CHEROKEE ELEMENTARY SCHOOL

SCOTTSDALE UNIFIED SCHOOL DISTRICT

PARADISE VALLEY, ARIZONA

EXECUTIVE SUMMARY

The replacement of Cherokee Elementary focused on retaining the positive culture and experiences present on campus, while bringing a Cherokee 2.0 experience online. The community went through a robust process that produced a design that focused on courtyards and gardens, with an amazing connection to the outdoors throughout campus. With a full 2005 Thomas school bus as the centerpiece and Arizona's first and only literary landmark, the project delivers joy and will inspire students for generations.

SCHOOL AND COMMUNITY RESEARCH AND ENGAGEMENT

The District and local Cherokee community was extremely committed to providing a collaborative and transparent process that would allow all stakeholders to come to consensus on the project qualities and priorities. The outcome was a community fully behind the project at it moved forward.

The design team underwent a deep set of research, both on curriculum and educational environment needs, but also into case study precedence, both building and plant adaptations, in dealing with Sonoran desert extreme climate. The solution is a perfect culmination of all stakeholder priorities, setting up the Cherokee community for a robust educational experience, and provides a strong community hub for decades to come.

EDUCATIONAL ENVIRONMENT DESIGN

Project based learning with a focus on outdoor connection, is the driving force of the campus and buildings design. The arrangement of learning clusters, that take advantage of a variety of indoor and outdoor breakout spaces, allows the staff to be flexible in how they deliver content and facilitate hands-on learning. The project affords spaces that provide a variety of opportunities for students to choose how they learn best. The project is adaptable and flexible not only in its spaces, but also in how it adapts to the surrounding climate, with the building itself operating as a thermostat of sorts.

PHYSICAL ENVIRONMENT DESIGN

Cherokee serves as a nurse plant, providing a safe and sheltering environment for students to flourish. The campus has 9 overhead garage doors, connected to the building's HVAC system, that allow for outdoor connection. This connection to nature doesn't just stop at windows and doors, but continues through material selections, wall graphics and physical spaces that align with curriculum.

KEY STATS

Grades Served:	PreK–5	Space per Student:	98 sq. ft.
Capacity of Students/ Occupants:	780	Cost per Student:	$35,447
Size of Site:	19.5 acres	Square Foot Cost:	$359
Gross Area of Building /Space:	77,000 gsf	Project Cost:	$27,648,876
		Occupation Date:	5/1/2021

RESULTS OF THE PROCESS AND PROJECT

The design concept and direction was careful to align with all stakeholders priorities. The project provided the district with a sustainable community asset for generations to come. The campus works beautifully as an incubator for hands-on learning, working well with a PBL and outdoor curriculum. The quality and aesthetics of the campus incorporated all of the priorities from the community, providing a safe school environment that retained the existing culture, bringing the campus into the modern era. Providing a full size bus within its walls has produced a completely unique experience at the heart of the campus, celebrating the history and significance of place, while bringing a novel learning lab to the students.

SUSTAINABILITY AND WELLNESS

Sustainability, durability and ease of maintenance was at the forefront of Scottsdale Unified School District's priorities. The campus design reacted by using an extremely simple and easy to maintain palette of CMU and stucco, with landscape that focused on xeriscaping. The buildings focused on passive solar strategies and providing shade at every spot possible.

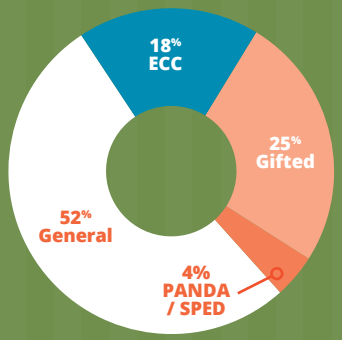
- **Reuse of existing PV solar**
- **Passive Solar**
- **Shade canopy**
- **Safe Materials**
- **Durable Materials**
- **Biophilia**

JUROR COMMENTS

"The overall design is fun, fostering play and curiosity. It is dedicated to transparency, flexibility, and collaboration. Outdoor spaces are the perfect mix for play and learning through a balanced and spacious layout around the campus"

"The exterior of the facility honors so much. The way the pods are managed raised the bar on the traditional no-interior-corridor design of schools to a minimized concept embedding community space. It has a warm feeling of an amazing sense of community through streets and doorways... almost whimsical in wayfinding."

POPULATION



RANKINGS

13th
Best ELEMENTARY SCHOOL in the nation
greatschools .org

A+
AEF SCHOOL OF EXCELLENCE

11%
FREE / REDUCED LUNCH

OFFERINGS

- *Cheer*
- *Run*
- *Typing*
- *Computer*
- *Homework*
- *Gardening*
- *Yoga*
- *Chess*
- *Codakid*
- *Theatre*
- *Drawing*
- *Lego Engineering*
- *Tennis*
- *Dance*
- *Gymnastics*
- *Soccer*
- *Student Government*
- *Band & Strings*
- *Music*
- *Art*
- *Physical Education*

SCHOOL & COMMUNITY RESEARCH AND/OR ENGAGEMENT

COMMUNITY DESCRIPTION

The Scottsdale Unified School District has over 22,000 students across 29 physical campuses, with one online high school. Located northeast of metropolitan Phoenix, the District serves the educational needs of students and families in Phoenix, Paradise Valley, Fountain Hills, Tempe and Scottsdale. Each of the District's 15 elementary schools have a unique campus and culture. The community at Cherokee Elementary School has been described as a public school with a private school feeling in great part because of its community and their involvement.

Cherokee Elementary School offers almost two dozen special programs. They were ranked the 13th best elementary school in the nation by greatschools.org. They are currently ranked 2nd in the state of Arizona based on AZMerit testing results. Cherokee has also earned a letter grade of an A+ rating by the Arizona Education Foundation as a school of excellence.

