



2019 JAMES D. MACCONNELL AWARD SUBMISSION

FARMINGTON HIGH SCHOOL
Farmington, Utah

Executive Summary

“Creating a Learning Environment for the Future”

Goals and Outcomes

In the fall of 2015, our firm went through a rigorous selection process and was chosen to program and design Farmington High School (FHS), the first high school for the city of Farmington, Utah. Throughout our 25 year relationship with Davis School District (DSD), our focus has always been on creating exceptional learning environments in a cost effective, energy efficient building. This time, the district approached us with a larger desire. Their vision was to design a *school for the future*. We were charged with questioning what we had done in the past and called to adopt and adapt to a contemporary learning environment. We were challenged to reimagine the optimal methods of teaching and learning through the lens of the modern era while incorporating methods to facilitate student, teacher, and administrative growth. We started from scratch by breaking down the current pedagogy, analyzing the data, and creating a new approach for the “*school for the future*” which culminated in Farmington High School.

Farmington High School is a unique and innovative comprehensive high school that resulted from a series of hands-on collaborative planning meetings between Davis School District administrators, faculty, students, and the community. The vision centered on creating an optimal learning environment that promotes *collaboration, communication, creativity, and flexibility*.

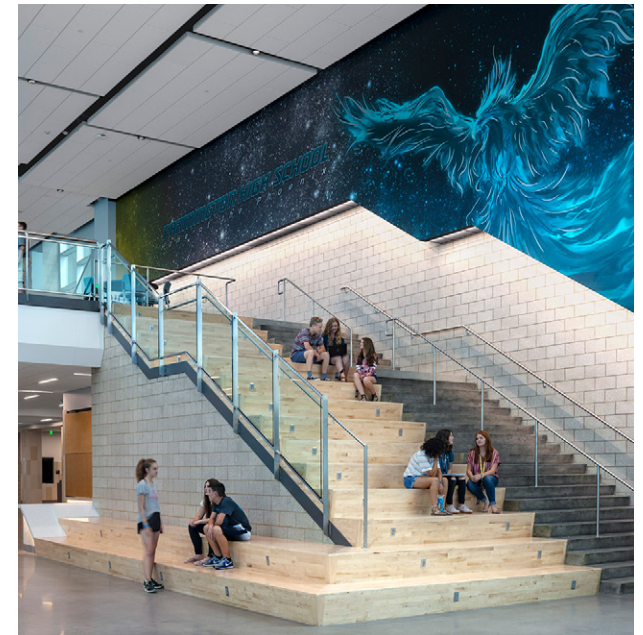
Utilizing a series of interactive meetings with the stakeholders, key design ideas came to fruition including different size classrooms, flexible learning spaces, and learning suites with separate teacher offices. In conjunction with this input, we conducted a detailed study of class sizes of four DSD high schools which provided integral data that acted as a driver in the change of the high school design model. The design of the new high school uses data driven assumptions for class size, accommodates project- and problem-based learning, and continues the model of collaborative learning that Davis School District has been a leader in propagating.



Courtyard

“We want a high school for the future. We do not want to rebuild the same high school that we did ten years ago. We want a high school that questions what is needed for the future economy. We want a high school that is focused on learning, not just in the classroom, but the entire building. We want a high school that fosters creativity, collaboration, and communication. We want this high school to be a sustainable, zero energy campus, if possible. We want to involve students, teachers, administrators, and community in the design process. One other small item... we want it to cost the same as that high school that we did ten years ago.”

—Gary Payne, FAIA, Administrator of Facilities
Management & Planning, Davis School District



