

(re) SETTING the COMPASS:

Journey of Discovery Leads to New Gloria Marshall Elementary School

Pivotal moments are inevitable in the course of every journey, occurring when conditions compel us to assess the decisions we've made and the plan we've followed to date. Such reflection is appropriate since those who do not pause to consider alternatives risk overlooking a better way ahead. In the realm of public education, sustaining a trajectory of excellence demands that we not rely on past successes alone. Instead, we must also look for signs that point to **pathways for improvement** beyond our current experience or comprehension. School leaders must intuit which strategies to follow and reset the compass accordingly, in pursuit of a preferred vision of the future.

The above is precisely what happened when Spring ISD, Texas, under the leadership of Superintendent Dr. Ralph Draper, worked with the design team in the planning and design of Gloria Marshall Elementary School.



Planning sessions

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Spring ISD, in Spring, Texas, is a suburban school district of approximately 36,000 students located to the north of Houston. Over the past decade, enrollment has increased steadily at a rate of approximately 2-3% each year. Spring ISD is a traditional, affluent area which is now transitioning to a lower income and an unusually evenly dispersed and diverse population. As the city of Houston began running bus lines to Spring, apartment complexes and lower income housing began to dominate the growth pattern and the population has shifted accordingly. Faced with an increasing percentage of low-income families and an even split of Hispanic, African American, and Anglo students, maintaining their historical reputation for high achievement is an increasingly challenging proposition.



Gloria Marshall was slated to become the 26th elementary school in Spring ISD, and the final building project to be funded as part of a 2007 bond referendum. It also was scheduled to become the 5th elementary school in the district based on a prototype design that was adopted in prior years. This prototype design was first executed by another Texas school district in the 1990s, and its initial attraction for Spring ISD was the low cost of construction. The prototype design also had proven to be more energy efficient than other schools in the area, requiring approximately 8kbtu/sf less energy than average.

While the elementary school prototype in Spring ISD might be described as “efficient,” unfortunately, “austere” would also apply. It is a largely windowless school (only 15 of 42 classrooms have windows), an approach that is nearly unheard of anymore in school planning, particularly at the elementary level.



Previous prototype elementary school floorplan. Only 15 out of 42 classrooms had windows for views, not daylighting

INSPIRATION:

The Confluence of Opportunity

With Gloria Marshall ES, Spring ISD wondered, “For the same cost as the prototype design, could we significantly raise the bar?” A number of factors weighed heavily upon the district’s sentiment to increase the “return” on its capital investment.

Project-Based Learning

Taking place concurrently with the beginning of the planning process for Gloria Marshall Elementary School was the early implementation of Project-Based Learning in Spring ISD. Given the positive results and feedback from teachers applying PBL in their classes, commitment to this pedagogy spread quickly throughout the district. During this time, Spring ISD coined a term for its particular brand of PBL, “**Discovery Approach Learning**”, and decided Gloria Marshall would be designed to support the PBL curriculum. This was one of several “**pivotal moments**” in the planning process: asserting that a **collaborative, hands-on and experiential approach to learning required an equally responsive and inspiring setting**. Clearly, the prototype design would require major reconsideration.

Energy/Stewardship

Despite better-than-average energy performance already being realized by the prototype design, rising utility costs demanded further design improvement in the conservation of natural resources. Specifically, Spring ISD sought **another 25 percent reduction in the Energy Use Intensity** at Gloria Marshall ES. Accordingly, an energy budget of 49 kbtu/sf was established, further rendering the previous design prototype obsolete.

Fun/Hands-On Learning Experience

Finally, through the planning and design of Gloria Marshall ES, Spring ISD saw the opportunity to create a truly engaging, one-of-a-kind facility in which a **sense of discovery would inform every aspect of the learning environment**. Given the district’s commitment to PBL and resource conservation, the planning team worked with the district to easily identify a number of learning experiences and teaching tools to incorporate in the design of the new elementary school.

The inspiration for the new Gloria Marshall ES is captured in the overlap and optimization of the above sources of influence. Collectively, they formed the basis for months of rich dialogue with district representatives in planning Gloria Marshall ES. They also signified the end of the former prototype in Spring ISD.

