James D. MacConnell Award 2015 SUBMISSION





Executive Summary

Linking Learning to Life

Designed as a facility for the next generation learner, Dr. Kirk Lewis' Career Technical High School is a collaborative and flexible environment that offers project-based learning for real world experience. For today's high school student, nothing could be more important than this concept.

In working together with a progressive district, the design team spent months going through an in-depth design process. The result of this process was an adaptive and interactive environment that not only teaches students core subjects, but it also offers the opportunity to obtain a professional certification upon graduation. Should students want to move into a college atmosphere, they may also obtain college credit through dual enrollment courses.

A facility for the i-Generation student, technology is integrated throughout the school and encourages students to explore, collaborate and truly become the next makers of society.



Budget: \$37,150,000.00

SQUARE FOOTAGE: 253,100 SF | CAPACITY: 1700 STUDENTS





Community Engagement Process

For a district located in the middle of an area with massive employment growth, the district, like many districts, had not expanded their career technical educational capacity. The student enrollment was growing every year, and the district's five high schools were already at capacity or above. They knew by 2017, their district would require space for approximately 3,000 new high school students. In fact, just a few years before, career and technical programs were titled "Vocational education." (This historically translated to practicing your skills in a pre-engineered metal building without A/C and with equipment that was 10-20 years older than the real world industries were using.)

The District Leadership worked for months to understand, research, and program what a new high school dedicated to a Career and Technical education could become.

The community demographics surrounding the district confirmed the need for such an institution:

- + Racial mix: 65 % minority
- + Socio-Economics: 72% live at a poverty level

The community's family culture valued hard work, but a college-level education seemed to be impossible financially. Therefore, acquiring skilled, technical, and/or workforce education was highly valuable. The District already offered a limited variety of these programs, but much expansion of the courses was required and a serious effort needed to relate these with the real world of knowledge, skills, and up to date equipment, industrial mentorship assistance, and expanded support from industry and business.

- + The district would need by 2017 a 1,500 to 1,700 student campus to relieve the overcrowding.
- + Approximately 30-35 acres would be needed.

The concept was to shift 300 to 400 students from each High School in the District.



Community Engagement Process

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Students who changed campuses would still be a member of that High School Campus for test scores, athletics, music and special core subjects, but report to the New High School. The District's Vision had clearly come to a position to understand and respond to the following challenges:

- The pressures of the future student + enrollment growth.
- The community's desire for more + relevant Career, Technical, and Workforce education opportunities.

- The petro-chemical industry, commercial construction and business sector each had an absolute need for serious improvement in qualified, educated employees prepared to contribute to the world of work.
- The parallel changes required in the +educational paradigm needed for a project-based, interdisciplinary, learning environment.
- The Vision implied these Concepts + and Goals, which, in turn, asked

"How do we design a Career and Technical High School that will engage, excite, and energize the 21st Century student?"

SHIDE DATOLINA

GENOA-RED BLUFF RD.

TECHNICAL

SUSTAINABLE

IGH SCHOO

STAFF PARKING (156 SPACES) BUS DROP AND STAGING (25)

SERVICE YARD

NEW TRANSPORTATI

ACADEMY

SERVICE DRIVI

SERVICE YARD

LOADING DOCK

AND POND

DETENTION

WALKING PATH

GRAYSON RD.

The Educational Environment had + to relate to students. That is, it had to be a "Student- Centered" not a "Teacher-Centered" design concept.

The leadership expectations were to create a new educational environment and new programs that prepared students with relevant skills and knowledge.

DETENTION

CHILD CARE ALTERNATE

AFTER HOURS ENTRY

COSMETOLOGY PARKING (12)

MAIN ENTRY

STUDENT / VISITOR

NORTH

Æ

PARKING (250 SPACES)



Community Engagement Process

Common ground needed to be established with students, parents, community leaders, local community colleges, businesses and industry leaders. Common ground was well established through many individual meetings, group workshops, community "Town Hall" meetings, student collaboration groups, and Visioning workshops with Educators and Instructors. All these successful efforts to communicate at all levels informed district leadership as to scope, schedule and possible cost parameters, including site requirements.

The comprehensive course programs were grouped into six Academies, each appropriate for a student's chosen Career Path, including the Technology and Design criteria. Each course selection was developed to respond to the work opportunities and vacancies throughout South East Texas and student interest surveys.

