

**Cool Alternative Paving Materials & Techniques**  
Developed by the Sacramento Cool Community Program  
Sacramento Tree Foundation, 201 Lathrop Way, Suite F  
Sacramento, CA 95815, (916) 924-8733 x 128  
[www.energy.ca.gov/coolcommunity](http://www.energy.ca.gov/coolcommunity)

Below is a list of various paving materials and techniques which can be made lighter in color and, therefore, cooler. For the coolest pavement, pick the lightest shade available. It's been shown that light gray and tan colors can reduce pavement surface temperatures by 20 to 40°F.

**Codes in parentheses:**

**N – New pavement applications, R – Resurfacing pavement applications**  
**A – Asphalt material type, C – Concrete material type, O – Other material type**

**Asphalt Chip Seals**

**(R, A)**

Chip seals are applied in a three-part process. The asphalt emulsion binder is first sprayed onto the pavement. This is followed immediately by an application of rock chips. Finally, the rocks are pressed into the asphalt binder using a heavy roller. This process is more appropriate for use on roads than on parking lots. Service life is usually 5 to 7 years. The road takes on more of the color of the rock used in the chip layer since it's not mixed together with the asphalt binder, so use of lighter colored aggregate here can make more of a difference in cooling the road surface.

Cost: \$0.09 - \$0.14 per square foot installed excluding surface preparation

Contact: California Chip Seal Association  
P.O. Box 5940, San Jose, CA 95150  
(408) 287-1400

**Asphalt Emulsion Sealcoats**

**(R, A)**

Emulsion sealcoats are the familiar pre-mixed products often seen in shopping center parking lots or on driveways. They consist of a fine aggregate (rocks of small size) in emulsion (suspended in water) with an asphalt binder. Emulsion sealcoats are brushed on over existing pavements to seal small cracks and protect the surface. When used properly they're expected to last 3 to 5 years. These products are usually black but are occasionally made in gray or tan with the addition of zinc oxide, although this may cost a bit extra.

Cost: \$0.06 - \$0.10 per square foot installed excluding surface preparation

Contact: Asphalt Sealcoat Manufacturers Association  
PMB 304, 5431 Auburn Boulevard, Sacramento, CA 95841-2801  
(916) 773-3968

Rayner Protective Materials/California Pavement Maintenance  
9390 Elder Creek Road, Sacramento, CA 95829  
(916) 387-0316, Bill Coe

## **Asphalt Pavement**

**(N, A)**

Asphalt pavements are typically composed of a three inch thickness of aggregate or rock held together by an asphalt binder, over a six inch crushed rock base. The asphalt binder is dark in color, so even when lighter colored aggregate materials are used the pavement still tends to stay fairly dark and hot. In many applications a pigment called carbon black is added to help the pavement stay blacker for a longer period of time.

Asphalt pavements can be lightened and cooled in a number of ways. First, by leaving out carbon black or other black pigments. Second, by choosing lighter colored aggregates to lighten the mixture slightly. Third, by adding light pigments or coatings to the pavement mixture.

Cost: \$1.00 - \$1.50 per square foot installed excluding surface preparation

Contact: Northern California Asphalt Producers Association  
P.O. Box 2201, Nevada City, CA 95959  
(530) 478-9357, Roger Smith, Executive Director

## **Asphalt Slurry Seals**

**(R, A)**

Slurry seals combine an asphalt emulsion with graded aggregate (rocks of special, even sizes). This mixture is then applied to existing pavement using a squeegee-like drag. Slurry seals are expected to last 3 to 5 years. Like the emulsion sealcoat, slurry seals are usually black but can be made gray or tan with the addition of zinc oxide.

Cost: \$0.12 - \$0.14 per square foot installed for parking lots excluding surface preparation

\$0.08 - \$0.10 per square foot installed for roads excluding surface preparation

Contact: California Slurry Seal Association  
P.O. Box 3690  
La Habra, CA 90632

## **Asphalt Surface Coatings**

**(N or R, A)**

Asphalt surface coatings are painted or sprayed directly over clean asphalt. These coatings are decorative, while also serving to protect the asphalt underneath. They come in many colors, but the lightest colors have the highest solar reflectivity and stay coolest.