Learning Stairs

Scope of Work and Budget



PROJECT DETAILS

LOCATION: FARMINGTON, UTAH

TOTAL ACRES: 45.82

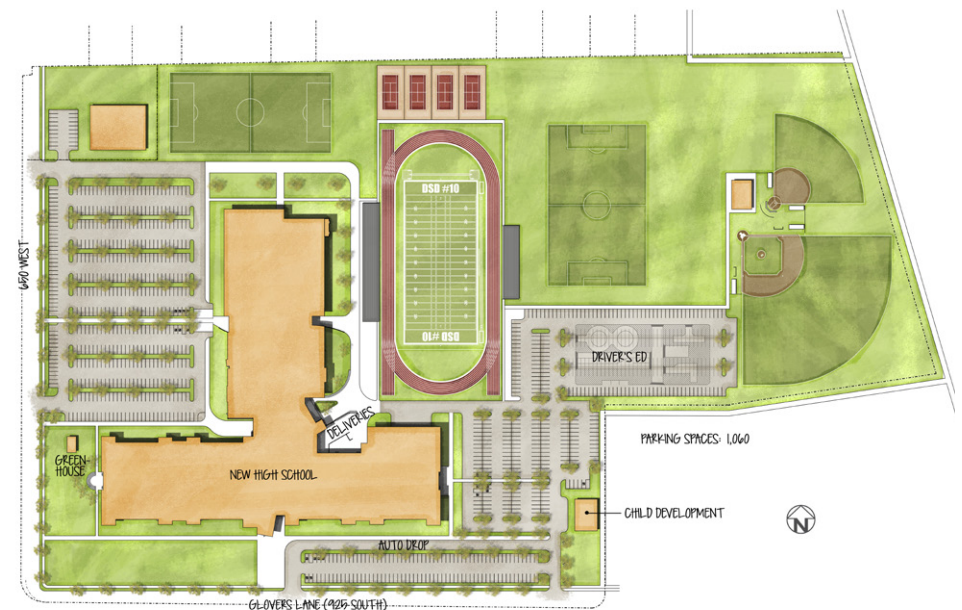
TOTAL SQ FT NEW CONSTRUCTION: 405,000

STUDENT CAPACITY: 2,077

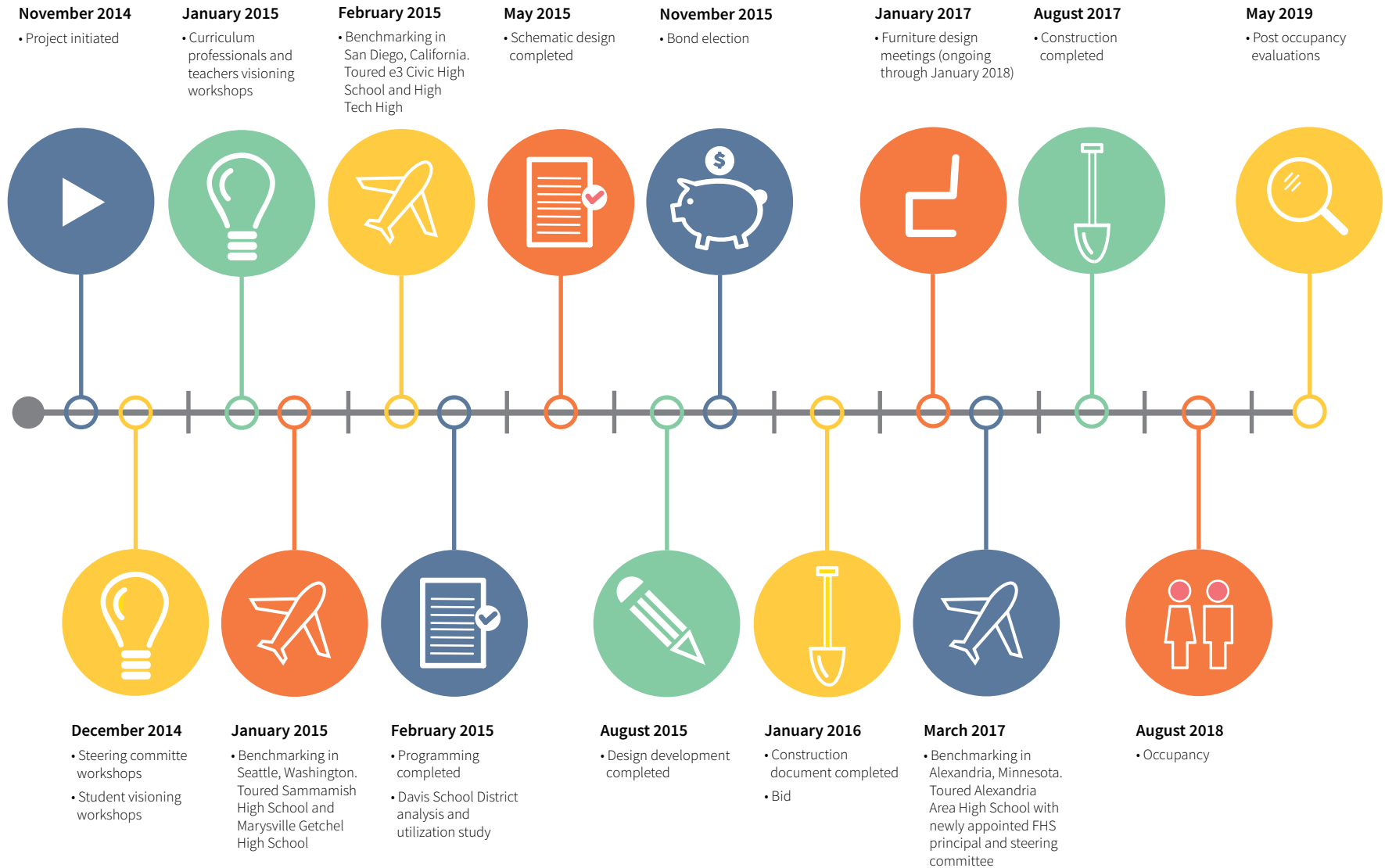
GRADES HOUSED: 10 - 12

OCCUPANCY DATE: AUGUST 2018

TOTAL COST BUILDING + SITE: \$75,755,071



Scope of Work and Budget



School & Community Engagement

The Community

Davis School District is a district of approximately 72,264 students and FHS will be their tenth high school. The school is the first and only high school in the city of Farmington and sits at a focal point within a fast growing community. It was a priority to include community input during every stage of design. To jumpstart the project, DSD assembled a steering committee comprised of a cross section of district personnel to help provide direction and decisions during the design process. This was a key element in tailoring the school's design to fit the district's needs.

The Stakeholders

Ongoing school and community engagement occurred during the design process through a series of focused workshops.

The key stakeholders included:

- Blue Sky (district steering committee)
- Student Visioning (district students)
- Curriculum Professionals and Teachers Visioning (district teachers and administrators)

Fourteen months elapsed between our initial design meeting and the project bid date. During the first ten months our architectural team had 37 design related meetings with Davis School District. We

toured multiple schools across the country as part of a benchmark study. We explored internal as well as external precedents and toured a number of companies (e.g., Adobe, Overstock, Google, Apple) in search of inspirations that could be incorporated in our learning environment. In keeping with our vision of designing a school for the future, we looked at bridging the gap between the learning environment and the future workplace.

Challenges

Designing an environment that can accompany students into their future is challenging. Since the learning landscape is constantly evolving, we wondered how we could best address this uncertainty?

Our goal wasn't to entirely reinvent the existing model. Instead, we focused on transforming and improving the existing model by dissecting and examining the data provided by existing schools. Our goal was to create the optimal learning environment by blending a mix of old and new approaches for an improved solution.

This transformation will inevitably require participants to adapt and transition with their new space. The new environment is designed to be flexible and aimed at providing new opportunities for teaching and learning. However, the change will require faculty coming from a traditional classroom setting to adjust to a new approach of a

blended learning environment.

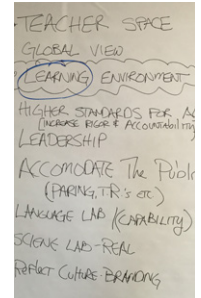
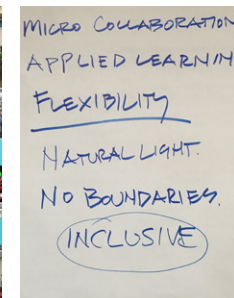
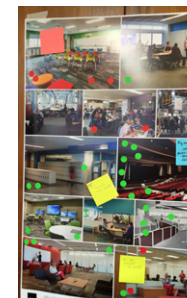
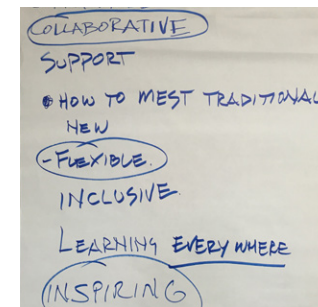
Value to the Community

Each component that went into building Farmington High is a reflection of its community. There was a buzz of excitement throughout the community during the announcement of the project. Students had previously been divided and shipped to two neighboring cities, so it was a cause for celebration upon hearing that they would be able to embrace a school of their own. Students, parents, and various members were eager to share their input and devote their efforts into building a school that best represented their values.

Early meetings included student and teacher focus groups. Through a series of discussions, scenario mapping, and vision boards, the groups were able to identify what was important to them. Their values focused on:

7 Core Tenets

- Learning Environment
- Community
- Collaboration
- Flexible
- Wellness
- Inspiring
- Inclusive



Community engagement workshops

Educational Environment

Educational Vision and Goals

The vision of the district was to design a school for the future. In order to make this a reality, we had to examine the current pedagogy by breaking it down to its core to weigh the pros and cons. After careful evaluation, we reassembled the necessary pieces to create an improved learning environment.

We took the 7 core tenets that were identified during the community workshops and attempted to design an optimal environment that allowed the users to experience those values. We aimed at providing the students and faculty with a flexible environment and tools to learn through collaboration and progressive methods.

Alternate methods of learning are encouraged within the new flexible learning environment. There has been a shift in focus from the teacher to students as the focal point in the learning process. The teacher now acts as a facilitator and fosters student development through active engagement with their peers and mentors as opposed to the passive learning via didactic instruction of previous models.

Many opportunities emerged when we transitioned to an era of constant learning. The potential provided by a flexible learning environment is limitless. We took advantage of this opportunity and aimed at creating an environment that could foster this belief at all levels, whether it may be in a setting that is formal vs informal, or individual vs group.

We examined the shifting paradigm of our education system and aimed at designing a school that not only met the current needs of the teachers and students, but could also transform and stay ahead of future needs.

Environment Supports Curriculum

Farmington High is designed to catalyze innovation in teaching and learning practice through spatial arrangements and interactions. One very critical aspect of the concept is to tailor each space to focus

on the learning experience. We strived to create an environment that is flexible in nature while optimizing its efficiency.

Providing classroom spaces that are flexible and varied in size allows instructors to utilize the space for the proper learning experience. Specific to this idea is the design of the “Learning Suites”, each designed with multiple sizes of classrooms that surround a central collaboration area. Additionally, every instructor has a private office to use during prep periods that is conveniently located along the main corridor to make approachable for students while also allowing teachers to monitor student activity. The spatial combination significantly increases the school’s utilization of learning spaces, key to meeting the district’s construction budget and student load requirements.

An overall sense of spatial connectivity is emphasized throughout the building by way of transparency. Interior transparency allows daylighting to infuse the space, creating a strong sense of visual connection for the users and promotes collaboration through proximity and visibility. The goal is to trigger curiosity and creativity by allowing students to explore their surroundings.

The curriculum revolves around a blended learning environment incorporating a hybrid classroom that can engage students in a truly customizable way. Students learn in part through online learning and are granted an element of control over where, when, and how they work. Technology is seamless, flexible, and integral to the building. Wi-Fi access is designed to allow for up to 5 devices per occupant enabling students to access their devices anywhere and at any time. Students can access videos of lectures, track assignments and progress, interact with peers and teachers, and review other supporting materials.