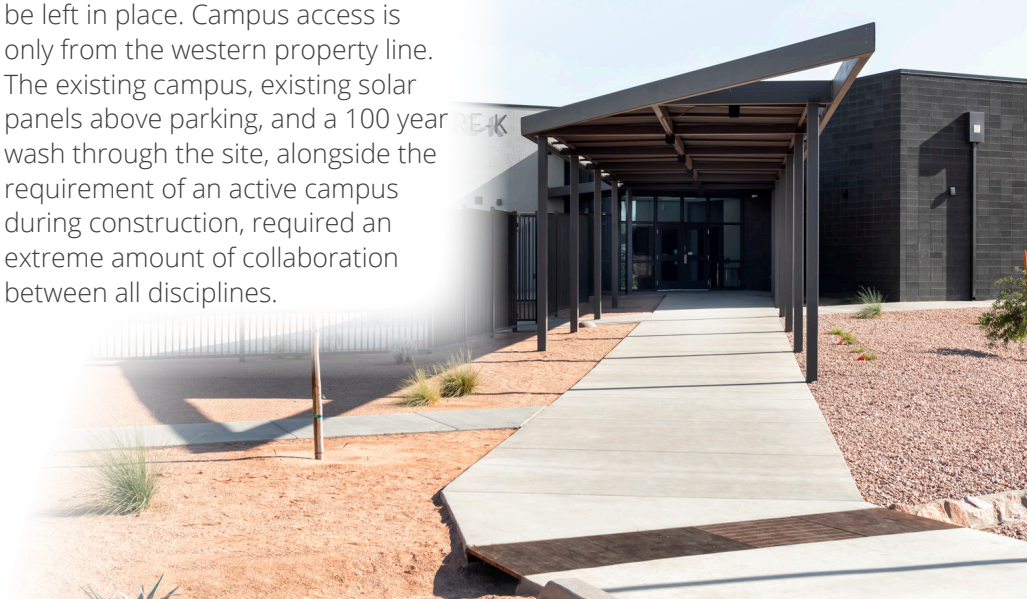
While within SUSD's boundary, Cherokee's campus is actually located within the Town of Paradise Valley, a mostly residential and affluent community. Cherokee maintains a community partnership with the Paradise Valley Police Department, providing a space on campus to serve as their substation. This both enhances the safety of the campus, but reduces response time for the department.

CHALLENGES

- The previous campus circulation was exterior-loaded and arranged in a courtyard style. This became a major community request, to retain the feel of a garden and courtyard style campus. Replicating these qualities presented a design challenge from a security and wayfinding perspective. The new design needed to minimize hallways and maximize the connection to nature, while remaining a secure campus.
- The District in its recent past dealt with some community disgruntlement in the previous community process used. With this fresh in their mind, the aspiration was for a completely transparent, collaborative process that would build alignment and consensus with the community.
- Although the acreage of the site is ample, due to project constraints, phasing and building placement was tight. The fields were requested to be left in place. Campus access is only from the western property line. The existing campus, existing solar panels above parking, and a 100 year wash through the site, alongside the requirement of an active campus during construction, required an extreme amount of collaboration between all disciplines.

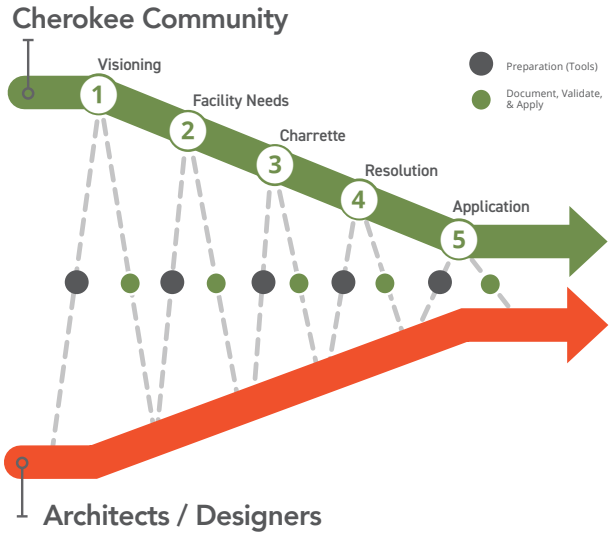
ASSETS

- One of Cherokee's best assets has been how involved their community was. The visioning committee met with the design team bi-weekly throughout early design, and all public workshops were extremely well attended. These all had positive influences on the outcome of the design.
- Cherokee has an amazing geographic location. Within the Sonoran Desert, the climate might be hot, but is ideal for outdoor activities for a majority of the year. With Mummy Mountain as a backdrop, the views from the site are amazing.
- As Arizona's first and only literary landmark, the project demands something special to celebrate that designation. This opportunity truly provided the community with a special and unique treasure amongst their campus.

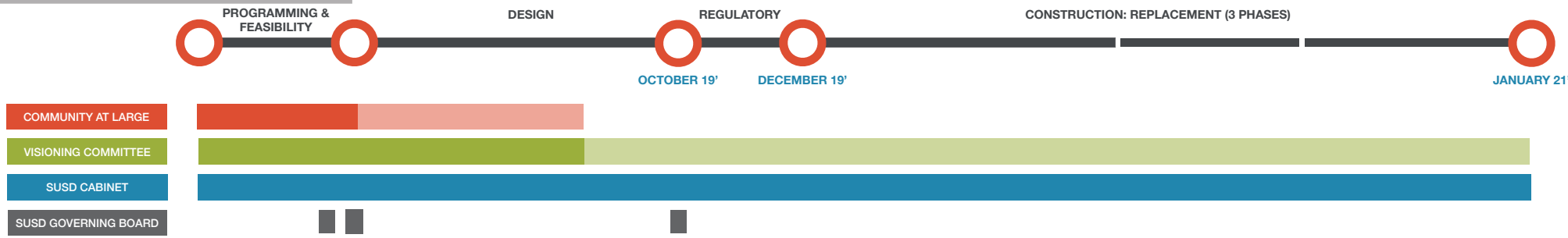


SCHOOL & COMMUNITY RESEARCH AND/OR ENGAGEMENT

Through a robust visioning and community engagement process, the Cherokee Design Team reached out to the experts to get design input. A visioning committee was formed as a representative body to lead the discussions, but the process was inclusive, involving the students, teachers, staff, district representatives, parents, community partners and the community at large. At least twenty public meetings were used to gain consensus within the project. The Paradise Valley Police Department is a welcome community partner, and operates a substation within the campus. Their participation both as a tenant and a community resource had major positive impacts on the design.