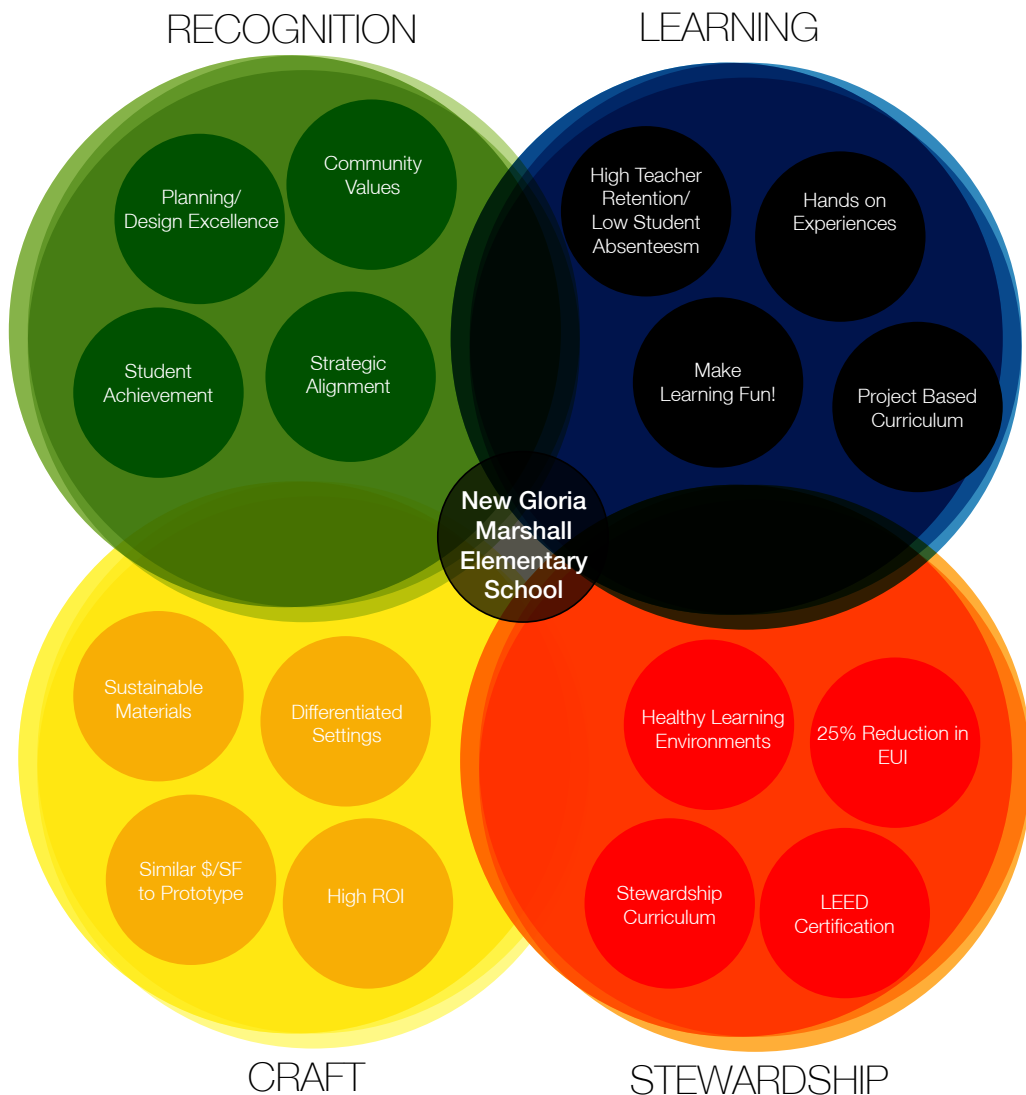
INNOVATION AT THE INTERSECTION:

A Collaborative Approach to Planning

In *The Medici Effect*, Frans Johansson makes the case that extraordinary innovation occurs at the intersection of different disciplines and fields of study. In a similar way, the success of the Gloria Marshall ES planning process—and the design that followed—is attributable to a **visioning process in which a steering committee of divergent-thinking professionals worked together with common purpose and shared enthusiasm on behalf of the school community.**

Led by the design team, Steering Committee representatives from Curriculum and Instruction, and Facilities and Operations began by establishing a framework of three guiding Project Objectives—**Learning, Stewardship, and Craft.** A fourth aspiration, **Recognition**, was also discussed as a means to keep the school community focused and informed of the district’s intention to create a “best in class” facility from the integrated perspective of academic achievement, operational cost and design excellence.

