



South Weber Elementary School K-2 Center

James D. MacConnell Award 2013
CEFPI

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BACKGROUND

South Weber, Utah is a small, formerly rural community that has recently become a suburb serving the adjacent urban areas of Ogden to the north and Salt Lake City to the south. Recent housing developments have not only exhausted the supply of available land in the area, but also brought an unprecedented growth in the elementary school population for the existing South Weber Elementary School. The school is part of the Davis School District, one of the largest Districts in Utah. The Davis School District is no stranger to growth. The District has added multiple elementary schools, middle schools and high schools district wide over the past 15 years.

In 2008 the design team along with Davis School District personnel came together to create a solution unique to the district. Located at the northern edge of the District, the student population in the South Weber Elementary School had grown well beyond its capacity resulting in nearly a dozen portable classrooms staged on the site. The surplus of students did not warrant a new elementary school; and even if it had, there was no land available in the community to locate a new elementary school. With these edges in the planning process clearly defined, several work sessions were held with district personnel, concerned parents and South Weber City officials to determine what the best solution for all concerned would be.

After several work sessions, it was determined that a new satellite facility should be constructed on the current campus that would reduce the overcrowding in the existing school. Different configurations of grades in the new satellite facility were considered. Should it be a K-2 Center? Or Grades 4-6? Educators within the district felt the needs of students, parents and teachers would best be served by a new K-2 center. This would keep the younger children separated from the main school allowing the specific needs of the kindergarten children to be met through the design of the new facility. Location of the current kindergarten in the existing facility required movement through the entire school for pick up and drop off as well other safety issues that could not be addressed in the existing facility.

Once the visioning process for the new K-2 Center had been completed, the design team and District personnel conducted numerous planning work sessions involving multiple stakeholders who were actively involved in five design charrettes over a six month period. The process used to design the K2 Center employed an integrative approach in order to identify the project's guiding principles, the school district's and community's goals, the funding and phasing requirements for design and construction, and the various aesthetic, educational and technical strategies for ensuring its success.

The initial charrettes analyzed various options for siting the K-2 center (including building orientation, massing studies, storm water flows, open space utilization, etc.) before the owner chose to create a partial two-story, stand-alone educational facility designed expressly for the lower grades of the school. These charrettes also established sustainable design objectives (including the Advanced Energy Design Guide for K-12 School Buildings (2008) and LEED NC). The school district elected not to pursue LEED certification, but was committed to creating a sustainable model school based on the David Orr's premise that "architectural design is also a form of pedagogy that instructs us well or badly, but never fails to instruct. When we get the design of buildings and communities right they will instruct us properly in how we fit within larger patterns of energy and materials flows". This design attitude helped to inform virtually every space in the building, turning each into a learning opportunity about the world in which these children, their teachers and families live.

Throughout the process---through communication and a clear sense of direction---the team was able to optimize the performance of the building relative to energy, water conservation and material utilization, while creating a facility that fully and imaginatively demonstrates its relationship to its local, regional and global context.

SCOPE

The charrettes identified the need for 4 kindergarten classrooms, 7 first grade classrooms and 7 second grade classrooms, plus a multipurpose room, media center and other related administrative functions.

Remodel work in the existing school relocated the administration to a location to monitor and supervise the drop off and pick of children as well as to provide an unobstructed view of the playground area for added security.

BUDGET

Construction Budget identified in February 2008 by the District for the K-2 Center was approximately \$10,690,000. Due to limited funding at the start of the project, the project was completed in two phases. The final total Construction Cost upon completion of the final of the two phases in December of 2010 was \$10,379,302.

The costs per phase were as follows:

Phase 1: \$ 5,686,047

Phase 2: \$ 4,693,255

COMMUNITY ENGAGEMENT

The stakeholders included the architect's design team (including landscape architects; civil, mechanical, structural, and electrical engineers; lighting and interior designers); the CMGC; representatives of the school district (curriculum specialists, facility managers, custodial and operations staff, district master planners, the school's principal; teachers; and community members).

CHALLENGES

The main challenge was to identify the solution to the overcrowded school without benefit of more land to build a new school. The K-2 Center solution was the first of its kind for the Davis School District. Forged as it was through an extensive integrative process where all ideas from all sources were heard and considered, District and community wide consensus was achieved and the success of the project is a testament to the process.

AVAILABLE ASSETS

The unique location of the school at the windy outlet of Weber Canyon served as the impetus behind a design that would teach by example. As a result, theming of the school became a focus for all.

The school mascot is a windjammer sailing ship acknowledging the natural force of the winds specific to this site. The building main entries are marked with small turbines that provide electricity to the school. The school also uses materials, colors, and unique features to reinforce the image of the school as a ship at sea. The giant periscopes from the roof to the lower classroom floor bring natural light to the lower floor and views out to the surrounding mountains. These periscopes are enclosed with translucent panels that create diffused daylight and provide the look of the shimmering surface of wind swept water. The theme of shimmering water is also found in the orientation and color patterns in the carpet tile flooring. A compass drawn into the integrally colored concrete floor provides way finding as the blue and beige colors of the concrete recall sand and water. Canvas "sails" provide dynamic shading for the sola-tube skylights that illuminate the commons areas between classrooms. Railing systems are a mesh material reminiscent of fishing nets; and the reading nook in the media center provides the stars in the night sky on the conical shaped ceiling reminding us of a ship navigating the sea by night.

VALUE OF PROCESS AND PROJECT

The themes of the school were used in connecting the students with their natural surroundings. The next articulation of this connection was to incorporate design strategies that effectively illustrate sustainable design ideas ranging from solar and wind energy to water conservation. The building employs a high efficiency boiler and chiller plant, in combination with a displacement air system which ensures high air quality and minimal noise. The building culinary

water is heated using a solar thermal panel array system mounted on the east end of the school. To demonstrate water conservation the school uses two stage toilets, ultra-low flow urinals and water conservative faucets. Rainwater is channeled from the roofs and hard-scaped areas of the site to rain gardens and constructed wetlands comprised of water-wise and phyto-remediative plants. The building is a compass, revealing orientation through the configuration of exterior sunscreens. At the north no screening is needed and north-facing windows fully admit diffused light. At the south, screening is installed horizontally above the windows. At the east and west, windows were carefully placed to be protected by the building itself. Windows can be opened in all classrooms to allow individual tempering of each space during the shoulder seasons. As described earlier, small turbines, like the sails of the windjammer boats, capture the wind and convert this natural force into energy for the school.

