

Pervious Paving Installed at Shoal Creek Hike and Bike Trail

The term pervious paving applies to a variety of paving materials used in driveways, parking areas, walkways, and patios that allow water to pass through them. Pervious paving helps control stormwater runoff and allows rain to be naturally filtered and returned to groundwater or, in our case, aquifer sources. Pervious paving can also reduce flooding which is a major concern here in the flash flood capital of the world. When water is able to slowly infiltrate the ground irrigation needs are reduced and less land is required to be set aside for stormwater retention ponds.

Studies have linked high levels of impervious surfaces to water quality degradation. Here in Austin, we had some first-hand experience of this when the City found that parking lot runoff had caused [sediment contamination upstream of Barton Springs pool](#) in 2003. In fact, two thirds of the impervious surfaces in developed communities are in the form of pavement related to automobile usage [Source: [Duluth Streams](#)]. Any design that uses alternatives to reduce impervious pavement is a positive step towards improving the quality of a community's water resource. Pervious pavements can replace residential driveways, low-traffic roads, fire lanes and emergency access roads; parking areas; sidewalks; pool decks and patios.

The new pavements are also replacing older pervious surfacing that is not as durable. For example, the City of Austin is testing three pervious paving systems in the Shoal Creek hiking trail area. Tony Arnold, Project Manager with the Planning, Design and Construction Division of the City's Parks and Recreation Department, says that the department is working to improve areas in the park that are prone to flooding without increasing runoff into the creek. Shoal Creek is in a floodplain and the current trails are made of granite gravel which is not durable enough to withstand the flooding that regularly occurs in the area. Another important aspect of this project involves improving existing drainage ditches and swales in order to increase the amount of runoff captured from surrounding neighborhoods. Parks and Recreation has worked with the [Austin Parks Foundation](#) and their volunteer groups to assist in this process and has seen improvements in recent rain events. Eighteen months ago, Parks and Recreation worked with Raymond Chan Engineers to create their first pervious system in a steeply sloped area. That first test has performed well so far. It includes a system of surface and subsurface drains that capture and direct runoff without affecting the trail. The second phase of the improvement involves an approximately one mile long piece of the Shoal Creek trail between Pease Park and 29th Street. This is a hike and bike trail in an area that is routinely flooded during heavy rains and the current granite gravel erodes quickly.

There are several different types of pervious paving, including paving blocks (many shapes and sizes), plastic grids that allow grass growth between the plastic, pervious concrete, and pervious asphalt. Some pervious paving systems can carry autos and trucks evenly without creating tracks or other heavy traffic wear signs. It's important to choose the appropriate system for the type of usage. A key factor to consider when designing pervious pavement areas is the infiltration rate of the underlying soil. In Austin, our soil types range from highly pervious sandy loam to clay which

has a much lower infiltration rate. Compaction of the underlying soil and subgrade must be minimized to ensure that void spaces remain open. Proposed use of the area (traffic volume and weight, speed, etc.), maintainability, and aesthetics are among other factors to consider when selection a pavement system and designing the system. Pervious pavement systems should not be used on sites with a likelihood of high oil and grease concentrations, including fast food establishments, automotive repair and sales, and parking lots with greater than 1000 average daily trips.

Pervious systems do cost more than asphalt surfaces with some systems costing as much as 40% more. However, the systems are easier to maintain and repair than asphalt and concrete. You can remove and replace sections, for example, to access underground utilities needing repair and eliminate expensive measures such as asphalt cutting.

Photos of the Recent StoneyCrete™ Installation at Shoal Creek

Photos courtesy of Scott Erickson, Stoney Creek Materials and Dick Peterson, Green Building Program



Mix truck driver inspects his load of pervious concrete at Shoal Creek Hike and Bike Trail in Austin, Texas. Seventeen loads of [StoneyCrete™](#) pervious concrete were placed and finished in record time.



This paving machine allowed a City crew to pave nearly 1350 feet of eight-foot wide path in six and a half hours--even though they had no experience with the new paving equipment.



Employees from the City of Kyle look on as COA employees place nearly 80 feet of path in under ten minutes. The City of Kyle is considering installation of pervious trails.



Plastic sheeting was used to cure the [StoneyCrete™](#) for maximum strength. Pervious concrete pavement was placed right on top of the decomposed granite path.