These organizing ideas were graphically developed and referred to as “The Butterfly.” The Butterfly offered a pictorial representation of the project vision, in which each Objective was developed to include specific features and/or measurements of a successful project. The overlapping nature of the butterfly “wings” reinforces the integrated nature of the Project Objectives. In other words, a successfully planned project would result in a design in which the Objectives are seamlessly woven and experienced holistically.



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This simple idea helped guide the balance of the planning process. As the planning process continued, the Project Objectives and initial design implications put forth by the steering committee were further—and fully—developed through discussions with district teachers, students, parents, board members and community representatives. The district’s vision for a truly new learning experience for elementary students in Spring ISD was now complete.

Gloria Marshall Elementary School received special recognition from the Gallup organization for the unusually high “level of student engagement and hope” found when they surveyed GMES students as part of their survey of thousands of students in schools across the country.

“We were notified by Gallup today that Gloria Marshall Elementary School has been named a Gallup High Hope School!”

Dr. Dalane Bouillion, Associate Superintendent of Curriculum and Instructional Services



“We are not only saving the district money – close to 50 percent when compared with our older building prototypes – but have created a dynamic building that will be used daily as an instrument of learning.”

Jeff Windsor, Director of Construction and Energy

“This project was slated to be a re-site project, but the designers recognized the economic challenges facing our District and proposed an innovative design solution that could save our district money on our maintenance and operations expenses for years to come. “

Dr. Ralph Draper, Ed.D Superintendent of Schools



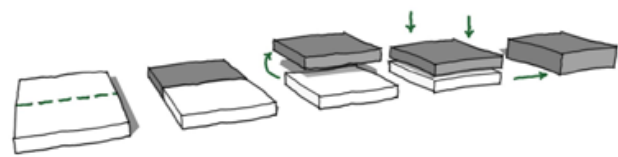
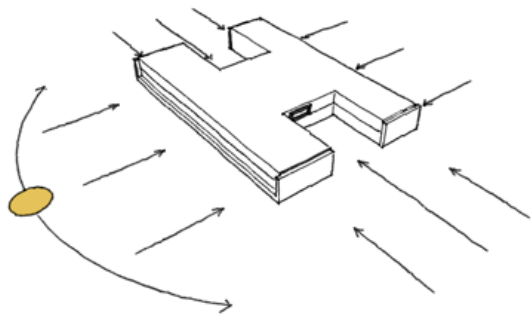
BRINGING IT ALL TOGETHER:

