

Fly Ash & Concrete in LEED® v4.1

For BD+C New Construction and Major Renovation

The U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED) v4.1 program is a point system designed to be applied to every building type and phase of a building life cycle. It recognizes responsible use of materials, land, energy, ergonomics, and design considerations. LEED v4.1 significantly raises the bar compared to previous versions, changing the traditional product (e.g., concrete) cost savings of using fly ash or other coal combustion products (CCPs) for a specific number of credits to a more complex system of determining credits based on environmental product declarations (EPDs), health product declarations (HPDs), and the percentage of cement replacement. To become a LEED v4.1 Certified project, a building must score at least 40 points. The Certified, Silver, Gold, and Platinum certification levels require 40, 50, 60, and 80+ points, respectively, to an ideal 110 points.

Category	Available Points
Integrative Process	1 (1%)
Location and Transportation (LT)	16 (15%)
Sustainable Site (SS)	10 (9%)
Water Efficiency (WE)	11 (10%)
Energy and Atmosphere (EA)	33 (30%)
Materials and Resources (MR)	13 (12%)
Indoor Environmental Quality (EQ)	16 (15%)
Innovation (IN)	6 (5%)
Regional Priority (RP)	4 (4%)
Total Points Available	110

Benefits associated with sustainable development practices include:

- Lower life-cycle costs because design is not constricted to initial cost, yielding increased profitability to owners.
- Enhanced habitability, occupancy, and productivity because of ergonomic design.
- Increased worker productivity and satisfaction.
- Possible energy tax rebates. (Tax rebates are not available in all states. For more information, visit <http://dsireusa.org>.)

FLY ASH IN LEED v4.1

Fly ash, in combination with other qualifying building materials, can contribute points in several categories when used in concrete and other building products. Building owners and engineers should consult with their project LEED representative to determine their max potential for using fly ash specifically for earning points toward LEED certification. The following are examples of the ways that fly ash and other CCPs may be used to earn LEED points in new construction projects.

MR CREDIT. ENVIRONMENTALLY PREFERABLE

PRODUCTS: There are three options within this credit that provide pathways to earn points. Option 1 is the most direct, awarding points for using products that reduce material consumption and demonstrate environmental awareness. Points in this credit category are awarded if over 70% of a building product meets one of the listed prerequisites designed around encouraging the use of environmentally responsible materials. The prerequisites

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through which a given building material can contribute points via the use of fly ash and other CCPs are:

- Ensuring a building product contains at least 50% pre-consumer content.
- Using at least 25% reclaimed material in a building product.
- Ensuring concrete used in a project contains at least 30% fly ash.

LEED v4.1 recognizes fly ash as 100% pre-consumer recovered product for the purposes of determining the quantity required to meet credit prerequisites. Multiple ash-containing building products can contribute points by meeting one of these prerequisites. As such, this encourages use of CCPs in other building materials such as bricks and pavers in addition to their typical use in concrete.

Option 2 awards points to projects that seek verification of chosen environmentally conscious materials through acquiring environmental product declarations (EPDs). These declarations demonstrate a product's impact on the project's life-cycle assessment, embodied carbon, and impact on global emissions. Proportioning fly ash in concrete, concrete products, and other building materials can significantly impact these factors and thus aid in accruing points through impacting EPDs.

Option 3 of the MR credit provides opportunities for points through the use of responsible raw materials. Of particular relevance to modern fly ash use practices are the points available for building products that contain reused materials. Using salvaged material, such as harvested fly ash and other recovered CCPs, may contribute to project points.

(IN) OPTION 1-3 INNOVATION 1 TO 5 POINTS:

These credits are designed to reward exceptional performance above the requirements of the rating system and/or innovative performance in categories not specifically addressed in the rating system. The use of innovative materials and products such as fly ash bricks, ground bottom ash, roofing tiles, flex-crete, poly-ash, etc., may qualify for points in this category due to their novelty and the subsequent reduction in the carbon footprint of the associated structure or building product.

CONCRETE IN LEED

As one of the most widely used building products, concrete plays a significant role in the sustainability of new construction and thus in the accrual of LEED points. Points are earned depending upon circumstances, conditions, and design. Green building is a collaborative effort. The key to maximizing points is for the project team—owner, architect, engineer, contractor, and concrete supplier—to work together as early in the construction process as possible so that team members can provide input on the best ways to achieve sustainability goals.



To learn more about green building practices and LEED, visit www.usgbc.org.

For more information or answers to questions about the use of fly ash in specific applications, contact your nearest Boral Resources Technical Sales Representative or call 801-984-9400.

