

Concrete Parking Areas Aren't White, They're **GREEN**

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You know concrete parking lots are more attractive. You know they provide lower life cycle costs than higher maintenance cost alternatives (which means more money in owners' pockets). You know they provide higher levels of curb appeal. But did you know concrete parking areas are a much greener alternative than the black stuff? This article is going to outline some of the many ways concrete parking areas are GREEN.

Sustainable building and LEED (Leadership in Energy and Environmental Design) are hot topics today among owners, engineers, architects and everyone else involved in creating our built environment. A number of cities and municipalities have taken active positions requiring that buildings be built under the LEED rating system. The sustainability trend will continue to grow and encompass an ever-growing percentage of the new structures being designed and built. Concrete, which has a strong history of providing environmental benefits, doesn't always get recognized for its valuable place as a tool in sustainable design.

Parking areas are one place where concrete is quickly being recognized for its tremendous environmental benefits. Concrete parking areas provide sustainable attributes like:

- Reduced energy demand for lighting
- Reduction in energies required for maintenance and repair
- Reduced heat island effect
- Reduced cooling loads on nearby structures

- Can contain recycled material
 - Concrete is manufactured locally
 - Concrete doesn't waste packaging materials
- Let's take a look at those attributes.

The ability to reduce the energy demand needed to light outdoor areas is simple physics that is often overlooked. When you think about it, the light colored surface of a concrete parking area reflecting more light than its black-colored alternative is common sense. In 1986, R. E. Stark of the Portland Cement Association did a study, "Road Surface's Reflectance Influences Lighting Design," which quantified the dramatic difference in the two pavement types as varying between 33- and 50-percent reflectance. This means you may be able to eliminate three out of 10 light fixtures in a parking lot and have the same levels of lighting. It also means you don't consume the electricity for the three lights or replace the bulbs in them for the life of the parking area!

When you build a concrete parking area, the typical maintenance required is sealing of joints every few years. While most people recognize the money saved by not having to seal, reseal, re-stripe or add additional top coats on asphalt, there are other environmental benefits. All the mechanical equipment used in doing the maintenance work on the asphalt is using energy. The energy to make the products being used, the energy to distribute them, the energy to lay the asphalt and the energy to refine the asphalt all have environmental impact. All this energy is not consumed when you use concrete.

The heat island effect is a dramatic con-

sequence of urban sprawl. It has been studied by NASA. Its website, www.nasa.gov, has numerous articles on the amount of heat being created by growth. We cannot expect growth to stop so the question becomes what can we do about it? NASA mentions using light-colored roads and roofs as one of the significant ways to help mitigate the situation. The MIT Technology Review states, "Blacktopping should be discontinued..." Georgia Tech's College of Architecture

newsletter writes, "While using lighter roofing materials can provide some impact, replacing the dark pavement represents the single largest market opportunity to address the urban heat island effect." These are pretty compelling sources of the same point.

There is another impact that is secondary to the heat island effect. If the pavement and air around a building are warmer in the summer because of the reflectance, then the cooling load the HVAC system has to offset is

logically higher. Those extra degrees of temperature amount to a significant amount of energy (and money) over the life of a building. Once again we see a concrete advantage.

Another green feature of concrete used in parking areas is that it can contain a number of recycled materials. Fly ash, blast furnace slag and silica fume are all byproducts of other industries that can enhance the properties of concrete when used in appropriate amounts. We also see aggregates and water being recycled in ever-increasing amounts during the production of concrete. These products benefit our landfill space and our environment.

An often-overlooked fact in the use of concrete is that it is generally produced locally. Even if you choose to ignore the positive local economic benefits, you have to consider the ecological ones. Transportation distances being reduced means less trucking and resultant air pollution. This fact is important enough for the U.S. Green Building Council to recognize a point for it in its LEED certification program.

Another often-overlooked benefit in using concrete is that you don't send a lot of packing materials to the landfill. Most products used in construction today arrive on pallets, in boxes, shrink wrapped, tied, taped and sealed together. All of those packing materials either end up in a landfill or buried on the site or burned. With concrete, the product arrives in a ready mixed truck, which serves as the packaging material, is unloaded and the truck returns to carry more concrete. It is a simple benefit that is rarely recognized.

Concrete parking areas not only provide life cycle cost benefits to owners versus competing materials, they also provide real environmental benefits that are rarely recognized. Unfortunately, we don't always get this message in front of the people who are making decisions on what kind of pavements to use in parking areas. That is changing. As more and more people hear the message the word continues to spread. Concrete has a large role to play in future discussions on sustainability. Its performance in the past assures its place in the future. n

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