

FROM CONCEPT TO CONSTRUCTION

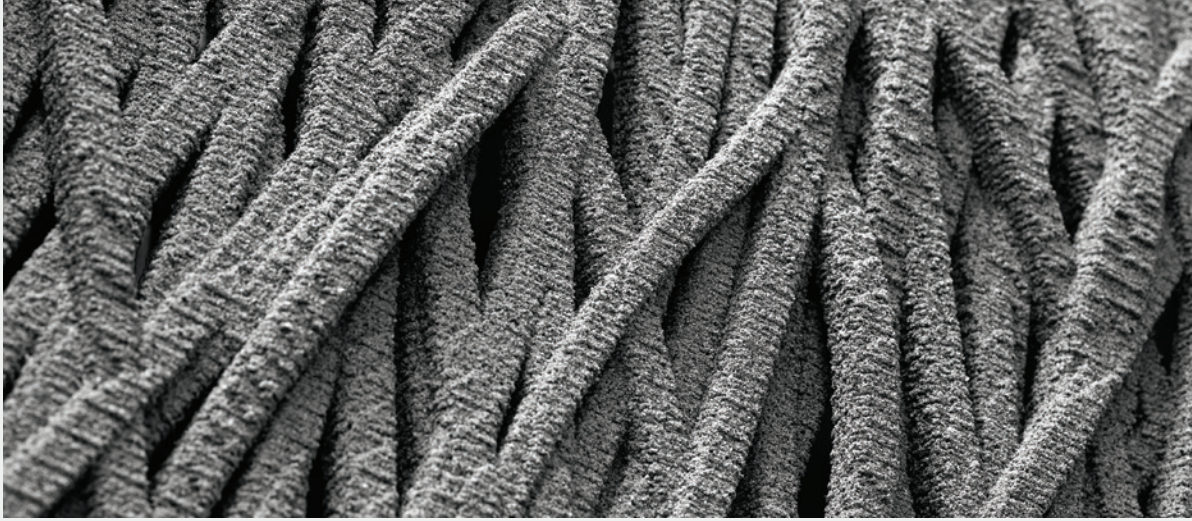


CREATING CUSTOM CONCRETE LANDSCAPE ELEMENTS WITH 3D CONCRETE PRINTING

BY BRIAN GRYSSEN, DIRECTOR OF SALES, MANGROVE

Custom landscape features often present a familiar challenge: a designer's vision doesn't always translate easily into fabrication or installation. Knee walls, pillars, planters and site furnishings may begin as unique, site-specific concepts, but traditional manufacturing methods can require compromises in form, complexity or constructability before a project ever reaches the jobsite.





As demand for distinctive outdoor environments continues to grow, landscape professionals are exploring new ways to deliver custom hardscape solutions without adding unnecessary complexity to the construction process. One solution is to bring landscape designers and fabricators together from the earliest stages of a project rather than after the design is complete.

That approach is illustrated through the partnership between Greenline Inc. and Mangrove. Greenline landscape designer Matt Michmerhuizen and Mangrove lead

industrial designer Spencer Hope work together from concept through installation, integrating design, engineering and fabrication into a single process.

“When we can connect early on in the process, we’re able to develop a deep understanding of pain points, goals, and the overall creative vision for a project. This really allows us to align our thinking and collaborate toward unique, beautiful design that’s truly tailored to each client,” said Hope.

Rather than waiting until a design is complete, fabrication becomes part

of the design process from day one, allowing design intent, constructability, manufacturing strategy and installation requirements to be evaluated together.

One example is the development of custom landscape elements such as Mangrove’s Diamond Knee Wall and architectural pillars. Rather than handing off completed drawings for fabrication, Michmerhuizen and Hope collaborate throughout the project to refine the design before production begins.

“Having manufacturing involved early gives us confidence that what





we're designing can actually be built the way we intended," said Michmerhuizen. "It allows us to focus on creating the best solution for the client instead of redesigning around production constraints."

The collaboration between Greenline and Mangrove illustrates how early coordination between design and fabrication can reduce revisions later in the project while helping preserve the original design intent.

Although every project has unique requirements, the overall process remains consistent: bring landscape design and fabrication together early, refine the solution collaboratively and carry that shared vision through production and installation.

Designing Beyond the Limits of Traditional Formwork

Conventional concrete fabrication often depends on custom molds and formwork, making one-off landscape elements time-consuming and costly to produce. As designs become more complex, those fabrication realities can limit what is ultimately built.

Mangrove is the first company in North America to operate production-scale Selective Paste Intrusion (SPI) concrete printing technology. The manufacturing process builds concrete layer by layer within a surrounding bed of aggregate. Because the surrounding aggregate supports each part during production, complex geometries can be manufactured without traditional formwork while maintaining precision, consistency and efficient material reuse.



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This approach changes how design teams evaluate custom landscape features.

"The flexibility in how we can create landscape and hardscape design with our technology is truly unprecedented. We're able to open our minds to a whole new set of creative possibilities," Hope said.

That collaborative process makes features such as organic curves, lattice structures, custom textures and project-specific dimensions more practical to evaluate during design rather than forcing revisions later in the project.

A Collaborative Workflow

Whether developing a custom knee wall, architectural pillar or another site feature, the process follows a workflow that keeps design intent and fabrication aligned throughout the project.

The process begins with the landscape designer's vision and the site's unique requirements. Early conversations establish design objectives, performance expectations and opportunities for customization.

Landscape and industrial designers then refine the concept together, balancing aesthetics, structural performance, fabrication strategy and installation requirements before production begins.

Once the design is finalized, the components are manufactured using Mangrove's SPI process before being prepared for installation.

Because installation considerations are incorporated throughout the design process, finished components arrive with fewer field modifications and greater confidence that the installed product reflects the original design intent.



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Benefits Beyond Aesthetics

While additive manufacturing is often recognized for producing complex forms, one of its greatest values is the collaboration it encourages.

“Throughout the design process, we can be producing full scale prototypes, evaluating them together, and iterating within days,” said Hope.

For landscape professionals, that means potential fabrication and installation challenges can be addressed during design rather than during construction.

“When fabrication and installation are considered early in the design process, everyone benefits,” said Michmerhuizen.

“Installation becomes more straightforward, we can stay true to the original design intent, and clients end up with a finished product that more closely reflects the vision we set out to create.”

Built for Long-Term Performance

Regardless of how a landscape element is manufactured, durability remains essential. Commercial and residential landscape features must withstand years of weather exposure, freeze-thaw cycles and everyday use.

Mangrove builds on more than three generations of concrete expertise through the Kerkstra family, combining decades of material knowledge with modern manufacturing methods to produce architectural concrete products intended for long-term outdoor performance.

Expanding What's Possible

The collaboration between Greenline and Mangrove illustrates a broader shift in how custom landscape projects can be delivered.

Early collaboration between landscape designers, engineers, fabricators and installers can help preserve design intent, improve constructability and create a more predictable path from concept to completion. When fabrication becomes part of the design process rather than simply the production phase, landscape professionals are better equipped to deliver custom solutions with confidence from concept through construction.



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