



Planning and Designing an Urban High School:

The New Lewis Cass Technical High School

By Jake Buehler

Opened in 1917, Lewis Cass Technical High School has educated some of Detroit's brightest students for almost ninety years. In 2001, however, Detroit Public Schools decided to replace this venerable institution with a new, state-of-the-art school. This article describes the planning and design process implemented by TMP Associates and Tucker, Young, Jackson, Tull (TMP/TYJT A Joint Venture) for the new Lewis Cass Technical High School. Particular attention is given to the design challenges presented by small urban sites.

When architects develop a site plan for a new school located in a rural setting, they often have the freedom to experiment with new ideas. Large parcels of land provide designers with ample space to create different site plan options that they can present to school district officials and community members. Unfortunately, these options are limited in urban settings. Here, architects are faced with the challenges of working around existing buildings, small building sites, and stringent city code requirements. Moreover, urban schools require architects to think "outside the box" in terms of traditional designs because they must address issues such as diversity, illumination, and context. These roadblocks can be challenging, but they can also help stimulate great designs and groundbreaking architectural ideas.

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Figure 1. Lewis Cass Technical High School, Detroit, MI (circa 1910)

The new Lewis Cass Technical High School in Detroit is an excellent example of a successful urban design. The school replaces the original Lewis Cass Technical High School that was built in 1917. Located in Cass Park in the heart of Detroit, the school is surrounded by some of the most historic buildings in Detroit including the Masonic Temple and the Kresge Building. The new Cass Tech is the largest building constructed using funds from the \$1.5 billion bond issue approved by Detroit voters in 1994.

The original Cass Tech is considered an icon in Detroit. Many of Detroit's brightest students for the past ninety years have been educated at Cass Tech and it holds a special place in the hearts of alumni and citizens. Students are required to take a comprehensive entrance exam before they are allowed admission into the school. Additionally, students are required to choose a career pathway similar to a college major. The career pathway offerings are all college preparatory programs. Students can study subjects in business management, arts and communications, engineering and manufacturing, health sciences, human services and natural resources, and agriscience.

Unfortunately, the old facility lacks the basic amenities that are standard in today's modern learning environments. The classrooms are too small, the existing media center is the size of an elementary school library, and the gymnasium has only 400 spectator seats. The science facilities are outdated and spaces for enhanced courses are very understated and inadequate to meet the needs of the vigorous career pathway curriculum.

Since Cass Tech alumni have a very strong bond with the school, Detroit Public Schools (DPS) initially investigated whether it was feasible to renovate the existing facility. The school district commissioned the architectural and engineering team of TMP Associates and Tucker, Young, Jackson, Tull (hereafter referred to as TMP/TYJT A Joint Venture) to conduct a thorough facility assessment of the original building. TMP/TYJT A Joint Venture examined the interior and exterior spaces to determine the steps

required to successfully renovate the school and convert it to a facility that reinforces the curriculum delivery. Additionally, the assessment team examined the mechanical and electrical systems and the structural integrity of the existing building.

According to John Castellana, FAIA, REFP, project design director and president of TMP Associates, the facility assessment revealed that the existing structure could not be efficiently adapted to meet the needs of the curriculum. "Several guiding principles were articulated by the school district as overall facility goals for the Detroit community. These were to improve student achievement, create a safe school environment, enhance community involvement, and transform the district into an efficient and effective organization. Using these goals as program requirements, the analysis examined all aspects of the original building to see what was needed to create appropriate spaces and an image to achieve success," said Castellana. The study concluded that building a new Cass Tech facility was the only viable solution to meet the district's goals and that a new school would:

- Provide flexible, appropriately sized learning environments to reinforce collaboration and stimulate student achievement
- Provide a safe and secure environment without compromise
- Welcome the community to share in its wonderful resources and create a catalyst for partnering opportunities
- Result in lower construction costs than remodeling and save annual operational costs



Figure 2. Artists rendering of the new Lewis Cass Technical High School

The results of the facility assessment were presented to the school district and the decision was made to design a new facility to replace the venerable school. Detroit Public Schools (DPS) has since established an exploratory committee that includes Cass Tech alumni members to research possible adaptive reuse projects for the older facility, which will remain standing after the new school opens.

Vision Planning

The designers understood the school's legacy and did not overlook its importance in the community. In order to replace an icon like

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Cass Tech, they knew that they had to capture the imagination of several user groups. In early 2001, TMP/TYJT A Joint Venture held a series of vision planning sessions with community members, alumni groups, teachers, staff, administrators, and students. The sessions were designed to gather ideas about what the various groups wanted in a new high school. Individuals were encouraged to express their feelings and ideas about topics such as heritage and image, community outreach, enhanced curriculum, enhancements for students and staff, school safety, classroom amenities, technology interface, performing arts components, and athletic spaces.



