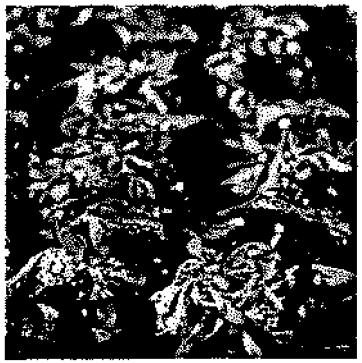
Green Sustainable Schools



The following information is for discussion purposes only. In today's schools there is a great deal of discussion regarding Green, Sustainable design and LEED certified schools. The extent to which these concepts are to be incorporated will need to be determined based on discussion between the architect, school district

Green schools are healthy for students, teachers, and the environment. Built right, green schools are productive learning environments with ample natural light, high-quality acoustics, and air that is safe to breathe. Schools everywhere are going green, nurturing children while saving money.

The U.S. Green Building Council [USGBC], a nonprofit organization works to move the building industry toward sustainability which is the design and construction of buildings that are environmentally responsible. Green design refers to design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five areas:

- Sustainable site planning
- Safeguarding water and water efficiency
- Energy efficiency and renewable energy
- Conservation of materials and resources
- Indoor environmental quality

The USGBC developed and maintains the LEED Green Building Rating System. LEED is the national benchmark for green buildings promoting sustainable design and construction. The objective is to:

- Reduce impacts of natural resource consumption
- Protect air quality and water quality, biodiversity, and ecosystem health
- Improve economics of building operations, asset value, worker productivity, and the local economy
- Enhance building occupants health and safety, relating to risk management
- Minimize strain on local infrastructure such as landfills, water supply, stormwater sewers and related development and costs; decrease transportation development and maintenance for roadways, and encourage better performance of mass transit systems.

The LEED for Schools Rating System recognizes the unique nature of the design and construction of educational facilities and provides verification that a building project, whether new or renovated, is sensitive to the environment. It addresses such issues as classroom acoustics, mold prevention, environmental site assessment, and other matters related to school design and operation.

Green schools are healthy places to learn, to teach, save money, provide hands-on learning and are environmentally friendly.

Planning Principles
Following are planning principles employed by school districts when renovating or constructing new schools.

Sustainable Sites:
- Construction activity pollution prevention
- Protect or restore habitat
- Storm water design [i.e. using existing natural features such as ponds and creeks enhanced by constructed basins, and lot-line swales over gutter-and-pipe engineering]
- Joint use of facilities

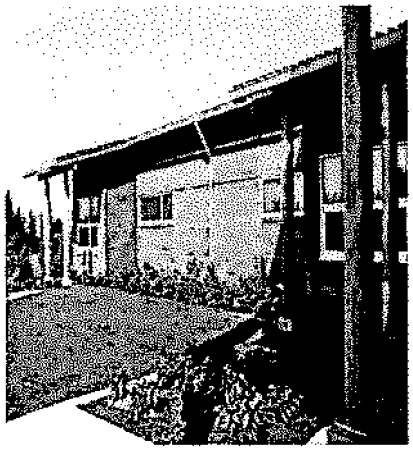
Water Efficiency:
- No potable use or no irrigation
- Water use reduction [i.e. use collected rainwater or gray water for toilet and urinal flushing or other non-potable uses]

Energy & Atmosphere:
- Optimize energy performance
- On-Site renewable energy [i.e. geothermal, hydroelectric, solar, wind]
- Green power [i.e. purchase of green electricity]

Materials & Resources:
- Storage & collection of recyclables
- Building reuse
- Construction waste management
- Regional materials
- Rapidly renewable materials [i.e. bamboo flooring, cork wall covering]
- Certified wood [wood/paper that comes from good forest management]

Indoor Environmental Quality:
- Increased ventilation
- Outdoor air delivery monitoring
- Low-emitting materials
- Lighting system design & controllability
- Thermal comfort design & controllability
- Daylight & views [75-90% of classrooms & other spaces]
- Enhanced acoustical performance
- Mold prevention

Innovation & Design Process:
- Innovation in design – project specific
- LEED accredited professional
- School as a teaching tool [i.e. high school students learn about alternative energy from the solar panels on their roof]



Architects, Portland, Oregon

This school building uses native plants and natural wild flower grasses in the landscape as well as provides water quality treatment on site with an outlet into an existing creek.