The result is a classroom that has fundamentally shifted instruction in a way that provides an integrated learning experience and an opportunity for personalization.

| PARADIGM SHIFT | |
|--------------------------|------------------------|
| Traditional Learning | Project-Based Learning |
| Isolated | Open |
| Teacher-Directed | Student-Directed |
| Teacher is Expert | Teacher is Facilitator |
| Fact-Based | Inquiry-Based |
| Standardized | Custom |
| Conformity | Creativity-Innovation |
| Accept Facts | Critical-Thinking |
| Independent | Collaborative Skills |
| Static | Dynamic-Agile |
| Inward Focused | Global |
| Mechanistic | Organic |
| Learning by Memorization | Learning by Doing |

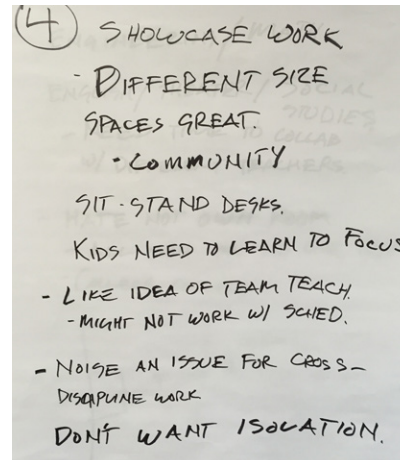
Educational Environment

Environment Supports a Variety of Learning and Teaching Styles

During the initial workshops held with district teachers and administrators, it was determined that much of the traditional classroom setting had been previously underutilized. Teachers felt their classrooms were either too large or too small. They felt their time spent in the classroom during prep periods were an inefficient usage of the space. They felt a sense of isolation at times being confined to one area. They hoped for an environment that allowed them more flexibility and could better facilitate collaboration. We listened to their feedback, and along with the help of numerous curricular experts we went to the drawing board.

We began by examining the current classroom conditions. We conducted a detailed study of class sizes of four existing DSD high schools which provided integral data that acted as a driver in the change of the high school design model that the District had previously been using. The design of the new high school uses data driven assumptions for class size. We closely analyzed data collected from the existing schools to determine what would be an optimal and efficient design for our future school.

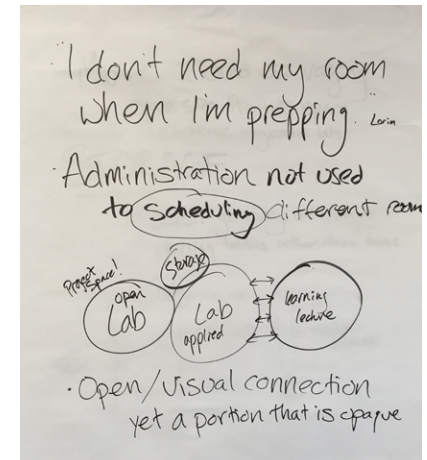
This ultimately led to designing a “Learning Suite” which incorporates three distinct class sizes that offers multiple customizations and flexibility. The Learning Suite is a core component for the educational experience unique to Farmington High.



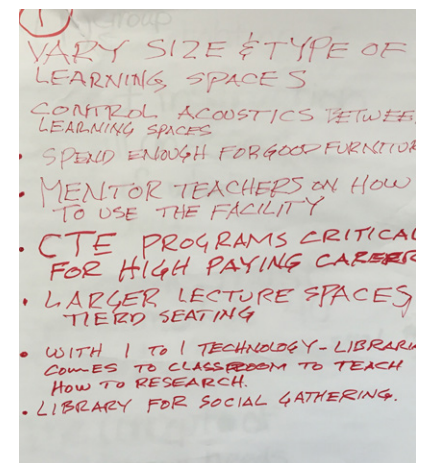
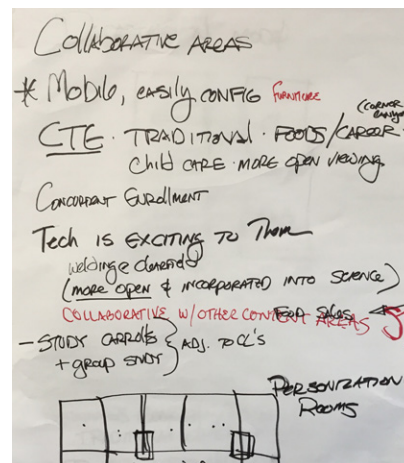
“We would like spaces to be more flexible to accommodate different programs.” — DSD Teachers



“Could benefit from more opportunities to collaborate with other classrooms.” — Davis School District Teachers



“I don't need my classroom while I'm prepping.” — Davis School District Teachers



Curriculum Professionals and Teachers Visioning workshops

Educational Environment

Case Study

We examined four existing high schools within the district to determine the optimal class size and utilization of space. We studied their program and broke down the numbers. We looked at program spaces, class sizes, scheduling class periods, utilization of space, flexibility of space, and overall efficiency.

The data revealed staggering information unveiling the inefficiencies within our current schools. The traditional school was designed with classrooms all of the same size, however, based off of our occupancy study we determined that spaces were underutilized and that students and teachers preferred spaces that were more flexible and ranged

in sizes. Why design a space that is one size fits all if the occupants' needs vary?

We broke down the silos of learning and extended the learning landscape outside the classroom, creating various sizes of classrooms as well as expanding the classrooms into collaboration areas and spaces that had previously been considered circulation areas.

We also prepared ourselves for the future by designing spaces that were flexible and capable of transformation. Students are no longer confined to the rigidity of the traditional classroom and can now evolve with their environment. This is meant to be a school that could fulfill our present needs and also adapt to future needs.

The learning space is radically decentralized for today's digitally-connected students, calling for a *diverse landscape of learning environments capable of nimble adaptation to evolving educational needs.*



Traditional Classroom



Flexible Learning Environment

Educational Environment

Proposed Classroom Design for Farmington High School

We were surprised to see that so much area within the traditional classroom went underutilized. The data directed us to design three distinct sizes of classrooms that could provide for a tailored learning environment and operate at optimal efficiency.

We then combined and expanded the classrooms to a central collaboration area to create a Learning Suite. The classrooms are equipped with a full wall of glazing to allow for easy supervision of groups working outside the classrooms in the collaboration areas.

By creating these custom yet flexible spaces, we could better accommodate various teaching styles and as a result we were able to achieve a utilization rating of 85-90% compared to the current rating of 70% for neighboring schools within the district.

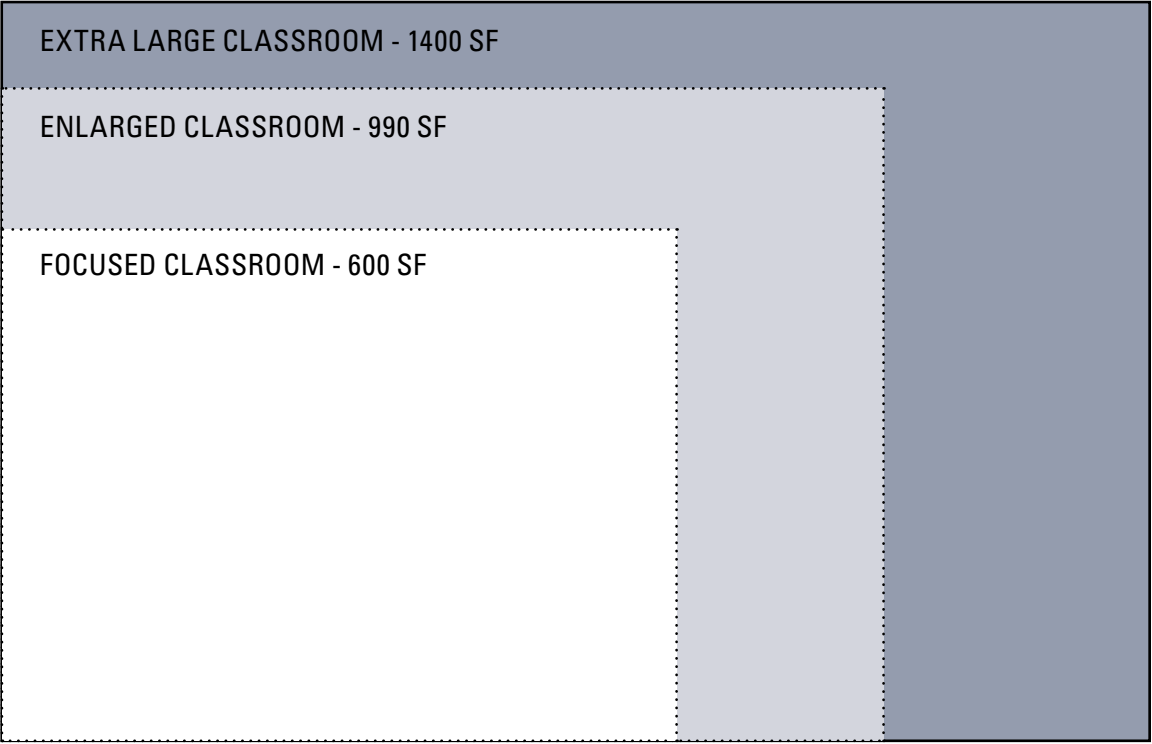
Traditional Classroom - Class Average of 4 High Schools Per Period (Rounded Up)