Figure 3. Architectural model of the new Lewis Cass Technical High School

At these sessions, Castellana emphasized the importance of vision planning, describing it "as an opportunity to interact with a diverse group of individuals to brainstorm global ideas and concepts. The result is a tool to set 'big picture' ideas related to the new school. As architectural development proceeds, all concepts can be measured against this tool to see if the macro ideas have been solved."

The vision planning sessions helped designers define the image of the new school and create schematic design concepts. "Urban Schools represent unique challenges and opportunities. Design concepts have to recognize the existing urban fabric of our cities and complement its context. Issues of light and air, access and land use need to be studied to achieve success," added Castellana. The designer's first priority was to determine how to fit the new school on an eighteen-acre site that was surrounded by buildings, parks, and a nearby highway system. The school site was also adjacent to the old school, which occupied nine of the eighteen acres. The designers employed a vertical stacking technique to maximize space and to preserve much needed acreage for parking and athletic fields. Nonetheless, the surrounding areas did not provide an abundance of space for construction crews to work.

Since Cass Park includes several historic buildings, the design team wanted to create a building that would comfortably fit into the area, have a distinct Detroit flavor, and make a statement that a new era had arrived for the Detroit community. Taking clues from Detroit's industrial and manufacturing heritage, the design team used a skeletal frame upon which pre-manufactured brick/concrete panels were attached. To complement this, large expanses of glass and light metal structures were installed. These

touches give the school a modern look, but pay respect to Detroit's industrial history. Additionally, the glass is tinted and shaded to reduce solar heat gain and decrease the demands placed on the mechanical systems.

Design Elements

The new Cass Technical High School was designed in an honest manner that is both classical and forward thinking to inspire its students and provide a stimulus for the community at large. The design not only preserves the school's proud traditions but also sets a new standard of excellence for 21st century urban high schools. Its appearance derives from a combination of the school's unique program needs, the desire to convey an image suitable for a school with a proud history of technical excellence, and the need to relate to neighboring buildings such as the Masonic Temple, the Fisher Building, and the nearby downtown skyline.

At street level, the classroom tower block is elevated to "lighten" the feel of the building while providing students with much-needed sheltered waiting areas. The base of the building is composed of glazed brick, stainless steel, and laminated glass in the lobbies and stair towers. The exterior walls consist of pre-cast concrete panels with embedded brick, tinted and fritted glass, aluminum composite panels and horizontal metal siding and louvers – all used within a five-foot planning and construction module. At the top of the building, curved metal roof panels hover above tinted glass and aluminum solar shades to further express a sense of lightness in materials and massing.

Many of the building's key spaces are articulated in its exterior form including the gymnasium, theater, indoor running track, dance studio, third level dining terrace, and the two-and-a-half story high, glass-shrouded media center. All of these spaces are easily recognizable from the exterior with many offering spectacular views of the surrounding neighborhoods.



Figure 4. Building site

Specific components of the school include labs that are designed to imitate real world working environments and cater to a

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Figure 5. Aerial view of building site

student's individual career pathway selection. The lab designs are flexible to accommodate future curriculum requirements. There are also "collaboration stations" where teachers and students can meet to share ideas. These stations are designed to promote interaction and encourage team teaching. The glass enclosed media center, located on the sixth floor, allows patrons to observe the surrounding neighborhood. The commons and dining space is located on the third level and include an outside terrace with views overlooking downtown Detroit.

Other major elements include: a 2,200-seat competition arena, a competition pool with 400 spectator seats, a 1,100-seat performing arts theater, an experimental theater, a dance recital studio, a football stadium, and a women's varsity softball field.

Construction

In November 2001, Detroit Public Schools approved the final design of the six story, 402,482 square foot facility. To meet a January 2005 occupancy date, the project was put on a fast track schedule to allow construction to begin before the completion of the final architectural and engineering designs. The foundations and structural steel frame were the first elements to be designed and bid.

"To meet this aggressive schedule, tremendous collaboration and trust had to be instilled on all team members: the owner, program

manager, construction manager and the architect/engineer. Continual on site communication is essential to minimize changes and allow construction to flow in a logical sequence. Accelerated schedules are not uncommon in school projects. Having team members that are accustomed to this is essential if a project will be successful. Of course, with accelerated schedules come changes due to the fact that the design is still being finalized while



Figure 6. New gymnasium under construction

construction is proceeding. Having a strong concept and repetitive structural grid allowed the Cass Tech project to proceed and limit the obstacles that had to be addressed," Castellana explained.

Construction started on the project in the spring of 2002 with the demolition of the existing Edison Building on the project site. Shortly thereafter, the structural steel frame was bid and erected. Construction is progressing rapidly and the school is slated to be completed in January 2005. With a capacity for 2,200 students, occupancy of the facility will be phased in as different areas of the school are completed.

The new Lewis Cass Technical High School will be the new icon for the Detroit Public Schools. Its past reputation as the "flagship" in the Detroit fleet will certainly be protected and enhanced as students enjoy and take ownership of the new school. The legacy lives on!

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