EDUCATIONAL ENVIRONMENT

By creating themes within the school reinforcing the natural elements that act upon the school and then taking these opportunities to enhance the building energy performance with actual teaching tools, the K-2 Center achieved one of the main project goals of creating a building that teaches.

In terms of the specifics, the building created areas for a variety of teaching and learning styles. Classroom spaces adjoin common break out areas which provides a setting to serve multiple classes at once. The furniture in these common areas also allows for small group teaching opportunities. Break out areas within each classroom itself allows for one on one instruction, while the greater portion of the room can be used for both instructional and experiential teaching and learning opportunities. Computers are provided throughout each classroom; however, there are also 2 computer labs which address the State testing requirements. Resource rooms are also a part of the educational environment.

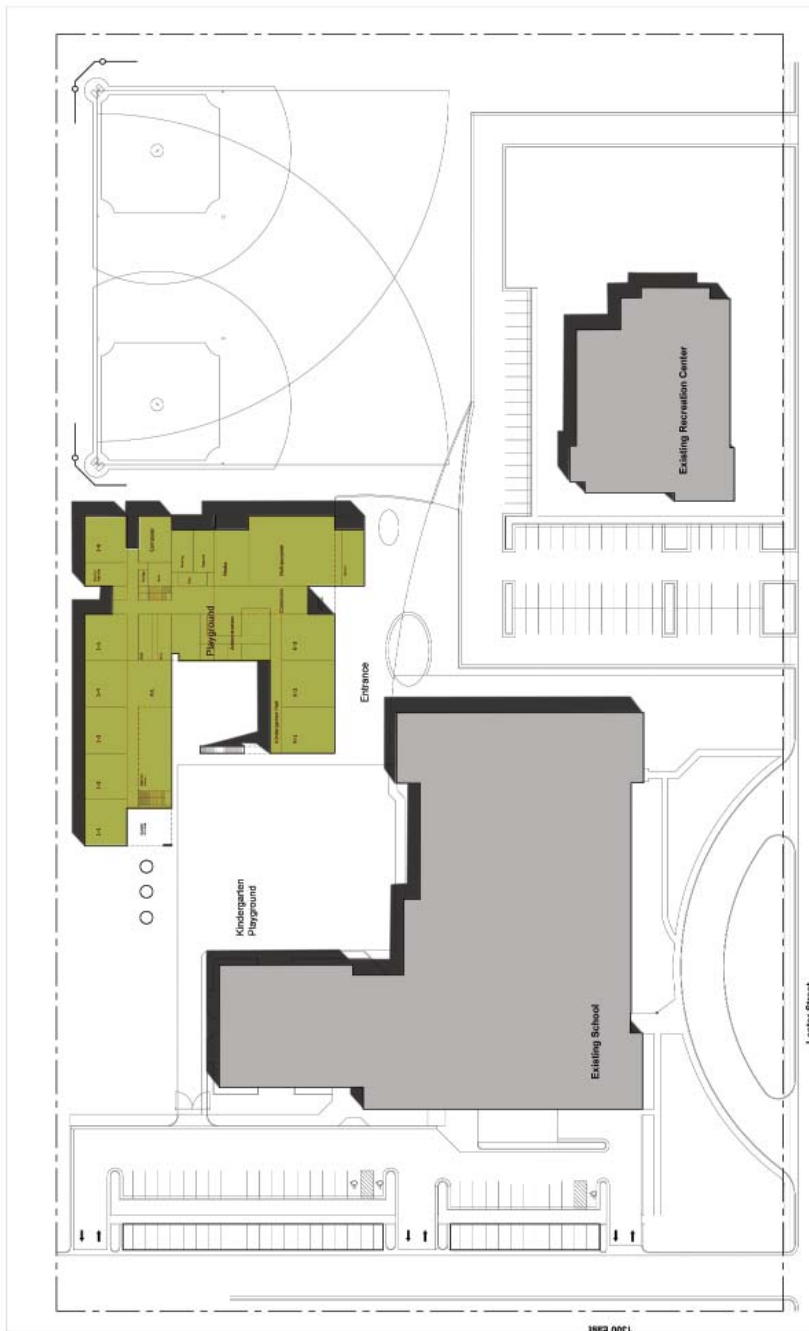
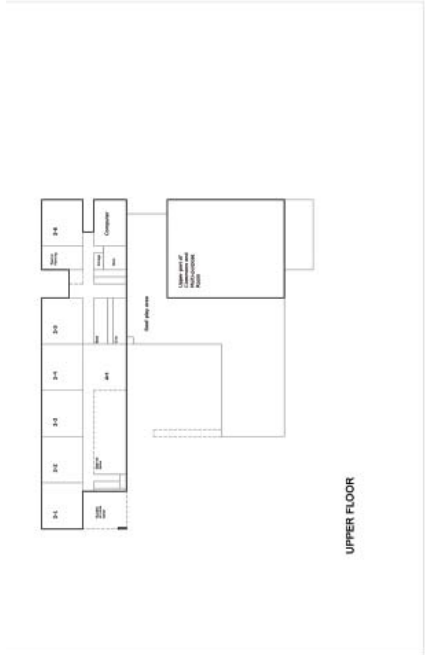
PHYSICAL ENVIRONMENT

The physical environment is primarily one of movement, color and instruction by example.