Cost: \$0.25 - \$0.75 per square foot excluding surface preparation

Contact: AsphaColor Corporation  
15081 Red Rock Road, Reno, Nevada 89506  
(800) 258-7679, Jason Jones, President  
asphacolor@telis.org

NEXUS

5957 Freeport Boulevard, Sacramento, CA 95822

(916) 424-4839, Michele Didier

www.nexusdistributors.com

Reed & Graham Inc.  
(916) 660-9370, Kurt Templeton, kurt@rginc.com  
www.rginc.com

**Pavement Texturing  
(N or R, A and O)**

Pavement texturing is a process that uses standard asphalt to produce a decorative pavement in a variety of colors and patterns. These pavements are used in street paving, traffic calming, pedestrian areas, medians & boulevards, parking lots, playgrounds, and other applications. These pavements are less labor-intensive to install, with the additional advantage of having no joints where water can infiltrate and weeds can grow. The construction process consists of first laying the asphalt, compacting it into a patterned form, and then finishing it with a polymerized cement coating. The resulting pavement can withstand extreme weather and traffic loading by combining the strength of concrete with the flexibility of asphalt. The choice of a lighter colored coating is needed to make the surface more reflective and keep it cooler.

Cost: \$2.00 - \$6.00 per square foot installed

Contact: StreetPrint Pavement Texturing  
(800) 581-2299, www.streetprint.com

**Porous Block Pavement Systems  
(N or R, C or O)**

Porous pavements are specifically designed to let water drain through them to the soil below while allowing pedestrian or light traffic loads to be supported. These prefabricated paving systems are usually lattice structures made of concrete or plastic. Lattice blocks are filled with aggregate materials or with soil and grass or ground cover. These systems are useful for pedestrian walkways, driveways, parking lots, overflow parking, fire lanes, or any other less frequently traveled surfaces. The lattice pavers can also be used to control soil erosion on hillsides.

Construction of block pavers consists of grading and fertilizing an underlying 12 inch bed of soil, placing the paver blocks and securing them with spikes and/or against a stationary edge, then filling the pavers with aggregate or soil and seed. Once grass has grown or enough aggregate has been put in place, the underlying paver is invisible. If grass is used, it will require normal watering and mowing maintenance procedures. If filled with aggregate, a lighter color aggregate should be chosen for cooler temperatures. Grass also stays cooler and cools the air above it by evapo-transpiring water through its blades.

Cost: \$1.50 - \$3.00 per square foot excluding surface preparation

Contact: Presto Products Company, GEOBLOCK Porous Pavement System  
P.O. Box 2399, Appleton, WI 54913-2399  
(800) 548-3424

Invisible Structures, Inc., Grasspave2 and Gravelpave2  
20100 E. 35<sup>th</sup> Drive, Aurora, CO 80011-8160

(800) 233-1510, [www.invisiblestructures.com](http://www.invisiblestructures.com)

California Precast Concrete Association  
(916) 362-1327

### **Portland Cement Concrete Paving**

**(N, C)**

Portland cement concrete is applied at depths of 8 inches or more for new construction of roads and parking lots. The thickness of the cement depends on the underlying soil and expected traffic conditions. Concrete is applied by first compacting the road bed, then applying the concrete, and finally finishing the surface, cutting joints and allowing the concrete to cure. Proper joint spacing is critical to control cracking of the concrete surface. Concrete pavement can also be constructed using techniques to speed the curing process and minimize traffic disruption.

Concrete pavements can have service lives in excess of forty years, with maintenance typically limited to joint and crack resealing. The surface reflectivity of concrete pavements is the highest of the available paving materials. Periodic high-pressure washing can remove dirt and oil buildup to maintain reflectivity and appearance.

