

GREEN SCHOOLS CASE STUDY
West Wing Elementary School

School name: West Wing Elementary School – Deer Valley Union School District
Address: 26716 N. High Desert Drive, Peoria, Arizona
Contact: Jerry Cipriano
Phone number: 602-467-5131
General location: northwest Phoenix
Grade Levels: (K- 6, 9-12, etc.) K-8
Number of students: projected 900
Number of staff: 66
Superintendent/Principal: Dr. Linda Price-Barry
Phone number: 623-376-5004

Physical descriptors:

building area	90,330 sf	number of stories	3
number of buildings	2	number of classrooms	54
floor area of conditioned space	86,039 sf	site area	15.2 Acres
landscape area	9.56 acres	Building footprint area	48,832 sf

Date of “commissioning”: August 2005

School Cost:

Total construction cost: \$11.2 million
Cost per square foot: \$130.74/sf
Additional funding sources: none

SUSTAINABLE SITES GOALS

Building area used as Community Space
Erosion and Sedimentation Control
Site selection
Alternative Transportation
Alternative Transportation
Reduced Site Disturbance
Reduced Site Disturbance
Stormwater Management
Stormwater management
Light Pollution Reduction

Sustainable sites strategies used

- Lower basin of site used for play fields because the basin was relatively flat compared to the rest of the site. This lower basin had already been disturbed by the developer.
- Designed to protect and restore open space and reduce site disturbance.
- Building drawn up into a three story building to minimize building footprint.

- Building orientated across the slope of the hill in a two story walk-out configuration to minimize amount of rock excavation.
- Even though the building was three stories tall the smallest face of the building was placed perpendicular to the community to lessen the school's impact.
- Building laid out in an east west configuration to better control day lighting into the classrooms. This also better controls the indoor air quality.
- Building functions laid out in a manner so that the kids would cross the site at the same elevation instead of climbing the hill to the multi-purpose building.
- Kept native landscaping where possible.
- Bicycle storage and changing rooms for students.
- Dedicated parking for carpooling.
- Site designed to manage Stormwater through rate and quantity and use of retention ponds.

Results obtained

Neighborhood seems pleased with the design, no complaints have been received. The east west configuration is working well.

Considering building orientation on the site improved cost effectiveness of maintaining the school **YES**

Building is used as community space – multipurpose area, 15,000 sf - 20% of school

WATER EFFICIENCY GOALS

Water efficient landscaping
Water Use Reduction

Water efficiency strategies used

The 70'-0" high hill created a potential storm drainage problem. The upper parking structure was designed to contain the water runoff. This water was then piped through storm drain pipes and head walls under the building to the lower playfields. The water from the hill above, building roof run-off and run-off from the parking lots then was allowed to free flow onto the grass playing fields. This water then gravity flowed across the grass ball fields filtering the water. At the end of the ball fields the water was again collected and permitted to free flow into the community retention basin.

The sprinkler irrigation system contains a moisture reading module that can sense if the irrigation system needs to skip a watering cycle because of recent weather conditions. All plantings above the building are low water use plants reclaimed from the existing vegetation.

There is a field booster pump as an override.

Installed sensor hand washing stations.

Installed waterless urinals and low flush toilets.

Results obtained

The Calsense sprinkler and irrigation system has worked during the rain storms to stop automatic watering until sensors show a need.
No specific data but seems to help.

Additional information:

Including water saving devices increased overall cost YES NO Unknown
Overall, incorporating water saving devices into the school was worthwhile
YES NO

ENERGY AND ATMOSPHERE

Energy sources: electric, natural gas, solar

HVAC type	Air Cooled Chillers	Number of Units	2	BTU Rating	321 Tons A/C
Insulation R-Values	roof	R-42	walls	R-25.76	
Window types	Hollow metal windows with insulating glass Low E on south side	U=0.29	shading Coefficient = 0.44	Visible Light transmission= 69%	

ENERGY AND ATMOSPHERE GOALS

Green power

Energy and Atmosphere strategies used

The bank of light fixtures adjacent to the window wall in the classrooms is switched separately from the rest of the light fixture switches. This switch is located adjacent to the teacher’s desk in the front of the classroom. The theory is that the teacher will be able to monitor when additional lighting would be needed. If all switches were placed at the classroom door the tendency would be to turn all lights on without checking for adequate daylight.

Fluorescent light fixtures have electronic ballasts and T-8 lamps.

Transformers are high efficiency with 25% less losses than NEMA TP-1. Transformers are K-13 rated by Powersmiths International eSaver.

No third party testing of systems but A and E team checked.

Exterior lights are on sensor system and shut down and ramp up accordingly.

Results obtained

Studies on energy savings are still being completed. Comparison suggests that when compared to a comparable school, energy usage has not been reduced by per square foot or per student. The cause may lie with the chillers. The chiller systems ran 24/7 during warranty test for three to four weeks. There is heavy usage of the Multipurpose room by the community on the weekends and the energy management system is not coordinated for weekend activities. There is also a high amount of traffic in and out of the buildings causing the doors to be open for long periods of time.

MATERIALS AND RESOURCES GOALS

Storage and Collection of Recyclables
Recyclables are commingled.

INDOOR ENVIRONMENTAL QUALITY GOALS

Environmental Tobacco Smoke Control
Carbon Dioxide (CO₂) Monitoring
Low emitting Materials (Adhesives and Sealants)
Low Emitting materials (Composite wood & Agrifiber)
Daylight and views

Indoor environmental quality strategies used

- Building laid out in an east west configuration to better control day lighting into the classrooms.
- Each classroom has exterior windows. Windows are placed high along the teaching walls to allow wide marker boards.
- The suspended ceiling slopes up to the exterior windows so light can bounce off the ceiling to the center of the classroom.
- Each classroom has a full height window so even little children can see out the window. This window is placed adjacent to a wall so the light entering the room can bounce off the wall into the room.
- Windows along the south side of the building have low-e glass to maximize lighting while minimizing heat gain.
- The view from the windows will either be the natural desert hill remaining on site or a view of the mountains located across the development.
- Where windows could be broken like in a gymnasium the glass windows are replaced with translucent insulated panels. Also sound transmission from Band and Music rooms have been minimized by replacing the glass windows with translucent panels.
- Room lighting has split controls
- Didn't use infrared or motion sensors – next school will
- Zero tolerance for tobacco products
- Cleanable duct work – currently using pleated filters that filter to a 97% level. The school is researching changing to the use of HEPA filters. Outside air on return circulation is 15% make up.

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