Academies:

- 1. Agriculture
- 2. Business and Human Services
- 3. Health Services
- 4. Manufacturing/ Construction
- 5. Technology and Engineering
- 6. Transportation and Shipping

The new proposed High School's scope and design was conceptually developed and programmed for inclusion in a District-Wide Bond Referendum. After months of reaching out to all of the stakeholders, the District's Leadership was confident of District-Wide, Grass Roots support. Communication had actually occurred.

The Referendum was passed with a 73% approval rating (and one of the highest in Texas), and enriched the whole process.

With a successful Bond Referendum, work began on specific project programming, conceptual design, and site selection for the New Career and Technical High School. The Design Process Phases were established to be:

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- A comprehensive planning workshop was organized which included, District Leadership to discuss and decide solutions to Critical Issues regarding political, community, educational models, site selection, budget, authority pathways, Educational Specs, and any issues in need of addressing at the District Highest Management level.
- A Design Committee was created to guide the design process throughout the next two years. The committee involved representatives of all stake holders impacted by the new facility.
- The Design Committee Workshops were scheduled to develop the Vision and Principles of the New Design.

Guiding Principles of the Design Committee:

Be inspirational in color, texture, natural light, finishes, and celebrating student achievement.

Support and express Community Values, Culture and History.

Create a Learning Environment which engages students, promotes creativity and critical thinking.

Design for safety and security.

Encourage exploration and curiosity throughout the campus.

Make the high school a part of the community's vitality and energy.

Intentionally design for flexibility and change, allowing opportunities for small group collaboration, large group collaboration, school-wide and community groups.

Plan for the Future





Educational Environment

The Pasadena Independent School District is situated in Southeast Harris County and part of the greater Houston area. It is significant that it is located along the Houston Ship Channel, home of the largest complex of petrochemical refineries and energy-service businesses in the nation, if not the world.

The communities of the School District are located just north of the NASA/ Johnson Space Center and east of the Houston Medical Center, the world's largest concentration of Healthcare and Research Institutions.

In 2010, the District's Leadership was experiencing some major economic, educational, and student enrollment challenges. Because of the explosion in the growth of the South Texas oil fields, construction in the commercial sector, petro-chemical industry expansion and residential sectors began to expand. Houston quickly found many of the required skilled refinery workers, and construction craftsmen were not available as in the past. And those who stayed or had recently arrived had all been employed.

Industry announced over 10 billion dollars of plant expansions along the Gulf Coast. Construction job openings were exploding, but could not be filled unless the educational system could increase qualified program offerings such as welding, instrumentation, computer science, construction skills, pipefitting, etc. (many of these skilled workers were also moving to South Texas to work in the oil fields).



Educational Environment

Understanding these priorities state-wide, the State Legislature changed its funding formulas to give significantly more support to career, technical, and workforce programs throughout Texas.

The district had a unique opportunity to provide a student-centered learning environment in which every student is a worker, and every teacher a facilitator. Therefore, there was a need to apply all of the knowledge that has been completed on 21st century learners in order to create spaces that allow the student to use their theoretical knowledge to solve real wold problems.





Physical Environment

Through sustainable concepts, flexible and multi-use environments, and application of technology to support and enhance learning, The Dr. Kirk Lewis Career and Technical High School successfully connects education with the diverse professional needs of the community.

The 253,100 square foot facility sits on a 27 acre site located adjacent to a well-traveled toll way and establishes the school as a prominent landmark for the local area. Massing and materials create an aesthetic that does not mimic a traditional learning environment but one of a professional atmosphere. Constructed of curtain wall glazing, concrete tilt up panels, metal siding, and exposed angled steel columns, it pays homage to the local professions and industries in the Pasadena area. The monumental entry immediately lets one know that this is much more than a school.





Physical Environment SUSTAINABILITY CONCEPTS

The outdoor sustainability park immediately demonstrates a commitment to LEED principles and sustainable concepts. The horizontal axis wind turbine, vertical axis wind turbine, photovoltaic array and interactive analemmatic sundial not only provide educational opportunities that demonstrate renewable energy technologies, but are functional components that reduce off-site electrical demands. The sustainable concepts continue through building orientation that maximizes north glazing, the best exposure for day lighting strategies in this geographical area. Perforated metal sunscreens protect other exposures and offer diffused light while maintaining visibility and connection with the outdoors. Sustainable exterior materials include insulated low-e glazing, metal panels, rubbed concrete tilt up walls, and Cool roofing to

reduce the heat island effect. Additionally, responsible management of storm water is an important component. Runoff from the roof is collected in a cistern for irrigation at planting beds used by the horticulture and turf management programs. The required storm water retention ponds serve a dual purpose to limit the volume of water released into the local watershed and provide sports fields during the areas predominant dry weather.