A vision fully realized

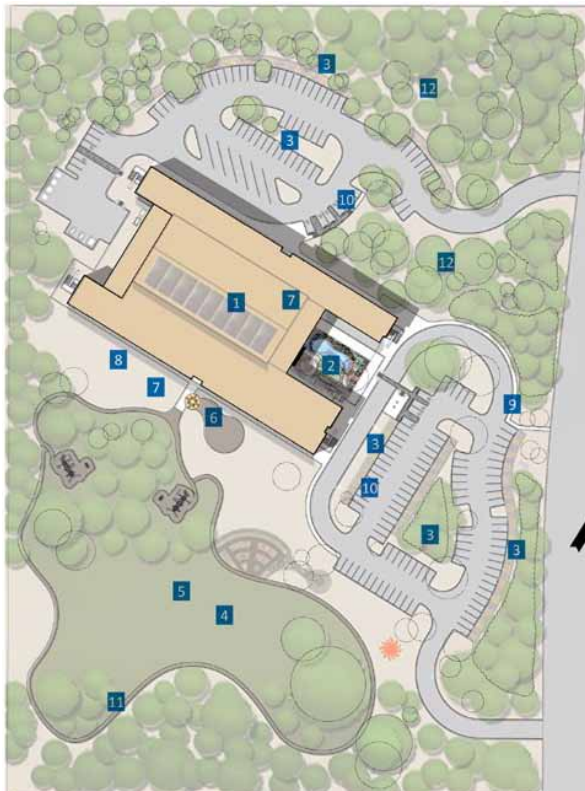
Program/Design Concept

The program for Gloria Marshall ES is necessarily influenced by that used in Spring ISD for recent elementary schools completed as a prototype design. Accordingly, Gloria Marshall ES accommodates 800 students in grades PK-5, and does so using the same number of formal instructional spaces within approximately 142gsf/pupil (copy of program attached). But that is where the similarities end. Instead, Gloria Marshall ES is conceived such that every space is a learning space, and learning is not confined to the boundaries of the classroom.

As a departure from the prototype, the design concept for Gloria Marshall ES began with a thorough, comparative analysis of building volume, surface area, footprint and roof area. Further study to optimize solar orientation and natural daylighting was conducted to create the most economical and site-responsive building form. This helped to avoid unnecessary costs associated with site clearing and construction of excessive building envelope.



Research was conducted to look at surface area, building footprint, roof area, and natural light.



- 1 White roof
- 2 Eco Pond
- 3 Bio Swales
- 4 Geo-Thermal Field
- 5 Wind Turbine
- 6 Sun Dial
- 7 Photovoltaic Panels
- 8 Rainwater Collection
- 9 Bicycle Paths
- 10 Hybrid Car Parking
- 11 Jogging Trail
- 12 Xeriscaping

The final site plan showing the building shape and orientation.

BRINGING IT ALL TOGETHER:

A vision fully realized

The final design is a two-story elementary school in which every instructional space is either north- or south-facing, to maximize daylighting and eliminate glare. Site vegetation is preserved to the maximum extent possible, and several mature trees were incorporated in the landscape design of the outdoor classroom. Where trees could not be preserved, they were salvaged, then cut, dried, and reinstalled as cladding material for interior and exterior surfaces of the school.

Upon entering the central commons space students are embraced with an environment that **instantly peaks their curiosity**, enticing them to begin a journey of discovery. The mixing of natural materials and textures with vibrant colors and playful gestures set the tone for the student experience. Along the journey students are given a variety of opportunities to **see, touch, and feel**, and engage in a variety of learning activities that provoke their interest and promote engagement through hands-on learning.

The inter-connectivity of spaces from first to second floor, along with the variety of scale of different places encountered along the journey, provide interest and variety, keeping the school constantly feeling new and fresh as you experience it from different vantage points. The interior architecture of this school is constantly framing views, to create unexpected connections back to nature and to other interior spaces highlighting learning activities. The entire building is **saturated with natural light** affecting the human spirit, and creating an interior that changes with time of day.



BRINGING IT ALL TOGETHER:

A vision fully realized

Sustainable Features

Gloria Marshall ES is truly a **“three-dimensional textbook”** in which students are engaged in a unique learning experience from the moment they enter the site. Most of the environmentally efficient features also have corresponding educational elements. The main entrance to the school passes the outdoor classroom, eco-pond, rainwater cistern and landscaped areas of indigenous plants. The canopy features a recycled hardwood ceiling, a material that is repeated on a protruding, second-floor resource room.



School parking and drive areas are carefully introduced to retain as much of the natural woodlands as possible, and all paved areas are lined with bio-swales to filter runoff before it enters the storm water system. The collection of rainwater in a 20,000-gallon Wunderground tank, provides the school's grey water use and further provides the irrigation free landscaping. Other site features include: bicycle and jogging trails; hybrid car parking; extensive xeriscaping; and wind turbine, photovoltaic and sun dial demonstration areas.





Eco pond and native landscaping



Water collection cistern/Erosion trough.