Resources

- [Sustainable Building Sourcebook: Materials](#)
- [City of Sandy Public Works](#)
- [Puget Sound Online](#)
- [September 2002 GBP Newsletter, with an article on pervious paving at Reliant Stadium](#)
- [Duluth Streams Toolkit](#)

Member Bulletin Board

Survey Opportunity for Builders: What do you think about green building?

Austin area builders and remodelers are invited to participate in a University of Michigan research study about their experience with and perspective on green or environmental building practices. This study is for ALL residential builders, not just those who are involved with green building. The survey takes about 15 minutes to complete. The goal of this research is to contribute to a better understanding of how innovation occurs in the building industry, and how to improve the fit between existing and emerging practices. Hopefully results of this study can facilitate your work in the long run. The survey can be taken online at www.umich.edu/~cscheuer or send an email to cscheuer@umich.edu to request a print copy of the survey. Here's a great opportunity to let your voice be heard! GBP will share a summary of the results in the newsletter when we receive them from the University.

2006 Cool House Tour

Don't miss the [2006 Cool House Tour!](#) The tour is Sunday, May 21 from noon to 6 p.m. Guidebooks will be available after May 8th.

AIA COTE Announces Top Ten Green Buildings in U.S. for 2006

Three out of ten of the top green buildings in the U.S. for 2006 are in Texas! Congratulations to Green Building Program members, [Jackson & McElhaney Architects](#) and [Lake/Flato](#) for receiving a Top Ten Green Buildings Award from the AIA Committee on the Environment (COTE). Jackson & McElhaney were honored for their design of the new wilderness classroom and meeting space at [Westcave Preserve](#) in Dripping Springs, Texas. Sustainable energy systems, including a photovoltaic array, ground source heat pumps, and daylighting are integrated into the building.

Lake/Flato did incredible sustainable design work on the [World Birding Center](#) in Mission, Texas. For starters, they were able to reduce the building's original footprint by 7,000 square feet. They also specified that all landscaping use only native plants and incorporated a 47,000-gallon rainwater system—integrating rainwater guzzlers, natural pools, and water seeps—to provide much-needed water for birds and butterflies.

Another Texas building, the School of Nursing and Student Center, the University of Texas Health Science Center at Houston, by BNIM Architects was included in the top ten. One of GBP's new staff, Shelly Comer, worked on that project. [Read the full article at AIA.org...](#)

USGBC Balcones Chapter Announces Officers of the 2006 Board

The mission of the [USGBC Central Texas – Balcones Chapter](#) is to promote sustainable construction and development practices throughout the environmentally diverse geographical region that is roughly centered on the cities of San Antonio and Austin. The Chapter serves as a local meeting point and action-center for the region's development and construction industries, communities and citizens. Congratulations to Katie Jensen, GBP staff member, who was voted Chair of the '06 Board! Kathy Zarsky of [The Beck Group](#) and Kirk King of Brooks Development Authority in San Antonio are Co-Vice Chairs; Claire Balfour of [Interface](#) is Treasurer; and Dick Grant of [TRANE](#) is Secretary. The [Balcones Chapter](#) is hosting a lunch with Rick Fedrizzi, President, CEO and Founding Chairman of the USGBC on May 10 at the LBJ Wildflower Center.

Have You Registered for the Affordable Comfort Conference Yet?

[ACI](#) is coming up fast. The conference will be held on May 22-26, 2006, in Austin. Don't miss this one! This is the premiere building performance conference in the country! Learn from top building scientists on how to design and build high-performing homes that are comfortable, energy-efficient, healthy and durable. This is the first time this conference has been held in the South and it will address the special problems of building in a hot-humid climate. Take advantage of this great opportunity to listen and talk to our best experts, without having to pay airfare and hotel costs. There are many attendance options--full and half day workshops and one-day attendance, as well as the full conference--so you can fit it to your interests, time constraints and pocketbook. [Find out more...](#)

ASHRAE, USGBC, IESNA Partner to Make Green Mainstream

Three heavy hitters in the building industry are joining together to co-sponsor development of a new ASHRAE/USGBC/IESNA minimum standard for high performance green building. The [U.S. Green Building Council \(USGBC\)](#); the [American Society of Heating, Refrigerating and Air-Conditioning Engineers \(ASHRAE\)](#); and the [Illuminating Engineering Society of North America \(IESNA\)](#) are working together to create Standard 189, a baseline that will drive green building into mainstream building practices. Scheduled for completion in 2007, the proposed standard will apply to new commercial buildings and major renovation projects, addressing sustainable sites, water use efficiency, energy efficiency, a building's impact on the atmosphere, materials and resources, and indoor environmental quality. The Standard will be an ANSI-accredited standard that can be incorporated into building code. It is intended that the standard will eventually become a prerequisite under LEED. [Read the full article at USGBC.org >](#)

