

# MILBY HIGH SCHOOL

## RENOVATION & EXPANSION

Houston ISD — Case Study







# HISTORIC RENOVATION MEETS 21ST CENTURY LEARNING

## EXECUTIVE SUMMARY

### School Profile

Shadowed by the smokestacks of Houston’s Ship Channel in one of the city’s most densely populated neighborhoods, Milby High School represents a place of pride for the community. Its iconic 1926 facade serves as a landmark and reminder of a common thread tying together generations. Today, Milby serves many students who face challenges: its enrollment is majority hispanic with 85% economically disadvantaged.

The key design directives for the construction of the new Milby campus were to **honor the tradition and legacy** of the 1926 school, and to facilitate the school’s mission to **serve every student** — college-bound or trade-bound — to forge a path for future, prosperous careers. Milby is more than a school. It’s an anchor within its community and the path to a better future, for this East side community.

### Goals and Outcomes

One of the primary directives for the new campus was to help both those students preparing for college, and

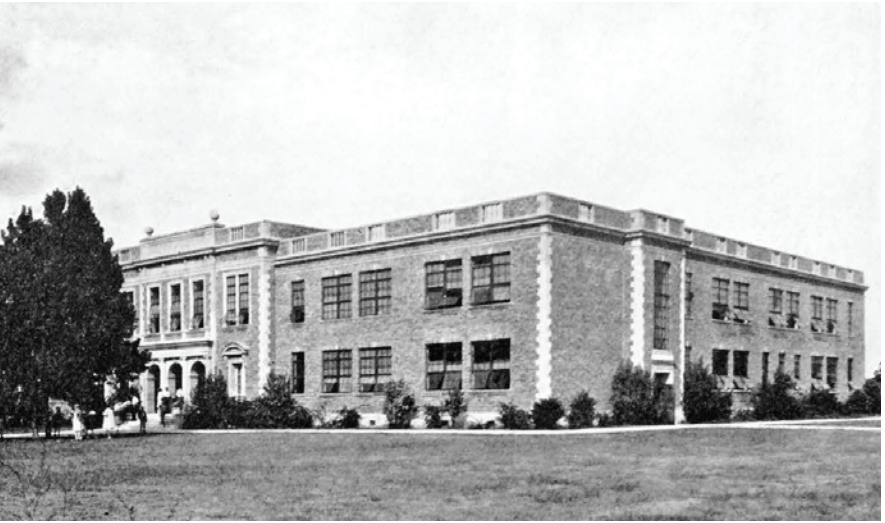
those on a more direct path toward technical careers. Milby is unique in seeking to merge its Career Technical Education (CTE) spaces with the school itself, rather than bus students to a separate campus. This strategy allows “linked learning” a key concept for the Milby administrators and encourages cross-collaboration between programs and community uses. In fact, many of the CTE spaces are used by the community, including a daycare and clinic.

Another primary goal of the project was to preserve more than 90 years worth of history, while also incorporating 21st century learning. This challenge was explored in an extensive consensus-based design process with a Project Advisory Team made up of community stakeholders

With 21st century learning concepts, learning no longer happens in a box, and the design for Milby reflects that. Glass walls are featured throughout the school for increased visibility, safety and collaboration. This strategy facilitates Milby’s goal of “linked learning” —

allowing students to make the connections across their curriculum and fosters a sense of community across the campus. The design team held numerous town hall meetings and visioning sessions, where all members of the community voiced their concerns and aspirations. Almost everyone who participated wanted to preserve parts of the historic Milby, but also recognized that the future of the school relied on its ability to adapt and change for the next generation.

In the final design, the 1926 “heart” of the school was preserved and restored, while new construction, consisting of north and south academic “wings,” wrapped around it. The connection between the old and new was preserved by use of materials, historic details, and supergraphics featuring historic drawings and articles. The project team overcame many hurdles — including an exceptionally tight budget, renovation-related surprises, and turnovers in management — in order to create an inspirational new campus that allows the tradition, spirit, and legacy of Milby to carry on.



Milby High School, 1926





# SCOPE OF WORK

## OWNER/CLIENT

Houston ISD  
Houston, TX  
713/556-6300

## KEY STATS

Grades Served: 9-12  
Capacity of Students/Occupants: 2,000  
Size of Site: 19 acres  
Gross Area of Bldg./Space: 280,000 gsf  
Space per Student: 140 sq. ft.  
\*Initial Budget: \$143/sf  
\*Square Foot Cost: \$217  
Final Construction Cost: \$58.2 million

Completion Date: August 2017  
Sustainability Rating Status: LEED Silver

## PHOTOGRAPHY:

Slyworks Photography  
Ruben Serrano

\*The project design was constrained by its initial construction budget, of \$143/sq. ft. which included 280,000 square feet of demolition of existing structures. During construction, the district bond budgets were increased due to manage the escalation of cost of construction in the city. Additional funds were applied to the project resulting in the final construction cost.



# THE EVOLUTION OF A COMMUNITY

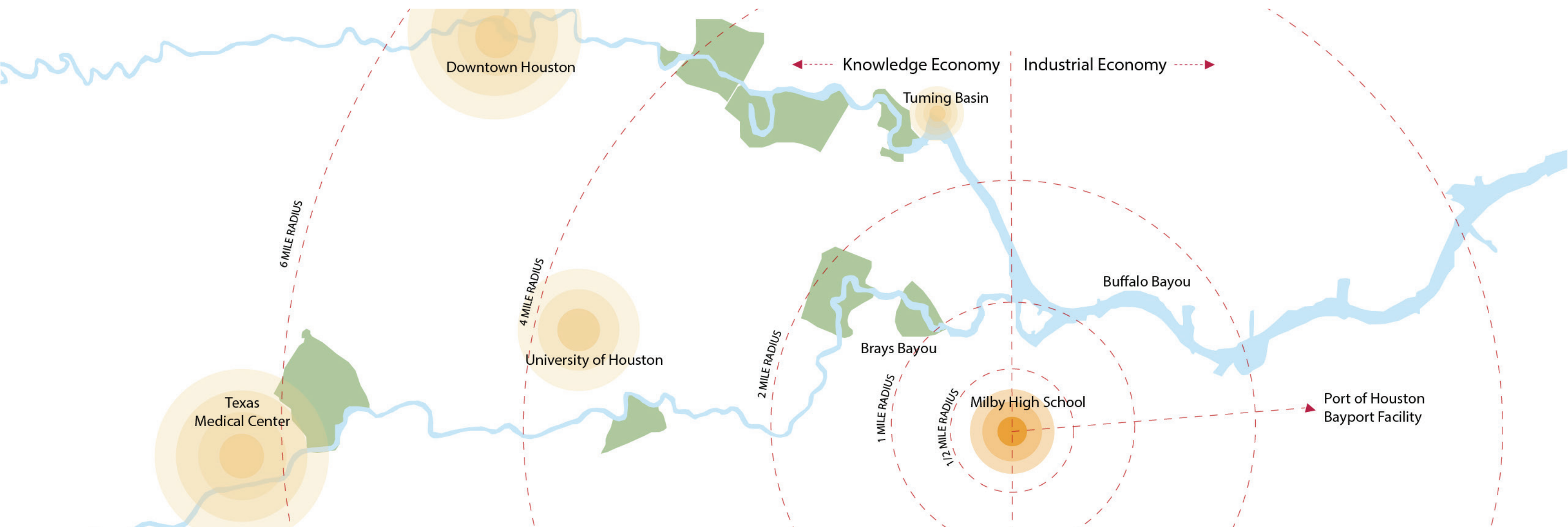
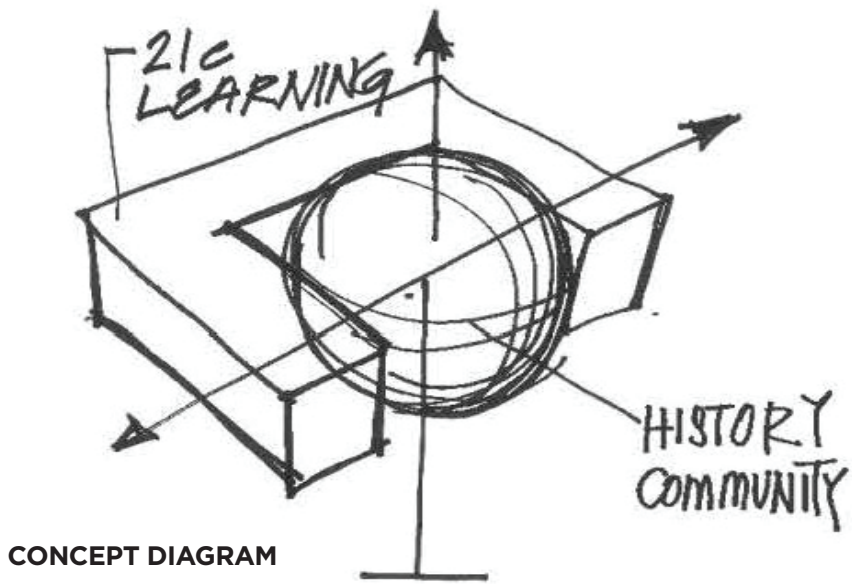


