

ARCOSA LIGHTWEIGHT IN ACTION:

Green roofs and other spaces over structure are quickly becoming essential to urban infrastructure, driven by mandates in cities like New York and Washington, D.C.

Both cities are adopting green infrastructure laws to combat stormwater issues, urban heat, and pollution, making lightweight aggregate (LWA) a critical component of this decade-long trend.

At a recent meeting between Arcosa Lightweight, two landscape architects, and green roof media supplier Naturcycle, the conversation centered on the increasing importance of LWA in urban green roof design.

“I don’t see any change in this for at least 10 years,” says Landscape Architect Michael Barnicle, presently with consulting firm Kimley-Horn and Associates.

Lightweight aggregate, he explains, is central to making green spaces feasible on buildings that can’t support the weight of traditional soils. “I have been using expanded shale for probably over 30 years,” Barnicle adds. “Being over structure, we’ve got to try and make that material as light as possible and still cost-effective.”

The Regulatory Landscape: NYC and DC Lead the Way

Both New York and Washington, DC have enacted significant green infrastructure policies.

NYC’s Climate Mobilization Act—specifically Local Laws 92 and 94—requires sustainable roofing zones on new construction and major roof renovations. Lightweight green roofs offer developers a practical path to compliance, helping them meet sustainability goals without compromising structure or aesthetics.

In DC, the Department of Energy and Environment’s Green Area Ratio (GAR) mandates vegetated roofing and permeable surfaces as part of its scoring system for new developments. Green roofs designed with LWA consistently help projects meet these performance metrics.

“In the DC market, the landscape architect must do a close-out to guarantee that the contractor has followed soil depth, retention, all of those details before they get their CO (Certificate of Occupancy),” says Barnicle. “So that’s how strict DC has become.”

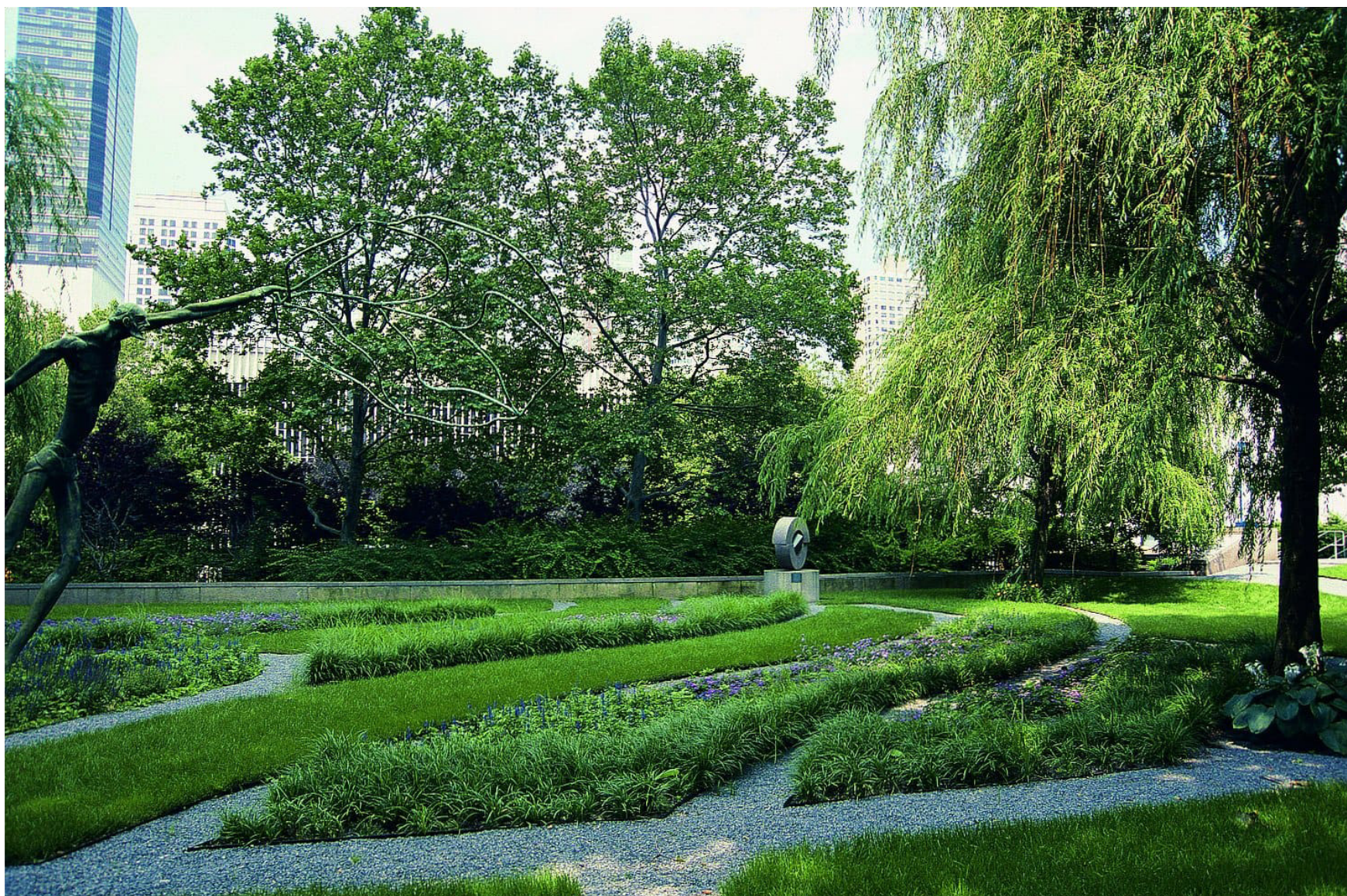
Why Lightweight Aggregate Is Essential for Urban Green Spaces

