PUSHING THE ENVELOPE

MILDRED B. POOLE ELEMENTARY SCHOOL

The US Department of Defense is a massive organization. Overseeing the military departments of the Joints Chiefs of Staff as well as the Army, Navy, Air Force, Marines, and Coast Guard, the DoD employs over 3,000,000 employees across every time zone and in every climate.

A substantial number of these employees have young families; approximately 73,000 children of these military families attend a school operated by the US Department of Defense Education Activity (DoDEA). DoDEA is committed to “ensuring that all school-aged children of military families are provided a world-class education that prepares them for postsecondary education and/or career success and to be leading contributors in their communities as well as in our 21st century globalized society.”

Executive Summary

Mildred B. Poole Elementary, located at Fort Bragg near Fayettville, North Carolina, consolidates and replaces two outdated facilities, accommodating 625 students in grades pre-K to 5. The 109,106 SF building is organized with smaller- scale “learning studios” grouped into neighborhoods, with academic spaces to support all areas of the curriculum. The design incorporates 21st Century School concepts such as flexible learning spaces, technology immersion, & environments to support performance-based learning.

SCOPE & Budget

Size: 109,106 SF

Site: 28.5 acres

Students: 625

Grades: Pre-K to 5th

Budget: Confidential

School & Community Engagement

Located in the Linden Oaks military family housing complex, a large neighborhood with many activities available within a controlled perimeter just north of Ft. Bragg, Mildred B. Poole complements two other schools within the area. Stakeholders during the design process included the district superintendent, teachers, military families and students, installation representatives (DPW, facilities), DoDEA, and the school district representatives (DoDEA-Americas).

The design team worked within the **installation's exterior design guidelines** and program adjacency requirements to create a school which integrated with the neighborhood's built environment. The installation design guides required pitched roofs, which created a design challenge with the building's deep, irregular footprints. The team achieved a **successful compromise with a mix of pitched roofs and a low slope roof system.**

The school's **gym and multipurpose areas are shared with the neighborhood for community events**, and the design allows these areas to be secured separately from the rest of the school for after-hours use.

Educational Environment

DoDEA's mission is to **educate, engage, and empower** military-connected students to succeed in a dynamic world. DoDEA's vision is to promote excellence in education for **every student, every day, everywhere.**

These core values support DoDEA's mission & vision through student-centered education and a focus on **excellence, continuous improvement, diversity, individual potential, lifelong learning, shared responsibility, and trust.**

Ultimately, the design process yielded the following 21st Century Learning goals: to create flexible, adaptable facilities; to design facilities to serve as both teaching tools and teaching environments; to support differentiated learning, multiple modalities of instruction, and multidisciplinary teaching; and to encourage real-world skills development.

When the time came to put these goals into practice, Mildred B. Poole Elementary provided a welcome opportunity to generate a cutting-edge design. The school not only integrates best practices for the design of learning environments, but also leading-edge sustainable design strategies, both of which will serve DoDEA and its students well for many years to come.

21ST CENTURY LEARNING

During a recent meeting at the school, teachers participating in a panel discussion were asked, “How is the school was working with the curriculum?” Teachers were extremely positive about the ways in which the school facilitates a variety of teaching and learning modes. The teachers are already noticing **improvements in learning after only one semester of occupancy!**

The learning spaces are grouped into **neighborhoods.** Each neighborhood includes four learning studios, a central learning hub, a group learning room, a 1-to-1 space, and a teacher collaboration area. This configuration provides **flexibility for students** to self-select their workspaces and project strategies while teachers circulate through the space.