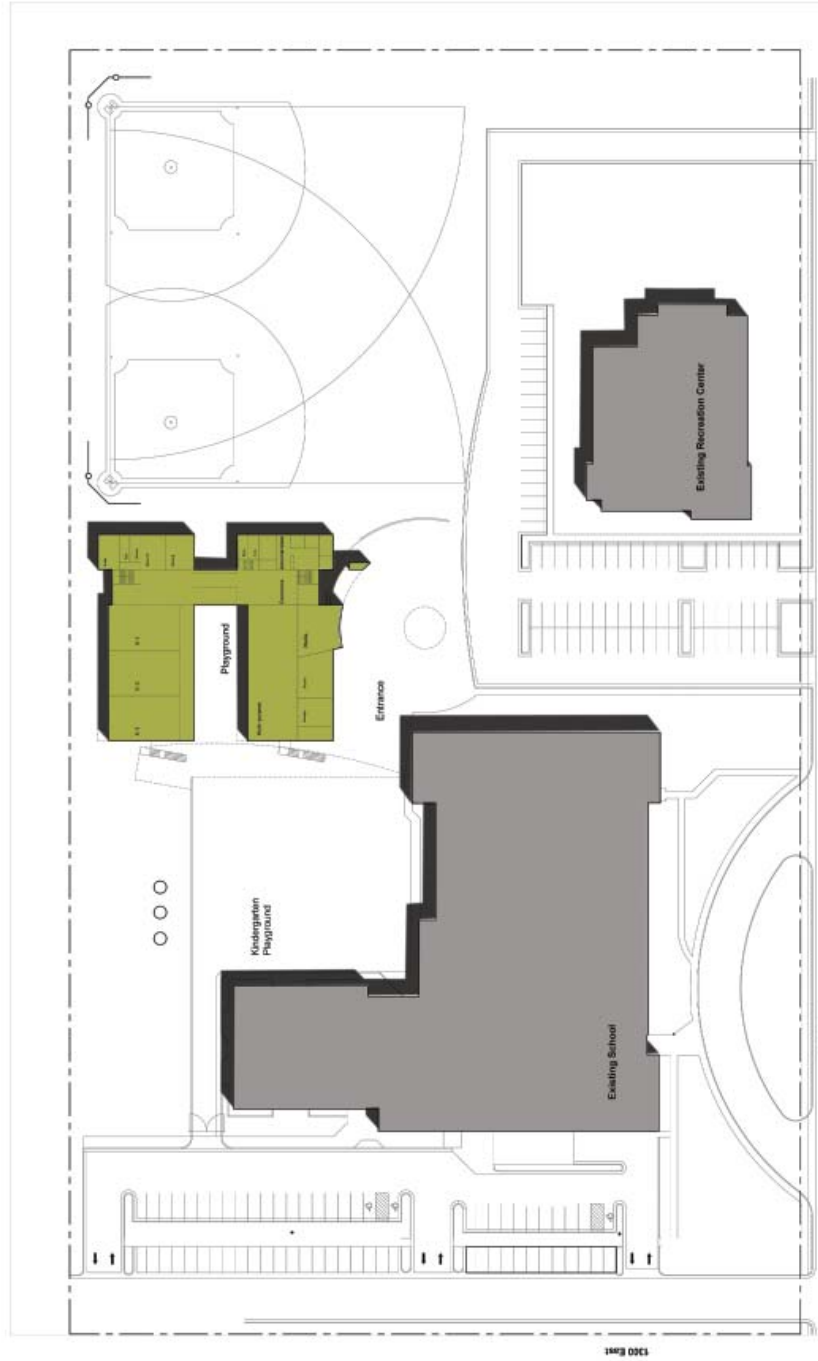
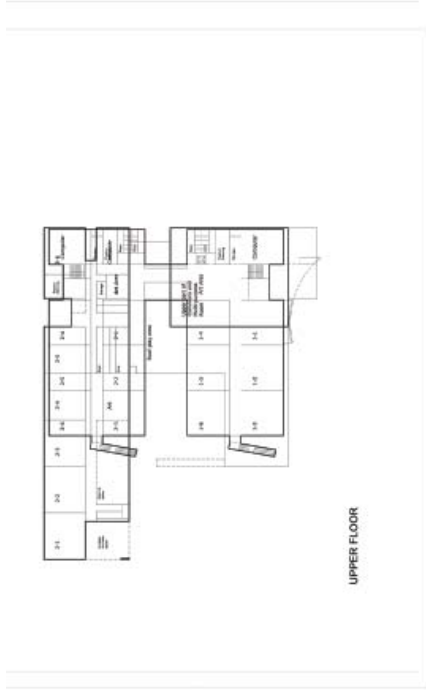
Sound management was also a big part of the physical environment. The break-out commons space utilizes the carpet tiles and the canvas “sails” at the ceiling for sound absorption. The classroom walls are angled and stepped to further reduce reverberation and sound transmission in the commons. The air displacement mechanical system in the first and second grade classrooms and the radiant floor system in the kindergarten rooms rely on natural convection for air movement thereby eliminating the need for forced air and the resultant sound issues.