PROJECT TIMELINE



ENGAGEMENT

COMMUNITY AT LARGE

WHO: Students, Parents, Community Members, Government Agencies, Cherokee Staff, SUSD Administration

ROLE: Transparency & Collaboration

VISIONING COMMITTEE

WHO: Parents, Community Representatives, Government Agencies, Cherokee Staff, SUSD Administration

ROLE: Representative Body

SUSD CABINET

WHO: Superintendent, Asst. Superintendents, Officers & Directors

ROLE: Arbiters of District Standards

GOVERNING BOARD

WHO: Mrs. Patty Beckman, Mrs. Allyson Beckham, Mr. Jann-Michael Greenburg, Mrs. Sandy Kravetz, Mrs. Barbara Perleberg

ROLE: Final Approvals

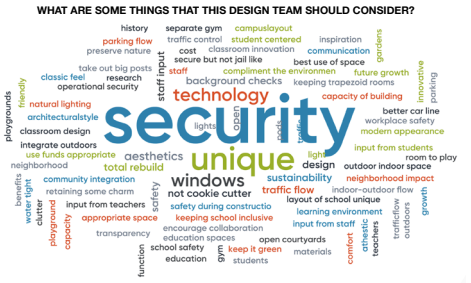
DEVELOPMENT OF PROJECT GOALS

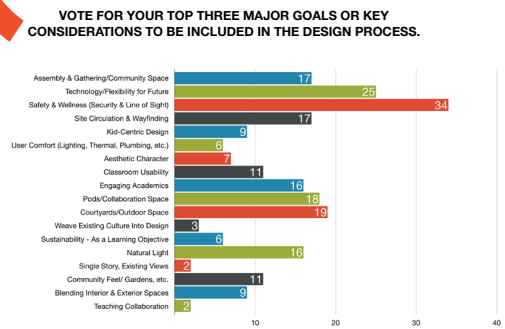
Everyone interested in the best Cherokee was welcomed and heard. The design process was built around a series of community workshops in collaboration with the Visioning Committee. The result was a clear understanding of the highest priorities amongst the stakeholders. Also, the process allowed for a data driven approach to building consensus behind replacement of the old campus. This gave the project a solid backbone with validated project goals, preliminary building and spatial relationships, site arrangements and vignettes that all defined the baseline for the direction of the design moving forward into Schematic Design.

MEMORABLE GOALS

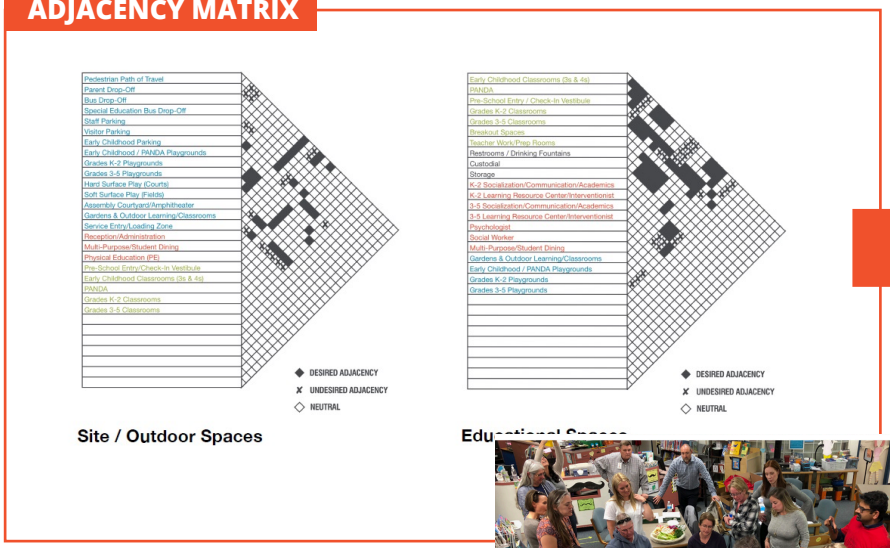
- SAFETY & WELLNESS
- UNIQUELY CHEROKEE
- STUDENT-CENTRIC LEARNING
- HIGH PERFORMANCE LEARNING ENVIRONMENT

COMMUNITY POLLING RESULTS

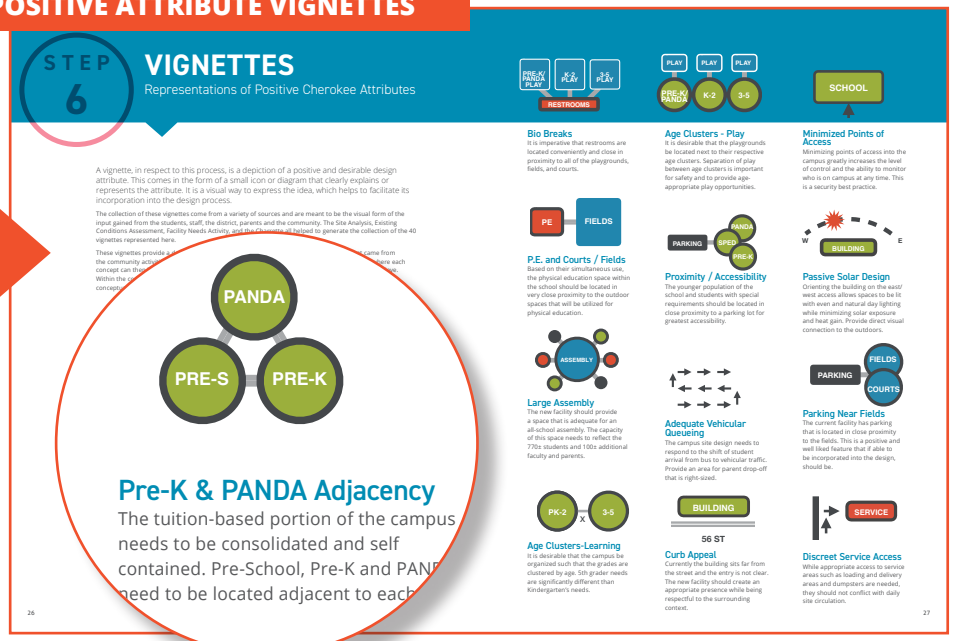




ADJACENCY MATRIX



POSITIVE ATTRIBUTE VIGNETTES



CAMPUS VISION AND GOALS

Cherokee's vision is closely related to the positive qualities that the existing campus had. The school utilized the layout of the campus to their advantage, creating many hands-on learning opportunities in a variety of gardens and courtyards throughout the campus. The replacement campus needed to take that strategy and use modern educational environment trends to enhance their current delivery. Although not a major goal, social emotional learning, and whole child development played a large role in the development of the solutions to the below priorities:

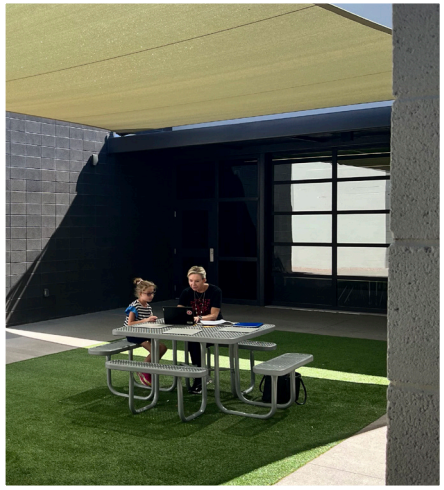
- **Project Based Learning:** The design provides a variety of spaces perfect for group and hand-on activities. Each learning cluster has a variety of spaces, both indoor and outdoor that can be used for small or medium group work. The flexibility of the breakout spaces allows for medium to large size group work, or even team teaching.
- **Outdoor Learning:** The design focuses heavily on the ability to learn outdoors. An outdoor classroom is adjacent to every learning cluster, and social porches and courtyards of differing sun exposure are present throughout the campus.

