

Emerald[™] SERIES

A Series of Sustainable Ready Mixed Concrete Solutions
to Meet LEED Certification



Emerald[™] SERIES INTRODUCTION



The construction and building materials industry is changing rapidly to reflect the increasing demand for green materials and Leadership in Energy and Environmental Design (LEED) Certification. Federal, state, and local regulations and specifications are increasingly calling for new construction to be certified, and contractors and developers are in need of materials that can help ensure their projects are sustainably built and can meet the rigors of the LEED certification process.

Emerald Series[™] is a new generation of concrete designed to reduce the carbon footprint by using post industrial waste, post consumer waste, recycled concrete, locally harvested raw materials, and pervious concrete designed for storm water management.

WHY EMERALD SERIES[™]?

Emerald Series[™] is tough, durable, and cost-effective. Most of all, **Emerald Series[™]** possesses excellent thermal-mass characteristics. **Emerald Series[™]** can ensure that your project gains vital points needed for the LEED certification by utilizing concrete's multitude of green properties - from low carbon to high percentages of recycled content.

Emerald Series[™] can help you achieve LEED Certification.

Excellence at a glance

Aggregate Industries Management, Inc. is a leading provider of aggregate and construction materials to markets in the US. Since 1997, Aggregate Industries' quest to deliver value has been evidenced in countless prestige projects and a growing list of steadfast clientele.

At Aggregate Industries, we believe in environmental excellence, sustainability, and corporate responsibility. Over the years, these core beliefs have guided our award-winning business practices. Our pledge of corporate responsibility is illustrated by our continuous efforts to further reduce CO₂ emissions, improve energy and water efficiency, and ensure ISO 14001 compliance at all Aggregate Industries sites.

We remain focused on safety, maintaining a diverse and skilled workforce, and supporting employee training and development to fulfill our commitment.

Aggregate Industries understands that our business hinges on our constant and unyielding commitment to putting the customer first every time. We believe that customer service, quality products, and consistency should be the benchmarks of any building materials business and they make up core competencies of our Company.

We look forward to serving both our clients and the community at large, now and in the years to come.

WHERE CAN EMERALD SERIES™ BE APPLIED?

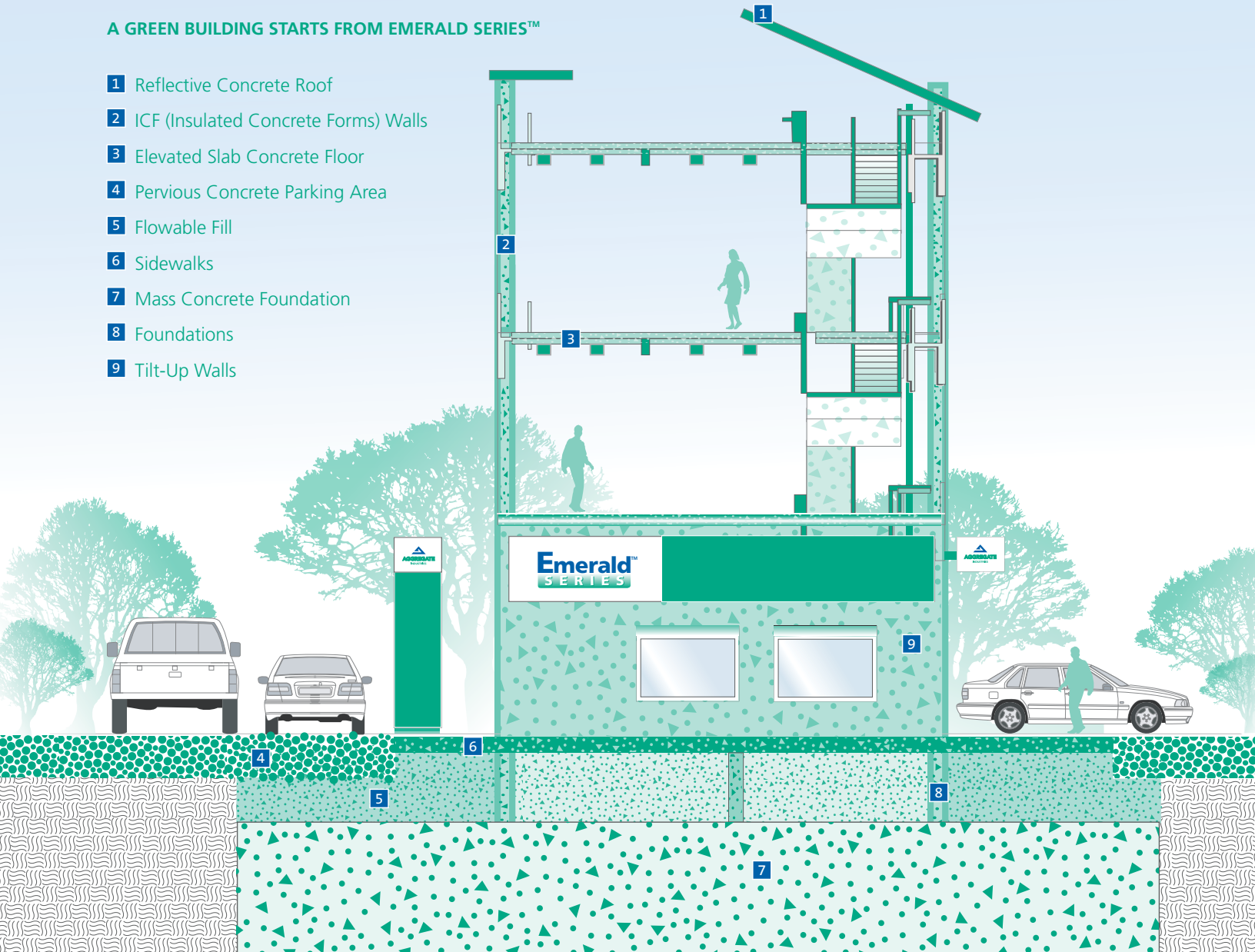
Emerald Series™ can be used for various applications, including:

