

ADVANTAGES OF USING CONCRETE PAVERS IN COMMERCIAL APPLICATIONS

The past few decades have seen an upward trend in the use of concrete pavers in commercial entrances, driveways and parking lots, plazas, and other retail and industrial applications. There is good reason for this – pavers offer numerous benefits that make them a superior choice for commercial applications. When seeking to create or update an outdoor space, the installation of concrete pavers can provide an eye-catching, cost-effective paving solution. Interlocking concrete pavers add character while functioning as a durable, low-maintenance, easy-to-install paving option.



Mechanical installation of Renewable Pavers™ manufactured by County Materials Corp., allow for large scale projects such as this one to be done in a fraction of the time it would take to be hand laid.

Enhanced Aesthetics

Simply put, pavers look beautiful and make a great first impression. Concrete pavers provide an appeal that carries an unspoken message of quality, sophistication, and lasting performance. Where aesthetics are a priority, interlocking concrete pavers can provide beautiful and stunning, yet functional, paving in place of alternatives such as asphalt or poured concrete.

From the designer's perspective, concrete pavers are exceptional for their sheer creative potential. Available in an array of shapes, sizes, colors and textures, pavers allow unparalleled choice in product selection and application. Whether the desired look is weathered and rustic, classic and timeless, or modern and contemporary, pavers are the perfect medium for creating unique designs.

Economic Value

At first glance, the price per square foot of concrete pavers may be greater than that of alternative materials. However, upon examining the durability, flexibility, low maintenance, and quick installation of concrete pavers, their lower life cycle costs can often prove to be the most cost effective option:

Durability

Concrete pavers are manufactured and installed to easily withstand high volumes of pedestrian and vehicular use. They have been used successfully in numerous residential, commercial, municipal, port and airport applications. ASTM guidelines for concrete pavers in the U.S. specify a minimum of 8,000 psi compressive strength; this is about twice as strong as a typical 4" concrete slab driveway. Some manufacturers produce concrete pavers that far exceed these industry guidelines. Properly installed concrete pavers, following industry recommendations, will easily last 20-30 years with minimal maintenance, and with proper care can be expected to last for 50 years or more. The high-strength concrete units offer resistance to freeze-thaw cycles, high abrasion and skid

resistance, minimal damage from petroleum products, and do not experience indentations from high temperatures.

Flexibility and Low Maintenance

Parking lots, driveways, and heavy traffic areas installed with concrete pavers typically perform very well when subjected to freeze-thaw cycles and minor movements of the earth. While control joints are intentionally added to poured concrete to accommodate the stress of settling and shifting of the earth beneath, the spaces between concrete pavers act as built-in control joints. Cracking and degradation of the paver surface is minimized because the sand-filled joints act to transfer the load without damaging the pavement surface. This results in a longer-lasting, lower-maintenance installation.

In fact, pavers are so superior in applications where some settling is expected that they were chosen as the primary paving material for the Hong Kong International Airport, which was built on land reclaimed from the ocean. The airport designers cited pavers' resistance to degradation from spilled fuel over that of asphalt, as well as their ability to hold up to extremely heavy wheel loads and aircraft stabilizer legs.

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Permeable Pavers: Raising the Bar for Property Development

Where property prices are high, or where stormwater control restrictions limit property development, permeable pavers can make the impossible project possible.

Permeable paver systems offer a functional, space-saving, and safer alternative to traditional water maintenance solutions such as retention ponds. They can enable development on sites that in the past simply did not have room for both development and on-site storm water management.

Development in high-value locations such as urban downtown areas is enhanced by the use of permeable concrete pavers because they can allow a greater percentage of the available space to be used for income-generating purposes, such as increasing a building's footprint or available parking spaces. This can potentially add to the bottom line for property developers.

Even where affordable space is available, pavers can reduce project costs substantially. In Moline, IL, the builder of the Autumn Trails subdivision found that using permeable pavers eliminated the need to install a storm sewer system. Selecting pavers reduced project costs by \$0.65/square foot compared to asphalt and over \$4.00/square foot compared to poured concrete.