Diagram based on illustration created for Collaborative Community Design Initiative by CDRC at the University of Houston, Susan Rogers Director

The map above illustrates how Milby's location makes it a true educational incubator for the professions of the future and the evolving global economy. With the Houston Ship channel to the north and its adjacent petro-chemical industries to the west, The Texas medical center, CBD, and Academic centers to the east, the school sits squarely within and seeks to take full advantage of the growing industrial and knowledge economies of Houston.

Milby's physical location is its inspiration for the type of highschool it needs to be to be relevant and progressive for its community. The concept diagram(right) illustrates that a proud tradition and history is preserved in the core of the school while the hope and awareness of the future is illustrated by the community's readiness to embrace 21st century learning and the new opportunities it affords.





# WORKING WITH THE COMMUNITY

“RELEVANT - COLLABORATIVE - COMMUNITY - SAFE --  
LEARNING - HISTORY”

The Milby Community was asked to articulate the vision and values for their new campus. These ideals became the drivers around which the design of the school evolved.

TRADITION - SPIRIT - SUSTAINABILITY - TECHNOLOGY

Through a series of town halls and community workshops, the team found community consensus on the direction of Milby’s future. Each meeting yielded strong opinions and desires so the team worked diligently to ensure the needs of the neighborhood , the school and the district were met.

Innovative games and exercises encouraged the PAT to think outside the box and imagine a school of the future. Through play the group learned to work and listen to each other and do the hard work of compromise but creating a shared vision.

Making sure as a design team that these ideas were documented and shared, was part of the success of these early community engagement sessions meant a more streamlined design process and better outcome. These graphic memories of the ideas shared and the decision reached, and the story told, kept all parties accountable throughout the process.





more than a school

## A RESOURCE FOR THE COMMUNITY



SCHOOL & COMMUNITY ENGAGEMENT

- ♦ Hair & Beauty Salon
- ♦ Print Shop
- ♦ Cafe
- ♦ Daycare
- ♦ Health Clinic

As a comprehensive high school, Milby includes traditional spaces to support 2000 students, but also has 44 learning centers, 12 science labs, athletic facilities with two gyms, visual and performing arts spaces with a 500 seat auditorium, a black box, dance theatre, and band/orchestra halls. As a Career and Technology High School it also includes 8 CTE programs and their accompanying lab spaces.

The CTE programs are designed to interface with and be a resource for both the school and local community. The layout intentionally engages the community in a way that the old school was unable to do. With the CTE spaces on the ground floor with access to outdoor learning courtyards and with access for pick up, drop off and delivery. The CTE lab spaces work as storefronts allowing the community to take advantage of various programs such as a daycare, clinic, print shop, salon and cafe.

These programs provide services that are delivered by the Milby students as well as in conjunction with providers and partners in the business community.

The CTE programs are more than just a vision of students gaining skills in these different professions, but encouraging them to aspire to own and run their own businesses.



SCHOOL & COMMUNITY ENGAGEMENT

Challenges

The school has a diverse group of stakeholders who were highly engaged in the project from the first meeting through the end of construction. Stakeholders included very active alumni from all eras — those who attended the school in the 60s and 70s when the neighborhood was predominantly white, and more recent alumni who are largely Hispanic. Both groups are rooted in this working class neighborhood. For many Milby was the culmination of their educational experience, and multiple family generations share their high school memories. Other stakeholders were current teachers, students, parents and local neighbors.

For all the stakeholders, Milby is more than just a school. It represented their livelihood, their children’s future, and a path to a better career. Over the years, the teachers and students had felt ignored and left behind other schools in the district. As the student demographic shifted to majority-minority in the 70s, many felt the city had focused its resources elsewhere. They needed to be reassured that the new campus would change all of that.

Gaining Consensus

Largely because of the very active consensus-based process, the new Milby campus fulfilled its goals — naturally serving every “student” of Houston’s under-served community — a high schooler, a community member, or a teacher. Gaining a fresh start with a full-scale renovation was seen as a bright spot within the community.

EDUCATIONAL ENVIRONMENT

The visions and goals of the school were established early in the design process. There was a clear desire to focus on flexibility, adaptability, and technology, but with a purpose. Every space was carefully considered and functions evaluated. Milby’s interpretation of 21st century education came to mean encouraging students to direct their own learning process, and to be inspired through making, seeing, and observing. “From concept to application” became a recurring theme for the many CTE areas and trades the school incorporates.

The school’s environment supports the curriculum using inter-connected CTE spaces that allow for more observation, communication, and collaboration. For instance, the health occupation CTE area is connected to both the daycare and the clinic, reinforcing real-world experiences and hands-on training. The cosmetology CTE area is connected to the fine arts area and theater, ready to be utilized for school performances and plays. This connectivity increases student interactions and understanding of other “worlds” — piquing their interest in an organic way.

A variety of learning and teaching spaces can be found throughout the distinct “neighborhoods” that house the academic spaces as well as the CTEs. Through flexible furniture, writable surfaces, connection to the outdoors and extended learning areas, teachers and staff are able to offer a variety of teaching styles that best suit their needs.

The team also put much thought into adaptable and flexible spaces. Milby’s library is frequently reconfigured for all kinds of uses: as a meeting space, an event space, or a classroom. The design team offered different furniture plan configurations for many rooms, and particularly for the classrooms and extended learning areas. Students, faculty and staff have already taken advantage of the many options.





## PHYSICAL ENVIRONMENT

Every detail of the physical environment at Milby was carefully considered. Key attributes of the design that reinforce the goals of the school include high transparency and visibility throughout, natural light in nearly all spaces, and the preservation of the 1926 historic building.

One of the first features that visitors notice is that nearly every room includes generous windows to the corridor. This increases safety by allowing administrators to keep an eye on classrooms. It also allows students to keep an eye on each other — and let administrators know if they see someone destroying property or being bullied, for example. Everyone at Milby has a stake in maintaining a safe and positive environment.