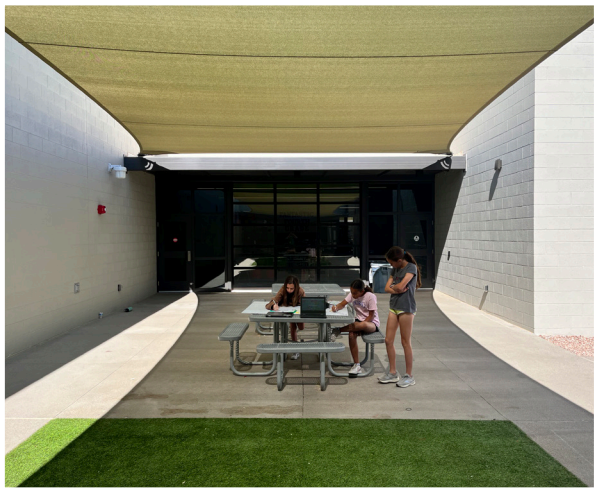
SUPPORT FOR A VARIETY OF LEARNING AND TEACHING STYLES

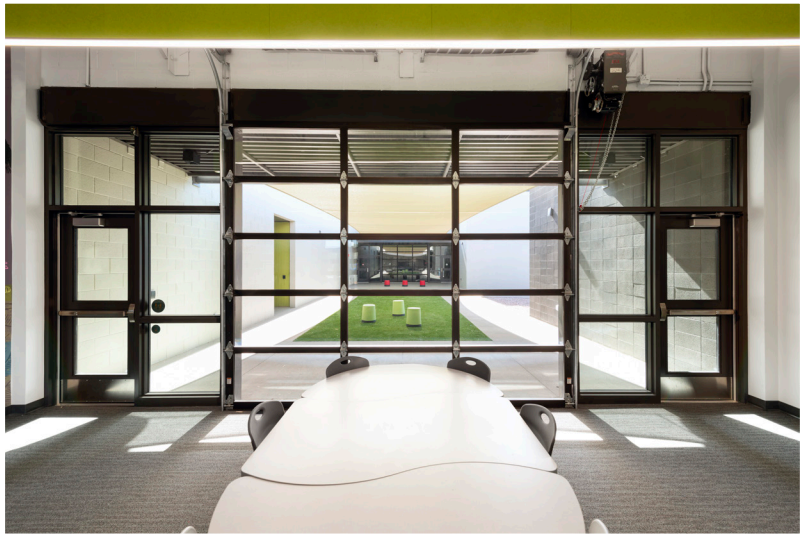
Not everyone learns or teaches in the same style. Cherokee is designed to afford the flexibility to both the teachers and students in their styles. The design needed to allow for a variety of spaces that would provide opportunities for all of the below styles.

- **Verbal**
- **Visual**
- **Musical/Auditory**
- **Physical/ Kinaesthetic**
- **Logical/ Mathematical**
- **Social**
- **Solitary**
- **Combination**

One way the campus achieves this is by providing spaces that accommodate a variety of student grouping sizes, in different locations. A focus on the primordial learning metaphors allows the campus to provide places for lecture, places for social collision and collaboration, places for quiet reflection, and places for application of what is learned. Closely related to the use of biomes and with a focus on the natural environment, the metaphors of the **campfire**, the **watering hole**, the **cave** and the **plains** are used throughout the design.