Solar Panel with interactive control box



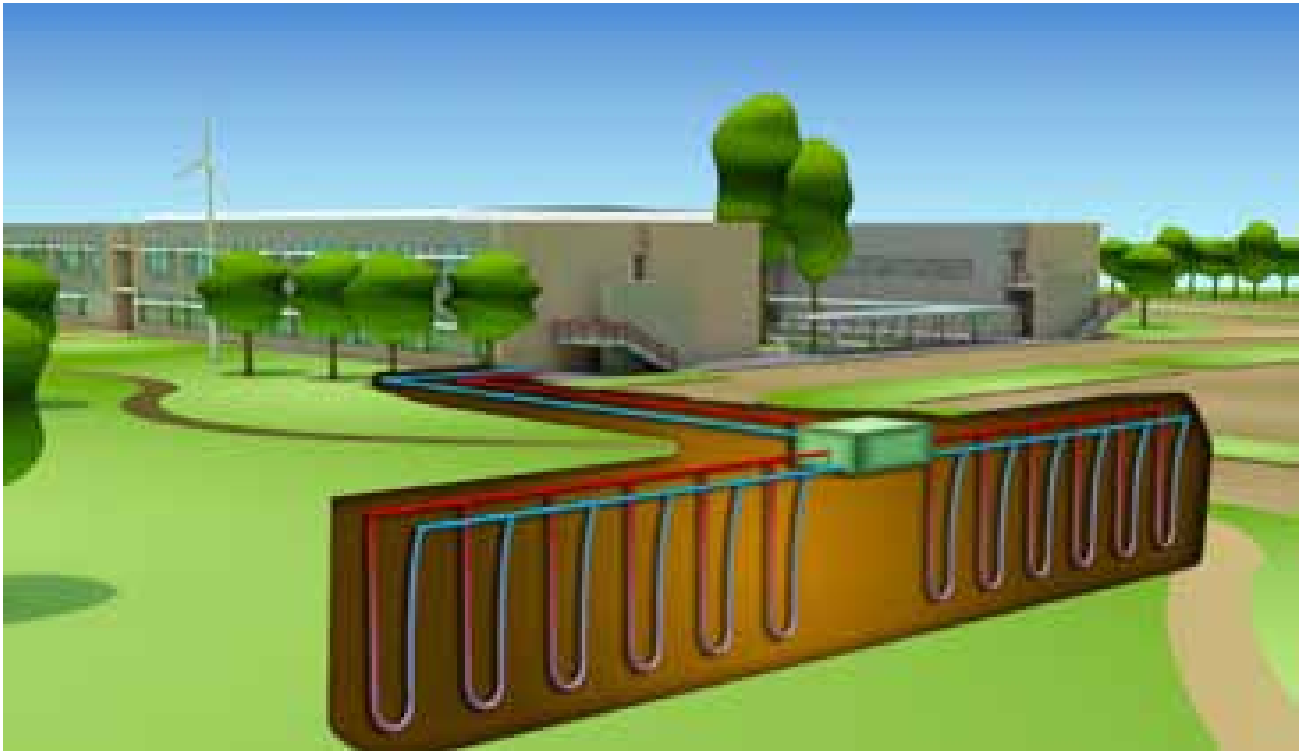
Building energy usage on display through interactive station