Cost: \$2.00 - \$6.00 per square foot excluding surface preparation

Contact: American Concrete Pavement Association (ACPA)  
5400 Old Orchard Road, Suite A100, Skokie, Illinois, 60077-1083  
(847) 966-2272, or (708) 966-ACPA  
Western States Chapter - ACPA  
(949) 221-9796, Tom Salata, Executive Director

### **Resin Modified Emulsion Pavement**

**(N or R, O)**

Instead of using the petroleum-based binders of typical asphalt pavements, resin modified emulsion pavements use a binder made primarily from tree resins. This binder is mixed with aggregate materials to produce compacted pavement of higher strength and resistance to fuel spills than traditional asphalt. The construction/installation process for resin modified emulsions is similar to that for asphalt pavements. The resin modified emulsion is first applied alone to the prepared area as a base coat. The binder and aggregate are mixed on site and then applied and compacted to a smooth finish. A final coat of resin is used to seal the pavement. Unlike asphalt pavements, the resin emulsion does not have to be heated for application.

This product is useful for environmentally sensitive sites. The resin binder is clear so the pavement retains the color of whatever aggregate is used. Use of lighter aggregates allows for a more reflective, cooler pavement.

Cost: unknown

Contact: Soil Stabilization Product Company, Inc., ROAD OYL Resin Modified Emulsion  
P.O. Box 2779, Merced, CA 95344-0779  
(800) 523-9992, (209) 383-3296, or [staff@sspco.org](mailto:staff@sspco.org)

## **Roller Compacted Concrete and Soil-Cement Pavements**

**(N, C)**

Roller Compacted Concrete (RCC) combines cement with natural or graded aggregate to create a pavement suitable for heavy loads at low speeds, such as warehouses or airport taxiways. Soil-cement pavements combine cement with sand or alluvium material to construct pavement suitable for low-speed, low volume uses like hiking trails and bike paths. Both RCC and soil-cement pavements have a natural appearance, taking on the color of the added aggregate or sand. Choice of lighter colors can keep the pavement cooler.

Cost: unknown

Contact: California Cement Promotion Council  
263 West Pintado Road, Danville, CA 94526  
(925) 838-0701, David Holman, Executive Director

## **Segmented Concrete Pavers**

**(N or R, C)**

Segmented concrete pavers are blocks precast into interlocking shapes. Unlike porous block pavers, segmented pavers can withstand high load conditions found in industrial or warehouse operations. The interlocking design helps to transfer stresses among the blocks to support these heavy loads. The pavers are installed over a conventional aggregate base over which a thin layer of bedding sand has been placed. Machines can be used to mechanically lay and interlock the pavers at high speed. No sand or grout is usually needed since the joints are tight. Segmented concrete pavers come in many designs, patterns and colors. Choosing lighter colors keeps the pavement cooler.

Cost: unknown

Contact: California Precast Concrete Association  
(916) 362-1327

## **White-topping**

**(R, C)**

This is a technique of covering existing asphalt pavement with a layer of concrete. Traditional white-topping with concrete added a 4 to 8 inch thick layer of concrete over an existing asphalt base. New concrete mixtures with fiber reinforcement, called ultra-thin white-topping, mean you now need only apply a 2 to 4 inch overlay of concrete to withstand normal loads on residential and low-volume roads. Special mixtures with higher cement content can also be used on surfaces that must be cured and ready for traffic within 24 hours.

The white-topping construction process consists of four steps: 1) coring the existing asphalt to determine its depth, type and condition, 2) preparing the road surface by water or abrasive blasting, or milling and cleaning, 3) placing the concrete, and 4) finishing and texturing the surface, and curing and sawing its joints. The proper joint spacing is critical to control cracking of the concrete surface.

Concrete pavements have a 1.5 to 2 times greater service life than asphalt pavements. Concrete pavements are naturally light gray in color and need no further lightening. Concrete pavements can be periodically pressure-washed to remove dirt and stains and to help retain its reflective qualities.

Cost: \$1.50 - \$2.50 per square foot installed excluding surface preparation

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5400 Old Orchard Road, Suite A100, Skokie, Illinois, 60077-1083  
(847) 966-2272, or (708) 966-ACPA  
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