

Basic, No-Cost Green Building Strategies

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GREEN AND THRIFTY

Clients often ask how to improve the energy efficiency and sustainability of a proposed building with no added construction cost. While some green strategies can be implemented within any budget, few of them can be implemented within a construction cost range of \$90 to \$110 a square foot.

It is possible, however, to make environmentally friendly design decisions on nearly every project without increasing construction cost, regardless of the budget size. None will produce a Collaborative for High Performance Schools (CHPS) or Leadership in Energy and Environmental Design (LEED™)-certified building, but all may modestly improve energy efficiency or material consumption, in turn lowering utility bills and maintenance costs for the owner.

KEEP IT SMALL

Stick with the absolute minimum square footage required by the program. Keep corridors at their minimum width. Move functions outdoors, if possible. If space can be shared by two functions, propose that to the owner. This keeps construction cost, conditioned space, lighting, material/resource consumption, and site disturbance to a minimum.

CONSIDER BUILDING ORIENTATION

Align the building along an east-west axis so windows face either north or south. In southern or hot climates, design large north windows to take in cool, diffuse north light. Minimize window height on the south side (strip windows work well), and shade the window from direct sunlight. When the sun is high in the south sky, a canopy or a tree makes an excellent sunshade.

In northern or cooler climates, place small windows on the north side and large windows on the south side to minimize heat loss and maximize solar gain during the winter. It is still important to shade south-facing windows during the warmer summer months to minimize solar

gain during the cooling season. Overhangs or other types of sunshades can be designed to admit the low winter sun while blocking the higher summer sun. Deciduous trees are excellent for this purpose, admitting light in winter and providing dense shade in summer. A good rule of thumb for overhangs (assuming that the overhang is level with the head of the window): Make the overhang as deep as the window is high.

Minimize east- and west-facing windows; the sun is low in the morning and evening, creating a lot of glare and solar heat gain.

Be sure not to confuse project north with true north. Even a slight deviation from true north can reduce the benefits of good orientation. Proper building orientation serves the dual purpose of providing good daylight (which reduces the artificial lighting load and consumption) and minimizing solar heat gain.

ELIMINATE FLOOR FINISHES

This option may be undesirable where thermal comfort and foot comfort is an issue, but it can be acceptable on commercial projects in service areas, toilet and locker rooms, corridors, waiting rooms, and cafeterias. There is a misperception that a concrete floor has a negative effect on acoustics, but surprisingly little of a room's reverberation occurs from sound reflection off the floor. Many concrete finishing options are less expensive than carpet or tile—and easier to clean and maintain.

DESIGN AN OPEN LAYOUT

In addition to reducing construction cost, open planning improves daylight and natural ventilation, reduces duct runs, minimizes material use, and eases reconfiguration of the space.

USE WATER-EFFICIENT FIXTURES

There is rarely an additional cost for these types of fixtures. On commercial projects, use electronic sensors or even push-rod faucets in lavatories. Consider waterless urinals. Many clients and engineers are leery of them, but they are quite clean and gaining in popularity, even in high-use areas such as airports and athletic facilities. Plumbers hate them because there are no flushometers to fix. There is a significant cost savings, both in construction and operation—these fixtures are less expensive than conventional fixtures with flush valves, are plumbed without a water supply, and do not consume water for flushing.

BE MINDFUL OF MATERIAL UNIT SIZES

Design the building to minimize cutting of plywood, lumber, and other materials sold in commonly known sizes. This will reduce material cost, material waste and disposal cost, and labor for measuring and cutting. Educate everyone on the design team to consider common standard material dimensions as a routine part of the design process.

MORE BEST PRACTICES

The following AIA Best Practices may provide additional information related to this topic:

- 18.11.01 Energy Design Guidelines for High-Performance Schools
- 18.11.02 Eco-Charrettes Save Resources, Build Teams

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- Go to www.aia.org
- Select “M” (for members) from the top of the home page.
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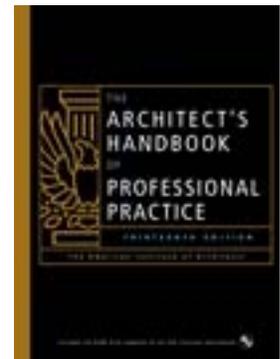
ACKNOWLEDGEMENTS

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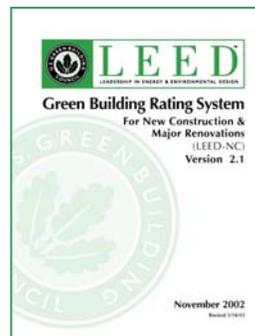


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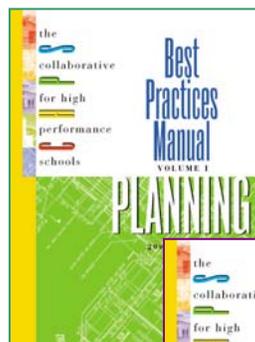
See also “Energy Analysis and Design” by Donald Prowler, FAIA, *The Architect’s Handbook of Professional Practice*, 13th edition, Chapter 18, page 616. The *Handbook* can be ordered from the AIA Bookstore by calling 800-242-3837 (option 4) or by sending e-mail to bookstore@aia.org.



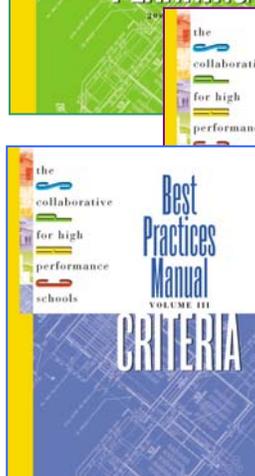
ADDITIONAL RESOURCES



The LEED Green Building Rating System™ is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. The LEED Rating System™ can be downloaded at no cost by visiting the Web site located at www.usgbc.org.



The Collaborative for High Performance Schools aims to facilitate the design of school environments in California that are not only energy efficient, but also healthy, comfortable, well lit and that



contain the amenities needed for a quality education. The 3 volume CHPS Best Practices Manual can be downloaded at no cost by visiting the

Web site located at www.chps.net.