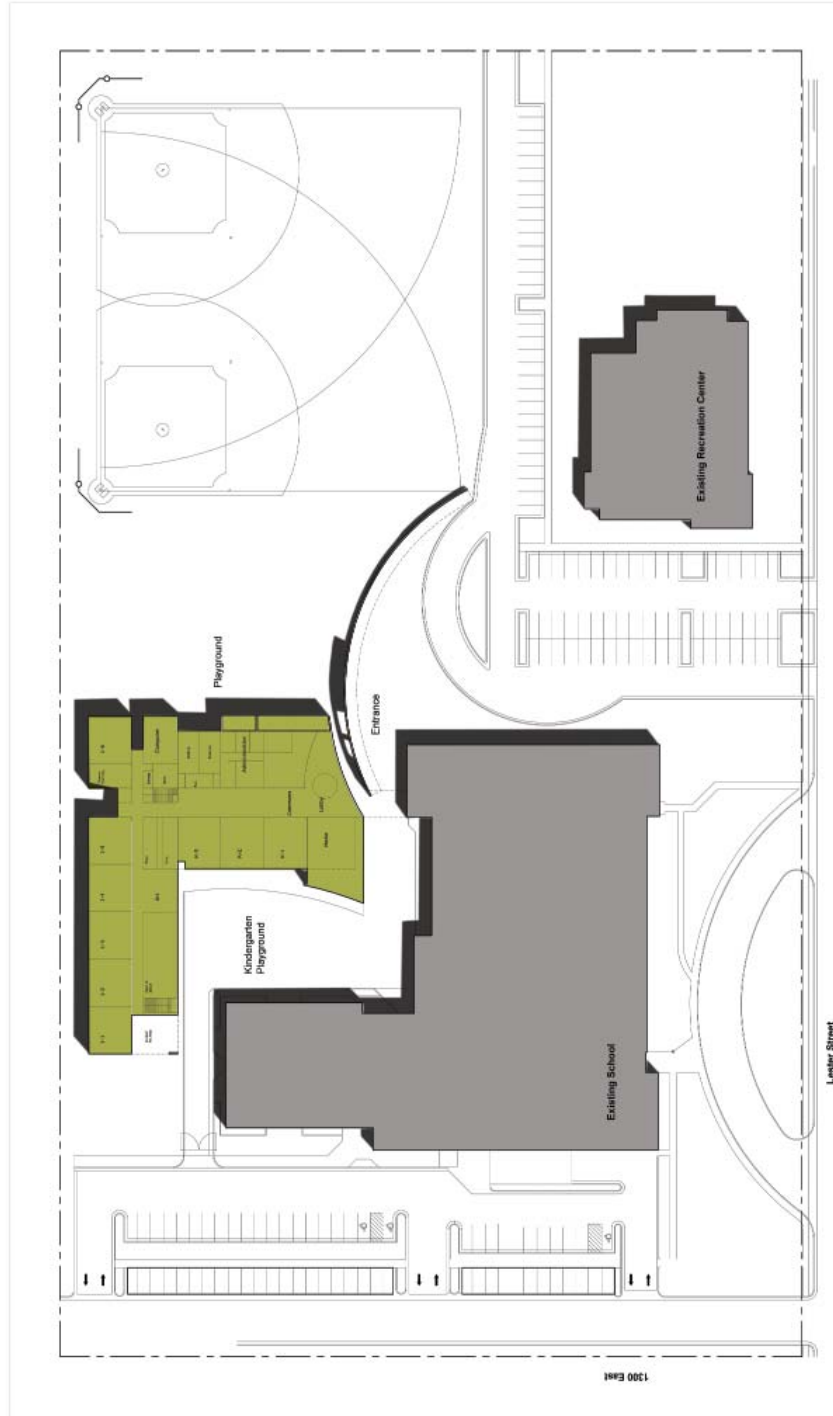
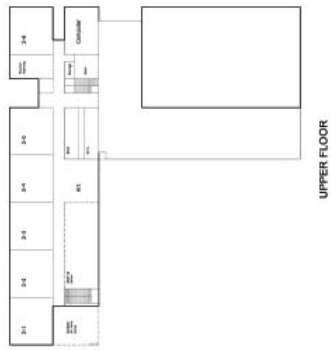
Day lighting, given its role in sustainable design and as previous described teaching tool, also became a main attribute of the physical environment. Classrooms were positioned and sized to take the maximum benefit of controlled north and south day lighting orientation. The depth of the classroom was sized to allow day light from the window wall to reach as far into the classroom as possible. Ceilings were angled to supplement the day light harvesting into the space, while also providing additional sound diffusion. At the furthest point in the classrooms from the window, sola-tube skylights supplemented the day lighting in the space. In the break out areas between classrooms day lighting was brought in through the giant “periscopes” and sola-tubes skylights. The canvas “sails” help to diffuse the light from sola-tube skylights into the space.

The school has been formed by the environmental influences of its location. Through this relationship and the ongoing dialogue between students and the built environment, a conversation between the school and the greater community is taking place. This conversation expands to the global community in the sustainable strategies expressed throughout the built environment of the South Weber K-2 Center. In this expression is the message that good stewardship of the environment begins locally to address a larger, global issue.



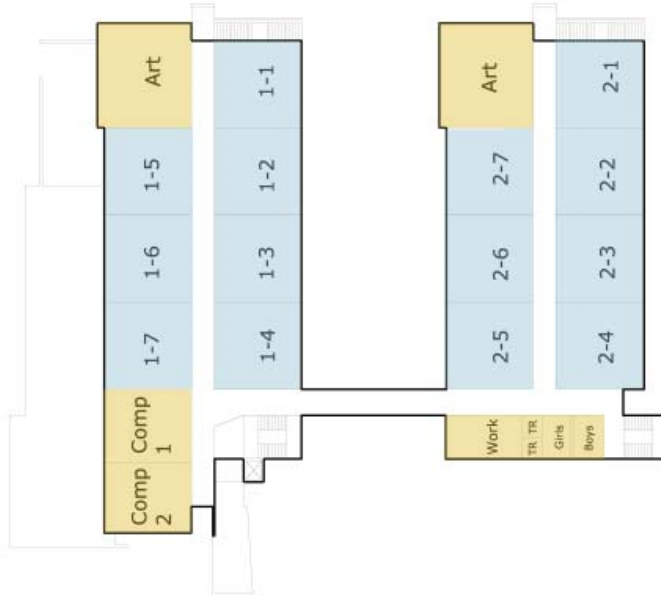
New South Weber Elementary School Site Option