NEIGHBORHOOD #1

NEIGHBORHOOD #2

NEIGHBORHOOD #3

NEIGHBORHOOD #4

LEARNING HUB

LEARNING HUB

LEARNING HUB

LEARNING HUB

OUTDOOR LEARNING

SECONDARY ENTRY

SECONDARY ENTRY

OT/PT

HEALTH

COMPUTING CENTER

INFO CENTER

COMMONS

MULTIPURPOSE

MUSIC

SCHOOL SUPPLY

GYM

STAFF COLLAB

LOADING DOCK

ART

KITCHEN

MECH/ELEC

MAIN ENTRY

ADMINISTRATION

SPECIAL EDUC OFFICES / GUIDANCE CENTER

ART PATIO

BUILDING SERVICES

CIRCULATION

COMMON SHARED SPACES

EXPLORATORY LEARNING SPACES

GENERAL LEARNING SETTINGS

STUDENT SUPPORT AREAS

NATURE-INSPIRED **NEIGHBORHOODS**

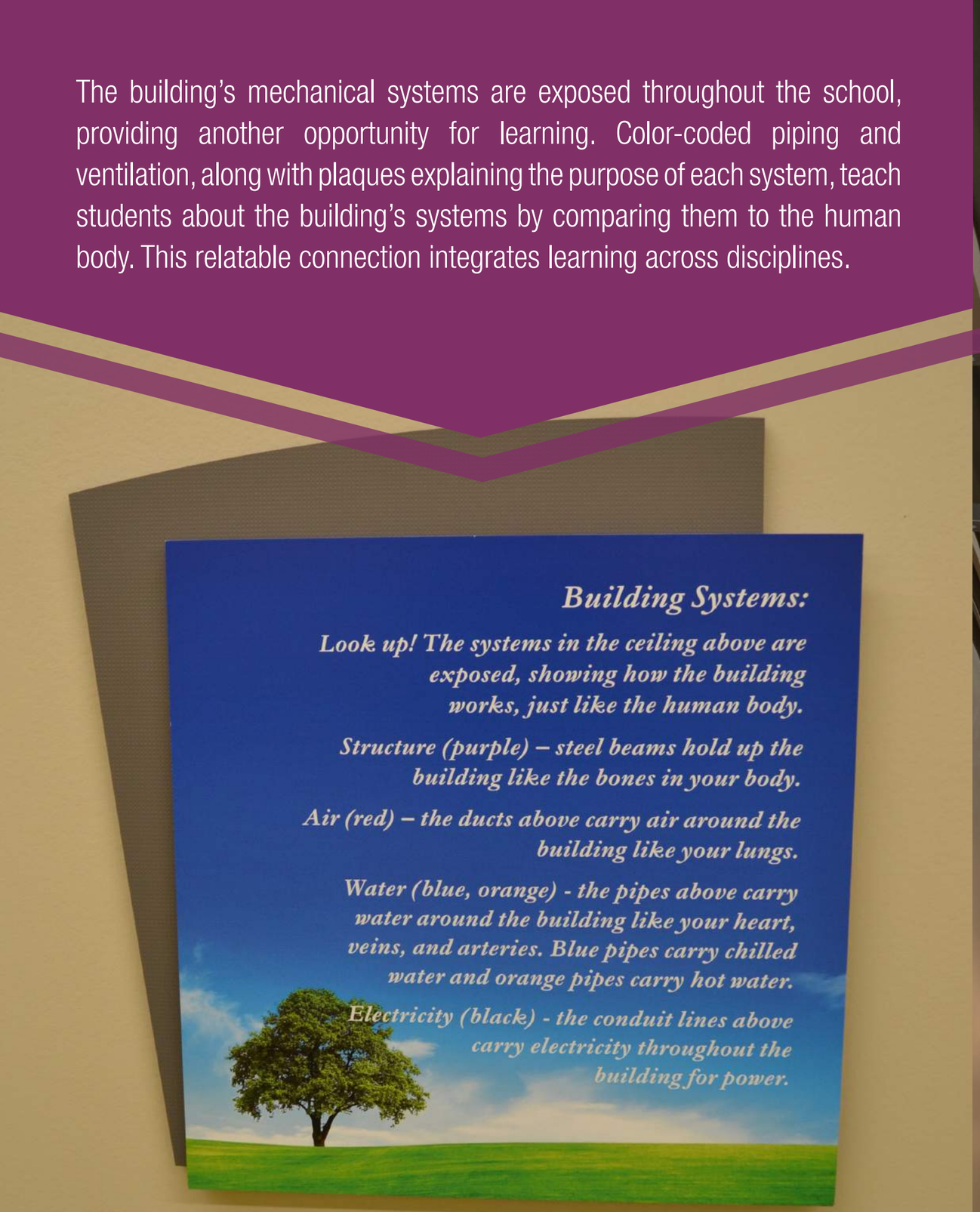
Within the neighborhoods, **operable glass partitions** allow the rooms to be subdivided easily, providing a degree of acoustical control while maintaining transparency. Operable partitions between each pair of studios have integrated marker board surfaces for instruction and collaboration.

