



AIA Best Practices: Basic no-cost green building strategies

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Summary

Architect Eric Shamp has identified seven different ways to build a more energy-efficient home in a cost-effective manner. The following methods will not secure LEED certification but might help reduce utility costs and lessen environmental impact.

Green and thrifty

Clients often ask how to improve the energy efficiency and sustainability of a proposed building with no added construction cost. While many green strategies can be implemented within any budget, few of them can be implemented within a bottom-end construction cost range, as might be found on projects for some public schools or nonprofit organizations.

It is possible, however, to make environmentally friendly design decisions on nearly every project without increasing construction cost, regardless of the budget size. None of these strategies 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 two functions can share space, 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 south-facing 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 especially 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 cost-competitive with carpet and 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 metered faucets in lavatories. Consider waterless urinals. They are becoming mainstream technology, even in high-use areas such as airports and athletic facilities. Depending on local water billing rates and maintenance costs, there may be 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.

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