Another impact of the transparency, both to the exterior and into the corridors, is that natural light infuses nearly every space: classrooms, offices, pod spaces, and transitional spaces like hallways. Students in schools with natural light have been shown to perform better at all kinds of cognitive tasks, be happier and calmer, be more alert during the day, and sleep more soundly at night.

Color is used to provide inspiration throughout the school. Blue was chosen to be soothing, and orange to be energizing. The colors also assist with space identification and wayfinding. Administrators report that students were quickly able to orient themselves within the new school due to color coordination and intuitive layout.

The co-existence of old and new, and the form that it takes, is the central organizing principle of the new campus. To tie old and new together, the team used repurposed materials and exposed structure.

During the demolition process, it became clear that nearly every type of construction was used, on the Milby campus over the course of nine decades. Renovation after renovation had been performed, but none as extensive as this undertaking. Among the gems uncovered was a “hidden” balcony stair, long ago enclosed and used for storage. The design team transformed it into a social gathering stair, finished with wood re-purposed from the school’s 1930s gym floor. Other surprises included old 1920s newspapers found stuffed within the walls. The design incorporates images from the newsprint into the hallway graphics to tie Milby’s history into the new construction.

## RESULTS OF THE PROCESS & PROJECT

Overall, Milby’s first year has been highly successful, with administrators and teachers saying that the building has opened up new opportunities for their students and programs to thrive. The school opening had more than 3,000+ people in attendance and positive feedback on all fronts. Now, students as well as the community utilize the space in ways they couldn’t before. Even alumni — critical stakeholders at Milby —gave their blessing.

Post-occupancy surveys were administered to students, and staff have been interviewed.

Preliminary results show that administrators and teachers feel:

- ♦ the school is safer and more inviting
- ♦ Milby’s history is well reflected
- ♦ the technology works well and enables them to teach in new ways
- ♦ the furniture works well and is flexible
- ♦ the CTE spaces encourage student achievement
- ♦ favorite spaces are the dining commons and learning commons
- ♦ stakeholder participation in the design process really had an impact on how the school looks and works

Students feel:

- ♦ the school is easy to find their way around
- ♦ they love the natural daylight and colors used
- ♦ they are thermally comfortable and feel the air quality indoors is good





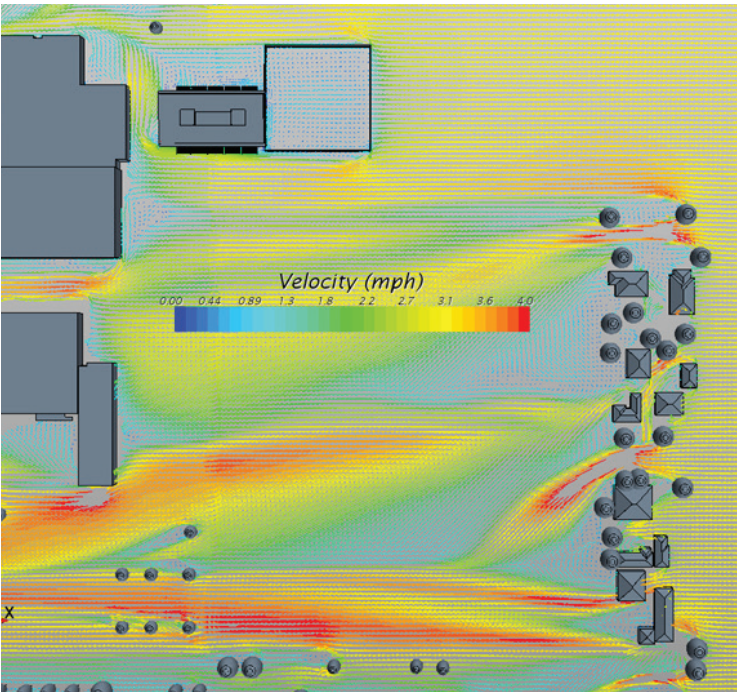
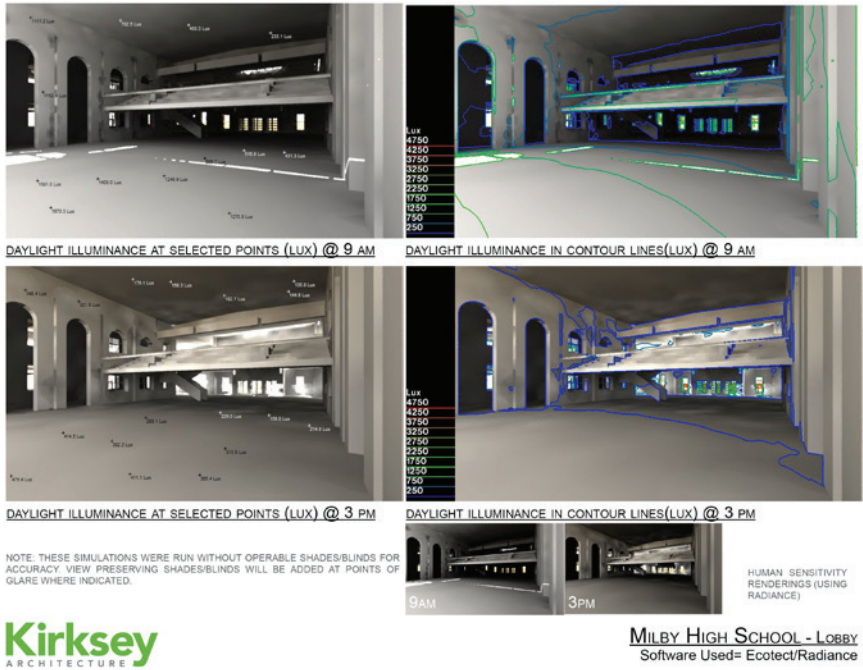
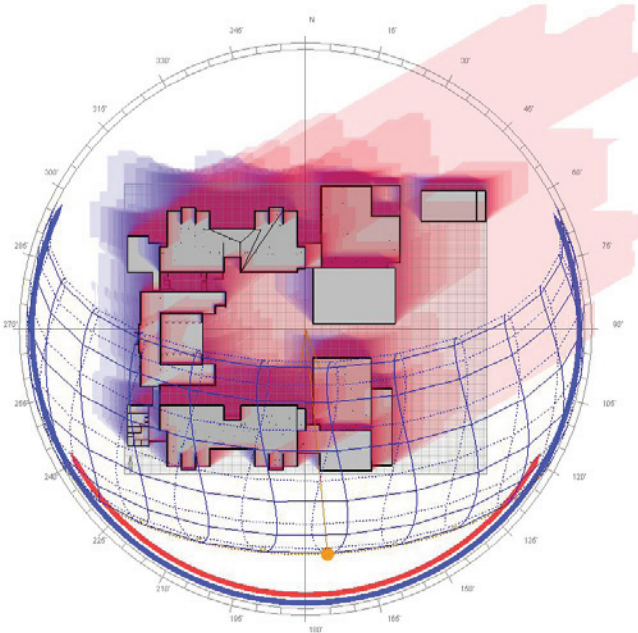
SUSTAINABILITY

The school is certified LEED Gold for its commitment to sustainable building practices. One of the most important sustainable strategies was the historic preservation: the 1926 facade and structure, along with 40,000 square feet of the original school floor area were preserved. This strategy both reduces the environmental impacts of the project by extending the life of the materials used, and serves to illustrate construction methods used to keep people comfortable in the era before air conditioning. The original 11'-0" tall windows, restored to their former glory, were once used to maximize cross-ventilation by increasing the building surface exposed to breezes. The restrictive budget led to minimalist, yet meaningful and sustainable interiors, featuring exposed brick and concrete structure. The exposed bones and veins of the structure also serve a pedagogical function, teaching students about the systems that make the building work.