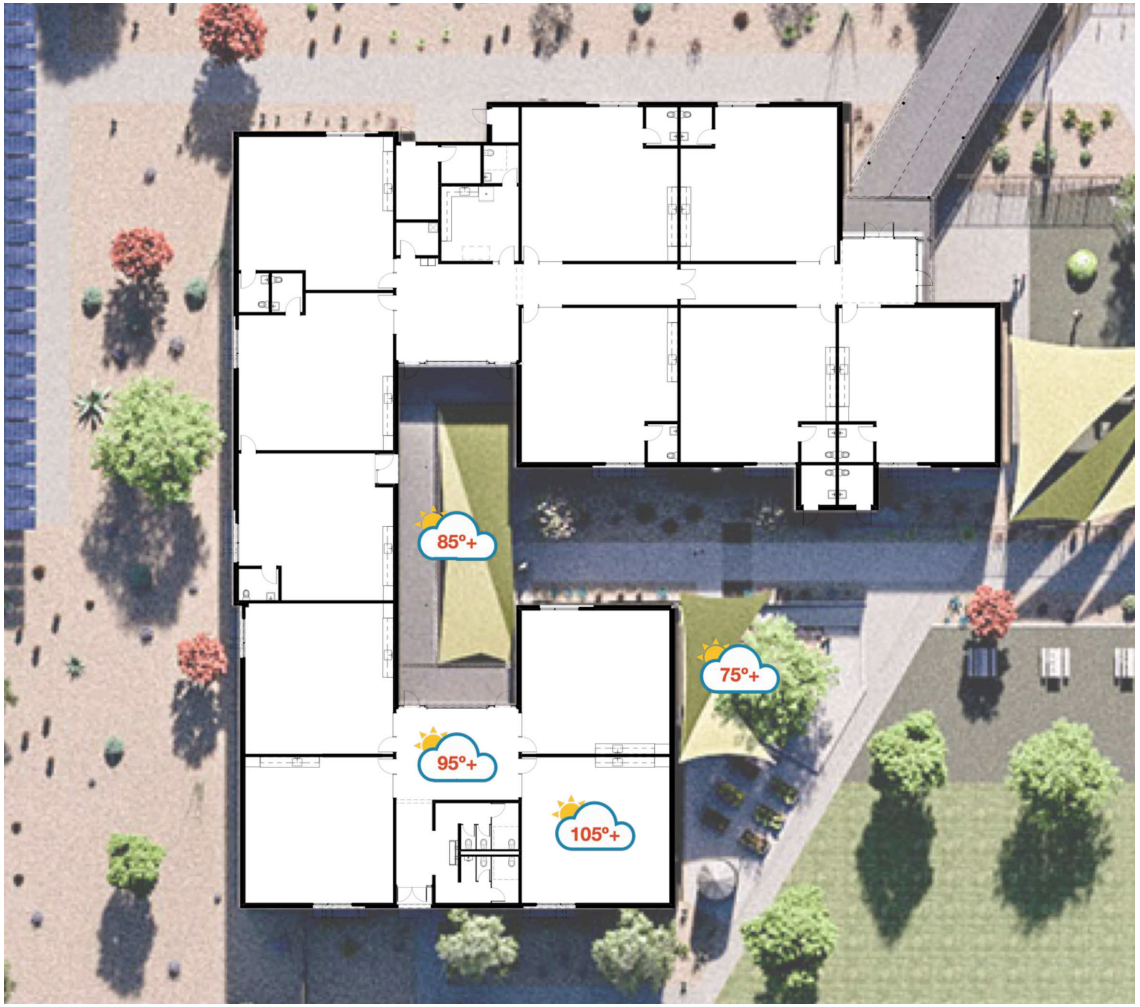


ADAPTABLE AND FLEXIBLE

Cherokee's design provides flexibility and adaptability that goes beyond just space, but also focuses on the flexibility of connecting with nature as often as possible. The campus has a variety of special spaces that afford both individual learning and teaching styles, but also afford agency as the students and teachers can choose the best environments for their tasks. Cherokee has 9 overhead garage doors located throughout campus; the gym, the stage and amphitheater, the art porch, and the breakouts within the learning clusters.

VARIETY AND FLEXIBILITY OF SPACES

- Outdoor Classrooms
- Tinker Space
- Small scale reading alcoves, and medium scale group reading
- Novelty Learning Lab, a secluded reading area and small learning lab within the school bus
- Pods / Breakouts, garage doors and flexible furniture
- Courtyards, shade canopy and flexible furniture
- Multi-purpose assembly, gymnasium, cafe and performance venue
- Stage and exterior amphitheater, with outdoor cafe



PODS AS THERMOSTATS

The design of the pods was intentional, such that the arrangement is a collision of academic and curriculum delivery requirements with the management of extreme climate.

Each pod is located in the center of 4 classrooms, allowing the teachers to push/pull students into the space for small group work, testing, mindfulness minutes, and other uses. Visibility from the classroom to these spaces is paramount.

As an extension, teachers can choose to climb further out of the shelter of the building as the climate allows. As depicted in the diagram, the variety of options includes a four walled classroom, a collaboration pod with three walls and an overhead door/window wall, an interior courtyard sheltered by a shade sail canopy, and finally completely out of the building canopy to an outdoor classroom.

THE BUILDINGS AND CAMPUS AS A LEARNING TOOL

The design of the campus is divided into three major biomes, which are reflected in both the exterior environment and the internal design of the learning clusters. Each age group is associated within one of these biomes. Kindergarten and 1st grade starts in the least harshest biome, the Deciduous Forest, and 4th and 5th grade end with the most severe biome, the Sonoran Desert.

Focus was given to providing opportunities for learning about nature, even from a seasonal perspective. The campus will operate significantly different depending on the time of year. Each outdoor classroom celebrates a separate biome, with a tree that represents that biome as a centerpiece, both for education and shade.

STRATEGIES USED

- **Xeriscaping**
- **Rain Gardens**
- **Sensory Learning**
- **Art Integration**
- **Play**
- **Permaculture**
- **Water in Sight**

CHAPARRAL

Southern Live Oak, tall vertical tree. Some agaves. Lots of fires which are a benefit as seeds pop and germinate. Dry weather, low water. Hot and humid. Kids can explore by growing their own oak trees in cups from acorns that drop in fall.

DECIDUOUS FOREST

Elm trees, cooling in summer and warm in winter. The trees create compost which help grow the forest floor fungi for herbivores the live there. These trees enjoy water! Sensory bark. Students can grow mushrooms in large covered tubs.

SAVANNA (SONORAN DESERT)

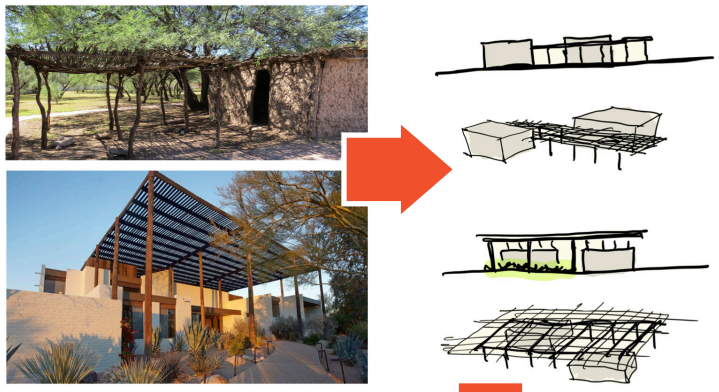
Shoestring Acacia, tall Australian trees, live in drought conditions and grow fast. Tall and grazing animals. Moderate weather. Kids could see how tall animals would need to be to reach the tree to eat it when mature. Sensory elements through long thin shoestring leaves.

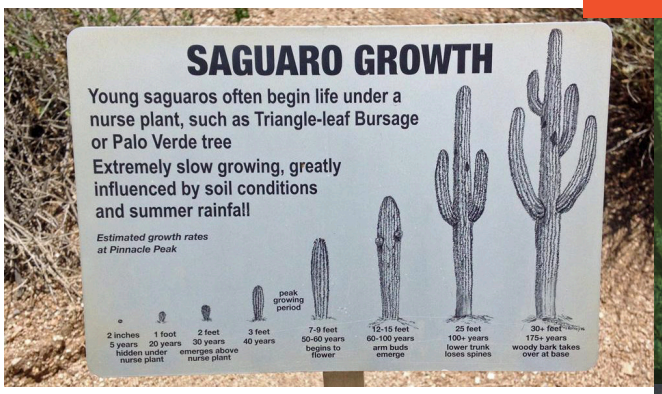
WHAT IS UNIQUELY CHEROKEE?

The design for the replacement of Cherokee Elementary started with a study of what makes the current campus unique and so well liked. A logical place to explore for inspiration is to define the unique qualities and to bring those forward through the design of the replacement campus.

These items came to the forefront as important:

- Garden and Courtyard Style Campus (Desire for connection to nature)
- Pods creating small communities for the different age groups.
- Arizona's first literary landmark.





