought onto the project early on a design-assist basis. That allowed for added resourcefulness in creating the building envelope, especially the use of long, narrow precast concrete sunshades over ribbon windows. (For more on this project, see the related article.)



LAB PARTNER

Precast concrete panels clad the high-bay laboratory at MAXLab on the Oak Ridge campus, which helped the facility achieve LEED Gold certification. Photo: CannonDesign.

CannonDesign also helped develop a related project, the 18,000-square-foot Maximum Building Energy Efficiency Research Laboratory (MAXLab), which investigates ways to improve processes and materials for building envelopes. The facility features a high-bay lab with an overhead crane for envelope-system research, a low-bay lab for HVAC-system research, a data center, and offices. The high-bay section was clad with architectural precast concrete panels, which helped the project achieve LEED Gold certification. The project also was completed on a construction manager-at-risk basis.

EMPHASIS ON HEALTHCARE

CannonDesign offers a general practice that excels in many markets in addition to the Science and Technology segment. “One of our strongest segments is our international healthcare practice, which allows us to contribute to improving patient outcome through creative approaches to clinical spaces and operational work flows.”

The firm has designed a variety of healthcare projects, which offer different challenges, but one core design goal ties them all together. “Incorporating views and natural light are important to healing environments, especially for oncology treatments, where a large percentage of patients receive infusion treatments and spend long periods sitting in one place,” he says. “It is vital that we make the environment comfortable while meeting the hospital’s functional needs as well as patients’ personal needs for either connection to other patients in similar conditions or personal solitude during treatment.”

Healthcare facilities tend to grow, adding building expansions to meet evolving community and healthcare delivery needs. “It is very challenging to add significant area to a building and not cut off the existing facility from views and light and prevent networks of endless, stagnant corridors.”

That emphasis can be seen in the company’s design for the Mount Sinai Medical Center of Florida, a seven-story hospital tower and emergency-care facility in Miami Beach, at the center of the campus facing Biscayne Bay. The architects designed a building with sweeping, curving faces

featuring large windows on a narrow, trapezoidal footprint. Architectural precast concrete spandrel panels were used to clad the building.

“It’s apparent in that building that we focused on connecting users to the views and the sun,” he says. “Our aim was to provide wall-to-wall glass to maximize daylight.” The precast concrete panels provide a durable, low-maintenance cladding that could cost-effectively supply the flowing curves on each façade. “It allowed us to take advantage of the three-dimensionally shaped façade, which breaks down the mass of the building by modulating and engaging with the strong Miami sun.”

Another recent healthcare project was the University of Kansas Hospital, a bed tower being built in multiple phases. Its façade features architectural precast concrete panels with vertical reveals, creating a staggered pattern over the face. A low front portion features a buff finish, while a larger portion at the rear features the same design but on a larger scale with a white concrete mix. A long stretch of solid curtain wall sits atop the low front portion.

DELIVERY METHOD ISSUES

Especially on its high-tech and healthcare projects, CannonDesign collaborates with construction team members in a multitude of formats, including Construction Manager at Risk (CMR). “CMR has really dominated the market during the past 15 years, due to tremendously escalating costs and the desire to control cost and reduce the risk of a bid-day budget bust,” he says. “We have had varying levels of success with it. It works best when major portions of the skin and mechanical systems can be competitively bid at

early stages prior to completion of documents, and the design team is allowed to work in an integrated manner to develop the design with the trade contractor.”

CannonDesign has also participated in a number of design-build projects. “I think the desire to integrate the design and construction

‘Owners need to realize that in design-build contracts, first costs tend to drive all decisions.’

team was a good goal, but owners need to realize that in design-build contracts, first costs tend to drive all decisions, even if those decisions impact quality and/or long-term costs for the owner. As the design professional, we are not always

able to engage in the debate of long term versus short term if we are contracted to the contractor.”

The firm also has been involved in a number of Public-Private Partnership (P3) projects. “As a large organization, we can bring a lot of skills and expertise to the table, so we can adapt to many types of contractual structures and still provide both exceptional design and exceptional service,” says Zensen. “But it can be quite challenging to be as responsive as we would like to be for the client and end users when our contractual obligations are directed to another entity that has other pressures and goals beyond the exact outcome of the facility.”

CannonDesign’s P3 Projects are focused in Canada, where the scale of some, such as the CHUM (the Centre hospitalier de l’Université de Montréal) in Montreal, requires engagement of the firm’s unique SFMO (Single Firm Multi Office) methodology, in which expertise and production are shared across multiple office locations.

“I expect we could see more of this format in the U.S.,” he says. “The P3 model exists due to pressures for expansion of services that are in conflict with available capital and finance opportunities available to tax-supported institutions. I think while this condition does not currently exist in the commercial healthcare industry in the U.S., these same pressures certainly exist in the higher education, the VA healthcare system, and infrastructure projects in this country.”

SUN ENGAGEMENT

Precast concrete produced a three-dimensionally shaped façade for the Mount Sinai Medical Center, which minimized the building’s mass and helped it engage with the strong Miami sun. Photo: CannonDesign.





STAGGERED FACE

Precast panels cladding the University of Kansas Hospital feature vertical reveals that create a staggered pattern over the building's face. Photo: CannonDesign.

The firm encourages a “designer-led, designer-built” format it has used with success and hopes to expand.

One element all the alternative-delivery methods share is a desire to accelerate the process. “Speed to market, reducing construction time, and accelerating realization of revenue are always critical to our clients financial proformas,” says Zensen. “But buildings are one-off designs. Every site comes with a different climate and different constraints, and each building solves unique problems for the owner and for the built environment. Speed can be the enemy of providing a great solution.”

To counter that trend, the firm is expanding its project-delivery options to include “designer-led designer-built” in which CannonDesign provides a turnkey project, providing the same advantages as CMR and design-build but maintaining contractual obligations and relationships with the client. “I’m excited about this concept,” he says. “It will allow us to accelerate some construction activities while continuing to develop the design, because the risk is all absorbed by the turnkey design team.”

The firm has used the format in Pittsburgh with success and is expanding its capabilities to other regions. “This is really the natural outgrowth of our construction management practice,” says Zensen.

COMMUNITY SERVICE CONTINUES

Although Zensen is no longer involved in an official capacity with the BEC-STL, the group continues to grow. “Starting the BEC was an exciting time,” he says. “Trying to get a new volunteer organization off the ground and provide high-quality education programs at low cost was quite a challenge during the height of the financial collapse. I’m glad we created a financially sustainable group by partnering with design and construction firms and could provide strong building-science-centered educational programs. It has allowed the BEC-STL to continue to serve this important community educational service.”

As he works to encourage creativity in the professional market, he’s also working in a volunteer capacity on the personal side. Zensen is now running the not-for-profit, Art in the Park St. Louis, which hosts an Art Fair Event featuring 80 artists. The event takes place annually in September and is attended by about 8,000 people. Proceeds are used to commission unique art pieces for a local park.

Art in the Park presents some unique challenges but also some of the same as BEC did due to its reliance on volunteer labor, Zensen notes. “I stepped away from BEC to expand my public service outside direct connections to the profession and to allow new blood to invigorate that organization,” he explains.

His new volunteer effort surrounds him with artistic people and allows him to contribute to his immediate local community. But, he does not intend to run this program indefinitely, either. “If I am running the program in 10 years, I’ve failed. Organizations of all types need new blood and new ideas. They need to be set up and organized to transition to new leadership, or they are destined to someday not exist.”