- Roofs
- Floors
- Parking Areas
- Foundations
- Structural Fills
- Walls
- Sidewalks
- Storm Water Management

The list is endless, and we will help you find the right solution for your specific needs.

A GREEN BUILDING STARTS FROM EMERALD SERIES™

- 1 Reflective Concrete Roof
- 2 ICF (Insulated Concrete Forms) Walls
- 3 Elevated Slab Concrete Floor
- 4 Pervious Concrete Parking Area
- 5 Flowable Fill
- 6 Sidewalks
- 7 Mass Concrete Foundation
- 8 Foundations
- 9 Tilt-Up Walls



Emerald SERIES ENVIRONMENTAL ATTRIBUTES

Our **Emerald Series™** can help you build greener and more sustainable buildings, which specifically focus on various environmental solutions, including:

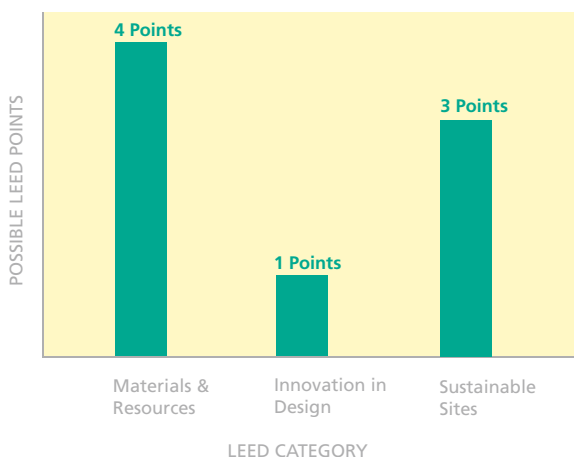
- Increased Reflectivity
- Higher Recycled Content
- Reduced Carbon Content
- Enhanced Thermal Dynamics and Reduced Heat Island
- Improved Site Sustainability
- Reduced Maintenance and Operational Costs

Emerald Series™ Products	Environmental Attributes	LEED Category	LEED Credits Product Contributes To
High SCMs Concrete	<ul style="list-style-type: none"> • Higher percentage of recycled content • Reduced carbon content by minimizing amount of portland cement 	<ul style="list-style-type: none"> • Materials & Resources 	<ul style="list-style-type: none"> • MR 4 Recycled Content 10% (1 Point) or 20% (2 Points) • MR 5 Regional Materials 10% (1 Point) or 20% (2 Points)
Moderate SCMs Concrete	<ul style="list-style-type: none"> • Increased durability 	<ul style="list-style-type: none"> • Innovation In Design 	<ul style="list-style-type: none"> • ID 1.1 Innovation In Design (1 Point)
Pervious Concrete	<ul style="list-style-type: none"> • Improved run-off water quality • Reduced water retention requirement • Increased site sustainability 	<ul style="list-style-type: none"> • Sustainable Sites 	<ul style="list-style-type: none"> • SS 6.1 Stormwater Design - Quantity Control (1 Point) • SS 6.2 Stormwater Design - Quality Control (1 Point)
High Reflectivity Concrete	<ul style="list-style-type: none"> • High reflectivity • Reduced heat island impacts • Reduced heating/cooling needs 	<ul style="list-style-type: none"> • Sustainable Sites 	<ul style="list-style-type: none"> • SS 7.1 Heat Island Effect - (non-roof) (1 Point)

SCMs: Supplementary Cementing Materials - locally produced and reused material, reduced carbon emissions; **MR:** Materials and Resources; **ID:** Innovation in Design; **SS:** Sustainable Sites

Regional Priority Credits incentivize the achievement of credits that address geographically specific environmental priorities. If a Regional Priority Credit is earned, then a bonus point is awarded to the project's total points.