- Math Classroom = 2 Small, 7 Average, 1 Large
- Humanities = 3 Small, 14 Average, 4 Large
- Science = 2 Small, 6 Average, 1 Large

Total Core Classes Per Period (Rounded Up)

= 7 Small Sizes, 27 Average Class Sizes, 6 Large sizes
= 40 Core Classes Per Period

Custom Classroom Sizes for Farmington High School



Educational Environment

Adaptable and Flexible Environment

Learning Suite

Each Learning Suite is comprised of varying sized classrooms surrounding a central collaboration area. The suites are designed to optimize:

- **Flexibility**
 - » Varying sizes of classrooms provide a custom learning environment.
 - » Allow for individual or group tutoring.
 - » Classrooms are equipped with a full wall of glazing to allow for supervision of groups working within the collaboration space. They also allow spaces to expand for project needs.
 - » Mobile furniture within the classrooms and suite offers flexible configurations.
- **Safety**
 - » Each suite is provided with added security that allows the area to be locked down and evacuated in case of an emergency. Automatic magnetic locking entrance doors lead into the suite and exits are provided within the suites that lead directly to the exterior from both levels.
 - » Transparent design allows for full supervision of the learning environment.
- **Collaboration**
 - » Proximity and transparency of spaces are designed to promote a sense of visual and physical connection among students and faculty. Creativity is generated through connectivity.
 - » Support learning between groups and collaborative development.
 - » Nurtures sense of community.
- **Energy Efficiency**
 - » The collaboration space creates a thermal barrier from the outside temperature to the inside classroom space, reducing heating/cooling loads, plus decreasing the size of the building fan units.
 - » Optimizes daylight by shading classrooms from direct glare while allowing borrowed light to flood in.

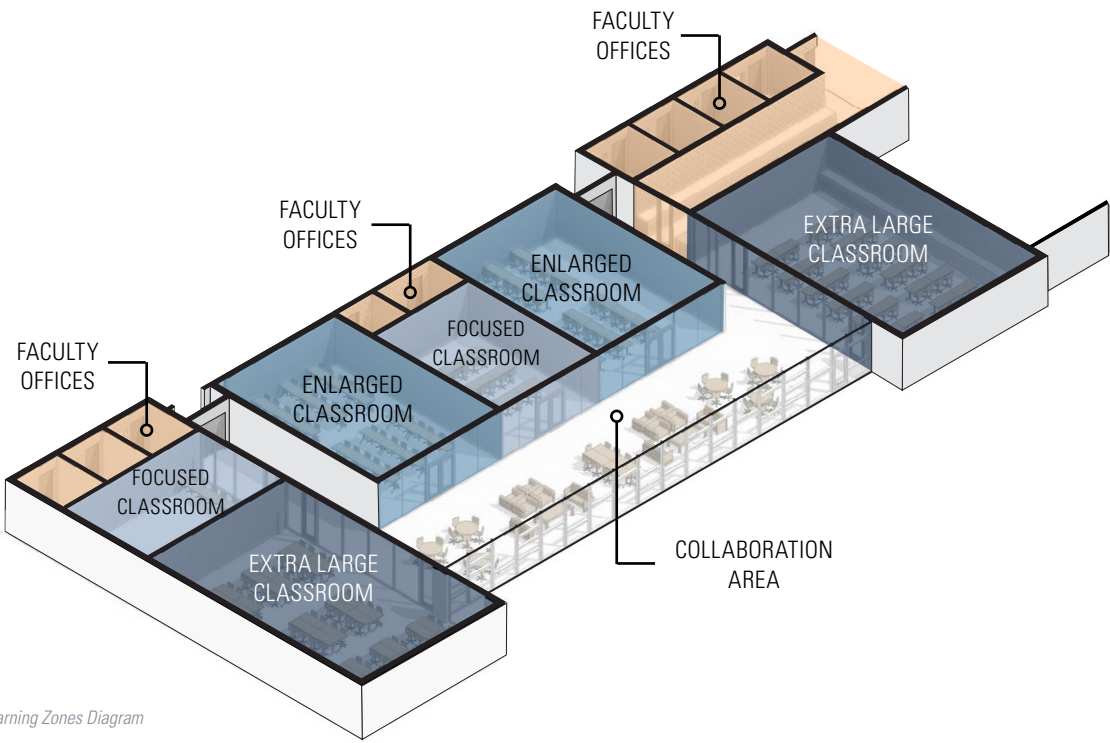


Educational Environment

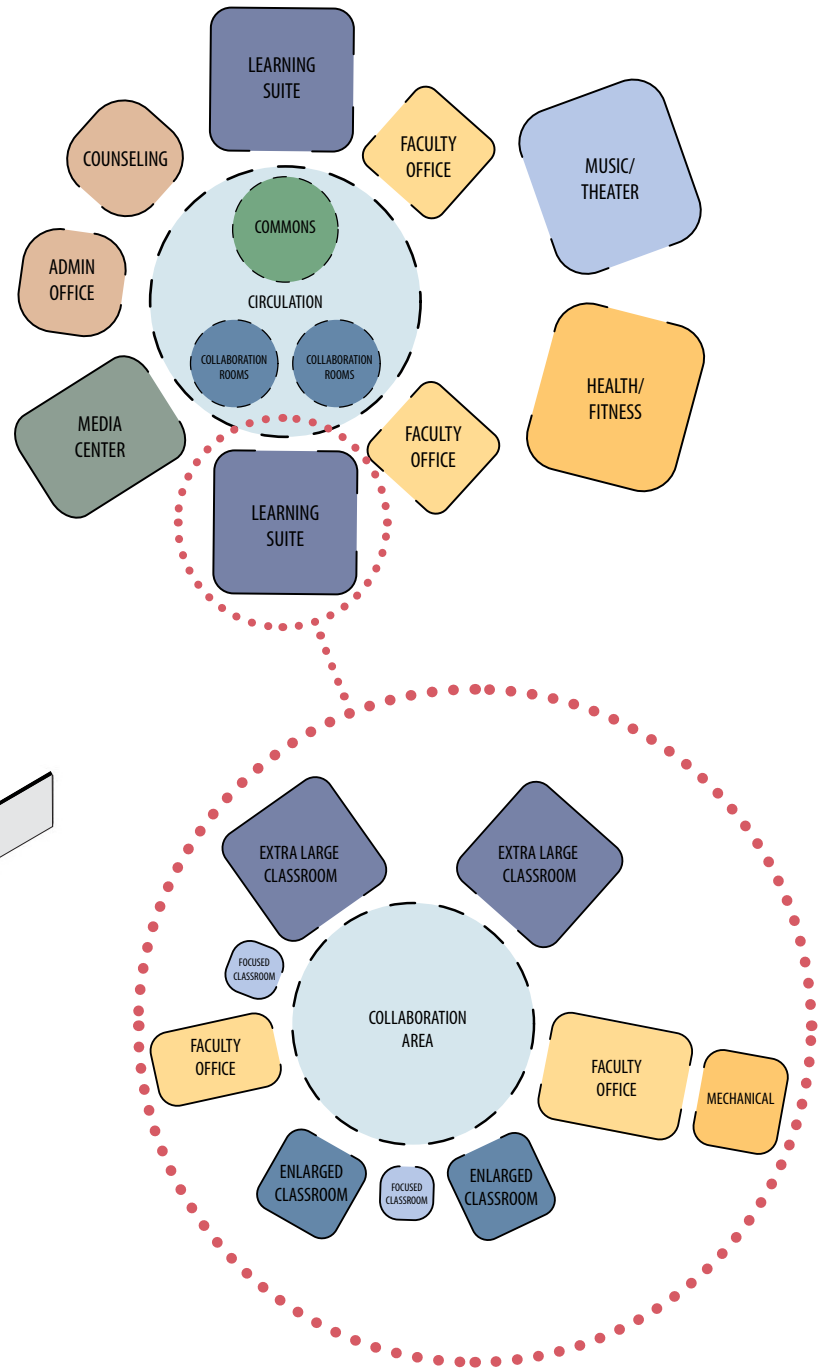
Adaptable and Flexible Environment

Learning Suite

Each Learning Suite is comprised of three distinct sized classrooms that include a focused classroom, enlarged classroom, and extra large classroom. The rooms have been designed with a full wall of glazing to allow for easy supervision of groups working outside the classrooms in the central collaboration area.



