

Penumbra Zona Franca La Lima











Location

Cartago, Costa Rica

Certification level

Platinum

Percent of Overall Diversion Achieved

99.9%

Facility Size

334,757 sq ft

Type of Operation

Manufacturing Medical Devices

Project Overview

Penumbra, developed by Garnier & Garnier, in Zona Franca La Lima, Cartago, Costa Rica, achieved TRUE Platinum certification with a 99.9% diversion rate, the first TRUE Zero Waste for Construction project certified in Latin America. The project set a precedent for the Costa Rican construction industry, demonstrating that diverting nearly every waste stream generated on a large-scale construction site is achievable through design-stage planning, dedicated infrastructure, and close coordination with local waste management partners.

Waste reduction began at the design phase: primary structural elements (columns, roof beams, tie beams, and mezzanine components) were manufactured off-site as precast concrete pieces under controlled factory conditions, then transported and assembled on-site with work limited to excavation, foundation placement, and erection, limiting the onsite produced waste. Benchmarked against a comparable nearby project in the same industrial park, this approach cut waste generation per area by more than 50%. A standardized pallet-return program, backed by a non-return fee, ensured systematic reuse and tracking. Organic waste was composted on-site and used as fertilizer for a nursery built entirely from reused materials on the project; wood, shade netting, and repurposed plastic bottles and containers repurposed as watering cans and flowerpots for the nursery. Working with waste haulers like Zero Waste S.A, the project achieved 100% of total material weight directed to its highest and best use, supported by a dedicated, weather-protected collection center with separated space for each waste stream.

These practices were reinforced through employee engagement and organizational commitment: zero waste content was built into the induction process for all employees, contractors, suppliers, and consultants entering the site, and a written Environmentally Preferred Purchasing Policy, enforced through software tracking, governed construction, office, and food and beverage purchases. A physical waste audit tracked program effectiveness across municipal, recycling, composting, and construction material streams. Project leadership extended this commitment into the community: on May 6, 2026, upper management representatives, including ZFLL General Manager Fernando Carazo and Project Managers Shalini Tahilramani and Ernesto Jiménez, Penumbra Facilities VP Chris Faber, Garnier Engineering Director Alvaro Ramos, and Scala General Manager Camilo Jimenez, joined a volunteer cleanup with the Municipality of Cartago's Waste Collection and Management Department, removing 1.25 tons of waste from the surrounding area in four hours.

This project demonstrates that zero waste principles can be embedded into large-scale construction from the ground up rather than retrofitted after the fact. By pairing off-site prefabrication with rigorous on-site tracking, employee training, and community partnership, Garnier & Garnier achieved a diversion rate that few construction projects worldwide have matched, and did so while building local capacity among waste haulers and subcontractors to support similarly ambitious projects going forward. As the first TRUE Zero Waste for Construction certification in Latin America, Penumbra offers a replicable model for the region's construction sector, proving that near-total diversion is not only possible but achievable without compromising project timelines or budgets.

“Working to meet the TRUE certification requirements was especially valuable because it pushed us to question the traditional way of building. The experience went beyond separating waste or meeting an environmental target. It demonstrated that sustainability can be integrated into the daily operations of even large, complex construction projects.”
- Shalini Tahilramani, Senior Project Manager

Learn more in their [press release](#) and [coverage](#).

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