Paul Altnauer, Arcosa’s National Technical Sales Representative for Horticulture & Filtration, notes that lightweight aggregate is essential for these projects, enabling architects to create vibrant green spaces without overloading building structures.

“If you have an existing structure that already has a load limit where you know you’re going to have to bring something in there that’s



Typical application for green spaces in New York, NY.



ABOVE: MPFP has used expanded shale for decades. At Fordham University's Lincoln Center campus, trees planted in the late 1990s now reach maturity—some with trunks over 12 inches in diameter. “It looks like a park on top of the building,” says Barnicle. “We've added some fertilizer over the years, but there's been no need for substantial upkeep—almost 30 years and it's still thriving.”

going to do the job and that's going to be light, that's where we fit in,” Altnauer says. “So, it was a unique experience to talk directly with those designers, hear their challenges and how they've overcome them. I'm also excited about the upcoming projects they have on the books. There's a lot more to come.”

The Value of Lightweight Aggregates

Lightweight aggregate's value lies in its strength-to-weight ratio. It allows for deep, biologically active soil layers—capable of supporting trees and diverse vegetation—without overloading rooftop structures.

“We couldn't do many green roof projects without the lightweight material,” says Rob Osterlof, Senior Design Associate at MPFP. “It's just not feasible to do full-weight soil on these rooftops.”

He explains that about 90% of their projects involve intensive media depths, which can exceed 36 inches for trees.

“If it's too light, you get waves and uplift. If it's too heavy, you overload the structure. We aim for around 70 to 80 pounds per cubic foot—still substantial, but a lot less than 120 pounds per cubic foot [of traditional soil],”

“We like to do trees, and certain trees work better with green roof soils than others,” says Osterlof. “Being able to know how the soil will perform allows us to specify the correct tree, and is therefore a big part of our design process.”

Economic, Environmental, and Social Benefits

According to Green Roofs for Healthy Cities (GRHC), green roofs help mitigate the urban heat island effect, improve air quality, manage stormwater, and provide mental health and social benefits.

“Green roofs add beauty and a park-like feel to urban rooftops,” says Osterlof. “These spaces are now valuable amenities for tenants and building owners alike.”

In both NYC and DC, regulations demand not only effective stormwater retention but long-term sustainability. LWA supports these goals by increasing infiltration and reducing runoff.

“These green roofs are acting like sponges, slowing that stormwater down before it hits the current infrastructure,” says Barnicle.

Arcosa’s Bill Wolfe adds that expanded shale’s structure plays a key role in filtration. “The material’s ‘ceramic sponge’ quality helps reduce stormwater contaminants,” says Wolfe.

However, Barnicle notes that current stormwater rules focus on volume, not chemical content.


“They’re not testing chemically,” he says, which leaves room for future policy evolution.