Are Concrete Pavers Practical in Northern Climates?

“Pavers look like a great option, but will they hold up under extreme winter conditions?”

This is a common concern in northern areas where pavement materials are subjected to alternating freeze-thaw cycles, salt applications, and snow removal. People often worry that concrete pavers won't hold up as well as other options, or that plow blades will knock them out of place.

When properly installed by a qualified contractor, concrete pavers withstand repeated freeze-thaw conditions easily. The joints between pavers allow for expansion and contraction, so heaving and cracking is unlikely to occur. Pavers perform similarly to poured concrete under the snowplow. Textured paver surfaces will require snow removal equipment to have the proper spacing, bumpers and rubber blade guards to protect the surface of the pavers from possible scuffs or markings. If a plow blade should happen to catch a paver edge and move or crack it, replacement is relatively quick and inexpensive.

Permeable pavers perform especially well in winter conditions. Snow and ice tends to melt faster from permeable surfaces because their wider joints facilitate excellent drainage. This can reduce the need for plowing and/or salt applications. One Illinois school district was able to eliminate 3-4 salt applications and 1-2 plowings per year after replacing their parking lot with permeable pavers.

Maintenance and replacement cost over time is an important consideration when pricing paving materials, and concrete pavers shine in this department. While asphalt requires periodic resurfacing and concrete repair can be expensive, pavers require only light cleaning and/or minor restoration every few years. One primary advantage of pavers is that they can be taken up and replaced with no new material input.

If a paver gets dislodged, it can be re-set very quickly and inexpensively. For example, to accommodate street repairs, pavers can simply be removed and put back into place without compromising the aesthetics or the structural integrity of the pavement.



In the same way, concrete pavers can be easily and seamlessly added if a driveway or parking lot expansion becomes necessary.

They also facilitate incremental construction, affording a project owner the opportunity to add paver areas in phases depending on site and budget considerations.

In parking lots, different-colored pavers can even be used to mark parking stalls or other pedestrian or traffic zones. This eliminates the cost of re-stripping every 2-3 years.

When the Morton Arboretum in Morton, IL was deciding on a new parking lot, a cost analysis was performed on concrete pavers versus heavy duty asphalt. The analysis showed that the project would break even at year 23, and that choosing pavers would save them \$600,000 over the estimated 51-year lifespan of the parking lot. Even though the cost was greater up front, the decision was made to utilize the pavers. Once the project was installed, real-life data showed a breakeven point at just 15 years – 8 years ahead of schedule, with a corresponding increase in life-cycle savings.

Quick, Efficient Installation

Pavers require no cure time and can be installed in weather not conducive for alternative materials. Installers certified by the Interlocking Concrete Pavement Institute (ICPI) or by a paver manufacturer can provide efficient and proper laying of

concrete pavers. Furthermore, modern mechanical installation methods allow even large areas to be paved quickly and cost effectively. Hiring a professional contractor experienced in installation is advised.

Sustainability

Pavers are a smart environmental choice for many applications. It's no coincidence that concrete pavers are becoming more popular as sustainability becomes a priority for local communities, as:

- Concrete has a lower embodied energy than materials such as plywood, glass, and steel. Compared to asphalt, concrete requires only about one third the energy to produce.
- The exceptional durability of concrete pavers means that fewer resources are needed to repave and replace surfaces over time. Additionally, they simplify surface and subsurface repairs by reinstating the same paving units; there are no unsightly patches or weakened pavement from utility cuts.
- Concrete pavers provide heat island mitigation. Many urban areas suffer from a phenomenon known as the heat island effect, wherein light and heat reflection from the built environment can raise local temperatures in warm

weather by as much as 22° at certain times of day. Concrete pavers – especially light-colored ones – can help address this uncomfortable and dangerous situation by reflecting heat and light.