SONORAN DESERT CONTEXT

Looking at Cherokee as a school that reacts to learning within the Sonoran desert, precedent exists already on how to adapt. Two types of adaptation as case study research were directly relevant; living adaptations and architectural adaptations.

Examples of architectural adaptations are nested volumes or ramada houses, shaded outdoor spaces, and exposed volumes with connective shade tissue.

Examples of plant and animal adaptations to the harsh conditions of the Sonoran Desert are expanding water bladders, large ears to dissipate heat, self-shading cacti and most relevantly, the symbiotic relationship between young saguaros and their nurse plant, the Palo Verde.

Young saguaros often begin life under a nurse plant, specifically a Palo Verde tree. Saguaro are extremely slow growing and fragile at their earliest years. This is a parallel between young students. Much like the cacti locating themselves in the shelter of the Palo Verde canopy, students will be able to look to Cherokee as their nurse plant.

STRATEGIES TO PROVIDE A NURSE PLANT

- **Keep kids healthy and safe/sheltered**
- **Biophilia**
- **Synergy of outdoor learning and outdoor connection**

PHYSICAL ENVIRONMENT DESIGN

OUTDOOR LEARNING CHARRETTE

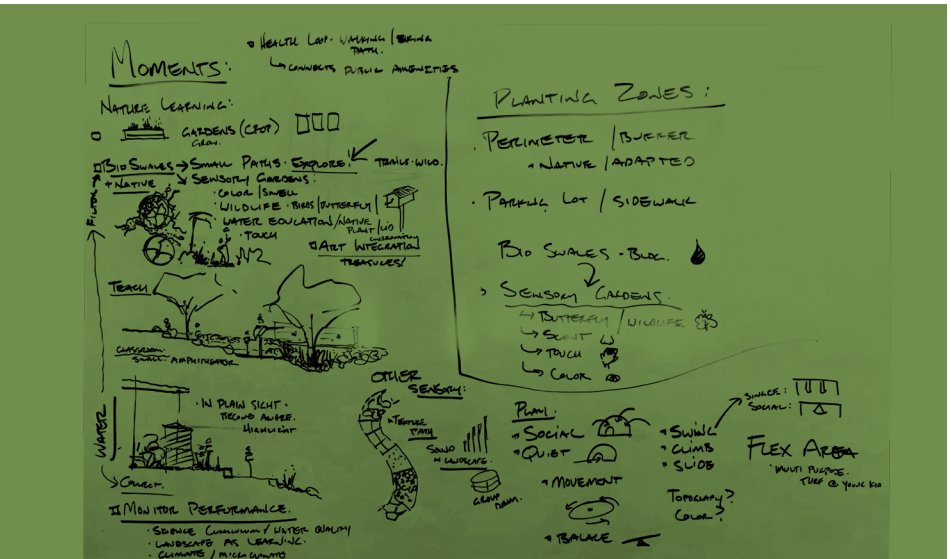
- Bio-swales throughout the campus
- Water Education
- Art integration throughout
- Sensory Gardens
- Wildlife: Birds, butterflies, etc.
- All native and desert adapted plants used, xeriscape to minimize water usage
- Learning through play

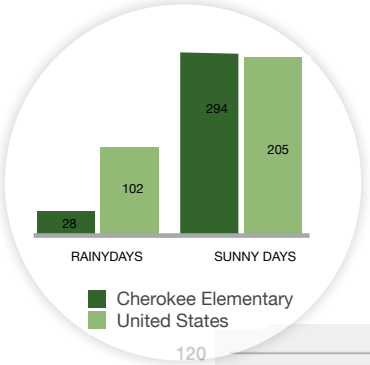
SITE ANALYSIS & CONTEXT

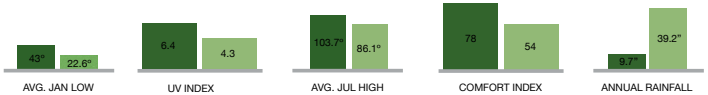
The team underwent a thorough analysis of the existing Cherokee Elementary site and greater community context. Investigations into the site's physical features, climate, social and contextual influences, among other patterns and characteristics provided a canvas with a clear intention.

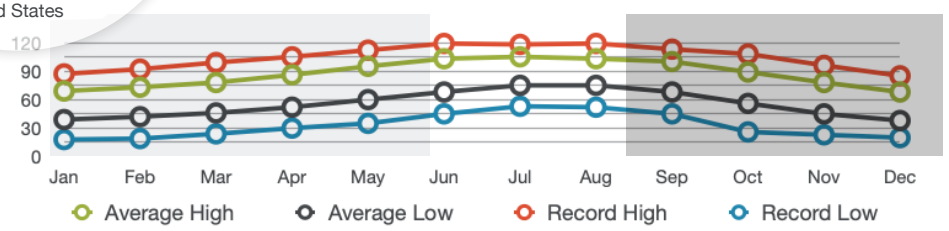
The analysis helped to isolate concepts or attributes that needed be incorporated into the architectural solution.

- The building needs to focus on mitigating the extreme climate as best it can to allow for outdoor use. With outside temperatures reaching beyond 100 degrees, strategies need to be included to allow the building to maximize shoulder seasons and allow for instructional minutes outside.
- The site needs to provide a solution for proper drainage, as existing conditions have been prone to floods. A 100 year wash travels through the site, and the site solution needs to safely pass this water on while creating a safe solution for the campus structures.