Learning Zones Diagram



Educational Environment

Adaptable and Flexible Environment

Level 1 Programming

Faculty/Collaboration Offices

- Faculty offices
- Prep rooms
- Collaboration rooms

Learning Suites

- Classrooms
- Collaboration areas

Fitness Facilities

- Main gym
- Auxiliary gym
- Wrestling
- Locker rooms

Performance

- Choral
- Band
- Theater
- Auditorium

Commons

- Commons/Food Court
- Learning stairs

Applied Technology

- Composite workshop
- Automotive
- 3D art
- Child development

Learning Suites

- Classrooms
- Collaboration areas



Educational Environment

Adaptable and Flexible Environment

Level 2 Programming

Faculty/Collaboration Offices

- Faculty offices
- Prep rooms
- Collaboration rooms

Learning Suites

- Classrooms
- Collaboration areas
- Science labs



Fitness Facilities

- Running link
- Dance
- Weight room
- Fitness areas
- Batting cage

Media Center and Cafe

- Media center
- Cafe
- Lounge

Counseling

- Counseling center
- Conference rooms

Applied Technology

- Robotics lab
- Prototyping lab
- 2D art

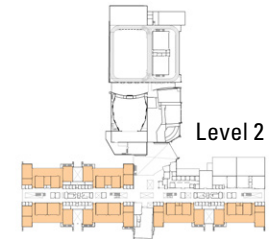
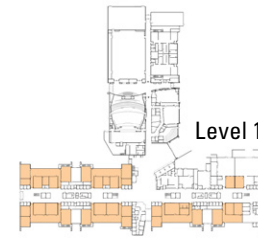
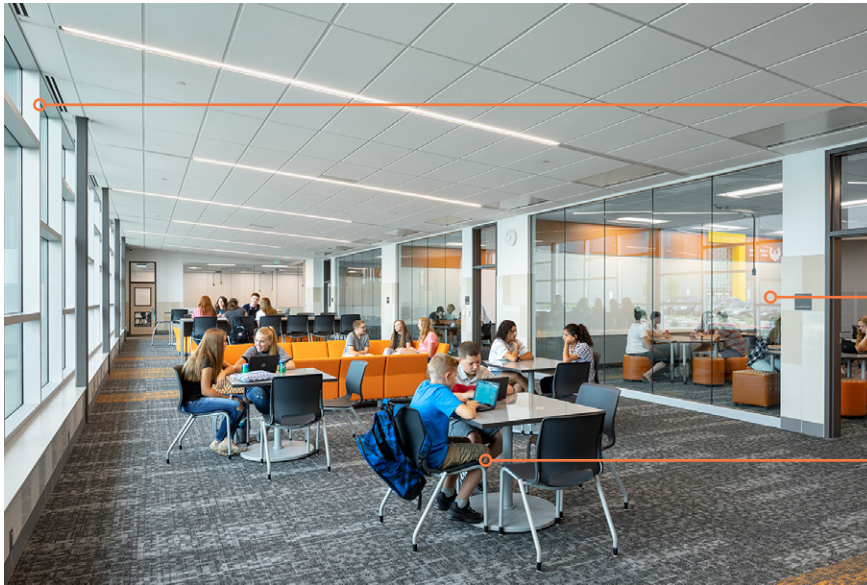
Learning Suites

- Classrooms
- Collaboration areas

Educational Environment

Learning Suite

Created to optimize flexibility, collaboration, energy efficiency, and safety. The level of transparency and connectivity is balanced to allow for diverse activities.



Collaboration Area

Transparency maximizes visual and physical connections between faculty and students within the learning suite. Also provides natural daylight.

White Boards

White boards are placed around the entire perimeter of the classroom for ease of communication and to help promote classroom engagement.

Mobile Furniture

Mobile furniture provides flexibility with classroom configurations. Accommodate different teaching styles and platforms.

Curtain Wall

Optimizes daylight by shading classrooms from direct glare while allowing borrowed light to flood in. Expansive views of the surrounding landscape are aimed to inspire students.

Transparent Classrooms

Transparent classrooms promote a sense of visual connectivity.

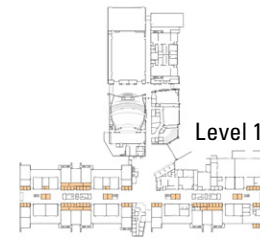
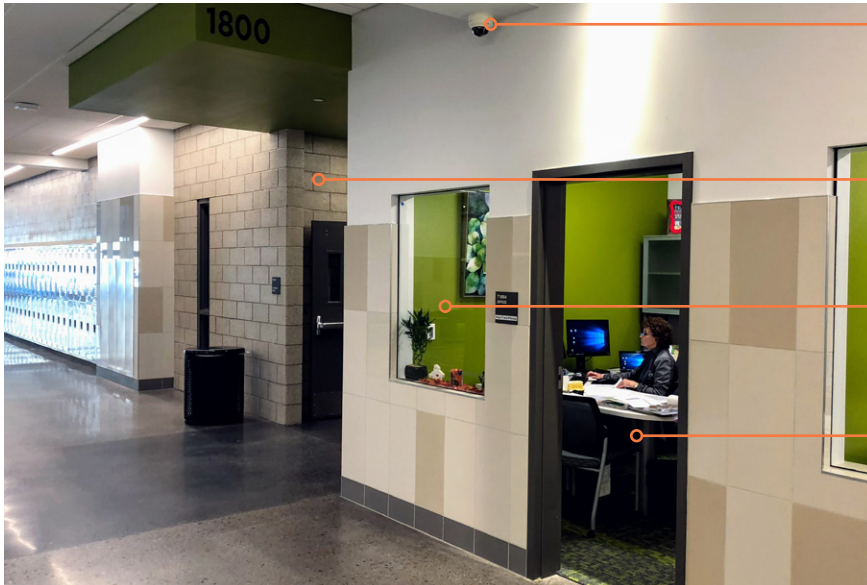
Collaboration Area

Central area designed to be flexible, allowing learning to expand and overlap into the space. Communal space promotes collaboration among students and faculty.

Educational Environment

Collaboration Rooms and Teacher Offices

Collaboration rooms and teacher offices are conveniently placed along the main corridors.



Lounge/Atrium

The natural daylight creates a comfortable and inviting environment for reading and studying. Also promotes a sense of community by encouraging casual gatherings.

Collaboration Rooms

Centrally placed along the main corridor, the collaboration rooms provide students their individual space for group projects and study. Space encourages collaboration, team building, and creativity by allowing passersby to view their work.

Safety and Security

The safety of students and faculty is a major priority. The school is equipped with a state of the art system that includes video surveillance, card access, and intrusion detection.

Entrance to Learning Suite

Learning suites and offices are placed in close proximity to allow for convenience and optimal utilization.

Transparent Offices

Maximized transparency makes teachers more accessible to students and provides additional surveillance.