The adaptable, open spaces help teachers to individualize instruction and tailor the curriculum to a variety of learning styles.

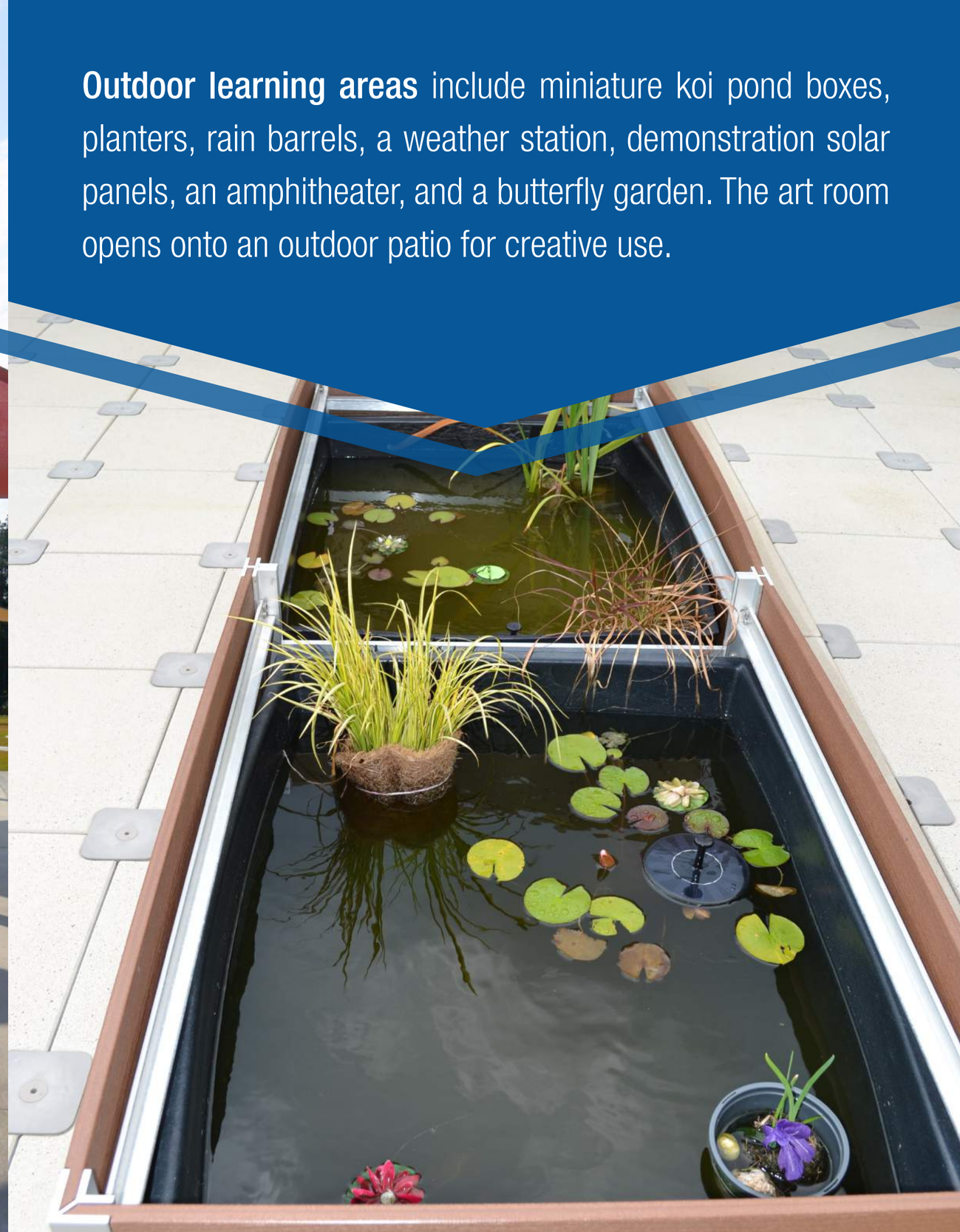
GROUP **LEARNING ROOMS**

OPEN **GATHERING SPACES**

The building's mechanical systems are exposed throughout the school, providing another opportunity for learning. Color-coded piping and ventilation, along with plaques explaining the purpose of each system, teach students about the building's systems by comparing them to the human body. This relatable connection integrates learning across disciplines.



