



# The Environmental Stewardship Green Building Primer for Church Buildings

Compiled by Episcopal Diocese of West  
Texas  
Environmental Stewardship Committee

*More and more religious leaders want to build  
and renovate in a way that supports life.*

Rev. Fletcher Harper, Episcopal Priest  
Director of GreenFaith  
New Brunswick, New Jersey

*Part of our discernment process in  
moving and building was to be  
good stewards of our land, our  
buildings, and the wildlife and  
native habitat. To that end, we  
employed architectural plans  
which would reduce impact on the  
footprint, conserve water and  
electricity, and maintain as much  
native wildlife and habitat as  
possible.*

Rev. Nancy Coon, Rector  
The Episcopal Church of the Holy  
Spirit  
Dripping Springs, Texas

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## **Mission**

This Green Building Primer for Church Buildings has been prepared by the Environmental Stewardship Committee of the Episcopal Diocese of West Texas. Its purpose is to introduce the layman to some of the principles and concepts of Green Building, also known as Sustainable Building, and to provide a guide to resources for implementing those concepts.

## **What is the connection between our buildings and our communal life?**

In every aspect of life, our actions demonstrate how we praise God and care for his sacred gifts to us. Our buildings can be a physical example of our respect for His creation and our fellow creatures. By carefully attending to the impact our buildings have on our congregations and our communities, we can powerfully communicate our love of God.

Over the past decade, individuals and organizations increasingly have chosen to renovate or construct new buildings in a manner that reduces their environmental impact. Rev. Fletcher Harper, an Episcopal priest and Executive Director of GreenFaith, an interfaith coalition for the environment in New Jersey, says, "People of faith have a vital role to play in the restoration of a healthy environment."

[GreenFaith](#)

## **How do our church buildings impact our congregations?**

The average U.S. citizen spends approximately 90% of his time inside a building. According to the Rocky Mountain Institute, most of these buildings, as they are presently constructed, have an enormous negative environmental impact.

Every year, reports the Environmental Protection Agency, building-related illnesses cost the U.S. economy billions in lost productivity and result in the decrease of human well-being from "sick building syndrome."

Of course, we will have buildings that are aesthetically pleasing, but we also want a healthy interior environment. Well-being and good health are enhanced in interior environments that have a proper air flow, that have a pleasing component of natural light, that reduce particular matter, and toxic compounds found in building materials. (You can scroll down to the section on [Materials for guidelines related to building materials that negatively impact the environment of your building.](#))

## How do our buildings economically impact our congregations?

The church building is an emblem of our faith and serves as the physical hub of our communal life. However, when we spend too much money on building and maintenance we divert funds from other projects which serve our mission. The financial advantages of an environmentally responsible building are great, especially for church buildings which are generally in place for the long term and will be used for many years.

A stable organization such as a church is an ideal candidate for green building. The life-use of the facility is likely to be under one owner, thereby creating opportunity to realize maximum benefit of design and installations.

[Examples of economic benefits of incorporating sustainable models into your building project](#)

## How do our buildings impact our communities?

According to the National Resource Defense Council, in the United States buildings account for:

- Over 40 percent of total energy use, twice as much as passenger vehicles. This includes 70 percent of all electricity consumption.
- 40 percent of global warming gas emissions
- 40 percent of raw materials use
- 30 percent of municipal solid waste from construction related activity (136 million tons annually)
- 80 percent of potable water consumption
- 25 percent of all wood harvested for use in US. The enormous quantity of wood harvested each year means that building construction often accelerates deforestation, degrades habitat, and worsens water quality.
- Poor people and people of color are disproportionately impacted by the hazardous industrial chemical emissions associated with the production of common building materials.

Given the pervasiveness of environmental challenges, the long reach of pollution far beyond its source, and the almost daily appearance of unexpected consequences of our actions, we urge you to consider the Precautionary Principle when making your building decisions. It's better to err on the side of caution when the environmental and health impact of a procedure or material is in question.

[Precautionary Principle](#)

## How does a congregation get to the point it has committed to an environmentally

## responsible building program?

Rev. Fletcher Harper, Executive Director of GreenFaith, says that an effective movement for environmentally responsible program comes from within the congregation. "Either two or three leaders in the parish will champion the cause and carry others along, or there will be a movement from the general congregation upwards. In the latter case, a group might engage outside help to present their case to the decision makers."

### [Conversation with Rev. Fletcher Harper on convincing a parish to adopt green practices](#)

## Once a commitment has been made, what is the most practical procedure to begin the design process?

The best opportunities to green your project will occur in the early planning stages. Make experienced green building professionals a part of your team from the start. Invite the members of your building and design team to come together early in the design process to set goals and discuss strategies.

Set your green building targets early. The sooner you define your goals, the further your dollars will stretch and the greater your return on investment will be. While the architectural costs of green design may be higher than more standard approaches, creating a high-performance design will lower your construction costs, especially if you involve your contractor early on.