Austin Green Roofs Update

Last year, the GBP newsletter had an article about a [green roof installation at an Austin Starbucks](#). The installation was designed by Heather Venhaus, an Environmental Designer with the [LBJ Wildflower Center](#). Recently, we heard from the Wildflower Center that the roof is doing very well. A Wildflower Center staff person is serving as gardener for the roof for about a year.

Also, the [Wildflower Center's green roof's study](#) using simulated building roofs is in motion again thanks to some timely funding from the [City of Austin's Watershed Protection](#) department. The center is using the funding to acquire some desperately needed monitoring equipment. They

hope to have all the green roof manufacturers install their growing media by the end of March so that planting can begin as soon as all the monitoring and irrigation systems are in place. The center is attempting to create a water lab on site so they can do more in-depth analysis of the quality of the water coming off the green roofs.

The Wildflower Center is sponsoring [Green Roofs 101](#) in July.

"Sustainable Cities" Report Lists Green Building as Key Element for Sustainability

A new report reviewing the renewable energy practices and programs of four U.S. cities has identified 14 common features necessary for success. The report, "[Sustainable Cities](#)," was prepared for the Sierra Club by Ken Regelson and examines programs in Austin, TX, Chicago, IL, Portland, OR, and Ft. Collins, CO. For comparison purposes, two cities were served by investor-owned utilities and two cities by their own municipal utility. The report determined that 14 key elements were necessary for implementing sustainability in energy in the four cities: leadership, a plan, funding, reduced energy costs, communications, training, inspections and measurements, efficiency rebate programs, renewable energy programs, green building, multi-family building programs, income qualified programs, new businesses and green roof programs. In addition to detailed examples for each of the four cities, the report contains links to more than 80 web sites with supporting information. (Rocky Mountain Chapter Sierra Club, 2005).

Trash to Treasure at UT

Volunteer with [Trash to Treasure](#) and help reduce waste during summer University move out! Sign up to volunteer for the Campus Environmental Center's second annual Trash to Treasure program, presented by the University Co-op. Trash to Treasure's goal is to reduce waste during move out by recycling unwanted goods in a campus-wide garage sale. Money raised goes to fund campus projects, and students can get cheap, cool, back-to-school stuff at the sale. Donations will be collected from May 6 to May 21. Volunteers will be needed from 9AM-Noon, Noon-3PM, and 3PM-6PM to staff drop-off locations, publicize the event, and collect and sort items. As a volunteer, you'll get a free Early Bird Pass to the Trash to Treasure Garage Sale on August 27, so you can get the best deals. You also get access to a volunteer-only sneak preview on August 26, where you'll get to scope out the stuff before anyone else. If interested, please contact [Stacey Louie](#), 512-495-3116, or sign up at www.TrashtoTreasureUT.com.

Brazilian Architect Wins the Pritzker

The 2006 [Pritzker Architecture Prize](#) Laureate is Brazilian Paulo Mendes da Rocha. The award is given annually to a living architect whose work demonstrates talent, vision, and commitment and has made consistent and significant contributions to humanity and the built environment through the art of architecture. Winners are chosen from all over the world. Former recipients include Aldo Rossi, Ieoh Ming Pei, and Jørn Utzon. Although Architecture is not included in the Nobel Prizes, the procedures for the Pritzker are modeled after the Nobels, with the final selection being made by the international jury with all deliberations and voting in secret. Nominations are continuous from year to year with over 500 nominees from more than forty countries being considered each year.

Looking for a Way to List Your Green Property?

GBP staff is regularly asked by prospective buyers "Where can I find a list of Green homes for sale or rent?" We refer buyers to [Sustainable Sources](#), a long-time GBP member that provides a variety of online services. The Sustainable Sources website has a [Green Real Estate database](#) that allows builders/sellers to list their properties for a small fee. The database is searchable by construction method, size, and price among other variables.

