

## Asphalt Pavements & LEED 2009: Credits & Opportunities

LEED, which stands for Leadership in Energy and Environmental Design, is the most widely recognized sustainability rating system in the U.S. It effectively serves as the *de facto* benchmark for the design, construction, and operation of high-performance green buildings. With more than 94,000 projects using LEED and 2.4 million square feet of building space certified under LEED every day, asphalt pavement contractors and material suppliers are almost certain to encounter LEED projects in the course of their business operations.



The decision to obtain a LEED certification is typically driven by building owners in both the public and private sectors, either voluntarily or through government mandates for green construction. While LEED focuses primarily on buildings, rather than infrastructure, there are several opportunities for asphalt paving contractors and suppliers to contribute toward a project's LEED certification. Some of the available credits are material-specific while others are more general in nature. This guide provides an overview of the available credits that asphalt pavements can help a project achieve under the LEED 2009 standard. Asphalt pavement contractors and suppliers will find this guide useful to understanding what customers are looking for when they ask for LEED documentation, and in developing proactive marketing strategies for the green construction sector. Project owners and designers will find this guide useful to understand how an asphalt parking lot or driveway can help contribute to a project's overall score under LEED 2009.

### Information About LEED

With a pedigree of nearly two decades, LEED is a highly evolved, complex system encompassing more than 20 distinct green rating programs. LEED certifications can be obtained for various categories, including Building Design and Construction, Operations and Maintenance, Interior Design and Construction, and Neighborhood Developments. LEED certification programs are also tailored to different market sectors, such as commercial, retail, schools, residential, and others. This guide is focused on the LEED 2009 for Building Design and Construction: New Construction and Major Renovation (LEED BD+C: New Construction) program.

The LEED standard was developed by the U.S. Green Building Council (USGBC), a non-governmental organization, and LEED certifications for projects are administered by Green Building Certification Inc. (GBCI). The standard is reviewed and updated by USGBC periodically as the overall building industry adopts more sustainable design and construction standards. LEED v4 was introduced in 2013 and was formally adopted on October 31, 2016 — all new projects registered after that date are subject to the LEED v4 standard. Projects registered with GBCI under the LEED 2009 standard have a sunset date for project completion of June 30, 2021. This means that contractors and suppliers will need to track both LEED v4 and LEED 2009 standards

until 2021. This guide focuses on LEED 2009; a separate guide for LEED v4 is available at [www.AsphaltPavement.org/sustainability](http://www.AsphaltPavement.org/sustainability).

To achieve certification, a project must attain a set of minimum prerequisites that apply to all projects, and then earn points or credits across various functional groupings, such as Materials & Resources and Sustainable Sites. A project requires a minimum of 40 points out of 100 to achieve basic LEED certification. Asphalt pavement contractors and suppliers can contribute to both the prerequisites and the credits.

## How LEED Applies to Asphalt Pavements

LEED looks at a building as a system of components, which may include associated parking lots, driveways, and sidewalks. Asphalt pavements are typically evaluated through these functions as part of a LEED project. Asphalt pavements may allow a project to qualify for LEED 2009 credits through the use of recycled materials, regional materials, porous pavements, and more. A review of the available credits associated with asphalt pavements from LEED 2009 is provided below.

### LEED 2009 Credits

#### Sustainable Sites (SS)

##### **Stormwater Design – Quantity Control (SSc6.1) and Quality Control (SSc6.2)**

One point is available for projects that reduce the volume of stormwater discharges, and 1 additional point is available for projects that improve the quality of stormwater discharges. Porous asphalt pavements can help a project earn both available points, when properly designed and documented. Even a porous asphalt overlay, such as an open-graded friction course, may be eligible for the water quality improvement credit. NAPA has three publications on porous pavements that designers, owners, and contractors might find helpful, all of which are available at [store.AsphaltPavement.org](http://store.AsphaltPavement.org):

- *Porous Asphalt Pavements for Stormwater Management* (IS 131) covers general site and pavement design, construction, and maintenance; and
- *Structural Design Guidelines for Porous Asphalt Pavements* (IS 140) is geared towards projects that expect higher traffic volumes and vehicle weights than a typical commercial parking lot or residential street.
- *Design, Construction, and Maintenance of Open-Graded Friction Courses* (IS 115) covers open-graded surface layers designed to improve drainage and reduce noise.