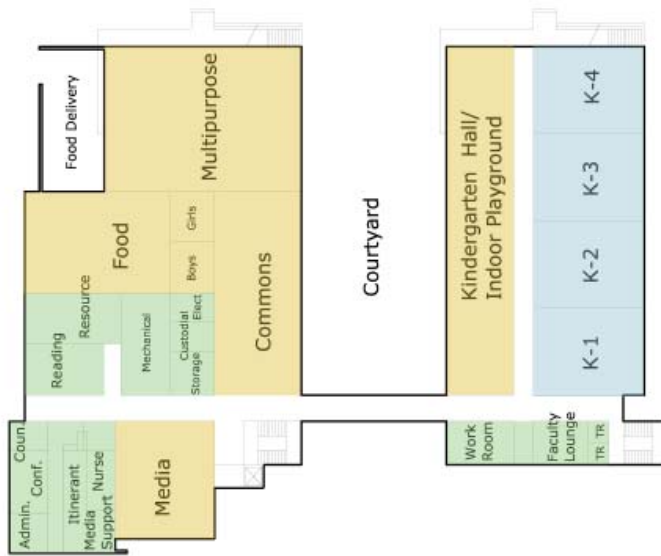


New South Weber Elementary School Site Option

Scheme (A)

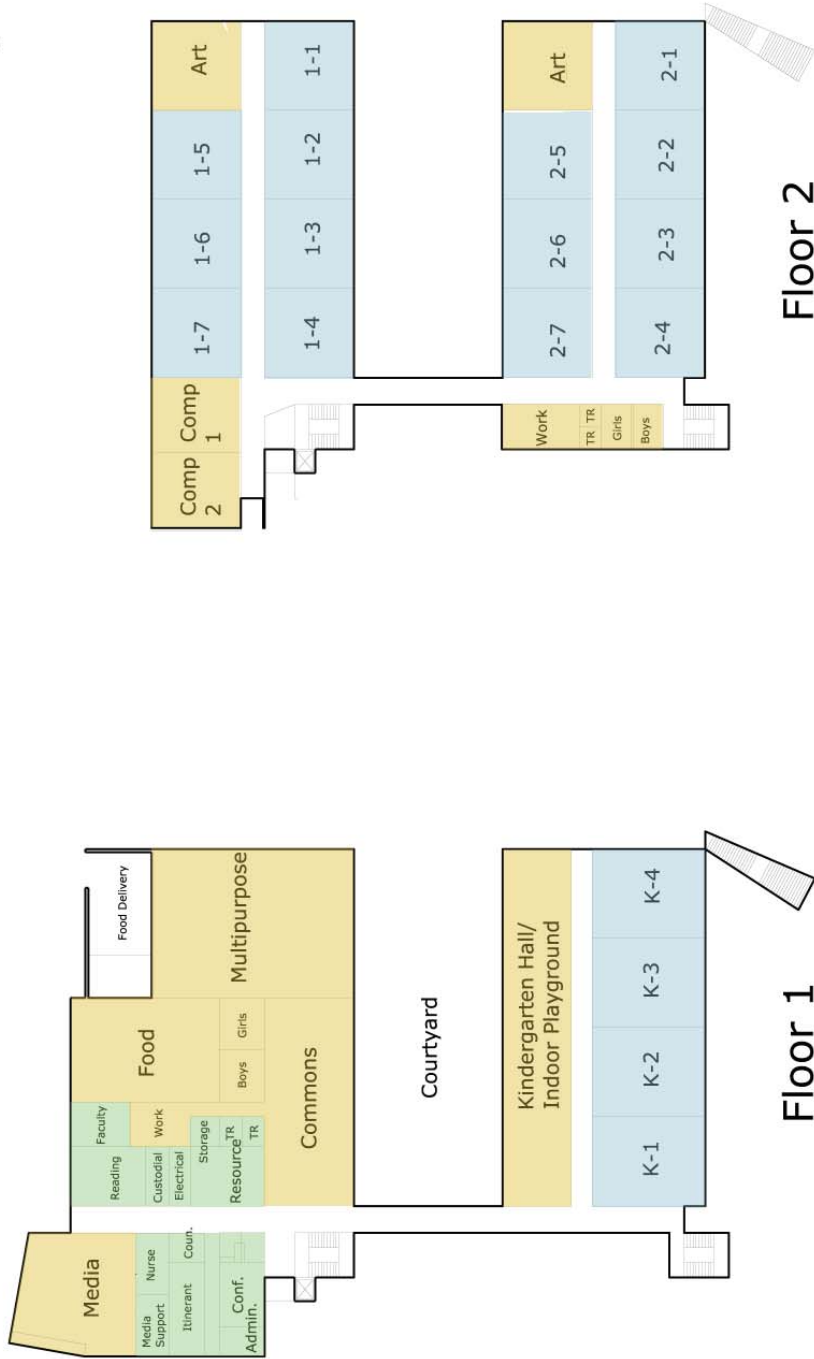


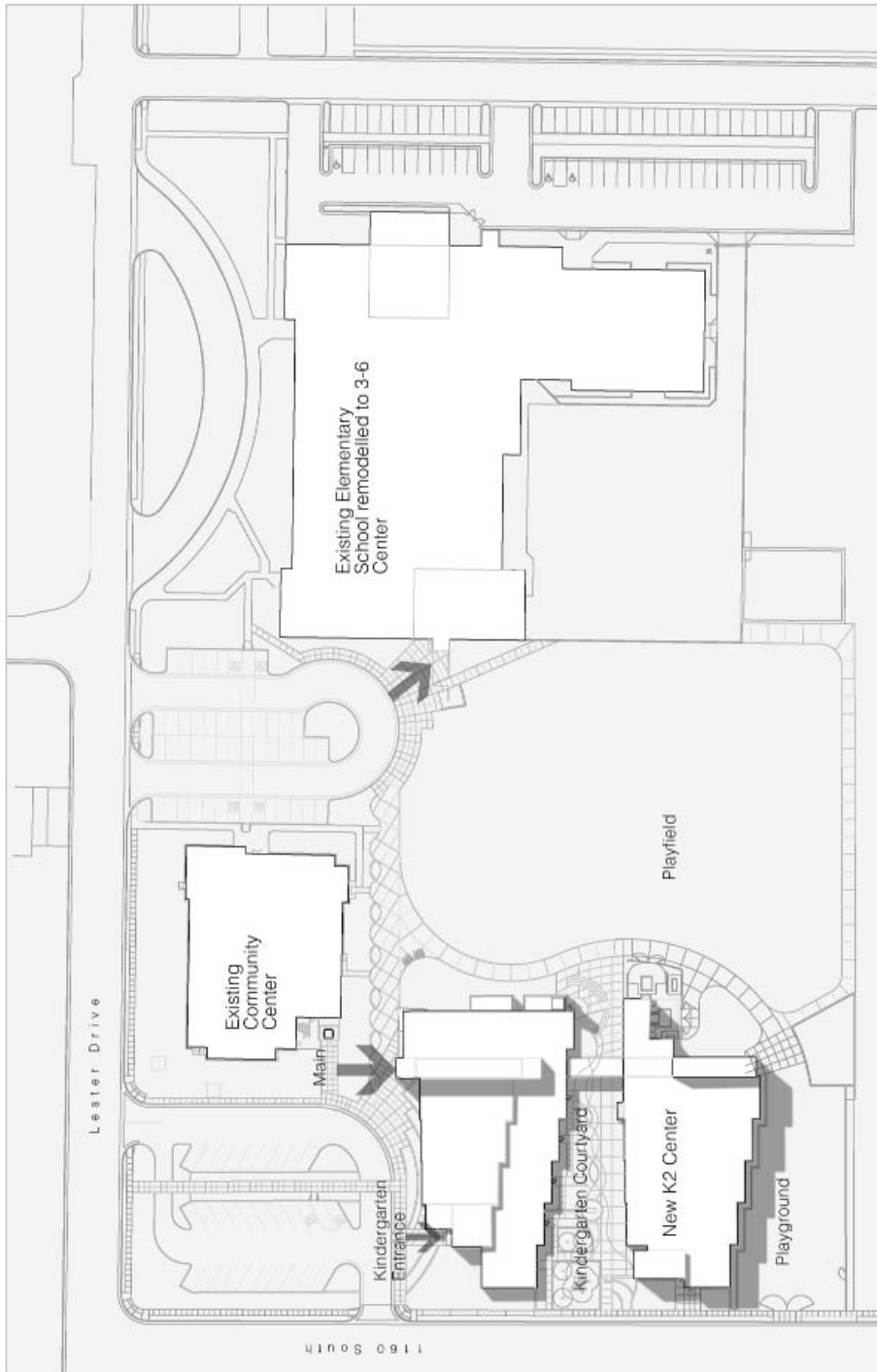