BUILDING SIMULATIONS

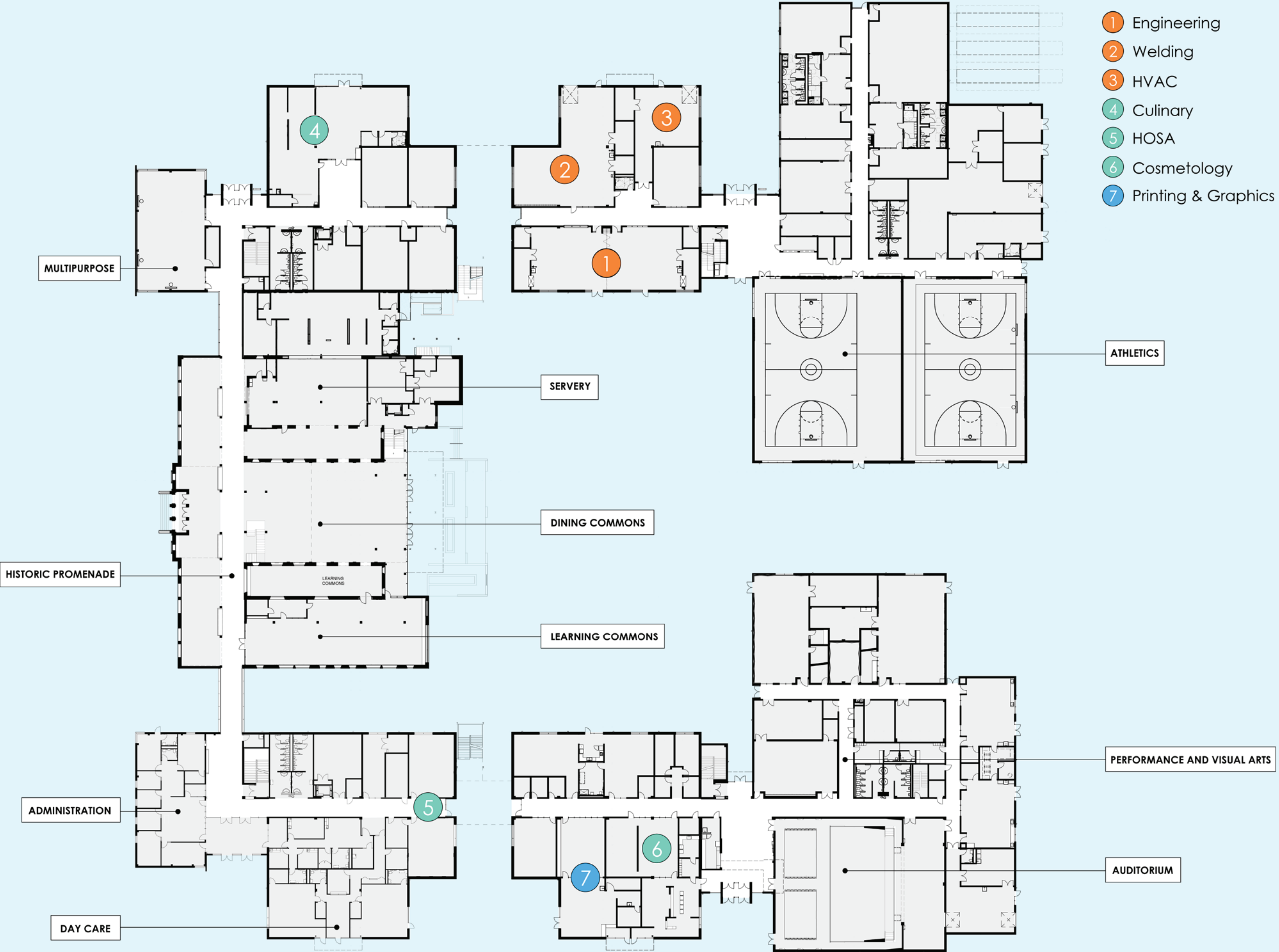
To optimize the functionality and comfort courtyard spaces, the design team undertook simulation studies of solar exposure and ventilation. These informed building massing and placement.

One of the design goals was to provide ample daylight to all occupied building spaces. Most rooms on the completed campus receive daylighting from more than one side. Classrooms and public spaces were studied extensively to ensure a high-quality, low-glare learning environment.

