2015 Exhibition of School Planning and Architecture

Battle Creek Area Mathematics and Science Center

Category: Renovation

Battle Creek Area Schools Battle Creek, Michigan

Battle Creek Area Math & Science Center

Restoring a Community Icon





Community Icon - Existing

Community Environment

BCAMSC outgrew its aging facility and in 2011 was gifted the former Cereal City USA Museum. Battle Creek Unlimited (BCU), the community's downtown development authority, led efforts to raise \$14 million, and the center sells its curriculum materials to schools worldwide for additional revenue.

The design solution involved salvaging as much of the original structure as possible. Two valuable features that were reused included the riverfront entry plaza and the lobby atrium. The exterior plaza already contained several valuable educational features including a windmill, miniature stream, sun dial and an outdoor classroom.



Before

Exterior Transformation

Community Environment

Additional exterior pathways were also developed to provide safe river access for Biology students to study and sample the river bank ecosystem. Adjacent proximity to Kellogg Corporation headquarters allows food science engineers to cross a pedestrian river bridge to make presentations, meet with students and introduce them to real world lab environments.

An abandoned public street once ran through the site and was addressed before the center's bus loop was constructed. The new Science Unit Distribution Center was fast-tracked eight months ahead of the Learning Center in order to accommodate strict production deadlines. There was also community concern that the Distribution Center would detract from the downtown image. However, careful siting, proper landscaping and a brick façade were used to minimize visual impact.



After

Outreach Program

Learning Environment

A comprehensive outreach program was developed to increase involvement of students, teachers, parents and administrators in surrounding communities in teaching math and science, with a focus on the following:

Professional Development – workshops, in-services, inquiry-based science, literacy integration, technology. Leadership Development – training principals and administrators in STEM education. Collaborating with professional organizations and statewide efforts.

Curriculum – assist area school districts with alignment and implementation.

Student Services – in-class and after school programs, research, special investigations and problem solving.

Community Involvement – work with museums, libraries, nature centers, business, educators and universities to enhance the curriculum.

Resource Clearinghouse – math manipulatives, science kits, reference materials and equipment.



Flexible Study Areas and "Cave Spaces"

Learning Environment - Continued

All classrooms contain high speed WI-FI, LCD projectors, document cameras and laptops. There is an exposed serpentine cable tray that weaves playfully throughout the collaboration space, which serves as a colorful technology reminder as well as providing easy cabling modifications in the future. The building's Main Distribution Feed (MDF) room has a canted glass display case that provides students a direct view into the building's "brain center".

Common area furnishings are equipped with oversize monitors and wireless connectivity to supplement the projectbased break-out areas. An energy dashboard provides real time energy consumption.



Exterior Features

Physical Environment (64,000 SF)

The design team was charged with transforming the existing agrarian aesthetic of a three-story museum into a cutting-edge learning facility. The concept involved removing the six "barn" roof forms to provide a new third floor and creating a cantilevered second floor supported by a sloping "V" column at the main entry. Elliptical holes were cut through existing floor structure to visually connect the three-story student collaboration spaces. An existing mechanical shaft became a glass display case for the students to better understand the building infrastructure. The silo-styled elevator was reimagined as a painted art exhibit as a nod to the building's history.

The new third floor is enclosed in highly insulated metal panels. The cantilevered second floor addition maximizes daylighting through an energy efficient curtain wall system with light shelves. Interior glass walls allow daylighting to penetrate the space; creating a collaborative atmosphere. Recycled content was utilized wherever possible including steel, concrete, acoustic ceilings, countertops, and furniture. Lighting design maximizes use of LED and occupancy sensors to reduce energy consumption. The building management system is designed to decrease air flow to unoccupied spaces. Low-flow plumbing fixtures and bottle-filling stations reduce waste.



Exterior Features – Solstice Pole

Physical Environment - Continued

A major goal was to create an environment that would stimulate student and visitor interest in STEM education. Other prominent features include a second story cantilevered greenhouse, a physics "perch drop", cable supported stairs, a building sustainability monitor, solar car project and a glassed-in technology hub display.