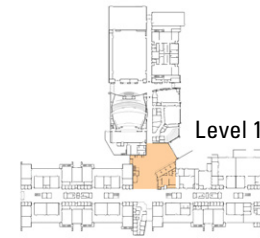
Teacher Offices

Teacher offices are strategically placed for ease of access to and from classrooms to improve utilization. Also makes them more accessible and approachable for students.

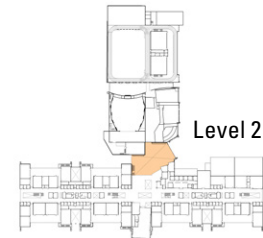
Educational Environment

Learning Stairs and Commons

Central and open gathering space for presentations, lectures, lunch, and social gatherings.



Level 1



Level 2

Administration Offices and Conference Rooms

Transparency maximizes visual connections between faculty and students. Also provides additional surveillance.

Curtain Wall/Natural Daylighting

Expansive windows provide natural daylighting and views of surrounding landscape. Promotes wellness and sustainability.

Food Court

Versatile space also serves as dining hall. Adjacent to learning stairs, used for large gatherings and presentations.

Commons

Open forum for lunch and casual gatherings

Mural/Art

Artistic visual cues are placed throughout the school to inspire and trigger creativity.

Lounge and Cafe

Flexible space connecting the learning stairs to the media center. Allows for informal gatherings and individual/group studying.

Main Circulation Stairs

Main stairs connecting the learning levels

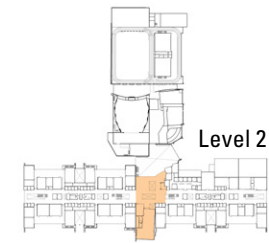
Tiered Seating

Tiered seating designed to be versatile. Used for presentations, studying, lunch, and social gatherings.

Educational Environment

Media Center

Comfortable, intimate, well-lit environment accommodates reading, studying, relaxing, and reflection.



Electric Glazing

Dimmable electric glazing controls optimal lighting throughout the room. Provides thermal barrier to reduce energy consumption.

Lounge and Cafe

Lounge extends from library to cafe/learning stairs to provide flexible space.

Tech Station

Computer/tablet station for research and studying.

Media Shelves

Shelves provide adequate storage for books/materials but transition towards technology related content.

Reading Lounge

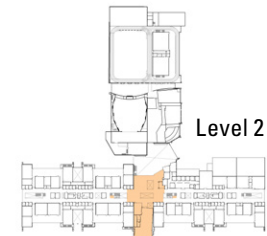
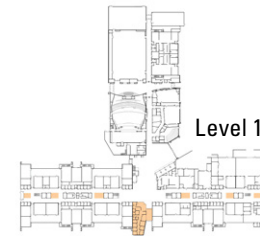
Lounge designed for casual reading, studying, relaxing, and reflection.



Educational Environment

Lounge, Cafe, and Entry Gallery

Flexible spaces incorporated within circulation areas that promote collaboration, creativity, and a sense of community.



Clerestory Windows

Windows maximizes natural daylighting and views of surrounding landscape. Promotes wellness and sustainability.

Cafe

Extension of cafeteria at 2nd level to provide healthy meals/ snacks for students in a casual and inviting area.

Lounge and Cafe Table

Lounge provides transitory space between the media center and learning stairs. Cafe tables are equipped with charging stations to provide a casual environment for students to meet and study.

Atrium

Open spaces maximizes visual connection as students move throughout the school. Promotes collaboration and sense of community.

Main Entry with Secure Vestibule

Main entry to school has a secure vestibule requiring visitors to check in at the administration office. Transparency provides visual connectivity and additional surveillance. The school is equipped with a state of the art security system that includes video surveillance, card access, and intrusion detection.

Lounge

Flexible spaces are experienced throughout the school. Promotes collaboration, informal gatherings, and individual/ group studying.

Educational Environment

Fitness Facilities

Spaces designed to be flexible, high performance, and efficient.

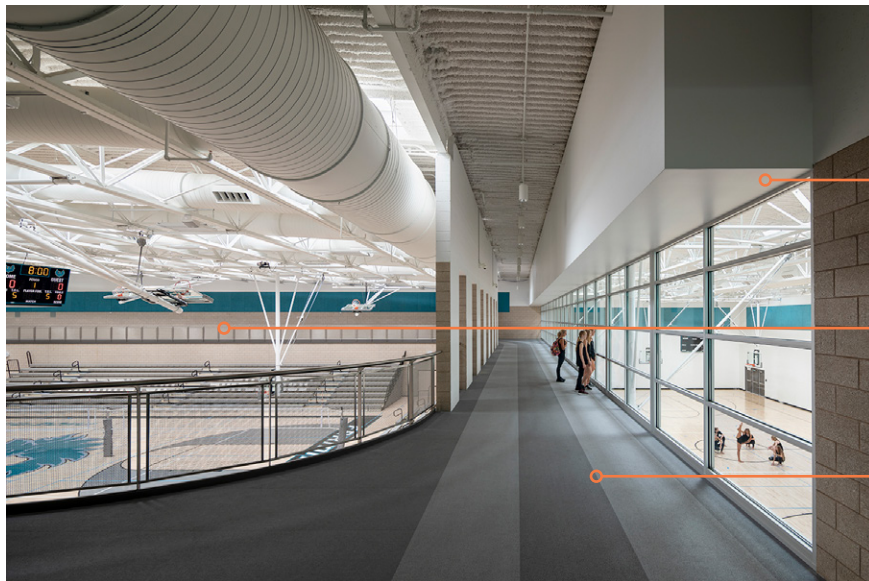


2nd Level Fitness Facility

The 2nd level fitness area, weight room, and dance room has been designed to provide a 50% longer indoor running track. Corner areas provide additional room for exercise routines.

Gymnasium

Gym is utilized during fitness courses, athletic events, competitions, practices, large student gatherings, and also by the community when school is not in session.



Transparent Barriers

The main gym is visually connected to the auxiliary gym by way of transparency. Provides an open and well-lit environment that promotes health and wellness.

2nd Level Fitness Facility

The 2nd level fitness area, weight room, and dance room has been designed to provide a 50% longer indoor running track. Corner areas provide additional room for exercise routines.

Running Link

The track link provides a sheltered environment for exercise and doubles as a year round batting cage.



Educational Environment

Adaptable and Flexible Environment

To support the collaborative learning environment of FHS, we had to select furniture that could keep pace and allow for flexibility.

An active learning environment has no room for passive furniture.

Over the course of a year-long process, we met with numerous district committees and furniture designers to determine the optimal furniture selection. When we focused on a student-centered learning environment, we transitioned away from the traditional rigid rectangular desktops in favor of trapezoidal and arc-shaped table tops that could easily cluster together to create collaborative seating for multiple group sizes. The desks and seats are mobile which can easily maneuver to create group settings as well as be separated for individual study. To take it a step further, the desktops are designed with a dry erase surface that can pivot vertically to allow students to quickly share ideas and promote creativity.

"I teach math. Having the ability for students to write on the walls and desks, engaged and with a partner is incredibly powerful."

—Farmington High Math Teacher

Careful thought went into the selection of the seats as well. To offer the students the most freedom in their interaction with others, we've provided seats that reduce resistance while moving and rotating allowing for a variety of seating options within the classrooms.

While designing furniture that is intended to be flexible, we did not want to compromise the ergonomics and comfort of the students. We paid close attention in designing the furniture to provide comfortable supports that help create a healthy learning environment.

White Boards

White boards are placed around the entire perimeter of the classroom for ease of communicating the curriculum and to help promote classroom engagement.

Teaching Styles

The flexibility provided by the furniture configurations allows for different teaching styles and promotes collaborative learning.



Flexible Desktops

Desktops are shaped to allow them to be configured together or separate. Include a dry erase surface that can pivot and transform to a white board for sharing ideas.

Variety and Comfort

Variety of furniture allows for greater flexibility. Adds creativity and comfort to a traditionally stagnant space.



Mobile Seats

Seats are designed to be mobile and allow students the most freedom to rotate and interact with their surroundings.