Green By Design Sponsorships

[Green by Design](#) is our one-day workshop for homeowners interested in buying or building green. We hold the workshop four times a year and it always sells out! We give our members the opportunity to sponsor the workshop, which keeps costs for participants low and gives sponsors a chance to get some great PR. Only GBP members are allowed to sponsor Green by Design. If you're interested in sponsoring the workshop, [click here for more information](#).

Let Us Help You Educate Your Clients

If you're a member of the Green Building Program, be sure to use our logo on your website and link to the GBP site. The Green Building site has tons of information designed to educate prospective home builders and buyers. Some thoughts about where to link: our [homepage](#), the [member directory](#), your company's listing in the member directory, the [Sustainable Building Sourcebook](#), the [member case studies page](#) (especially if you have a case study on our site), the [Seven Steps to Green Building](#) (pdf download), or the [factsheet section](#). If you have any questions or need a web suitable copy of our logo, just [contact us](#).

High-Quality Digital Photographs Needed

We have an ongoing need for high-quality photos of rated projects (300 dpi in 8"x10" size) to use in advertisements, exhibits, and PowerPoint presentations and on our website. We would like exterior, interior, and detail shots. Photos should be well-composed, well-lit, with debris and clutter removed. Pictures of projects with established landscapes are particularly needed. Please e-mail them to your [Green Building Program staff representative](#).

Green Building and Global Warming

A major contributor to global warming is the unprecedented increase in greenhouse gas (GHG) emissions, mostly carbon dioxide, caused largely by the burning of fossil fuels. Worldwide, human beings create a staggering 20 billion tons of CO₂, half of which ends up in the atmosphere. The other half is stored by the oceans (8 billion tons) and plants and soils, especially trees (2 billion tons). Grist Magazine reports that the government has released annual stats on U.S. greenhouse-gas emissions, as required by the U.N. climate-change convention. The news is about what you would expect: The U.S. is the biggest GHG polluter. Not surprisingly, fossil-fuel combustion is responsible for the bulk (94 percent) of the emissions.

And what do we use all that fossil fuel for? Powering buildings and driving cars.

Buildings are a Big Part of the Problem

According to [Architecture 2030](#), buildings emerge as the largest energy consumers and greenhouse gas producers when you combine the energy required to operate residential, commercial, and industrial buildings with the embodied energy of industry-produced building materials like carpet, tile, glass, and concrete. Forty percent of the world's resource and energy use is linked to the construction and maintenance of buildings [source: [GlobalGreen](#)]. The building industry's huge demand for energy and raw materials causes pollution, depletes natural resources and plays a major role in accelerating global warming issues.

What Can We Do?

It's time to get serious -- about building green, that is. Given that most buildings use fossil fuel supplied energy, we need to turn our attention to decreasing --or even eliminating-- fossil fuel energy use in buildings. Buildings that can produce energy, not just consume it, and buildings that operate using clean, renewable energy technologies will go a long way towards saving the world. As a start, it's entirely possible to create buildings that use less than half of the energy of a mainstream building. The building industry can easily incorporate energy conservation strategies and alternative energy technologies into all their projects.

The GBP's commercial rating tool has some great ways to reduce energy use:

- Start with commissioning: include energy conservation in your design intent, require that all mechanical systems be tested so you can verify that they are working properly.
- Find an appropriate site: ideally, the project will use existing infrastructure and be in close proximity to basic city services.
- Reduce the building's impact to the site: keep as many of the trees as possible and add more trees to the site if you can. Trees are important players in the global warming struggle. Using a tree to shade a building can reduce the amount of energy used for air conditioning by up to 70%. Trees also take carbon dioxide out of the air and store it as carbon in wood. Granted, they don't take up a lot of CO₂ but we need all the help we can get at this point. At the very least we should seriously strive not to cut down existing trees. The rate of global warming speeds up as the planet loses trees.
- Offer transportation alternatives and incentives: locate the building close to a bus stop or a proposed light rail stop. Offer a stipend to employees who don't need a parking space and incorporate areas to secure bicycles and shower/changing facilities. Encourage carpooling by providing preferred parking for carpoolers.
- Design for energy efficiency: integrate daylighting systems, electric lighting systems, and controls to optimize daylighting strategies and minimize energy consumption and heat generation.