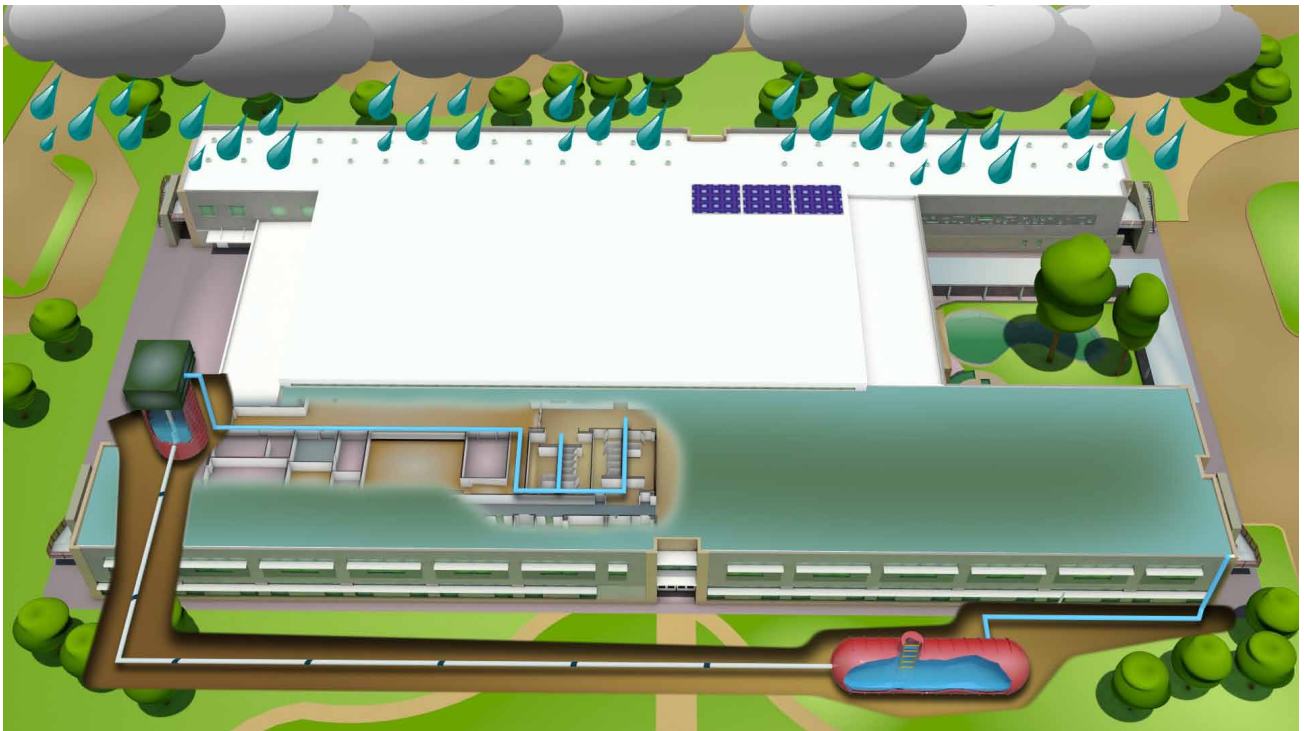
Students can see water being piped through the building