Permeable concrete pavers also deserve special mention as a sustainable construction material. These concrete pavers are specially installed to filter storm water runoff through the paver joints to base and sub-grade layers that act as natural filters by capturing many harmful pollutants. Permeable pavers are widely recognized as an effective solution for reducing total suspended solids (TSS) levels in storm water to EPA-mandated standards. This makes them an environmentally preferable solution for a number of reasons:

- **Stormwater management** – Runoff from paved surfaces can cause serious environmental damage such as erosion and silt build-up in rivers, lakes and streams. By allowing rain and snowmelt to infiltrate on site, permeable paver systems reduce or eliminate runoff problems. Permeable paving eliminates surface puddles and local flooding, and is typically required in many waterfront applications to protect fragile shorelines.

- **Groundwater recharge** – With permeable pavers, a higher percentage of rain and snowmelt percolates naturally down through layers of aggregates to maintain healthy groundwater levels.
- **Pollution control** – Permeable paver systems trap up to 80% or greater of TSS, including salt, oil and other pollutants in runoff rather than allowing them to wash into the local watershed where they can harm fish and other wildlife. The aggregate base and subbase system acts as a built-in filtration device.
- **Tree maintenance** – Trees beautify our cities and help regulate temperature in urban areas. Trees need adequate groundwater to stay healthy. Permeable pavers promote tree survival and growth by allowing tree roots to receive the air and water they need.
- **Tax incentives** – Local governments may offer tax incentives, utility fee reductions, expedited permitting or approval for demonstration projects to encourage use of permeable pavers as a sustainable best management practice.
- **Lower lifecycle costs** – While permeable pavers often have higher costs initially, they don't require the installation of underground drainage piping,

and they reduce the need for continuous expansion of drainage infrastructure.

Improved Safety

Safety is always an important consideration for commercial projects. Concrete pavers can help improve safety in several ways:

- **Improved traction** - Interlocking concrete pavements can maintain good skid resistance values throughout the life of the pavers when compared to other pavement surfaces. Concrete pavers can be made with or without surface treatments, such as high sand and cementitious content in the surface, or those with stone-like textures made by shot-blasting, hammering, washing, or tumbling the surface.
- **Light reflecting** - Using light colored pavers can help improve nighttime visibility around a commercial establishment. This can help prevent accidents and deter crime.
- **Traffic calming** - Physical design measures such as roundabouts, raised crosswalks and textured pavements are often extremely effective in slowing and regulating traffic for improved safety of drivers and pedestrians alike. Concrete pavers can play an important role in many of these traffic calming devices.

How to Ensure a Successful Concrete Paver Project

Whether the primary concern is sustainability, budget, or aesthetics, increasing numbers of commercial property owners and project designers are turning to concrete pavers for their superior performance and exceptional value.

The number one way to ensure that a concrete paver project meets expectations is to make sure the installation is completed correctly the first time by a professional contractor certified through the Interlocking Concrete Pavement Institute (ICPI) and through a manufacturer such as County Materials. More project owners and construction professionals are requiring landscape professionals to have certified installers onsite performing the work; they recognize the value of using certified professionals who stand behind their workmanship and uphold industry standards for interlocking and permeable paver applications.

About County Materials

County Materials Corporation is a family-owned, American-based manufacturing company and leading source for construction and landscape products. Its headquarters are in Marathon,

WI, where it was founded in 1946. The company has grown into a diversified organization that supplies products for growing communities at more than 44 locations across the Midwest. Follow County Materials Corporation on LinkedIn for updates about the company's latest concrete innovations and charitable activities. For more information visit www.countymaterials.com.

Resources

American Society for Testing and Materials (ASTM) C 936, Standard Specification for Solid Interlocking Concrete Paving Units

Interlocking Concrete Pavement Institute, Case Study in Engineered Interlocking Concrete Pavement: Hong Kong international Airport, 2004.

Interlocking Concrete Pavement Institute, Tech Spec 13: Slip and Skid Resistance of Interlocking Concrete Pavements, 1998.

Erin Ashley, Ph.D., LEED AP and Lionel Lemay, P.E., S.E., LEED Ap, Concrete's Contribution to Sustainable Development, published in the Journal of Green Building, Fall 2008.

Heat Island Effect, U.S. EPA website: <http://www.epa.gov/heatisland/>.

South Carolina Department of Transportation publication, Traffic Calming Guidelines, revised 2006.