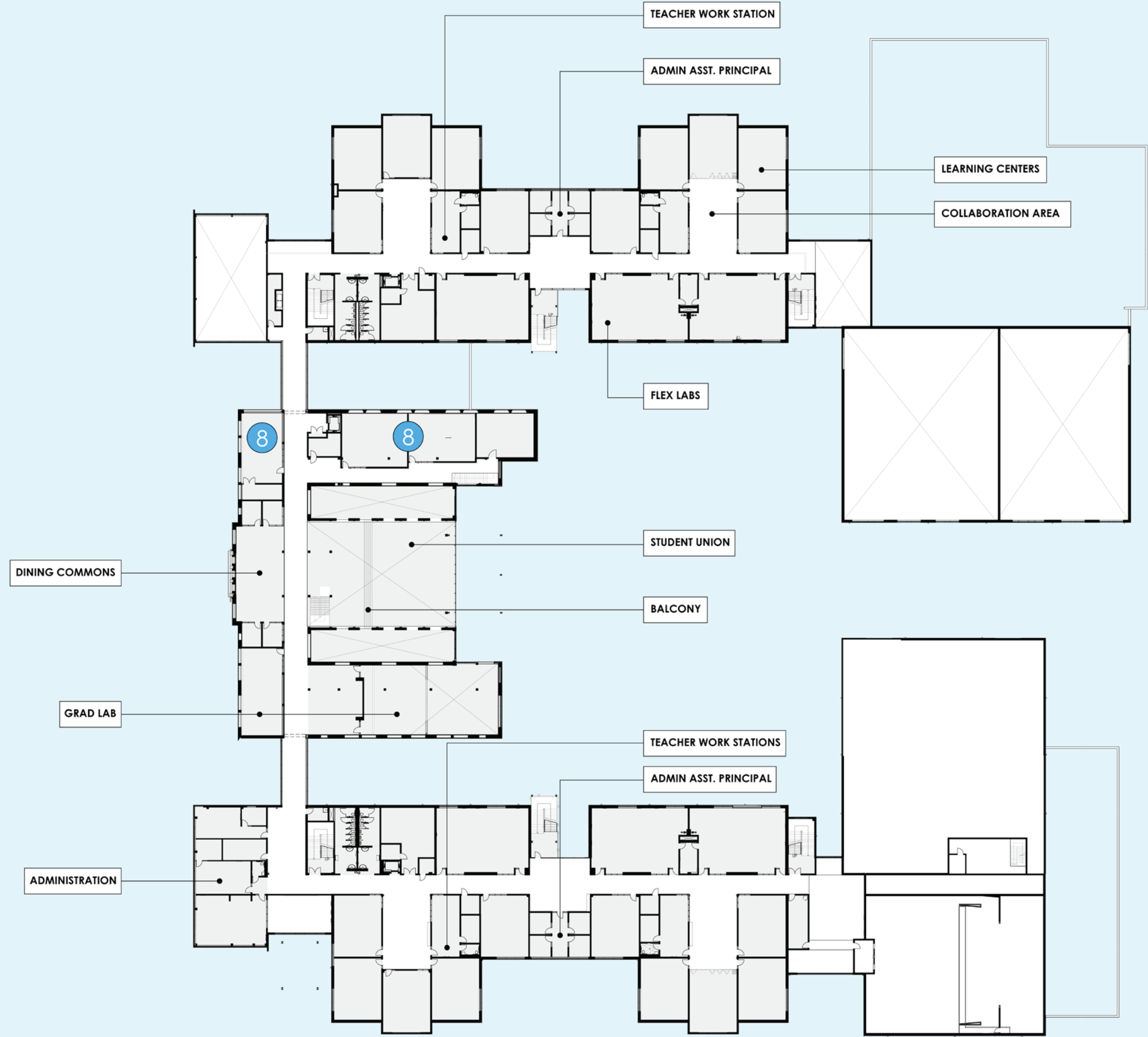




# 1ST FLOOR







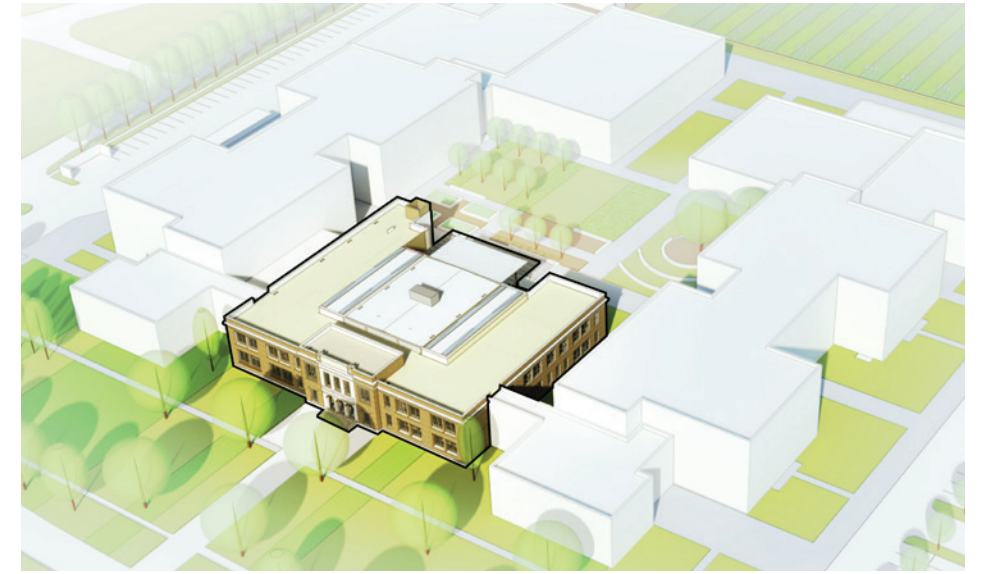
8 Principles Of Information Technology

# 2ND FLOOR

\*3rd Floor is similar



# HISTORIC HEART & STUDENT UNION







The original proscenium with school mural as part of the old library

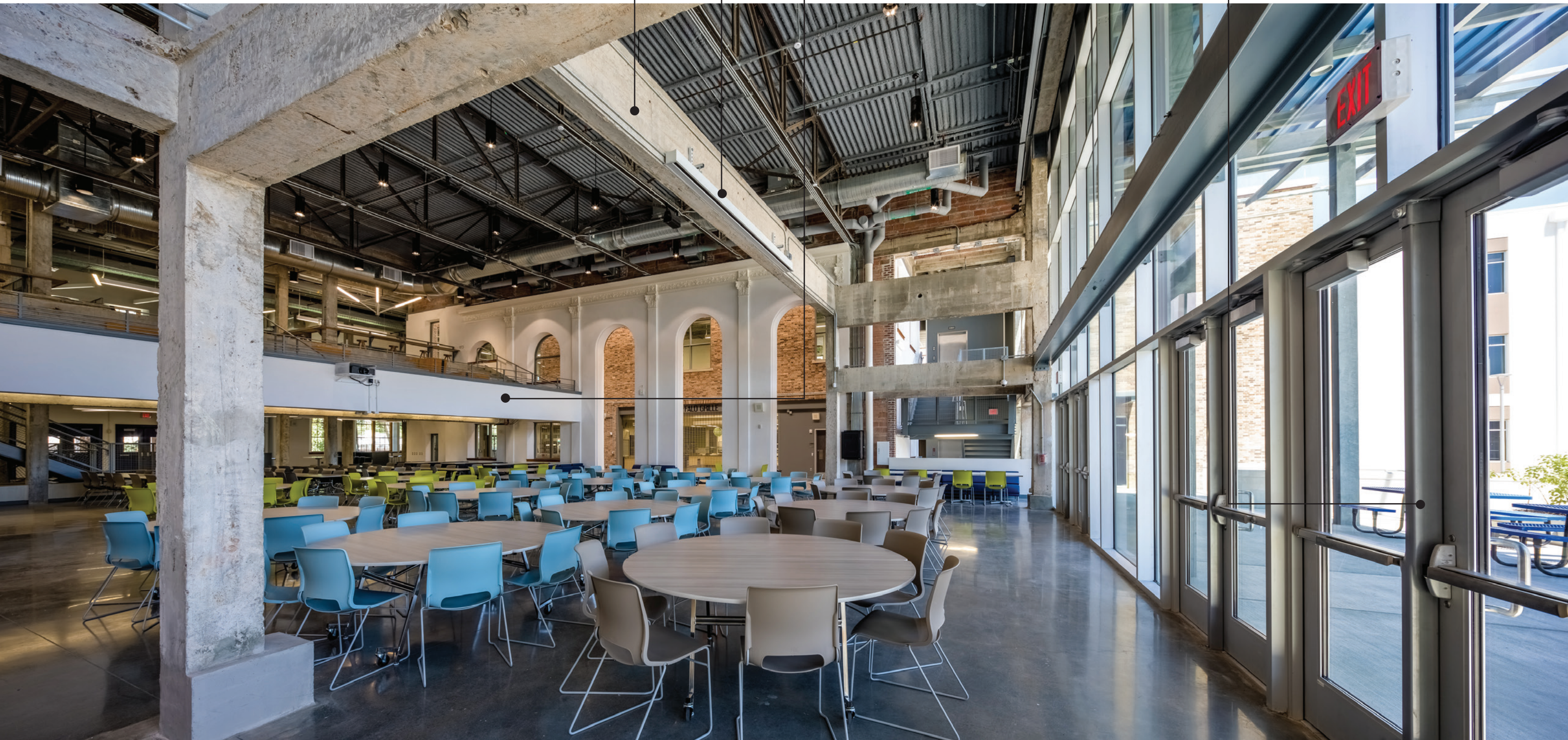
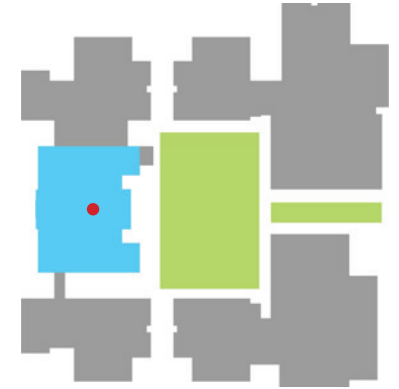
Original proscenium opened up and structure exposed

supports projection screen

hidden balcony was discovered during demolition and re-purposed into social gathering stair