Educational Environment



FHS Composite Workshop



Salt Lake Boeing Plant

Creating a Learning Environment for the Future

To better prepare the students for careers within the evolving landscape of the future workforce, FHS has designed a curriculum that includes technical courses in exploring computer science and programming, robotics and automation, and engineering.

One of the more innovative programs established in collaboration with local industry partners Boeing and Orbital ATK led to the creation of a composite workshop, replacing the traditional cabinet making woodshop.

The workshop teaches students technical knowledge and skills to plan and manufacture projects using composite materials. The course also introduces students to the Utah Aerospace Pathways Program, which provides students the opportunity to graduate high school with a certificate in aerospace

manufacturing and begin a career in the field.

The aerospace sector is growing rapidly within the state of Utah and the program is aimed at making a positive impact preparing students for future opportunities. This is among the first time industry partners and K-12 educators are working closely together to directly address their workforce needs in the state. The six aerospace industry partners in Utah are Boeing, Harris, Hexcel, Hill Air Force Base, Janicki, and Orbital ATK. The industry partners have worked closely together with the school district and the Utah Manufacturers Association to provide paid internships for the students during the certification process and define the requirements to hire them out of high school.

Through the support of the community and industry partners, the additional curriculum and programs are aimed at molding future engineers, technicians, and scientists while preparing them for future challenges.

“Improving our education system is the most important thing we can do to build a strong economy for the future. This program provides students who have a passion for technology and innovation the opportunity to become familiar with aerospace manufacturing and get hands-on experiential learning.”

—Larry Coughlin, General Manager of Boeing Salt Lake



Architecture becomes part of the **social fabric** of the **community** where it exists. It is important that the architecture **reflects** and **complements** elements of that **community**.

Physical Environment

Physical Environment

When approaching the design of the new high school in Farmington, Utah we felt that it was important to let the surrounding landscape shape what this building would become. We studied the surrounding landscape ranging from the Wasatch Mountains, Farmington Bay, to the Great Salt Lake and started to break up the graphical information into categories to help inform the design.

The first category was color. There is a rich tapestry of colors that is created from the transition of the mountains to the farmland, to the wetlands, to the lake, and to the sky. By utilizing these color combinations and transitions in the design of the building we are able to create an architecture that is born uniquely of this place.

The second category was texture. Similar to the changes in colors across the landscape the textures change dramatically as well. We were drawn to the way the landscape interacts with weather and how those textures can change in rain, wind, or snow. The rich texture that is created from a heavy wind storm blowing across the water of the Great Salt Lake helped to inform the rectangular patterns that create different patterns in the window

mullions around the school, the metal panel configurations, and tile throughout the interior of the school.

The third category was branding. This high school is designed for learning of the future which is exemplified by the identity of the physical space. It is an exciting and innovative high school born out of the integration of a new culture of learning, its community's values, and unique geographical influences. The design was informed from all of the influences in Farmington but utilizes these influences in new and creative ways, culminating in a brand that is "Future Learning".

Every portion of the school is created to provide opportunities for flexible learning spaces. All of the learning suites are set up for multiple learning environments and these all extend to the exterior with outdoor learning spaces. A natural wetland is a focal point at the corner of the school property and can be overseen from the learning suites. Students learn and interact with the building and the environment simultaneously. The expansive views of the surrounding environment are intended to inspire the students.



Physical Environment



Physical Environment

The design of Farmington High School is purely a reflection of its environment. Utilizing the colors, shapes, textures, and patterns of its surroundings, we were able to create an architecture that is born uniquely of this place. This building would not be the same if it were designed for a different area.

"The large open windows are impressive. I didn't understand how the color design was inspired by nature to match the school until seeing a sunset through the west doors. It was stunning! The building just blended in with the backdrop."

—Parent of student at FHS

Colors, Textures, and Patterns

The design was strongly influenced by its natural surroundings. From the reflection of colors of the environment to the grid-like patterns created by the Great Salt Lake.

Indigenous Plants

During the design of the exterior landscape, much care was placed upon planting indigenous plants to replace the ones disrupted during construction. The design team made great efforts to preserve and add back to the natural landscape.

Wasatch Mountains

The Wasatch Mountains cascading from the east helped inspire the design of the building and will continue to inspire the students that walk through the halls.

Solar Shades

The colors and grid-like patterns of the solar shade were inspired by the textures that blew across from the Great Salt Lake and Farmington Bay.

Physical Environment

Facility Fit in Community Context

Architecture becomes part of the social fabric of the community where it exists. It is important that the architecture reflects and complements elements of that community.

Farmington, Utah is nestled in between the Wasatch Mountains and the Great Salt Lake. For this community, the vast landscape helped shape and offer many opportunities to connect with the environment and outdoors. A network of streams and trails sprawl from the foothills to the lake creating a lush environment that departs from the urban city in exchange for a healthy and active lifestyle that is directly engaged with its natural surroundings.

Farmington High School was the perfect fit for such an active and dynamic community.

How the Project Inspires and Motivates

In recent years, the city has seen rapid growth with the influx of younger members and families. The growth has required the community to adapt and transform along the way.

The vision for FHS had been to design a learning center for the future. To fulfill that vision to its fullest potential, FHS is designed to be more than just a school, it represents an extension of the community that is designed to continuously engage and grow alongside its neighbors.



Physical Environment

Sustainability

The design team worked closely with the school district with multiple iterations to improve system performance to provide the best learning environment for the students while delivering energy efficiency. They considered many factors including, comfort, lighting, noise, and ventilation effectiveness.

Based on our studies of existing high schools within the district, we calculated that the majority (over 60%) of the electrical cost results from demand charges. The cost of electricity has consistently been on the rise over the last decade and shows no signs of leveling off. To design for a more sustainable future that could also counter these increasing costs, we aimed at designing a net zero ready building.

Along with the assignment of designing FHS, the firm was also selected to design a parking facility for the district’s school buses on an adjacent site just east of the high school. This presented us another opportunity which we seized and took full advantage of by integrating a photovoltaic system within the parking canopies. The by product is enough energy to power the school and create a net zero ready building.

Various components of the HVAC system have been designed to improve energy and maintenance. The team applied Thermal Displacement Ventilation (TDV) to more effectively provide ventilation air and create a quieter, healthier, and more comfortable learning environment. The result greatly reduces energy consumption by eliminating refrigerated air conditioning and by applying a method of Indirect Direct Evaporative Cooling (IDEC) instead.

Over the course of the school year, the results show that the overall energy consumption for FHS is at a fraction of the usage compared to the traditional high school within DSD. In building a more sustainable and comfortable school for the future, we were also able to exponentially help the district cut back costs.

In addition to an energy efficient building, the designs of the surrounding landscape and irrigation system are aimed to achieve durability and sustainability by incorporating low water use plants, a Weather Trak irrigation system to maximize water savings, and a wetland detention area to promote urban wildlife as well as allowing the students to engage the wildlife as part of their studies.



Cost Implications

Typical High School: 405,000 SF

| | |
|---------------------|--------------------|
| Mechanical Cost/SF: | \$25.50 |
| Electric Cost/SF: | \$18.10 |
| Cost to Operate: | \$1.00 / SF / Year |

| | |
|------------------------|------------------|
| Total Cost First Year: | \$405,000 / Year |
|------------------------|------------------|

“Better” High School: 405,000 SF

| | |
|---------------------|-------------------|
| Mechanical Cost/SF: | \$27.80 |
| Electric Cost/SF: | \$19.90 |
| Cost to Operate: | \$0.75/ SF / Year |

| | |
|------------------------|------------------|
| Total Cost First Year: | \$303,750 / Year |
|------------------------|------------------|

FarmingtonI High School: 405,000 SF

| | |
|-----------------------|--------------------|
| Mechanical Cost/SF: | \$32.51 |
| Electric Cost/SF: | \$20.04 |
| Photovoltaic Cost/SF: | \$2.38 |
| Cost to Operate: | \$0.15 / SF / Year |

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|------------------------|------------------|
| Total Cost First Year: | \$ 60,750 / Year |
|------------------------|------------------|