EMERALD SERIES™ ENVIRONMENTAL CONTRIBUTION



Please refer to our **LEED Certification Guide** to assist in identifying **POINTS** that apply to your specific project or visit: www.aggregate-us.com/leed.cfm

Concrete Volume Calculator:
www.aggregate-us.com/rmc_calculator.cfm

LEED Calculator:
www.holcim.com/scripts/leed_calculator/calculator.php

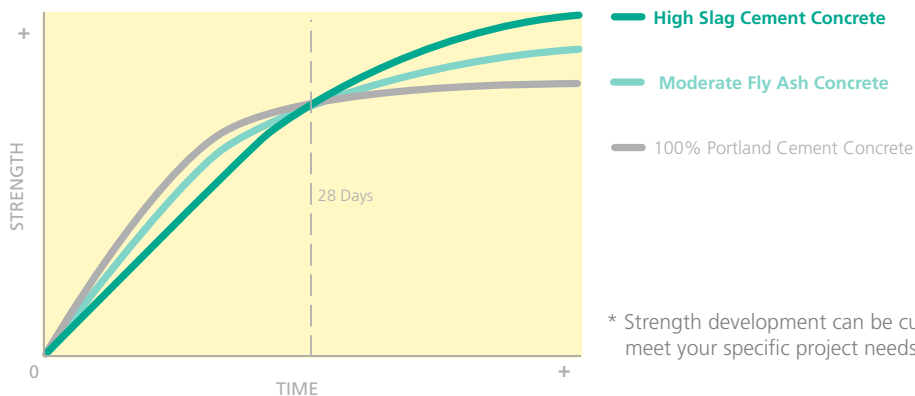
HOW FLEXIBLE IS EMERALD SERIES™?

Our **Emerald Series™** can be either performance based or specification driven. We will work with you and your clients for the maximum benefit and assure compliance with the relevant standards and specifications. We offer a flexible approach to alternate design and construction methods to achieve maximum value. Furthermore, we will make certain that you receive the products you need to ensure your building achieves the certification standards you are seeking.

Concrete Type	Application	Performance/Specifications
High SCMs Concrete	<ul style="list-style-type: none"> • Large foundations • Barriers • Dams • High cementitious content mixes 	<ul style="list-style-type: none"> • $\geq 30\%$ fly ash or $\geq 40\%$ total SCM • Reduced heat and thermal cracking • Reduced shrinkage and permeability • Improved acid resistance
Moderate SCMs Concrete	General use for most applications	<ul style="list-style-type: none"> • $\geq 15\%$ fly ash or $\geq 25\%$ total SCM • Improved workability • Enhanced strengths at 28 days • Reduced potential for efflorescence
Pervious Concrete	<ul style="list-style-type: none"> • Exterior pavements (parking areas, sidewalks, and paths) • Low volume streets • Driveways 	<ul style="list-style-type: none"> • $\leq \frac{1}{2}$" sized gap-graded aggregate • Very low w/c ratio • 15% to 30% voids • Flow rates of 3gal/ft²/min to 8 gal/ft²/min
High Reflectivity Concrete	<ul style="list-style-type: none"> • Exterior pavements (parking areas, sidewalks, and paths) • Interior flatwork where the concrete is exposed • Low and steep-sloped roofs 	<ul style="list-style-type: none"> • SRI rating range from 30 or higher • Enhanced by utilizing Slag Cement or light colored fly ash • Reduced lighting requirement/cost • Creates a safer environment

SCMs: Supplementary Cementing Materials - locally produced and reused material, reduced carbon emissions; SRI: Solar Reflectance Index

TYPICAL CONCRETE STRENGTH DEVELOPMENT*



* Strength development can be customized to meet your specific project needs.