Interior building materials were selected with sustainability, economy, long life and low maintenance in mind. Sustainable concepts incorporate low VOC finishes, no wax LVT and porcelain flooring, and wood ceilings at specialty areas for aesthetic and acoustical benefits. Clerestory windows in common areas combined with natural lighting in virtually every teaching space enrich productive learning environments while reducing the need for artificial lighting. Lighting sensors with energy efficient and LED light fixtures, and an efficient HVAC system that is monitored at a central district location through direct digital control (DDC) also assist in maintaining efficiencies.

Sustainable concepts are further expanded into promoting healthy living. A fitness center consisting of two aerobics rooms and a circuit and weight training room open to an exterior fitness trail with exercise stations. Programs not only provide students a healthy workout regiment, but are reinforced with other school programs that promote health and sustainable diets for lifelong fitness.

11



Physical Environment FLEXIBLE TECHNOLOGY, MULTI-PURPOSE + COLLABORATIVE SPACES

The facility can adapt to changing technology and use through various means. While the facility has a backbone of technology wiring dispersed from various MDF and IDF rooms via open cable trays, there is also a wireless overlay throughout the entire facility. This system is integrated with the district network as well as with the facility technology systems and programs and even farther with individual faculty and student learning devices. This allows faculty member to visually display information and videos about their programs and events on any one of the 40 informational monitors throughout the corridors and collaborative areas, through short throw projectors within classroom, or on the large 16 screen video display walls at the entry Lobby and Dining area. The technology additionally allows areas to be linked together so that presentations and

video demonstrations can expand into common adjacent areas.

During the design process it became apparent that the one reoccurring theme was change. The building had to provide flexible spaces to meet the ever-changing needs of the Academy Programs. Also, to meet the realistic parameters of the budget, non-essential areas needed to be reduced. Interior areas were designed with relevance to adjacent areas connectivity, and flexibility in mind so they promote a continual flow of inspiration and creativity between the disciplines.

Since the building did not have a formal auditorium, other concepts were introduced as there was still the need to accommodate large groups. The main lobby was designed to accommodate larger groups and includes a 16 screen video wall for presentation. If additional space is necessary an upward acting partition can expand the space into the Conference center. If there is a need for even greater space another upward acting partition can be raised to incorporate the teaching theater. The proximity to the culinary arts kitchens their associated meeting spaces were also intentional. Through the use of operable glass partitions, the culinary program can serve groups as intimate as 20, but can also expand into the lobby for events that seat over 450. With the collaborative integration of culinary for food, hospitality for service, marketing for event programs and menus, and technology for programs the school has continually hosted large and small groups within the school, the district, and the greater community.



Physical Environment FLEXIBLE TECHNOLOGY, MULTI-PURPOSE + COLLABORATIVE SPACES

The main dining hall has also been designed to accommodate larger groups. While functioning as the main dining area to serve up to 450 students at a time, it also and includes a 16 screen video wall for presentation. The area further expands into the interior and exterior amphitheaters not only expanding the space, but further linking the interior and exterior building environments.

Flexible spaces are incorporated in many other areas of the building whether it is several cosmetology classrooms that can be transformed into a fashion runway, aerobics rooms that can open to double in size, or circulation areas that function as collaborative spaces for small intimate groups or larger classes to study. The collaborative areas further provide nontraditional teaching spaces adjacent to the classrooms that can be utilized by teachers and students.

The reference center expands the notion of Library. It is a space that goes beyond housing traditional resources. While there continue to be published reference and reading materials, most resources can be accessed electronically through the student's devices. Conference and collaborative areas with full marker walls provide flexible platforms. The coffee bar run by the Culinary arts program is not only a collaborative extension of program space, but promotes the research center as a destination.

Classrooms were constructed to advance the ideas of flexibility. With a short throw projector display on a full wall marker surface with magnetic primer, the traditional teaching wall becomes an interactive and multi-media surface.



Physical Environment FLEXIBLE TECHNOLOGY, MULTI-PURPOSE + COLLABORATIVE SPACES

Another full wall is covered with tackable surface to promote the display of teaching materials and student work. They are enhanced a healthy environment that provides fresh conditioned air, natural light in every classroom, and acoustically sensitive spaces.