- Remember the roof: a light colored, reflective roof can go a long way towards keeping a building cooler in our hot climate. Vegetated roofs are also a great choice to keep roofs cool and mitigate some of the heat island effects caused by development.
- Energy, energy, energy: install on-site renewable energy systems to meet a percentage of the buildings energy needs. Tie into Austin Energy's district cooling and heating loop for all HVAC building energy needs.
- Use rapidly renewable materials: reduce the use and depletion of finite raw, and long-cycle renewable materials by replacing them with rapidly renewable materials.
- Use regionally sourced material: - specifying materials that are manufactured locally, reduces the environmental impacts resulting from transportation and supports the local economy.
- Use only certified wood - support environmentally responsible forest management.

What's the Bottom Line?

The bottom line is that this is not about money anymore -- this is about survival. The solution to global warming is not going to come from the government. The building industry itself will have to step up and implement as many solutions as we can. In a recent survey, 71% of voters said they believe that "global warming is already having an affect on weather." This means that many of almost everybody is aware that something must be done. Everybody will have a part to play in averting this environmental crisis. As a developer, building professional, or facility operator, you have a lot options and *you can make a difference*.

Uh, Is There Any Good News?

Yes. It's precisely because the building sector is responsible for the largest consumption of fossil fuels and natural resources that we have such a huge opportunity to make a substantial difference.

Keep in mind that the AIA has said that "the risks of climate change are so significant that *immediate* action is necessary." Start with your current project. We used to hear that the building industry needs 18 years to bring new ideas from the fringe to the mainstream. That's just not true anymore. These days, new technologies are much quicker to be accepted and implemented and buildings can and should be upgraded from project to project. In Britain, new building regulations are coming online that will raise energy efficiency requirements by 27%. The government normally allows a three-year transition period; however, because of the urgency of global warming, the transition period will last only 12 months.

Building green does make a difference. The city of Austin was able to avoid construction of a new 500-MW fossil fuel power plant, thanks in part to energy conservation and green building initiatives in the city.

If the architecture, planning and building community act now and act decisively, we can lead the way to environmental stability.

Resources

[The Mercury News: Article by Ross Gelbspan](#)
[Global Green](#)
[Green House Network](#)
[Woods Hole Research Center](#)

[AIA Climate Change Factsheet](#)
[Green Building Concepts](#)
[Architecture 2030](#)

Commercial Photovoltaic Systems in Austin

by Carlos Cordova

A variety of commercial customers from the [Habitat Suites Hotel](#) and [IBM](#) to [Centex Beverage](#) have installed solar electric systems at their business through [Austin Energy's Solar Photovoltaic Rebate Program](#). Since the program began in the summer of 2004, commercial customers have received rebates that average \$81,029 each and their installations have produced an average of 23,378 kilowatt-hours of electricity annually per solar system: that's enough to power two typical homes in Austin year round.

Austin Energy offers one of the highest solar rebates in the country at \$4 per watt and \$4.50 per watt for non-profit organizations. This rebate level helps pay between 45-75 percent of the cost to install a solar system. The maximum rebate for commercial customers is \$100,000.

In addition, commercial customers who install a solar system this year or in 2007 are eligible to receive a federal tax credit of 30 percent on the remainder of the cost of installation that does not receive a rebate. For example, on a \$50,000 installation, if Austin Energy provides say a rebate of \$35,000, the customer is eligible to receive a federal tax credit of 30 percent on the remaining \$15,000 cost, approximately \$4,500. There is no dollar cap on the amount of federal tax credit a business can receive.

The solar rebate program helps diversify electric generation in the community and also assists in developing the clean energy industry in Austin. Since its inception, Austin Energy customers participating in the program have helped offset more than 1.7 million pounds of carbon dioxide that otherwise would have been emitted at power plants. This is also the equivalent of planting 30,000 trees or removing almost 200 vehicles from the roadways by using clean energy generated from solar systems.

Photo courtesy of Natalie Marquis



Habitat Suites Hotel installed a PV system in 2005.



PV system installed at IBM's Tivoli complex.

Visit the Austin Energy website for [more information about the Solar PV Rebate Program](#) or call 512-482-5346.

(Building Code Basics is on hiatus until GBP hires someone to fill our code specialist position.)

May's Green Links

Sustain-a-Ball	Zilker Garden Rainwater System	Be Worried. Be Very Worried (TIME cover on Global Warming)
Cool House Tour 2006	Green Goes Mainstream	Clean Energy Incubator
2006 Affordable Comfort Home Performance Conference	Energy Savings Calculator: Lighting	Sustainable Energy Coalition

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