Wind turbine



Geothermal HVAC



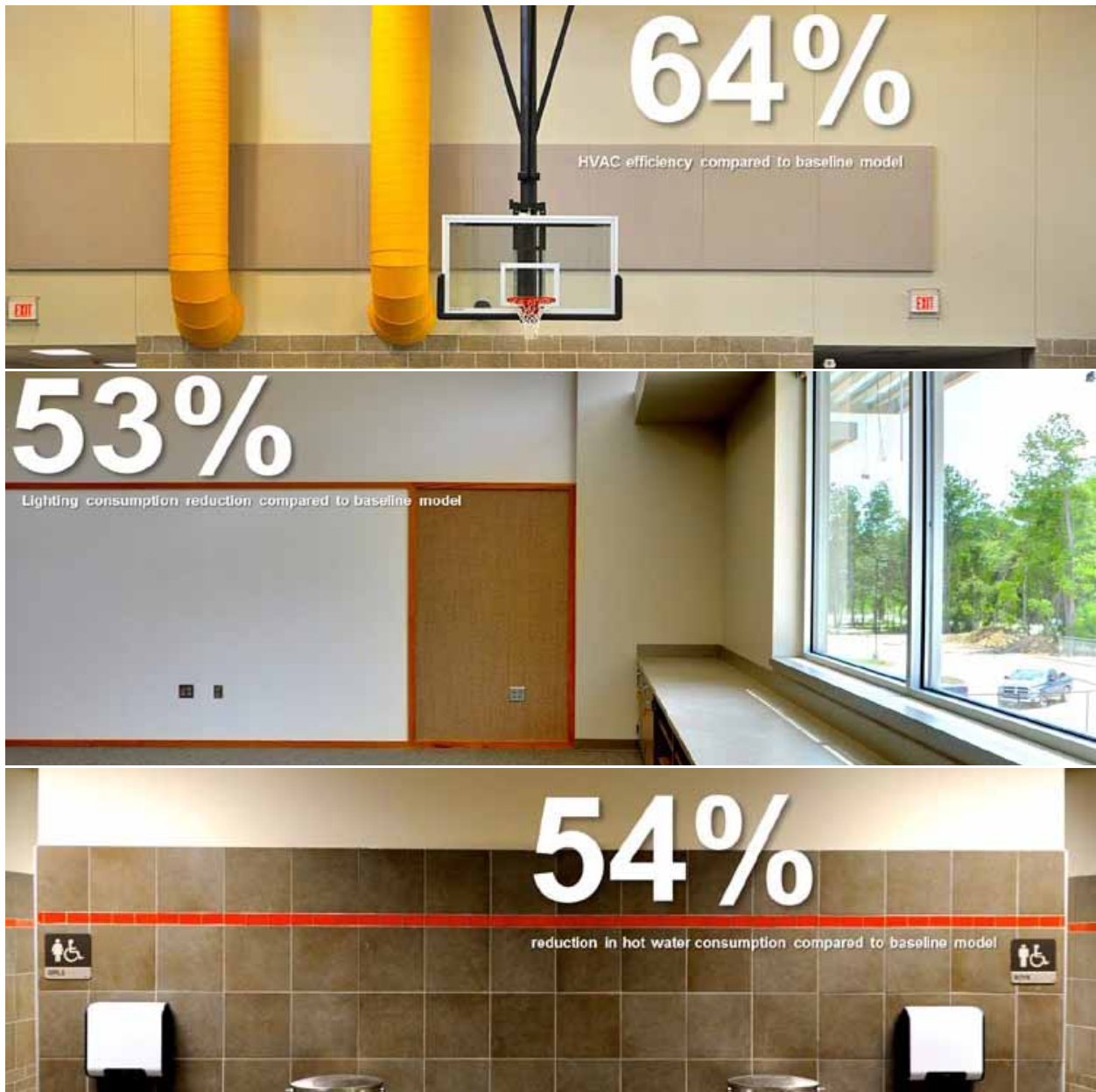
Rainwater harvesting

EVIDENCE

A vision fully realized

The success of Gloria Marshall ES was made possible by the wisdom and foresight of Spring ISD leaders, who paused long enough to recalibrate the values and priorities of the district and ensure these concerns were reflected in the design of this new school. The district's shift to project-based pedagogy, coupled with the resolve to achieve exemplary operational performance, resulted in an instructionally innovative and sustainable model for contemporary elementary learning. The evidence of this is abundant.

From the standpoint of energy reduction, Gloria Marshall ES far exceeded the goal of a 25 percent reduction in energy use. After one year of operation and using actual utility consumption and cost data, Gloria Marshall ES is functioning at just 24 kbtu/sf - a 64 percent reduction from the baseline. Lighting power consumption has been reduced by 53% and hot water consumption has been reduced by 54%.



EVIDENCE

A vision fully realized

Spring ISD had also set a goal for Gloria Marshall ES to achieve a LEED-Silver certification from the U.S. Green Building Council. In December of 2011, Gloria Marshall became the first school in the Houston area to obtain LEED-Gold certification.

The district's emphasis on Discovery Approach Learning inspired a number of "teaching tools" the designers integrated into the school. Several are listed below and pictured on the following pages.

Solstice Windows:

Colored panes of glass that allow students to track the movement of reflected shapes across the floor as the sun moves across the sky.

Ball Bounce:

Hands-on experiment to measure the transfer of energy upon impact of bodies in motion.

Fahrenheit/Celsius Thermometer:

Hands-on device to compare relative temperatures, side-by-side.

Gravity Slide:

A hinged incline plane to measure acceleration due to gravity.