Organic form is set in motion by a three-story pendulum inside the central stair. The pendulum is hung from a structural steel cone severed by a glass guardrail allowing students to see the inner workings. The pendulum weight continuously draws patterns in a black sand bed at the base of the lobby stair.

There was a conscious effort to utilize the circulation spaces as functional education spaces. The use of flexible furniture arrangements and multiple types of seating arrangements in the common areas, allows project-based learning, group interactions and time for reflection throughout the school day.

The initial \$19 million budget progressed through several value engineering phases to match the final \$14 million donation.



Community Focus

Planning Process

Planners, architects and laboratory consultants led stakeholders through charrettes, meetings and tours of nationally-recognized facilities to establish a common language and gain an understanding of goals. The Educational Specification and laboratory layouts were developed uniquely for this project.

A very thorough planning process invited and encouraged participation. The planning and design team led students, teachers, thirteen area superintendents and community members through dozens of activities: presentations, meetings, tours, questionnaires, facility assessments and a press conference. Carl Dehn, President of Battle Creek Unlimited stated, "This was truly a community–focused process from the very beginning. There were several meetings with local business, school superintendents and community forums to solicit input. A major goal was to create a positive dialogue in the extended community regarding this exciting project and we definitely achieved that result."



Floor Plans



Floor Plans



Floor Plans



Exhibition of School Planning and Architecture Project Data

Submitting Firm:	Tower Pinkster
Project Role	Planning, Architecture, Engineering
Project Contact	Matt Slagle, AIA
Title	Senior Design Architect
Address	4 East Fulton, Suite 200
City, State or Province, Country	Grand Rapids, Michigan 49503
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Joint Partner Firm:	KBD Planning	Inside Out Architecture
Project Role	Education Planner	Science Lab Planning
Project Contact	Bill Day	James Biehle
Title	Educational Spec Writer	Science Lab Consultant
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Other Firm:	Teton Design	CommTech Design
Project Role	Structural Engineering	Technology Consultant
Project Contact	Bert Sherman	Bret Emerson
Title	Structural Engineer	President and CEO
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City, State or Province, Country	Grand Rapids, MI 49506	Rockford, MI 49301
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Construction Firm:	Schweitzer Construction
Project Role	Construction Management
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Address	9807 Bellevue Road
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Exhibition of School Planning and Architecture Project Data

Project Name	Battle Creek Area Math and Science Center	
City	Battle Creek	
State	Michigan	
District Name	Battle Creek Public Schools	
Supt/President	Linda Hicks, Superintendent	
Occupancy Date	Sept 2013	
Grades Housed	8-12	
Capacity(Students)	354	
Site Size (acres)	6.9	
Gross Area (sq. ft.)	63,879	
Per Occupant(pupil)	107	
gross/net please indicate	net	
Design and Build?		
If yes, Total Cost:		
Includes:		
lf no,		
Site Development:	\$657,469	
Building Construction:	\$9,323,012	
Fixed Equipment:	\$401,567	
Other:	\$1,051,581 - Technology	
Total:	\$12,536,971 Includes all above plus fees, services, taxes, admin costs, etc.	





Before

"This project was the cornerstone to the revitalization efforts which have breathed new life into downtown Battle Creek."

> - Carl Dehn President of Battle Creek Unlimited



After

"Inspiration through Innovation is realized in the accomplishments of our community of students and teachers... the instructional and common spaces are designed to teach, inspire and innovate!"

- Luke Perry, Director of STEM Battle Creek Area Mathematics and Science Center









Science classrooms feature ample daylighting and flexible furniture (above).

Tiered computer labs support lecture-style teaching and use of technology (left).



"INNOVATION THROUGH INSPIRATION"

In the third floor atrium, a cantilevered physics perch becomes a place to safely drop objects and measure the results. Physics labs also provide a flexible dark room for optics study and an inflatable planetarium.