Floor 2



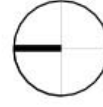
Floor 1

Scheme (B)

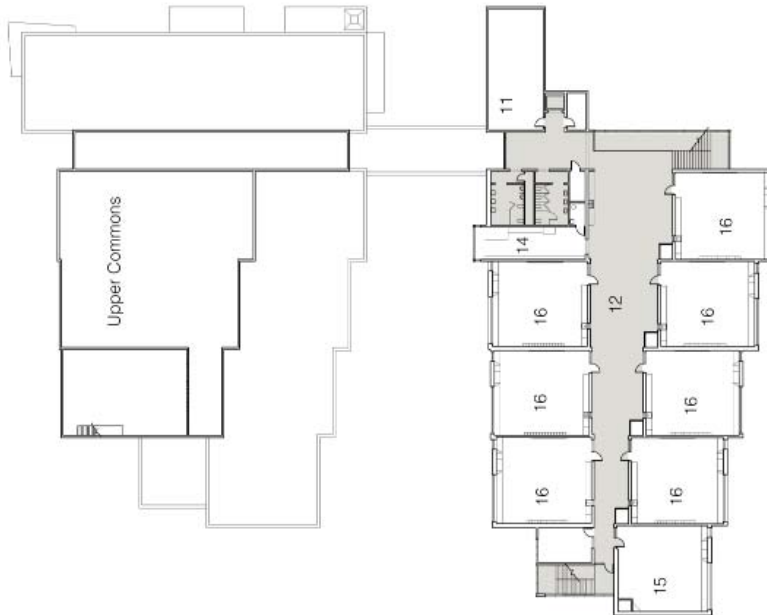
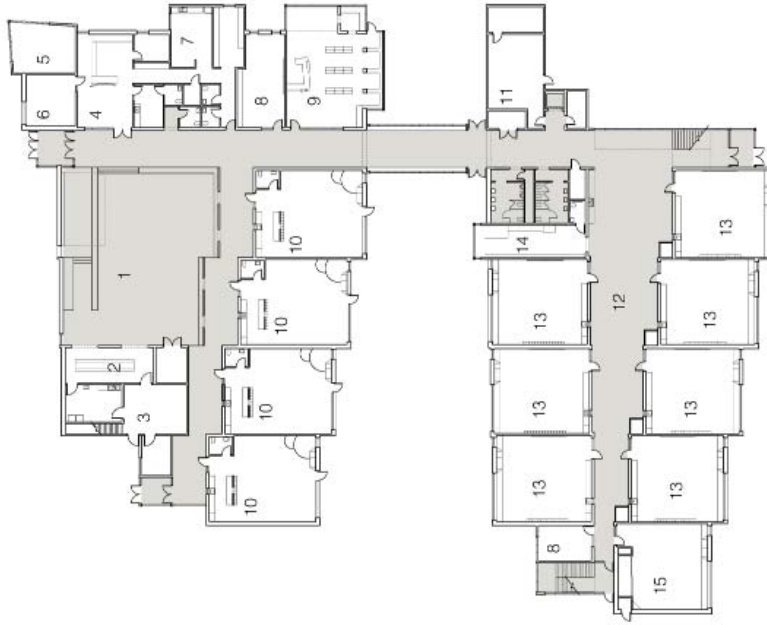