## STUDENT UNION & DINING COMMONS

access to outdoor classrooms and gardens

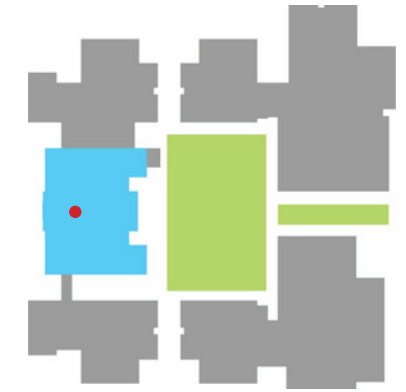




BEFORE



ORIGINAL 1926  
“HEART” OF THE SCHOOL



dining commons

hallway opened up,  
structure exposed

“hidden” balcony stair, revealed  
during demolition. saved and restored



“As we’re walking through the hallway, people look up and say, ‘Oh, that’s kind of industrial,’ and I explain that was intentionally part of the conversation. We wanted everything to be visible so that our engineering students could see it on a day-to-day basis.”

— Roy de la Garza, Milby Principal



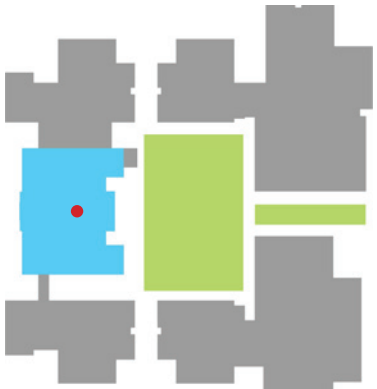
“HIDDEN” BALCONY STAIR

archways open into what was previously an outdoor courtyard. Connection between learning commons and dining commons.

original plaster molding restored

sections of 1930s gym floor repurposed for social gathering stair

each “box” is fully powered for students to easily plug in



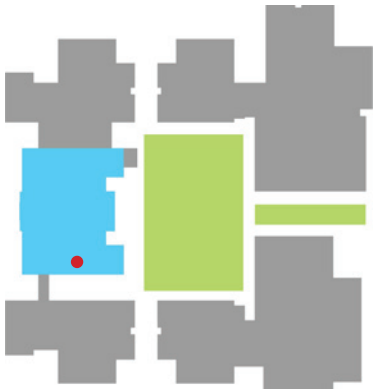




“Kids shouldn’t be inside a room where they can’t see outside.”

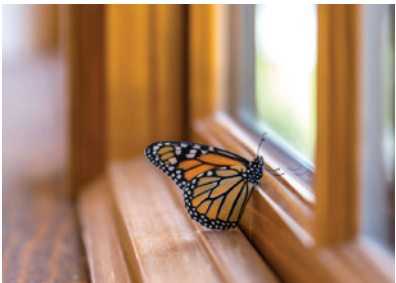
— Rowena Verdin,  
Milby’s Librarian

LIBRARY



new energy-efficient aluminum clad wood windows echo the original 1926 mullion detail

double-height space carved out of original two-story space allowed for more natural daylight and views to the outside



learning commons - is also butterfly hatchery .Butterflies are then transfered to the garden in courtyard just outside window

low mobile shelf heights allowed for more visibility and better line of sight throughout the space, as well as maximized flexibility

original terrazo floors are cpmplemented by playful woodplank texture, that replaces the original wood floors



## ORIGINAL CORRIDOR

original corridor of the 1926 building is opened up, eliminating old metal lockers in place of glass display shelving that showcases past and present school trophies, veteran plaques and memorabilia

original terrazzo floors, in almost excellent condition, refinished to extend the life of the material

transparency allows light and views of nature to penetrate the building and showcase learning at all times

exposed ducts, piping, and wiring allows students to read the infrastructure of the building, transforming the building itself into a teaching tool





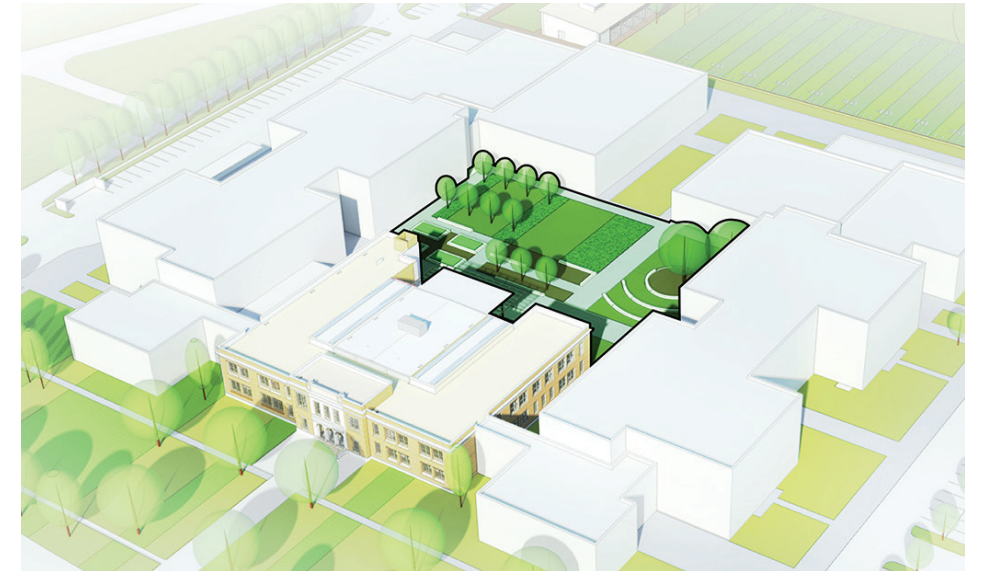
## CONNECTION BETWEEN OLD AND NEW

The glass bridges connect the old and new, allowing the 1920s building to be showcased and stand out on all sides. This strategy allows the 1926 building to stand out like a jewel in a setting of a ring and helps to create outdoor courtyards that enhance the overall transparency of the school.