The importance of furnishings, fixtures and equipment were not underestimated. The District contracted the architectural team to coordinate furnishings that enhance and promote the design concepts as well as comply with established budgets. The furniture had to be flexible, adaptable, and able to incorporate technology. Working with furniture vendors; flip top tables, stackable chairs, soft lounge seating, lounge seating with tablet arms, study tables, and powered tables to plug-in and charge were reviewed and critiqued. Final selections were easily reconfigurable and were specific to their appropriate spaces. The furnishings package was delivered under budget which allowed savings to be used to supplement needed school equipment. Finally, it was important to get the teacher out of the classroom. Once individual classrooms were not assigned to an instructor, scheduling could be more flexible and classed could be utilized every period. Teacher offices were created not only to provide the teacher with a personal space, but create a collaborative environment where instructors could coordinate lesson plans as well as provide student and small group access to teachers during off periods.







Building as a Teacher

The facility reinforces the principles of design through the concept of 'Building as Teacher'. Multiple large scale graphics, developed with the design committee, clearly brand the major program spaces and academies. They are constructed of the same durable materials that the corridor wainscot is composed of. These are reinforced with various accent colors that identify the areas. The graphics assist in quickly referencing areas of interest, way finding, or providing inspiration through the two story Lobby graphic with the schools motto:

> "Empowering students to successfully transition to the global community through unique educational experiences."

Being a career and technical school, it was important for systems to be displayed so one can see and visualize how the building operates. While the sustainability farm introduces the concept, it is an important component of the interior design. All of the MDF and IDF rooms were constructed with storefront glazing. This visually celebrates the technology systems that are used in lieu of the traditional approach of hiding these areas. Other elements include visibility into the air handling rooms, a glass enclosed elevator, and the use partially exposed ceilings to display HVAC, plumbing, electrical, structural, and technologies that further explain the operating systems of the building. Students who participate in the manufacturing and construction, and technology and engineering programs have visible, real world examples to reference the components and function of their trade.



15



Safety + Security

Since integration of the school and the community was paramount to the success of the programs, the traditional relationship between school and the public had to be redefined. Instead of isolating the school from external influences, the facility needed to be intimately integrated and connected with the local area. Fostering a safe and secure environment was essential, but the environment still needed to remain transparent and welcome connection to the community. These goals at first appear contradictory, but were realized through multiple physical and technical systems that provided a secure but non-intrusive environment.

Visibility and transparency into virtually every teaching space provides passive security and oversight into the spaces, but also showcases the programs and the student's achievements.

Traditional methods of security consisting of a welcoming but secure entrance vestibule where you must be buzzed into the building were combined with a security office, door hardware, camera systems, P/A systems, security alarms, and HVAC and emergency equipment overrides. It was however, nontraditional approaches that offered an additional level of safety. Programs with direct public access have a video/intercom system on the doors. When a client arrives, the local program reception area has the ability to see the individual on their monitor and converse with them prior to electronically and remotely allowing access into the building.



The school now serves as a community location for events in which students also participate actively.

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HILT:

Results of the Process + Project

The concept for the facility had its foundation implemented over 20 years ago when educators realized that instruction had to change to meet the needs of both students and industry. Change required students to gain skills and abilities to think critically, solve complex problems, develop better communication, and collaboratively work with others to drive advancements and become a valued asset in the skilled workforce. This concept continued to be developed by the Pasadena Independent School District and grew into the long range goal to create a facility that offered students a real world environment with hands on, student centered learning to address the needs of student and local community. This focus created a flexible, collaborative, and interactive learning environment that enhanced the development of skills and provide industry certifications that are required for careers in the local community as defined by business partners and labor market statistics, while at the same time providing a platform to pursue higher educational goals. The programs offered in harmony with the "building as teacher" inspires students to successfully engage and pursue their chosen career while following their passion.

Through research, best practice tours, and current industry trends the district administration, design committee, local business partners, community volunteers, stakeholders, students, and the design consultants participated in a collaborative visioning and programming effort. This identified six meaningful and relevant career pathways to address the current and future needs of the area. They were formalized into the Academies of Agriculture, Business & Human Services, Manufacturing and Construction, Health Services, Technology & Engineering, and Transportation & Shipping.







Results of the Process + Project

These were then supplemented with school administration, district career & technical administration, counselors and college & career preparedness staff. It was critical that the core and CTE educational requirements were integrated with community and business concerns to promote relevant learning that engages each individual student. When this holistic curriculum and physical environment are integrated, it becomes a safe learning atmosphere and fosters a climate where student can engage and take risks.

The facility addressed these needs through adjacencies and flexibility of program spaces. The physical environment encouraging collaboration of teacher, student and program planning engages students in their areas of interest and promotes individual and group learning opportunities.



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