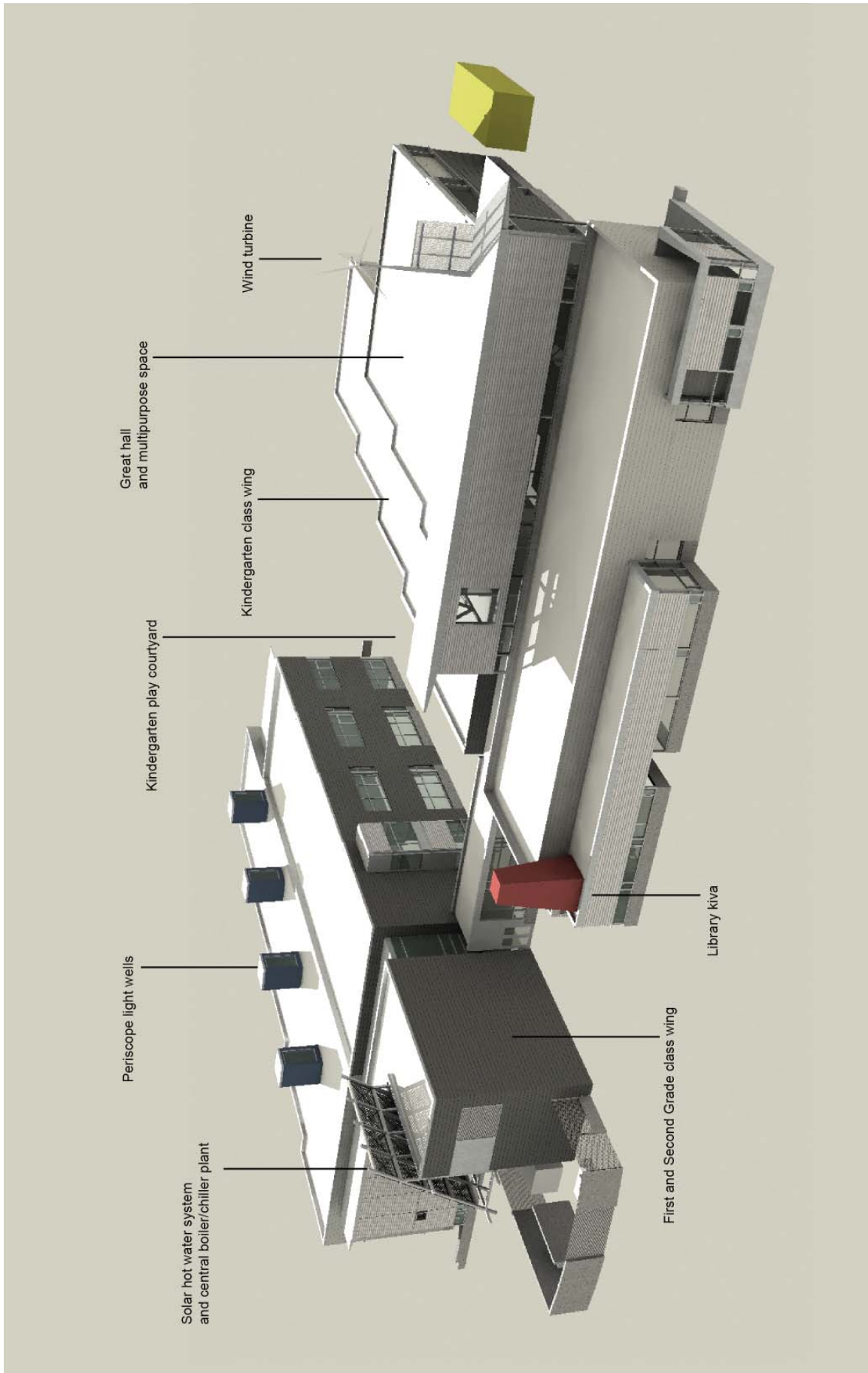


- Key**
- 1 Main Commons and Stage
 - 2 Galley
 - 3 Services
 - 4 Reception
 - 5 Principal
 - 6 Conference
 - 7 Lounge
 - 8 Resource
 - 9 Media/Library
 - 10 Kindergarten
 - 11 Mechanical
 - 12 Group Activity Commons
 - 13 First Grade Classrooms
 - 14 Teacher Prep Area
 - 15 Digital Lab
 - 16 Second Grade Classrooms



Floor Plans







wind turbines marking entries



solar array



view of media center and reading nook "night sky"



kiva



commons



cafeteria "galley"



break-out teaching area for multiple classes



break-out teaching area for small groups



giant "periscope" introducing daylight to breakout area and canvas "sails" diffusing sola-tube daylighting