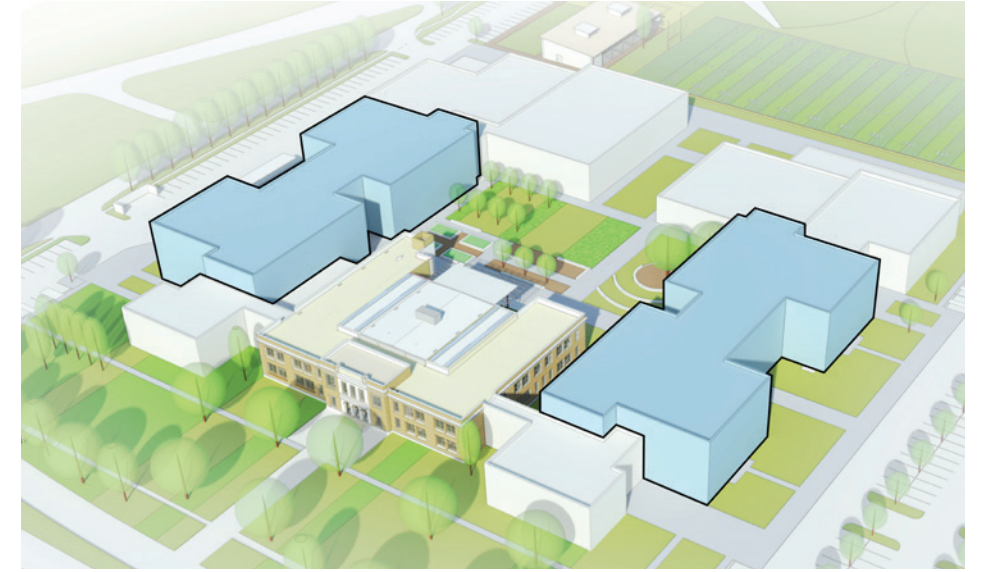


# LEARNING LANDSCAPE





# LEARNING NEIGHBORHOODS



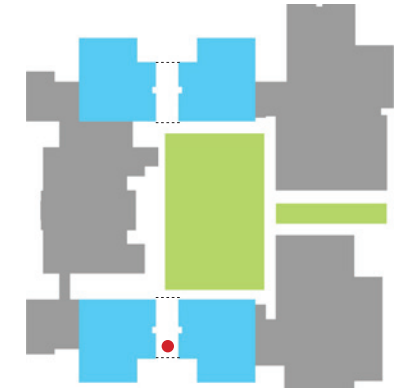


## LEARNING NEIGHBORHOODS

In the new building supergraphics illustrate the unique story of Milby High School and its surrounding community

Color is used for wayfinding, and defines the different vertical neighborhoods

gathering area outside offices brings natural daylight to main corridor

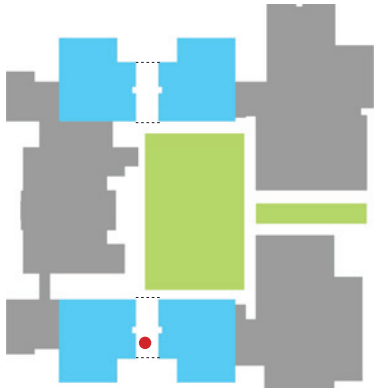




LEARNING NEIGHBORHOODS

Glass Markerboards — inside and outside of classrooms — are some of the more popular elements of the new learning spaces.

co-working teachers office, with visibility to extended learning areas for safety & security



extended learning areas allow for a variety of seating options. Each learning area has a different assortment and arrangement to emphasize unique configurations





original construction drawings and print ads from the 1920s were found stuffed within the walls during demolition. Repurposed as “supergraphics,” the art is used for wayfinding and ties in the school’s history in a creative use of materials.

soft seating and varied furniture inspires creativity and brings playfulness into the waiting areas that also become learning spaces

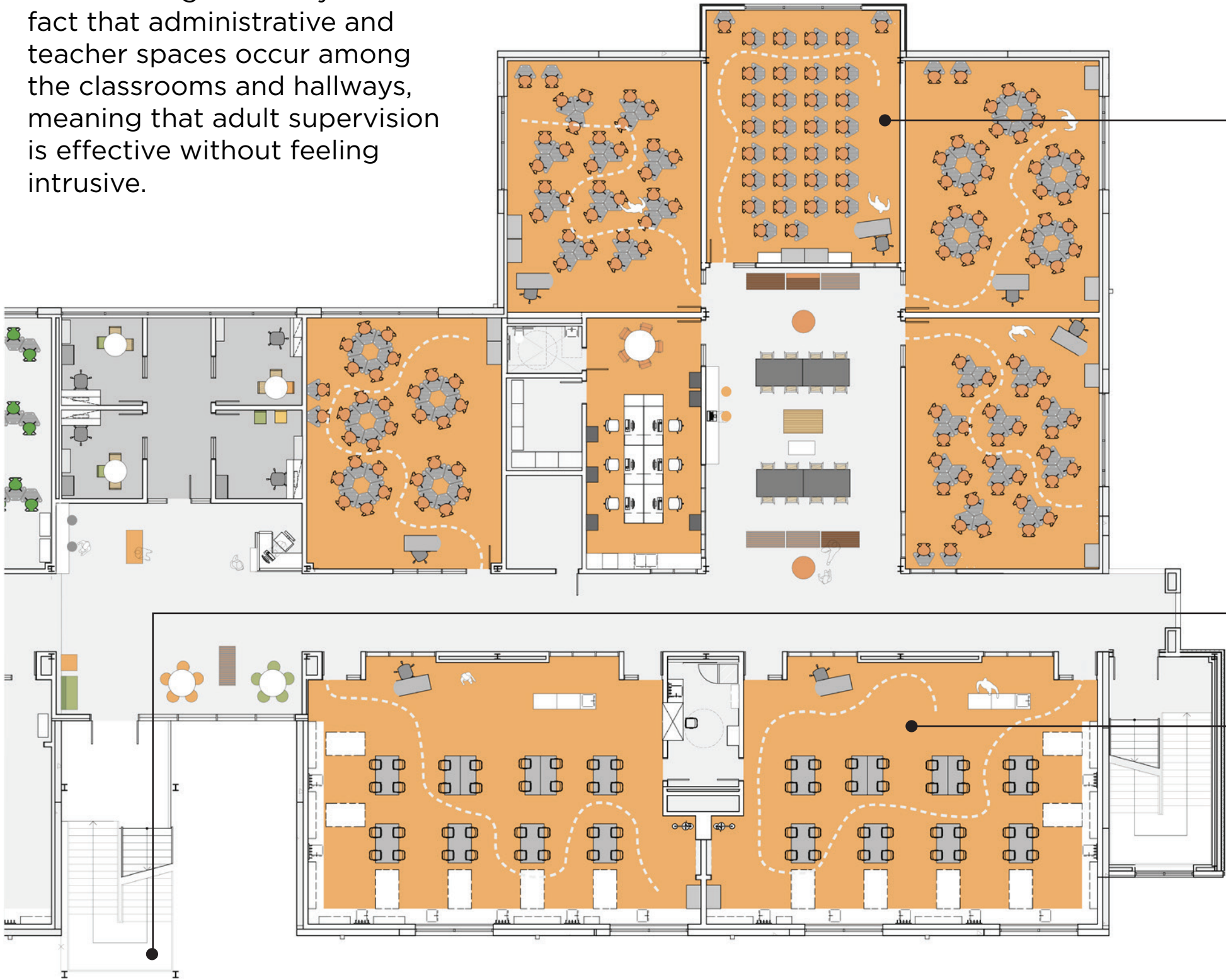
transparency allows for daylight to penetrate the space, creating a sense of openness and connectedness