#### Materials and Resources (MR)

##### **Construction Waste Management (MRc2)**

Projects that develop and implement a waste management plan that diverts at least 50% or 75% of construction and demolition debris from disposal can earn 1 or 2 points (respectively). Reclaimed asphalt millings returned to a plant site for recycling can contribute to the project's eligibility for this credit. Diversion may also include donation of materials to charitable organizations and salvage of materials on site.

### **Recycled Content (MRc4)**

Projects can earn 1 or 2 points for using materials with recycled content when the value of the recycled content constitutes at least 10% or 20% (respectively), based on cost, of the total value of materials in the project. Recycled content is the sum of post-consumer content plus half the pre-consumer content. The recycled content is multiplied by the material cost (including delivery but excluding installation or construction costs) to determine the value of the recycled materials.

Asphalt pavements that contain recycled materials can contribute toward a project's overall recycled content value. In the context of asphalt pavement, post-consumer content includes reclaimed asphalt pavement (RAP) from road millings, recycled tire rubber, and recycled post-consumer asphalt shingles (PCAS) sourced from roofing contractors (tear-offs). Pre-consumer content includes materials such as blast furnace slag, recycled manufacturing waste asphalt shingles (MWAS), and RAP from manufacturing waste, such as start-up/shut-down waste, job overruns, etc.

Examples of how to calculate the value of recycled materials in an asphalt pavement are provided below. Also, USGBC has an Excel-based Materials and Resources Calculator, available for free at [usgbc.org/resources/materials-and-resources-calculator-v2009](http://usgbc.org/resources/materials-and-resources-calculator-v2009).

Example 1: An asphalt pavement mixture contains 20% RAP (by weight). The cost of the mix is \$45/ton and the hauling cost is \$5/ton for a total material cost of \$50/ton. The job calls for 1,000 tons of mix. The mix producer's RAP stockpile consists entirely of road millings (plant waste and job overruns are stockpiled and processed separately).

The recycled content is 20%

The material cost is \$50/ton × 1,000 tons = \$50,000

**The value of the recycled materials is 20% × \$50,000 = \$10,000**

Example 2: A mix contains 5% MWAS (by weight) and 15% RAP. The recycled shingles are sourced from a nearby roofing manufacturer's production waste. The mix producer comingles road millings with plant waste and job overruns, and records indicate that plant waste and job overruns comprise 10% of the RAP stockpile. The cost of the mix is \$45/ton, and the hauling cost is \$5/ton, for a total material cost of \$50/ton. The job calls for 1,000 tons of mix.

The post-consumer content is 90% post-consumer content × 15% RAP = 13.5%

The pre-consumer content is (10% pre-consumer content × 15% RAP) + 5% MWAS = 6.5%

The resulting pre-consumer content percentage is halved: 6.5% ÷ 2 = 3.25%

The total recycled content for the credit is 13.5% + 3.25% = 16.75%

The material cost is \$50/ton × 1,000 tons = \$50,000

**The value of the recycled materials is 16.75% × \$50,000 = \$8,375**

### **Regional Content (MRc5)**

One or 2 points are available if at least 10% or 20% (respectively) of the total materials value is for permanently installed products that have been extracted, harvested, or recovered, and manufactured, within a specified distance of the project. Materials transported by truck have a 500-mile limit, with greater distance allowed for rail, inland waterway, and ocean transport. The regional

content value is based on the percentage of a product that meets the regional content criteria, multiplied by the total value of the material (including delivery, but excluding installation or construction costs). An example of how to calculate the regional content value is provided below. USGBC's Excel-based Materials and Resources Calculator, available for free at [usgbc.org/resources/materials-and-resources-calculator-v2009](http://usgbc.org/resources/materials-and-resources-calculator-v2009), can also be used to calculate the regional content value.