Outdoor learning areas include miniature koi pond boxes, planters, rain barrels, a weather station, demonstration solar panels, an amphitheater, and a butterfly garden. The art room opens onto an outdoor patio for creative use.



Physical Environment

SUSTAINABLE DESIGN STRATEGIES

Sustainable design strategies create a healthier indoor environment, reduce operating costs, and minimize the school's environmental footprint.

The two-story design preserves green space on site, and the north-facing neighborhoods are filled with **diffuse natural light**. The high-performance insulating concrete form (ICF) walls clad with brick and stucco veneer **maximize thermal performance** while providing great **acoustical separation** from outdoor noise. The light-colored standing seam and modified bitumen low-slope roof **reduces the heat island effect**, and the full geothermal HVAC system **reduces energy use for heating and cooling.** LED lighting with occupancy/vacancy sensors further **reduces energy consumption.**

The interior environment is **designed for both wellness and a child-scale detailing. CO2 monitoring** for demand-controlled ventilation **boosts indoor air quality,** while materials such as rubber flooring, resilient carpet, reclaimed barn wood, and other **recycled materials** serve as **teaching tools** as well as lower-impact finishes. Wood ceilings features at the neighborhood entrances welcome students and families and celebrate the neighborhood connections.

The new school, while modern, reflects both the established scale & materials of the military housing community. Classic red and beige brick facades, pitched roofs, and covered walkways help to integrate the building in its neighborhood environment.

Inspired by the **natural wooded site**, the design incorporates references to the landscape through materials, wayfinding, and signage. Each neighborhood is named for a **native North Carolina tree** which is celebrated through signage and floor patterns, and assists with wayfinding. In the commons and information center, a large feature wall clad with **reclaimed North Carolina barn wood emphasizes recycling of materials**. Hopefully, this inspiration will in turn inspire the students to learn more about the surrounding environment.

An **energy dashboard** allows the students to see and understand how various factors contribute to building energy and water Seeing this cause and effect motivates the students to take part in conserving energy and water!

*graphic of dashboard for demonstration purposes only

The RESULTS

The students and teachers are using the spaces as intended, and the **qualitative metrics show greater teacher and student achievement and satisfaction** after Mildred B. Poole's first semester in operation.

FLEXIBILITY & ADAPTABILITY

The flexibility of the school's learning spaces allows for **maximum adaptability.** The school administrators, teachers and students can adapt not only to diverse learning styles and project needs, but also to fluctuations in the student population throughout the school year with a military population.

Teachers and administrators are confident that students who might be uneasy about transitioning to a new community will be **excited to learn in the modern, colorful space.**

“NET ZERO READY”

Predicted Energy Use Intensity (pEUI) of 29

After energy modeling, the design has a predicted Energy Use Intensity (pEUI) of 29. That figure not only **exceeds the AIA’s 2030 Commitment’s current targeted energy reduction goal** of 70% energy reduction above average energy use for a given building type, but it also comfortably puts the school in the range of “Net Zero Ready.”

In designing the school and incorporating holistic sustainable design strategies, the design team found ASHRAE’s Advanced Energy Design Guide to be an invaluable resource. The Guide delineates design strategies to achieve a 50% energy use reduction over ASHRAE Standards (specifically, the minimum requirements of Standard 90.1-2004), and included a wealth of information specific to K-12 school design regarding daylighting, glass selection, and other key factors.

SUCCESS!

Inspiring, engaging learning environment? Check.

High-performance, Net Zero-Ready building? Check.

Innovative curriculum, happier kids, better learning, substantial energy savings? Check, check, check, check.

With DoDEA constantly raising the bar for what schools can be and how they can perform, the future looks bright for the field of K-12 design, and for every student who has the opportunity to learn and grow in one of DoDEA's leading-edge learning environments.