Emerald™ SERIES TECHNICAL REFERENCES

Aggregate Industries actively participates in local and national organizations to improve environmental standards of green building materials, including:

ACI: American Concrete Institute

ACI 522: Specification for Pervious Concrete Pavement; **ACI 207:** Mass Concrete;

ACI 229R: Controlled Low-Strength Materials (CLSM)

ASTM: American Society for Testing and Materials

ASTM C94: Standard Specification for Ready Mixed Concrete;

ASTM E2634: Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems

ISO: International Organization for Standardization

ISO 14001: Environmental Management Standard

NRMCA: The National Ready Mixed Concrete Association

2PCP: Pervious Concrete Pavements; **CIP #38:** Pervious Concrete

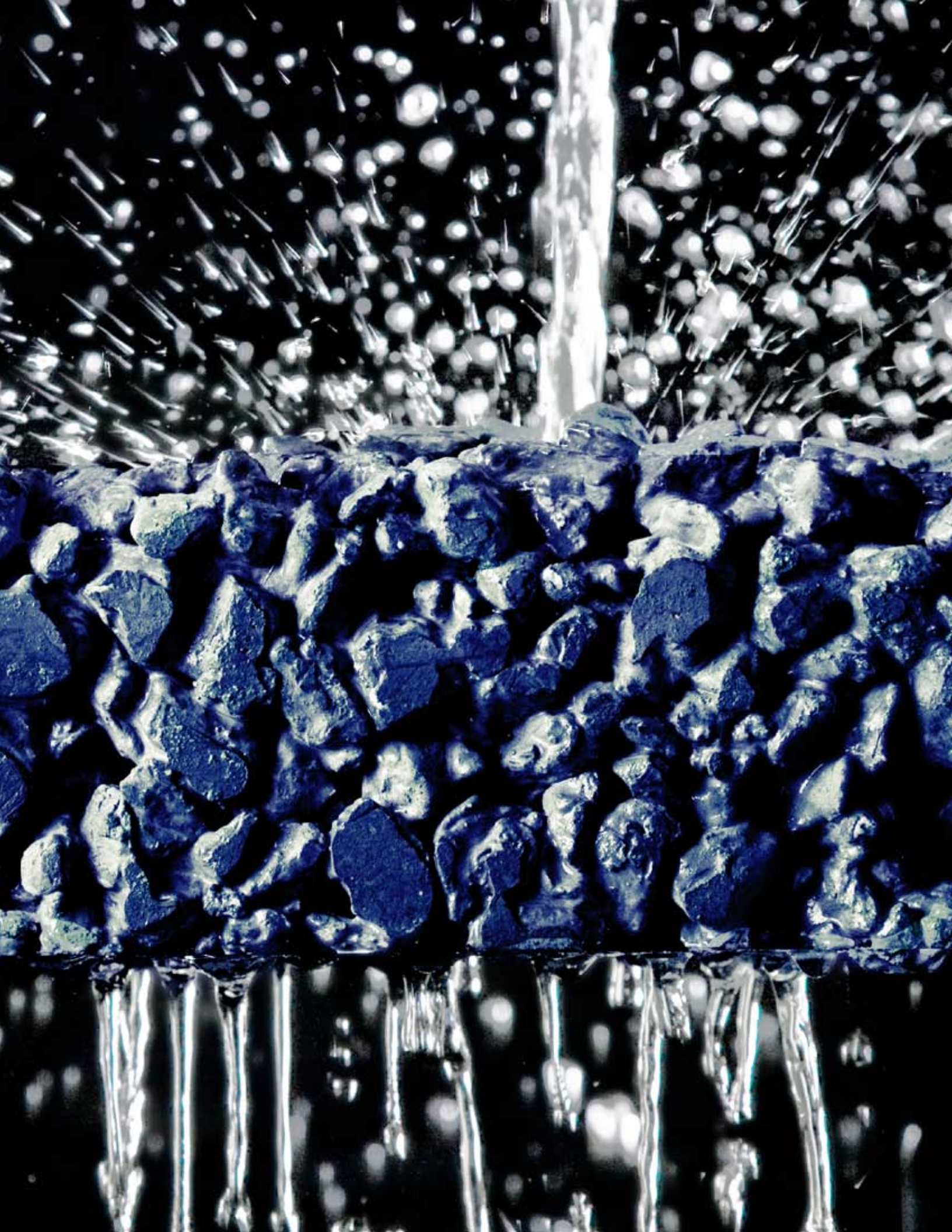
PCA: Portland Cement Association

PCA R&D 2982: Solar Reflectance of Concretes for LEED Sustainable Sites Credit - Heat Island Effect

USGBC: U.S. Green Building Council

LEED: New Construction & Major Renovation Reference Guide







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