Source: Multnomah Education Service District, Dull Olson Weekes

(Photograph used for illustration purposes only)

Aesthetics

The indoor and outdoor structures and spaces where students go to school need to be aesthetically pleasing and healthful settings. The facility should be inviting to the students, making them feel that the space is special, and therefore emphasizing that each individual is important. Aesthetics that affirm the value of the individual must be stressed, with spaces for the admiration of the accomplishments of self and others. The school should resemble a place for academic success, high self-esteem, social interaction, and physical safety. The facility layout should be especially easy to comprehend and reflect how classes relate to one another in order to minimize the lost feeling common in students. Spaces should be provided for socialization among students and with teachers. Spaces should also be provided to display student work.

Variety of Instructional / Learning Spaces

Ongoing assessment of student progress will require facilities to be able to adapt to a changing program. Multi-use of buildings should be the norm. Spaces should allow for a wide variety of specialized instructional and hands-on learning experiences.

Today, students do not just work in groups of 20-25. As technology continues to advance, students are becoming more involved in extensive individual learning activities that are supplemented by small group (2-6 students), moderate group (10-20), and large group (50-150) activities. Space should be provided for students to plan, work independently and collaboratively, give and/or receive tutoring as well as accept instruction.

Indoor and Outdoor Learning Environments

By rethinking spaces, better use of facilities can be made. Some ideas include: use green areas instead of pavement and use hallways as art galleries or museum strips. Creativity and functionality should work hand-in-hand. Color, greenery, building materials, and furniture should be selected carefully to develop a pleasing and inviting atmosphere.

The learning environment should be student-centered and designed for "hands-on learning," promoting student autonomy and independence. Space for active participation should be incorporated with modular, flexible classrooms providing opportunities for integrating disciplines and easy

access to tools of exploration. The outdoor site should serve as a pro-active learning environment as well. Outdoor spaces with benches, sheltered areas, and amphitheaters can be incorporated in the design.

Learning from Others

Modern office environments provide greater insights into flexibility than current school environments. Many of their concepts should be taken into consideration:

- Demountable, movable non-load bearing wall systems.
- Modular furnishings.
- Raceways, cable trays.
- More generic space that can be adapted to specialized uses.

Planning Ideas

Following are planning ideas employed by other districts when developing school facilities and sites:

- Building orientation important - obvious focal point/ main entrance. Front of building should be facing where public can see it.
- Good signage – marquee board (with directions on how to find entrance and location within the facility) – good directional/informational signage inside and out.
- Welcoming area by front door. Welcome area open, using spacious hallways and common areas.
- Create easy access for parents/community.
- Pleasing, warm, inviting, soothing colors.
- Visually appealing, both internally and externally.
- Arched ceilings in corridors.
- Natural Sunlight - skylights, glass, block glass, windows, open areas.
- Enclosed media center with skylights
- Student art work – several showcases around school to promote student achievement.
- Plants – artificial and real.
- Classroom – tile with soothing pattern and color; comfortable furniture.
- Complimentary carpet and tile mix appropriately used throughout the building.
- Top windows operable.
- Student spaces should be equipped with technologies for student use.
- Transparent walls & spaces
- Landscaping – good upkeep
- Dumpster not visible
- Separate access road for deliveries
- Ergonomic – movable furniture (inviting / welcoming)
- Tables / chairs vs. desks
- Natural seating / bancos
- Decorative concrete / polished flooring (various color / designs)