### [Metropolitan \(San Antonio\) Partnership for Energy / Build San Antonio Green](#)

## Does the physical site make a difference in planning a healthy building?

As your team begins to assess the site for your building pay special attention to the location, orientation, and shape of the plot or existing building. Siting will have lasting impacts on the overall costs of your projects and the aesthetic impact upon those who use the building.

### [Site considerations for green building](#)

## Is it practical to seek green solutions for small projects?

Apart from the actual siting of a building, the concerns and strategies for your project will be much the same for new buildings as for modification of existing space. Your congregation has a wide range of options for making a positive impact on your building's environmental footprint. Even if you are not making structural changes or building from scratch, you can update systems, equipment, and furnishings.

Whatever the scope of your project, you can identify the areas where you feel there is greatest possibility of acting or where you most strongly want to make a change.

## After the siting and design of a project where should the planning committee focus its attentions?

You will find a huge range of possibilities for greening your building in three areas of construction and planning:

- Materials selection

- Efficient use of water
- Efficient planning for electrical systems.

## How does the selection of construction materials affect the environmental and health impact of a building?

In selecting materials there are two arenas of action you will want to consider:

- Reducing waste
- Choosing materials that do not pollute or negatively impact the health of those who use the building.

## What is the role of reducing construction material waste in creating a green building?

Given that over 30% of landfill material is composed of construction waste, a green building plan will include strategies to reduce waste.

By using reused and recycled materials as much as possible - during construction and throughout the life of your building - you will save money and help conserve natural resources such as wood.

### **Suggestions for reducing construction-related waste destined for the landfill**

## How do the materials used in a building impact environmental quality and human health?

All materials you might consider for your project exist on an environmental impact continuum of varying positive and negative impacts on human health and the environment.

Some building materials - such as arsenic-treated wood and PVC plastic (also known as vinyl) - stand out because they are directly linked to some of the worst environmental health problems, such as cancer, reproductive disorders and childhood disease.

Healthy Building Network has identified a range of "worst in class" chemicals that are included in product manufacture or that lead to their release in the materials' life cycle.

At the top of the "worst in class" chemicals list are Persistent Bioaccumulative Toxics (PBTs). A priority subset of PBTs is Persistent Organic Pollutants (POPs).

### **Simple Explanation of PBTs and POPs**

From an environmental health perspective PVC (polyvinyl chloride or vinyl) is the worst plastic because it poses unique and major hazards in its manufacture, product life and disposal.

PVC has contributed a significant portion of the world's burden of persistent toxic pollutants and endocrine-disrupting chemicals - including dioxin and phthalates - that are now universally present in the environment and the human population.

When its entire life cycle is taken into account, this seemingly innocuous plastic is one of the most environmentally hazardous consumer materials produced. Global vinyl production totals over 30 million tons per year, and 75% of PVC is directed to building applications.

Dioxins, furans and PCBs are the prime POPs connected with building materials. Building materials that release PBT's include polyvinyl chloride (PVC) based

products, mercury thermometers, lead solders and roofing materials, and certain paints and finishes.

Volatile Organic Compounds (VOCs) refer to a large number of chemicals that also of concern to human health as they affect the indoor air quality.

### Explanation of Vocs

Cement and concrete are pervasive components in building construction today. How can they be used wisely, and what are some precautions about cement to keep in mind?

In terms of environmental advantages, concrete is an attractive material: it is notable for its durability, longevity, heat storage capacity, and, in general, chemical inertness. For passive solar applications concrete's ability to function as a structural element while also providing thermal mass makes it a valuable material.

However, the production of cement is very energy intensive, in fact, one of the most energy intensive materials used in the construction industry. Because so much energy is required to produce cement, it is a major contributor of carbon dioxide emissions into the atmosphere. Experts estimate that cement production contributes to about 7 percent of carbon dioxide emissions from human sources.

To minimize environmental impact, therefore, we should try to reduce the quantity of concrete used in buildings, use alternative types of concrete, and use concrete wisely.

### Practical Suggestions for Reducing Environmental Impact of Cement in Construction

How can you identify materials that negatively impact your building?

The environmental and health impact of our buildings have important implications for the way we view ourselves as part of the local and world community.

There are numerous sources of information about the chemical components in building materials, for example: The US Green Building Council, Healthy Building Network, the Environmental Protection Agency. These organizations and many others have websites that identify materials containing chemicals you will want to approach with caution. In some instances, there is a rating system from most dangerous to less.

Conscientious planning in the early stages of project development can specify alternative and safer materials.

Many environmental risk factors largely can be modified by established, cost-effective interventions.

Design Strategies for Healthy Interiors

Healthy Building Network Guidelines for identification of building materials that will negatively impact your building in terms of environmental and health considerations

### Healthy Building Network resources to help you understand and find healthy materials

What are some basic strategies for increasing water efficiency, both inside and outside our buildings?

We live in an era of increasing climate uncertainty and in Central and South Texas

this often means drought conditions and imposed water restrictions. Further, we are experiencing increased pressure on our existing water supplies by an expanding population which implies increased domestic, commercial and industrial demand. Therefore, the way in which we use this precious resource is a standard of responsible citizenship, creation stewardship and thoughtful consideration of others. There are numerous strategies for increasing water efficiency in our buildings. Any strategy which reduces water waste increases the cost efficiency of your building. Holy Spirit in Dripping Springs has developed an admirable water-use program, and St. Mark's Church in San Marcos is incorporating many features in its building plan. (Scroll down for statements and ideas from both parishes).

