# Beneficial Use Case Study

## Zuri Gardens

### Coal Combustion Product Type
Fly Ash (PozzoCem® Vite Green Cement)

### Project Name
Zuri Gardens

### Project Location
Houston, Texas

### Project Participants
Eco Material Technologies, HiveASMBLD, LP Building Solutions, Cole Klein Builders, City of Houston

### Project Completion Date
2026

### Project Summary
Zuri Gardens is a 13-acre Houston development integrating 3D printing and fly ash-based green cement to create affordable, resilient housing. When complete, the community will include 80 two-story homes featuring printed concrete lower levels made with PozzoCem® Vite, a near-zero-carbon cement alternative. By replacing portland cement in the printed walls, the project significantly reduces the embodied carbon compared with traditional portland-cement systems.

### Project Description
The first floor of each Zuri Gardens home is produced using a robotic 3D printing system. The equipment places a printable mortar made with Eco Material Technologies' PozzoCem® Vite in successive layers, forming the structural walls of each residence. Made from fly ash and proprietary additives—with no portland cement—the material reduces carbon emissions by more than 90 percent while delivering the strength required for durable housing: about 3,000 psi in seven days and more than 5,000 psi within 28 days.

PozzoCem® Vite hardens within minutes of placement, allowing each newly printed layer to support the next without slumping or distortion. This rapid-setting behavior enables continuous operation at high production rates: a roughly 90-square-foot wall can be printed in about 35 minutes, and the complete printed wall system for a home can be finished within a matter of days. According to the project team, pairing 3D printing with fly ash-based cement has reduced construction costs by an estimated 7 to 8 percent compared with traditional lumber-and-drywall methods.

After printing, crews install reinforcing steel, plumbing, and electrical lines within the hollow wall cavities. The walls are then filled with a lightweight concrete foam, creating a solid, insulated mass-wall assembly. This monolithic system yields homes that are quieter and more resistant to water, fire, termites, and impact damage than conventional wood-frame construction, while also helping stabilize interior temperatures during Houston's long, hot summers.

"This project proves that the next generation of cement and concrete and advanced construction technology can work hand-in-hand to deliver beautiful, durable, sustainable homes at scale—without compromising affordability or performance," said Grant Quasha, President of Eco Material Technologies.

Zuri Gardens marks Eco Material Technologies' second collaboration with HiveASMBLD on affordable housing in Texas, following a 2023 project in Round Top that used the same fly ash-based cement to construct a series of smaller 3D-printed homes. Together, the two developments demonstrate how fly ash-based cement alternatives and automated construction methods can be deployed at community scale to expand housing access while reducing cement-related emissions.

*Rendering by Hive3d Builders*