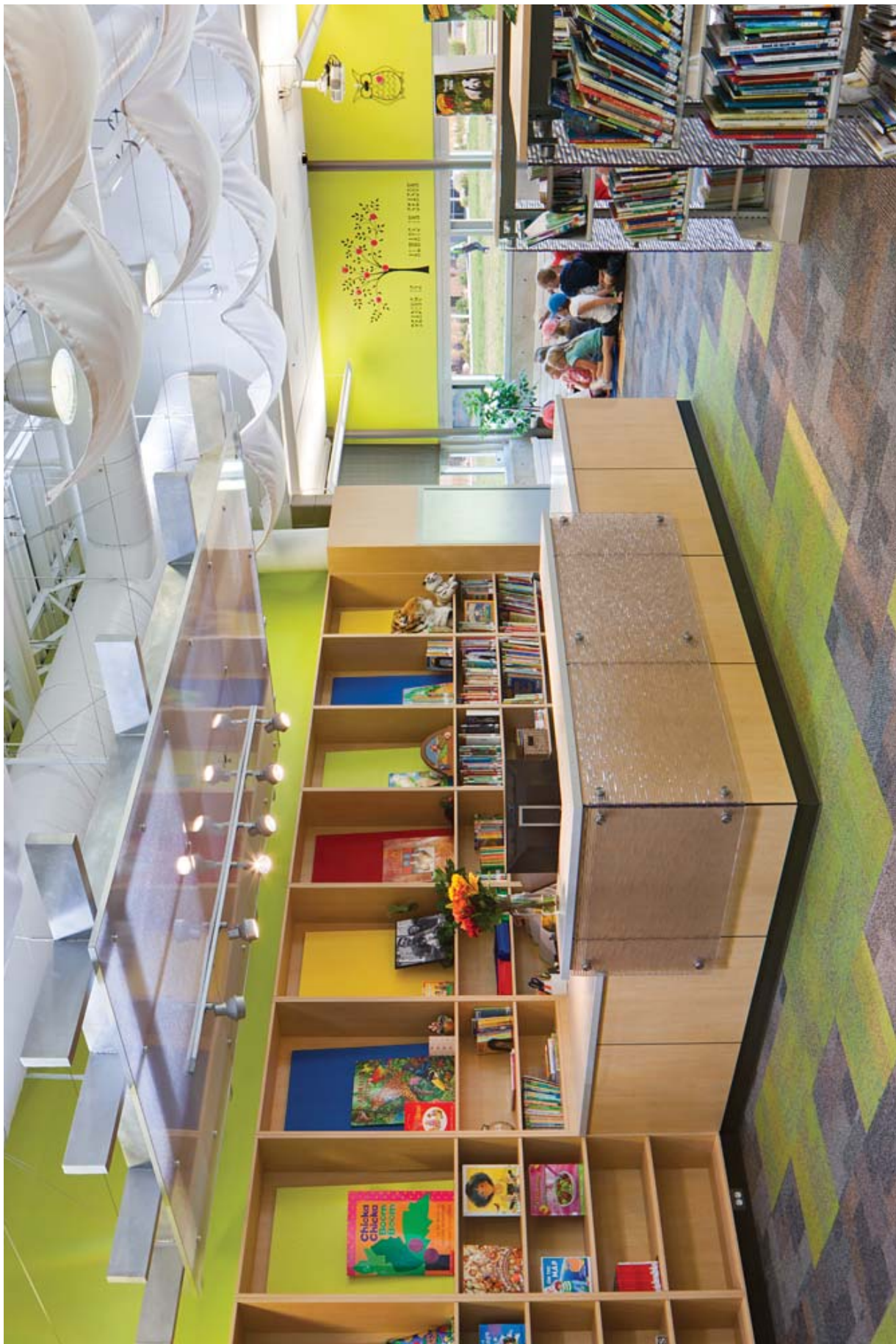




giant “periscope” at the lower level connecting the interior with the exterior



the media center



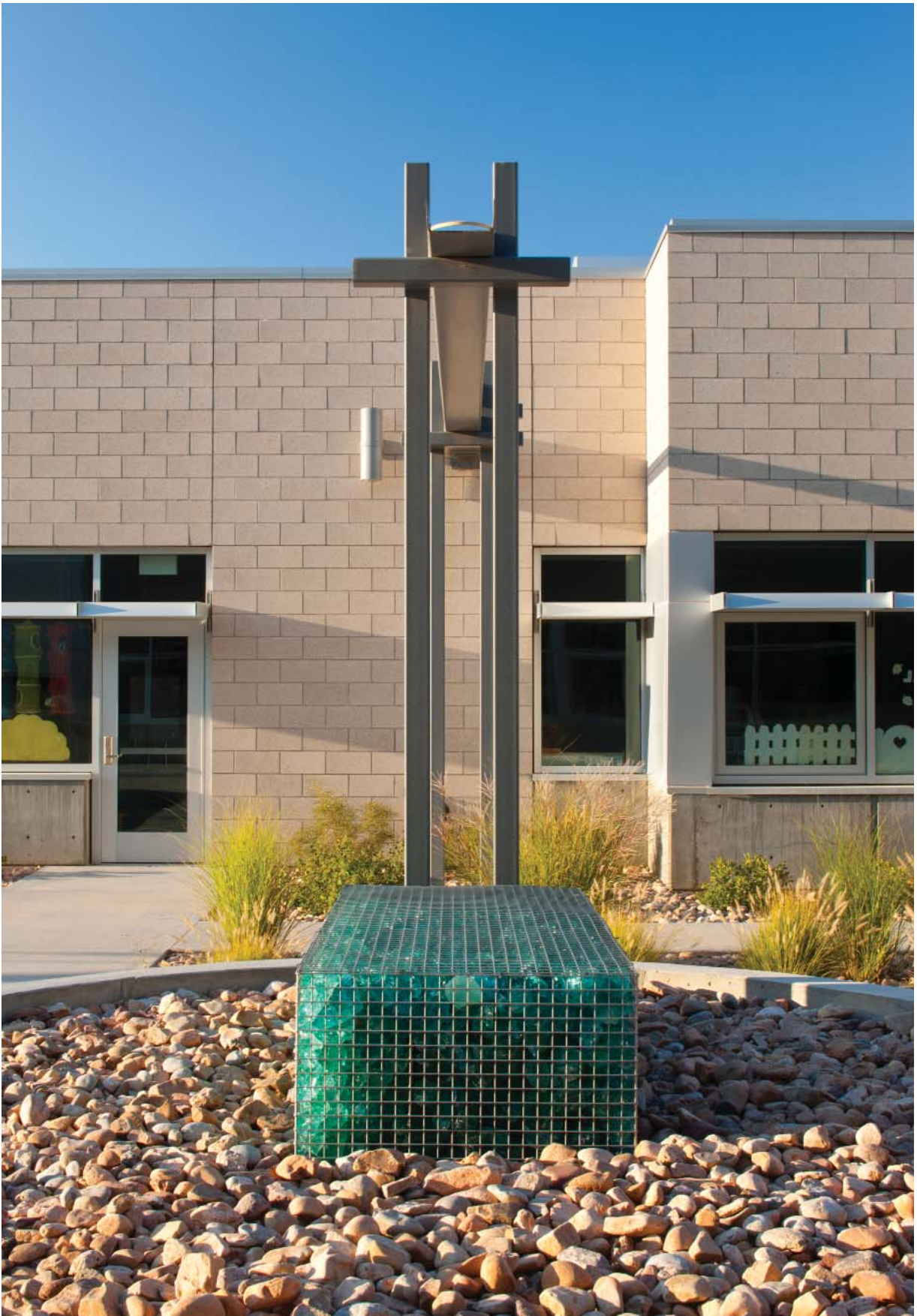
the media center



the reading nook



exterior courtyard



gathering rainwater