River Table:

Exterior trough with weir gates to create dams, and control flow and volume of water across a series of locks. Water discharged into eco-pond.





helix slides



tree house reading room from reclaimed wood collected onsite



interactive building systems display



gravity slide



ball drop



Celsius/Fahrenheit thermometer



project-based learning



project-based learning



green spaces surround the school



educational sundial



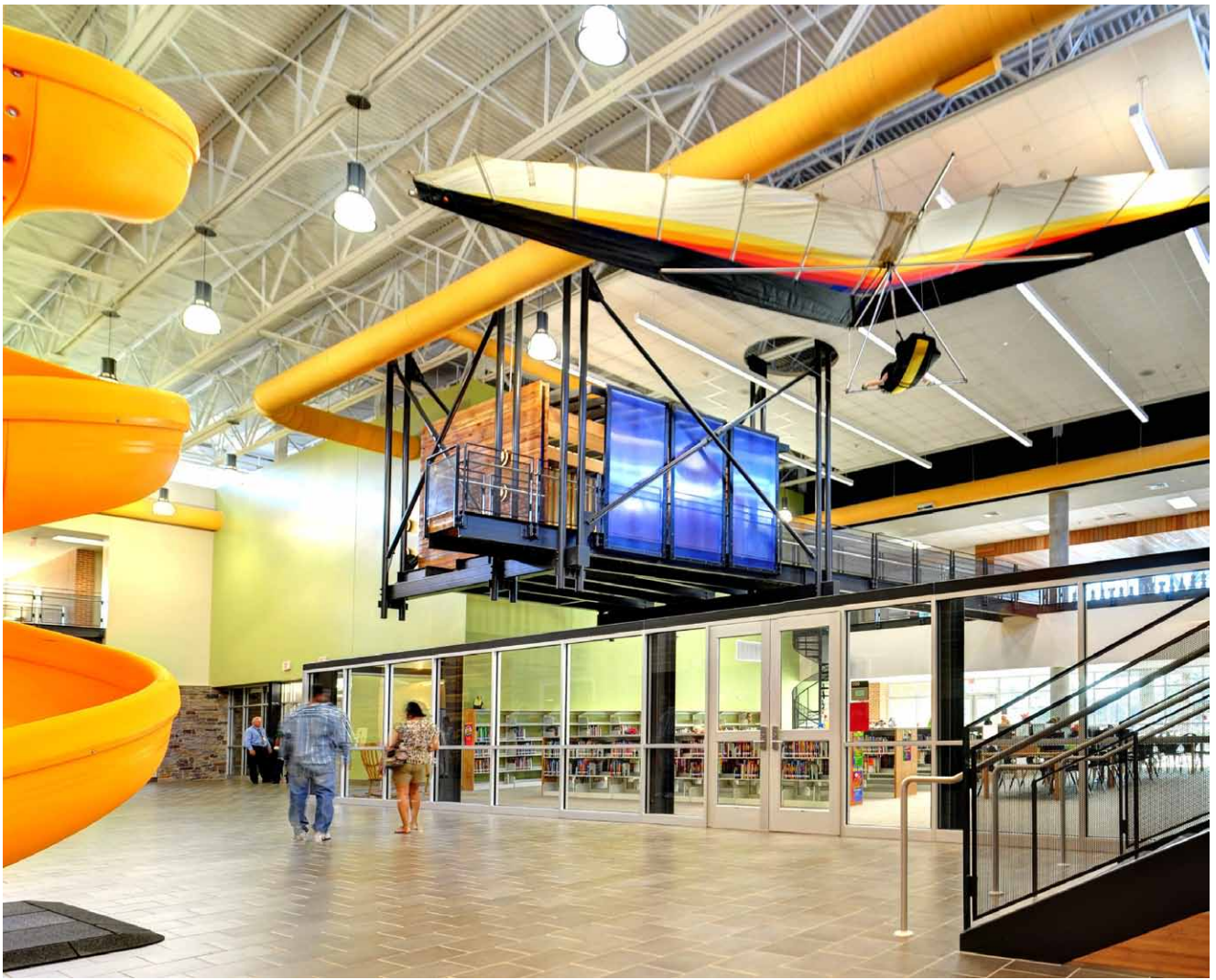
local materials



solstice windows



daylight harvesting



library interior



oversized elevator



all classrooms have daylight and views



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view of courtyard with eco pond



exterior views