Example: A mix contains 75% virgin aggregates, 20% RAP, and 5% virgin binder. The cost of the mix is \$45/ton, and the hauling cost is \$5/ton, for a total material cost of \$50/ton. The job calls for 1,000 tons of mix. The virgin aggregates are sourced from an on-site quarry and therefore meet the regional material criteria. The RAP is also stockpiled and processed on-site, also meeting the regional material criteria (for recycled materials, the extraction point is the stockpile, recycling facility, or other location where the material is collected and processed before manufacturing). The virgin binder is sourced from a terminal located 5 miles from the plant, which is supplied by a refinery located 100 miles from the plant, and the refinery receives its crude via pipeline from an oilfield 800 miles away. The virgin binder does not meet the regional material criteria, as the extraction point exceeds the 500-mile threshold (no additional distance is granted for transport via pipeline).

The regional content of the mix is 95%

The material cost is \$50/ton × 1,000 tons = \$50,000

**The value of the regional content is 95% × \$50,000 = \$47,500**

An additional innovation credit for exemplary performance can be awarded for projects that select materials within 100 miles of the project site if the total value of regionally harvested, extracted, and manufactured materials is 20% or more of the cost (see LEED Interpretation #10403 for more information). As aggregates for asphalt mixtures are often sourced within 100 miles of a project site, and aggregates typically comprise 93–96% of a mix, asphalt pavements can be influential in helping a project achieve this innovation credit. (*See more about innovation credits in the following section.*)

### Innovation in Design (ID)

#### ***Innovation in Design (IDc1)***

Innovation in Design credits are available for projects that achieve exceptional performance above the requirements set by the LEED standards. There are three separate paths to earn points within this category. Asphalt pavements are potentially eligible for all three categories.

#### 1. *Innovation in Design (1–5 points)*

Projects that achieve significant, measurable environmental performance using a strategy not identified in the standard can earn up to 5 points (1 point per innovation). ID credits are awarded on a case-by-case basis. Asphalt pavements could potentially earn points by using innovative green technologies, such as warm-mix asphalt. Warm-mix asphalt offers the benefits of reduced emissions, reduced energy consumption in the manufacturing phase, and the ability to achieve better compaction, which has been shown to improve pavement life and performance.

#### 2. *Exemplary Performance (1–3 points)*

Points may be awarded for projects that exhibit exemplary performance in an existing credit.

One point may be earned for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit. For instance, the use of regional materials at 30% of the total materials value for the project (instead of 10% or 20%) could be eligible for this credit.

3. *Pilot Credit (1–3 points)*

USGBC has a library — [www.usgbc.org/pilotcredits](http://www.usgbc.org/pilotcredits) — of nearly 50 Pilot Credits a project can earn. Ways asphalt paving contractors and suppliers can help a project earn pilot credits include:

- Develop and implement a plan to reduce particulate matter (PM) emissions from diesel-fueled vehicles, construction equipment, and temporary power generation during construction.
- Employ contractors, subcontractors, and building trade workers who are certificate holders under a qualified green building training program prior to the commencement of work. A list of qualified programs is available at [www.usgbc.org/node/4720457?view=resources](http://www.usgbc.org/node/4720457?view=resources).
- Project teams may pursue the entire LEED v4 Materials and Resources category in place of the MR credits from LEED 2009. All prerequisites from the LEED v4 Materials and Resources category must be met.

*Regional Priority (RP)*

***Regional Priority (RPc1)***

RP credits have been identified by the USGBC regional councils and chapters as having additional importance for the project's region. Up to 4 extra points can be earned for projects that achieve credits from that region's RP list. In some regions, RP credits can be achieved through the use of asphalt pavements. For instance, *Stormwater Design — Quantity Control* is an RP credit in the northeast. A project in the northeast that meets the requirements of this credit can earn 2 points instead of the normal 1 point. A database of RP credits and their geographic applicability is available on the USGBC website at [www.usgbc.org](http://www.usgbc.org).

**Summary**

Asphalt pavements are eligible for a variety of credits in the LEED 2009 rating system. Paving contractors and suppliers who understand how their products qualify for LEED credits can provide added value to customers seeking LEED certification for a project. This can be an effective marketing tool for contractors and suppliers who are proactive in their efforts to support the green construction sector and can bolster a company's brand identity as a leader in sustainability. Project owners who are seeking LEED certification can maximize the number of credits earned by engaging with asphalt pavement contractors and suppliers during the design, procurement, pre-construction, and construction phases of a project.

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