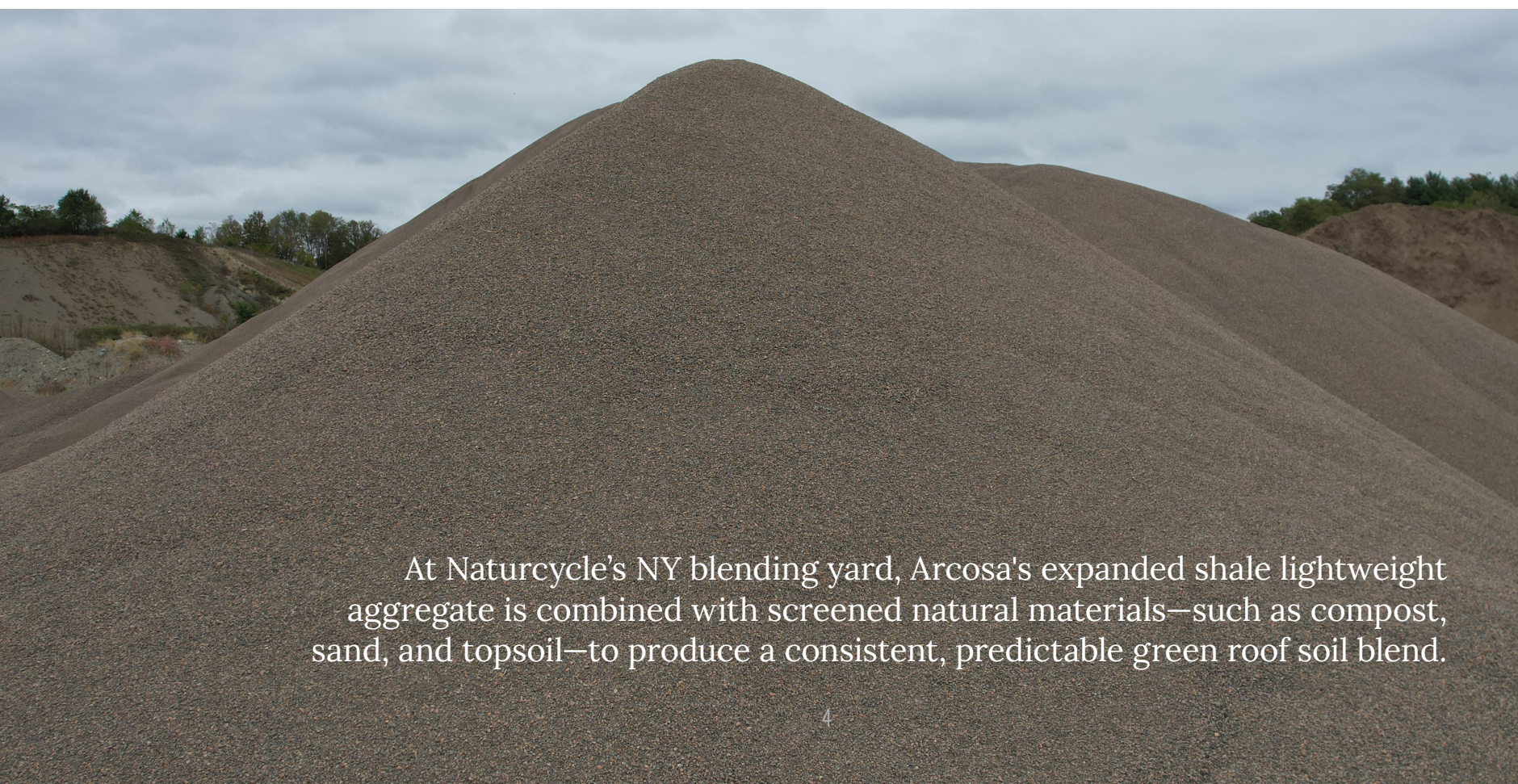
The Future of Green Infrastructure

Green roofs are no longer just a visual enhancement—they’re a critical tool in resilient urban planning.

“For us, being able to lighten up the soil is a critical part of being able to make these spaces beautiful and usable,” says Osterlof. “You could make a lightweight roof deck with pavers and foam, but is that a usable space? No. So you want that lightweight soil. That’s a critical tool for us.”

As more cities embrace sustainable roofing laws, demand for green roofs—and the lightweight materials that make them possible—is expected to grow significantly.

With partners like MPFP, Naturcycle, and Arcosa Lightweight working together the future of landscapes over structures is not just possible—it’s thriving. 



At Naturcycle’s NY blending yard, Arcosa’s expanded shale lightweight aggregate is combined with screened natural materials—such as compost, sand, and topsoil—to produce a consistent, predictable green roof soil blend.