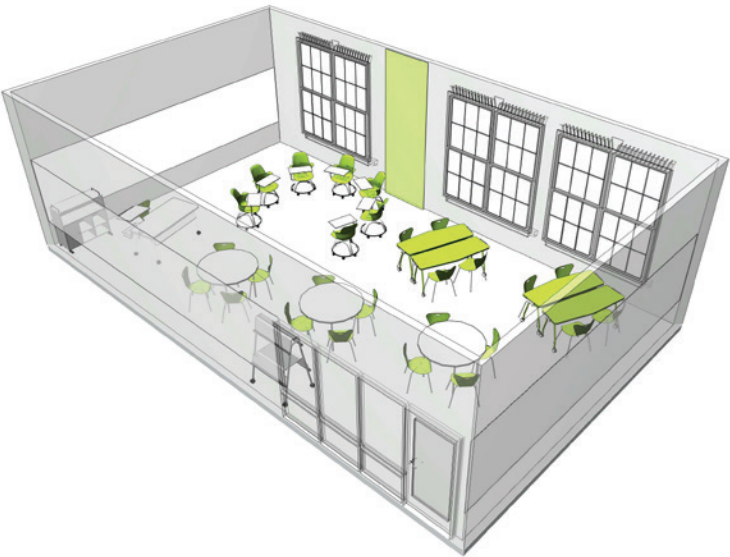


FURNITURE WAS NOT AN AFTERTHOUGHT

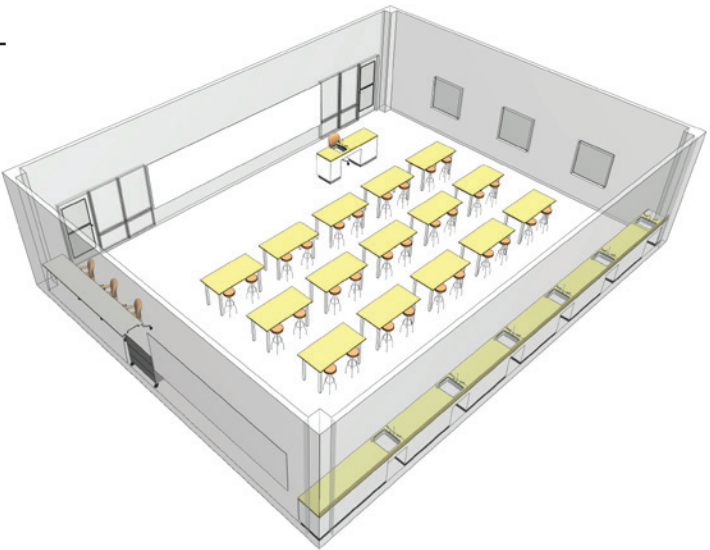
The learning neighborhoods scale safely, and security is aided through visibility and the fact that administrative and teacher spaces occur among the classrooms and hallways, meaning that adult supervision is effective without feeling intrusive.



classroom layouts showcase a variety of solutions, while the extended learning areas offer independent or small group work, but still equipped with enough seating for an entire class

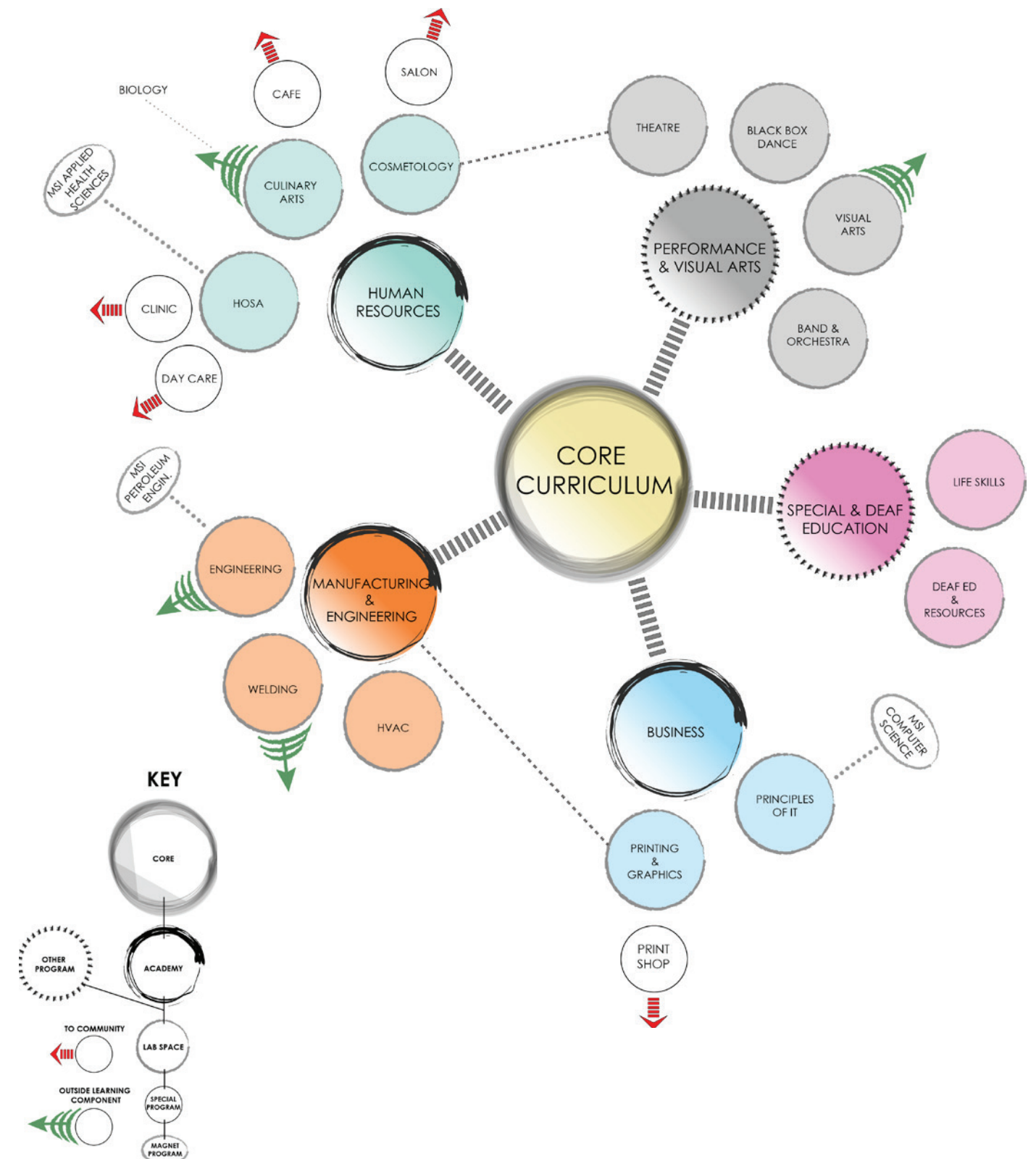


balcony and exterior circulation connects neighborhood communities to the outdoors



flex labs allow for classwork and lab work to be completed in the same room

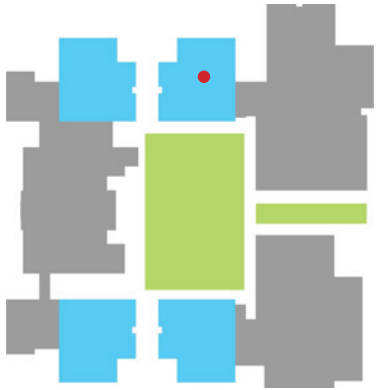






The welding program is one of the most popular programs and a skill that is in high demand in the oil & gas industry. The welding facilities are also used by other programs like engineering, HVAC classes, and robotics.

WELDING / ENGINEERING /  
HVAC CTE SPACE

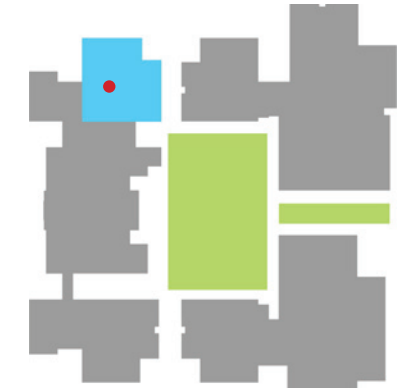


inside the space





## CULINARY CTE SPACE



eating area for students

storage pantry

easily accessible power for future  
equipment or machinery

large food prep areas





## PRINT & GRAPHICS CTE SPACE



swivel screenprinting press; the school creates and prints their own signage and t-shirts

natural light and high ceilings with good ventilation make this a safe space to operate the different types of equipment found in the lab

glazing allows connection between graphic arts and imaging





COSMETOLOGY CTE SPACE