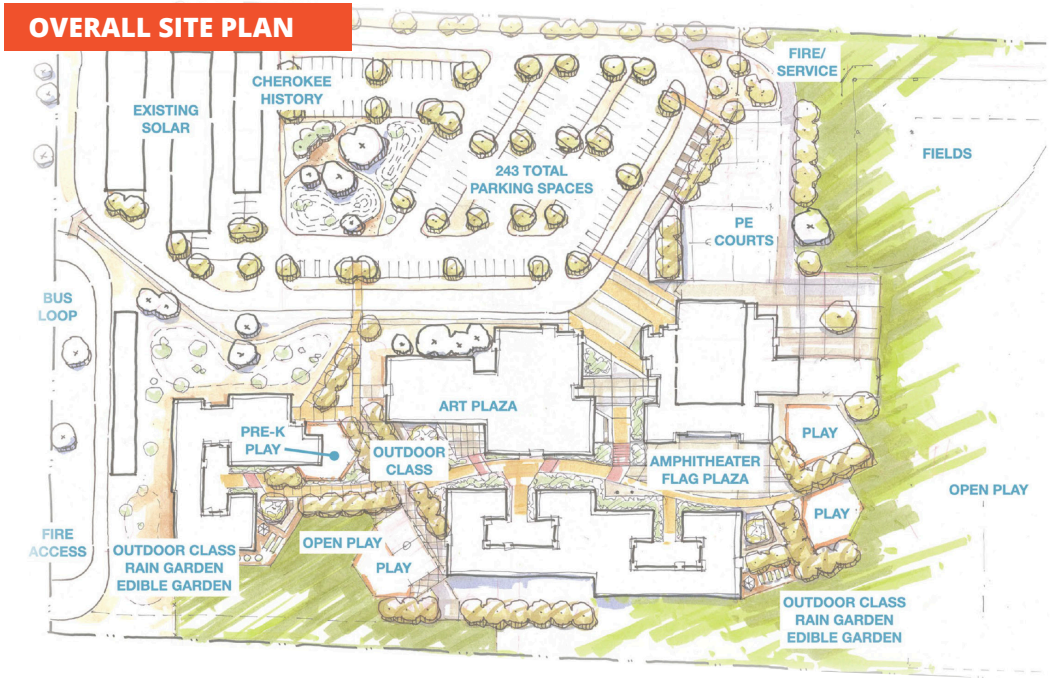


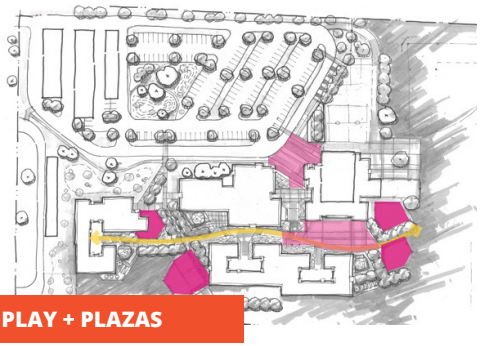




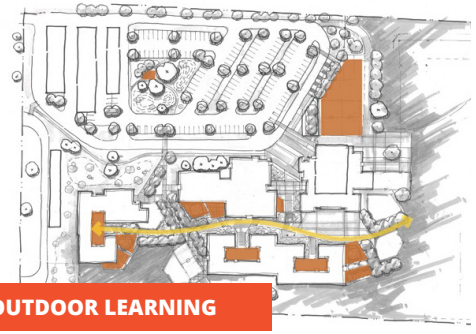


OVERALL SITE PLAN





PLAY + PLAZAS



OUTDOOR LEARNING

Novelty has established itself as having a positive effect on learning. A unique experience can boost engagement and interest, and even positively affect behavior. Both of these are the case at Cherokee. An upcycled 2005 Thomas school bus, retired from Scottsdale's district fleet, now resides in the center of campus within the media center acting as a vibrant learning lab. The students beg to have reading time on the bus, and it has provided a strong incentive. The design team involved an experience and fabrication company to help bring the idea to life. The front of the bus celebrates its stupid smelly roots through sensory play. Tactile learning is reinforced, with each button, horn, light, and switch operating to provide a make-believe experience as you look out the media center onto campus.

ARIZONA LITERARY LANDMARK

The Literary Landmarks Association celebrated Cherokee Elementary as Arizona's first and only literary landmark in 2017. Author Barbara Park (1947-2013) was inspired to write the plot of Junie B. Jones and the Stupid Smelly Bus when she found a young Cherokee student walking home after he missed the school bus. Barbara later wrote Mick Harte Was Here, a novel that was influenced by the tragic passing of a 4th grade Cherokee student and highlighted the importance of wearing a bicycle helmet. The Stupid Smelly Bus series has sold more than six-million copies worldwide.

Cherokee celebrates this history with a fully interactive experience for the students, complete with a hidden/secret door, an audio reading station and a variety of other amenities that is the talk of the campus among the students.

STUDENT INVOLVEMENT AND CURRICULUM INTEGRATION

It was important that the team provide an opportunity of integrating the current learning on campus with the designing and building of a new school. Both the design team and contractor collaborated on creating a video STEAM lesson for the students to learn about volume, area, and artist expression. As a product of the process, all gardens on campus were designed by the students, taking into account isle width, accessibility, design for teaching, and the artistic forms chosen.

UNINTENDED RESULTS

COVID ADAPTABLE

Like many students across the US, Cherokee students learned from home during the pandemic. While they were at home, their new school was building built. With such a focus on outdoor connection, fresh air inside and the ability to move learning outside became a huge benefit. While this project was designed prior to the pandemic, no one knew that the strategies used would allow for such ease of use during its first year.

A MULTI-USE PARENT PLAZA

Originally intended as a shade canopy for drop-off and pick-up of students, the campus community has utilized this plaza area for a number of uses that continue to enhance the sense of community and place. Frequently there are food or coffee trucks, ice cream socials and other gatherings that utilize the open area. It has really become a vibrant space for parents and neighbors.

RESULTS OF THE PROCESS & PROJECT

Scottsdale Unified School District's top goal was to provide a collaborative and transparent process, to ensure consensus within their community. From that respect, the process is a resounding success. In addition to consensus, the building needed to provide a learning environment that supported project based learning with a focus on outdoor connection and involvement. The campus provides a rich connection to the outdoors, serving as a catalyst for the use of the outdoors in an otherwise extreme climate.

In addition the campus does an excellent job at satisfying the memorable goals established by the community process.

UNIQUELY CHEROKEE

- Cherokee 2.0 retains the courtyard and garden style of campus, bringing it into the modern era.
- The aesthetic character reacts well to the existing culture and context, and has provided a strong new identity to the campus.
- The community has embraced the camp