Physical Environment

Sustainability

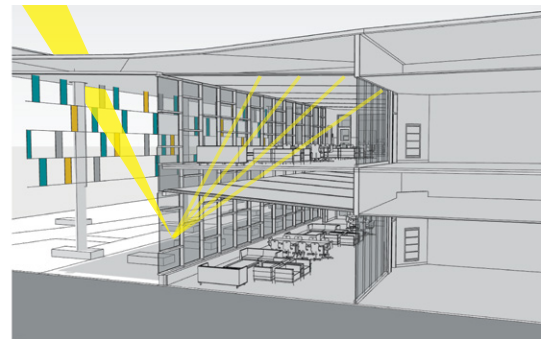
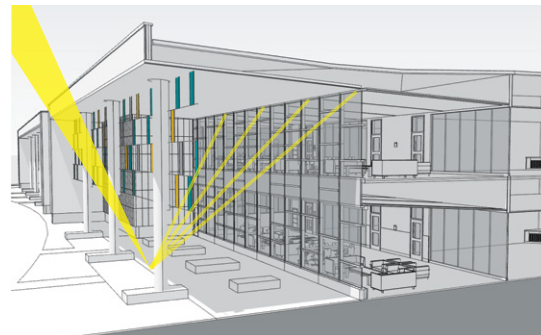
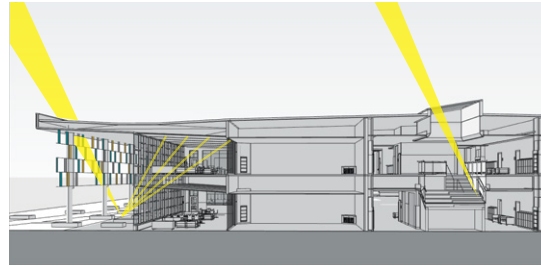
Solar Shades

The roof overhangs at the south side of the building are strategically placed in a grid-like system to help shade the windows against solar heat gain. The majority of the interior is protected from direct sunlight while providing plenty of natural daylight for the learning suites.

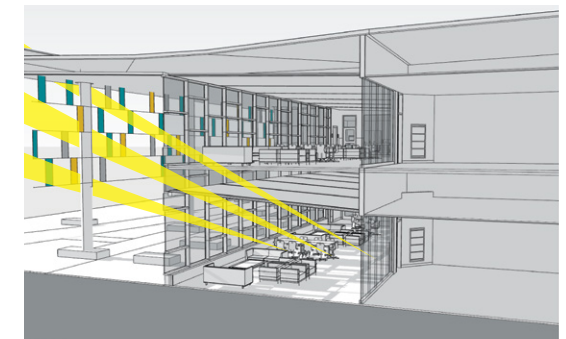
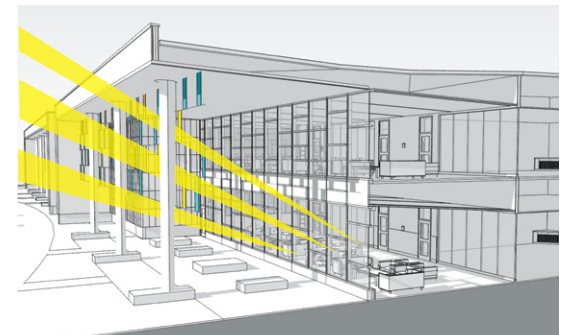
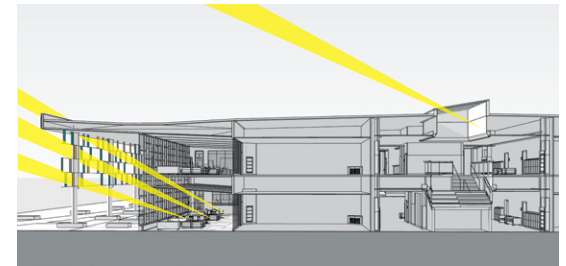
The solar shades also create a covered outdoor learning space for students.



Summer Sun



Winter Sun



Results of the Process and Project

Achieving Educational Goals and Objectives

At its core, Farmington High School was designed to fulfill the learning objectives of its students and community. We looked to design a learning environment that best suits the needs of the future curriculum. Careful thought went into the design of every detail to allow students and teachers the maximim opportunity to succeed.

To gauge the success of the first academic year in session, we've conducted a post occupancy evaluation that included students, faculty, administrators, parents, and support personnel. The response was overwhelmingly positive:

According to the survey, over 90% of the teachers were satisfied with the design of the building in helping them provide a quality learning experience for their students. The consensus agreed that the design supports their individual teaching styles and needs. Consistent with the views of the faculty, the students also agreed that the design encourages collaboration and interaction between student and teacher.

"This... this is it. I think that students are learning how to take responsibility for their own learning. They're learning skills that they are going to need in the future, and I think that students are better prepared for college and life after high school more than ever."

—Merci Rossmango, Assistant Principal

Achieving District Goals

The district's vision was to create a school for the future. The end product was far from an ordinary school, but rather a learning environment that can transform and adapt to the user's needs.

"The school is a powerful tool that is capable of taking on and adapting to the modern era of learning."

Achieving Community Goals

The commitment to learning doesn't just stop with preparing the students for the future; the school also established a program for adult learners. The program is focused on continuous education for the community to grow alongside the students.

The school is designed to be utilized by the community to its fullest. When students leave, the doors open for the community to continue learning, the flexible spaces allow for community meetings and gatherings, and the fitness facilities and fields are used by the community for practices and competitions. In addition, the exterior landscape is tied into the existing trail system to further connect the school with the community.

Unintended Results and Achievements

We were hopeful that the designs implemented as part of FHS would produce successful results. However we weren't prepared for the overwhelming sense of gratitude that the community has displayed while embracing their school.



Results of the Process and Project

Post Occupancy Evaluation

"Incredible design! I am grateful that my student has the opportunity to attend this amazing school!"

—Parent of student at FHS

"The white board walls and desks are the best thing ever."

—Teacher at FHS

"I love the learning suites and commons area multipurpose capabilities. The technology is amazing!"

—Student at FHS

"As to the overall appearance, both interior and exterior, I find it to be beautiful. The choice of bright yellow was bold but makes a statement that sometimes bold is good. It's welcoming and cheerful! Traits we all should possess, not just the students."

—Teacher at FHS

90% of students agree that the design of the school makes it easier to work in groups.

65% of teachers noticed changes to their teaching techniques as a result of the learning environment.

74% of students agree that the design of the school supports their individual learning style and needs.

63% of students agree that the design of the school helps make learning more fun.

80% of students are satisfied with the ability to work in small groups during class.

87% of teachers believe that the design of the school encourages student-teacher interaction.

90% of teachers are satisfied with the building in helping them to provide a quality learning experience for their students.

72% of teachers and students feel it is easy to rearrange the classroom furniture.

83% of students and teachers report that they use the collaboration spaces daily.

88% of students and teachers are satisfied with the amount of light in their classrooms.

90% of teachers agree that the design of the school supports individual teaching styles and needs.

80% of everyone surveyed are satisfied with the building overall.

91% of everyone surveyed feel safe inside the building.

87% of teachers agree that the design of the school promotes collaboration.

71% of teachers believe that the design of their classroom enhances their student's ability to learn.

40% of parents surveyed noticed improvements in their students academic performance.

70% of teachers believe that the design of their classroom enhances their ability to teach.

52% of parents believe that the design of the school enhances their students ability to learn.

Educational Brief

When we were first tasked with the project of building Farmington High School, we were thrilled to be presented with the opportunity to help shape and redefine the scope of the learning environment. It forced us to question everything we knew about designing for an optimal learning environment.

We wanted our approach for FHS to be scientific and analytical. Through a rigorous data analysis we were able to calculate optimal conditions and methods. Every component that went into the design of this school had been carefully calculated and driven by numbers.

The culmination of this school is a testament to the efforts of the community. It is evident that every person involved in this project has a lasting impact. Our collective efforts resulted in a much greater accomplishment than what a single district or firm could generate on its own.

The future is bright and opportunities are limitless for students at Farmington High School. They are well-equipped with the educational tools and environment to adapt, grow, learn, and succeed as they expand their horizons.