### **Suggestions for increasing water efficiency in your buildings**

#### **How can we design energy efficiency into our buildings?**

A wide-range of actions are available to increase energy efficiency in your building, such as incorporating natural light, orienting the building to the cooling and heating needs of the building, and careful selection of fixtures and systems. Both the Church of the Holy Spirit in Dripping Springs and St. Mark's Church in San Marcos incorporate many of the features recommended on this website. Studying their mission statements and environmental goals provides a practical guide for getting a green building program started.

### **Suggestion for increasing energy efficiency in your building**

#### **Once the building team has identified its goals for siting and design and has defined its approach to building materials and energy and water efficiency, what happens next?**

To effectively bring together the elements of your green project, you'll need to think ahead and coordinate closely between multiple disciplines. Be prepared to make the shift from the more linear building and design process of traditional construction to an integrated approach.

Throughout the course of your project, green building experts from architects to lighting engineers can help you overcome barriers, offer insights on economics and marketing, and help you stay on schedule and on budget. By spending a little extra up front to hire a project manager with green building expertise, you can streamline the design and building process and save yourself money in the long run.

### **Examples of cost-effective integrated design approaches**

#### **What does it mean to estimate the "life-cost" of a building?**

A stable organization such as a church can make good use of a life-cost analysis (LCA) of construction and maintenance, rather than a first-cost approach. Life Cycle Cost Analysis (LCA) is a term used broadly to apply to any of a number of analytic techniques to evaluate the environmental impact of a material or a service throughout its life cycle from extraction or harvesting of raw materials through processing, manufacture, installation, use and ultimate disposal or recycling.

As you value-engineer your project, examine green investments in terms of how they will affect expenses over the entire life of the building. Consider each line item in terms of its relationship to other features in the design. Many energy-saving features allow for the resizing or elimination of other equipment. Often total capital costs can be reduced by energy-saving elements that will pay for themselves

immediately or within a relatively short period of operation.

US Green Building Council and Healthy Building Network and other sustainable building organizations encourage a Life Cycle Cost Analysis of any given building project. Both USGBC and HBN offer resources for help assessing life cycle costs, but their approaches differ. Review their websites and resources in light of your organization's goals and capabilities. As in most cases, a careful comparison and adaptation of some but not all aspects of a particular system will probably work best for your project.

### **Tools for Life-Cycle Cost Analysis**

Because of the long-term use of church buildings, they are ideally suited to profitably incorporate many LEED (Leadership in Energy and Environmental Design) and other sustainable building models into its design.

## **Just what are the US Green Building Council and the Healthy Building Network? How can they help with our building project?**

USGBC and HBN are national organizations devoted to promoting green building. They offer scores of resources for your project, but their approaches differ. We encourage you to review their websites and resources in light of your organization's goals and capabilities. The USGBC is best known for its LEED system of evaluating the degree of a building's environmental compliance. In most cases, a careful comparison and adaptation of some but not all aspects of a particular system will probably work best for your project.

Healthy Building Network

### **U.S. Green Building Council and LEED**

## **Is there an organization that is oriented to the building culture in our diocese?**

Yes, The Metropolitan (San Antonio) Partnership for Energy / Build San Antonio Green is a relatively new organization with offices and helpful staff to help you with all aspects of your project. Especially noteworthy is the display of alternative building materials and design systems.

### **Metropolitan (San Antonio) Partnership for Energy / Build San Antonio Green**

## **Is there anyone within the diocesan organization with whom we can consult about our green building project?**

The Environmental Stewardship Committee of the Episcopal Diocese of West Texas will be happy to speak to your committee or any other entity in your organization regarding the practical, ethical, and spiritual benefits of building with an eye to conserving creation and promoting the health of all who use our buildings.

**Contact: Hall S. Hammond, Chair**

**[hshammond@aol.com](mailto:hshammond@aol.com)**

## **What are examples of green building in the Episcopal Diocese of West Texas?**

The Church of the Holy Spirit, Dripping Springs, is a sterling example of a parish that has built with a commitment to a healthy environment, beautiful design, and

respect for creation. St. Mark's Church, San Marcos, is still in the developmental stage, and shares notes on the planning process of defining objectives.

**Sustainable Building Practices in the Design of  
The Episcopal Church of the Holy Spirit, Dripping Springs, TX**  
[www.dsholyspirit.org](http://www.dsholyspirit.org)

**Copy of Objectives and Goals for Minimizing Building Impact on  
Environment, from the Building Committee of St. Mark's, San Marcos, Texas**

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The information contained herein has been compiled and often directly quoted from websites of the following organizations:

Build San Antonio Green  
Environmental News Service  
GreenFaith  
Healthy Building Network  
National Resources Defense Council  
Non-Toxic Times  
U. S. Green Building Council  
World Health Organization