SAFETY & WELLNESS

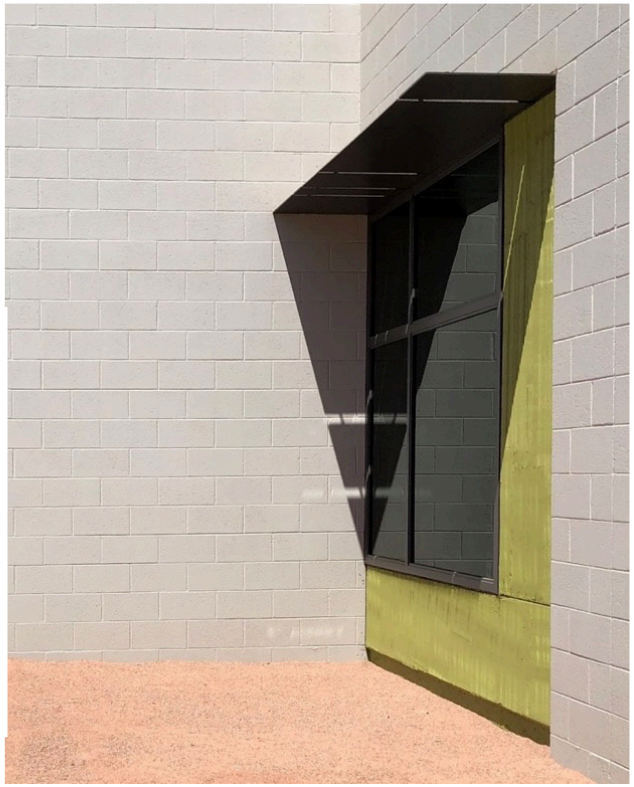
- Student emotional and social well being is at the forefront of the design. Wellness through biophilia, yet subtle, is everywhere on campus.
- The Paradise Valley police chief was integral in helping review the site and building design from a CPTED perspective, but also helped in creating a safe and intuitive site circulation and way-finding.

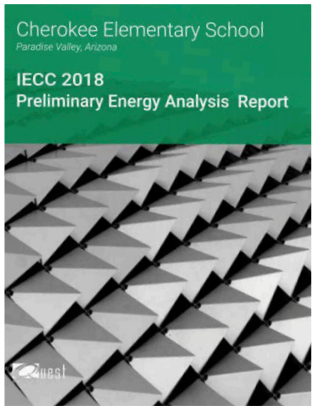
HIGH PERFORMANCE LEARNING ENVIRONMENT

- Cherokee provides a building that focuses on user comfort(healthy indoor environment, natural daylight & transparency, thermal comfort)
- The project retained the existing solar panels, and continue to be used as shade for parking and bus drop-off.

STUDENT-CENTRIC LEARNING

- Pods/breakout spaces are provided at each learning cluster, with transparency between the classrooms and the courtyards.
- Variety of learning styles are afforded by availability and agency.
- Tinker and hands-on spaces are provided both inside and outside.
- Learning spaces are supported with flexible and collaborative furniture.



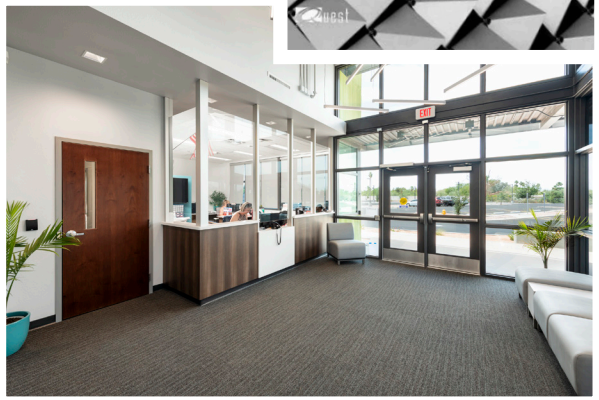


ENERGY EFFICIENCY

A full team sustainability charrette, to include the District, their visioning committee, our design team, the contractor, our renewable energy consultant, landscape architects, civil, mechanical, electrical, plumbing and structural engineers, and interior designers was held on Earth Day, April 22, 2019. Goals were established that drove the design regarding among others; insulation values, lighting and glazing values, HVAC design, and utility rates and incentives. Indoor air quality and daylight access were major influences. The project specifications used LEED Gold as a standard, and a red list of hazardous materials was created and used to ensure none were used within the project. The architecture of the building was carefully designed to utilize passive solar strategies to both let as much daylight in, but to limit the solar heat gain from those exposures.

SAFE MATERIALS

- Zero VOC Paint
- Carpet Tile with recycled backing and fibers
- Large format wall tile with patterns or color blocking
- Entry carpet to control dirt
- LED lighting
- Acoustic panels integrated into light fixtures to provide optimum conditions



DURABLE MATERIALS

The palette for Cherokee is designed to be simple, economical and maintainable. The client repeatedly reminded the design team that their staffing allowed for limited upkeep on landscape and building maintenance. The materials palette of the building is essentially just CMU and stucco, and very simple box forms and shade canopies. The impact of the design comes less from the architectural forms, but more from the interstitial spaces and the function of those spaces within the Sonoran Desert. The colors were chosen with both biophilia and the surrounding context in mind.

The design lands in the middle ground between very humble desert dwellings, and clean and modern aesthetics to mimic the mid-century modern neighborhood context.

OUTDOOR LEARNING AND WELLNESS THROUGH BIOPHILIA

As the world population continues to urbanize, biophilic qualities in our surroundings reduce stress, enhance cognitive performance and improve our well-being and expedite healing. Cherokee sees an alignment between outdoor learning and wellness through biophilia. Learning outdoors is active and increases students' physical, mental and social health. Access to nature has also been shown to decrease the symptoms of ADHD.

PATTERNS OF BIOPHILIA

In the context of what is locally appropriate and responsive, the below patterns have been incorporated into the design of Cherokee Elementary School as a way to strengthen the concept of the school as a nurturing shelter for learning.

- Visual Connection with Nature
- Non-Visual Connection with Nature
- Non-Rhythmic Sensory Stimuli
- Thermal & Airflow Variability
- Presence of Water
- Dynamic & Diffuse Light
- Connection with Natural Systems Natural Analogues Patterns
- Biomorphic Forms & Patterns
- Material Connection with Nature
- Complexity & Order Nature of the Space Patterns
- Prospect
- Refuge
- Mystery
- Risk/Peril

Examples

- Cherokee provides at all occupied and learning spaces, windows and transparent materials that allow for the visual connection of the inhabitants with the exterior landscape and biomes.
- The design incorporates opportunities for direct interaction with nature through horticulture and gardening, even edible gardens. In addition the site design celebrates rain events with audible and accessible water features through the design of the exterior spaces.
- The arrangement of the shade sails are placed to mimic the shade canopy of the Palo Verde tree. The stucco has been scored to mimic the ribs of the saguaro cactus.
- The campus design allows for a variety of vistas with both short and long. The arrangement of the arrival sequence to the Administration building is oriented to frame the peak of Mummy Mountain in the background.
- The interior design integrates wall graphics throughout that focus on providing content related to natural biomes and the plants and creatures that live there.
- The campus is designed such that as you travel throughout, the experience is revealed in bits and pieces, a subtle game of peek-a-boo. In particular, the edge faces of the front lobby and entry are hidden around the corner, compelling visitors and inhabitants deeper into the campus.