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PAE Consulting Engineers

# PAE Living Building Challenge Office

Portland, Oregon



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*Innovative water infrastructure helps ensure net-positive water use in a five-story, mixed use building.*

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## **SERVICES**

Design-build  
Water Strategies

Located less than two blocks from the Willamette River, a five-story, mixed-use structure planned for Portland, Oregon's Old Town Historic neighborhood is poised to become the first developer-driven and largest commercial urban Living Building in the world. Designed by ZGF Architects and PAE Consulting Engineers—the primary occupant of the building—the 58,700-square foot structure will produce 105 percent of its energy needs and meet its potable water needs from harvested rain and internal water recycling. The project is the first building in the world to produce retail-grade fertilizer from captured waste onsite (urine and compost leachate) with only the sun and rain as inputs.

A key member of the integrated design team, Biohabitats engineered the building's water and waste infrastructure, which includes onsite systems for harvesting rainwater for potable water supply, greywater treatment for reuse in toilet flushing and irrigation, and nutrient recovery. The nutrient recovery system turns high strength waste into retail grade fertilizer, an innovative demonstration of upcycling otherwise detrimental water pollutants and recovering valuable nutrients like nitrogen like phosphorus. The building includes 20 composting bins to manage toilet waste and a 71,000-gallon rain cistern.

In addition to supporting the project's pursuit of the LBCs stringent Water Petal, the water infrastructure contributes to the building's positive impact on Willamette River Watershed and the broader regional ecology.