TODD VOGEL AND KAREN HUST

Integrated Water Strategies for the Loom House

Bainbridge Island, Washington

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The Loom House.

Innovative water harvesting and onsite wastewater treatment systems help create the world's first renovated home to achieve Living Building Challenge certification while also advancing water policy.

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Designed in 1968 by mid-century modern architect, Hal Moldstad, the Loom House is a 2,000-square-foot property on Bainbridge Island, an area where groundwater provides the only source of drinking water. The property was originally comprised of a main and guest residence linked by an outdoor patio. When the homeowners wanted to update the property and add a carport, they did so with a bold ambition: create a home that would restore the land it sits upon and become the first residential remodel to meet the requirements of the Living Building Challenge (LBC), the world's most rigorous performance standard for buildings.

As the water consultant on a design team led by the Miller Hull Partnership, Biohabitats developed strategies to ensure that the site's water infrastructure would respect existing hydrology and operate within a defined water budget. After developing a water balance and collaborating with the client and design team, Biohabitats developed three water systems. A rainwater to potable system collects and sends water from the roofs to an underground cistern and mechanical room, where it is filtered, disinfected, and pressurized for distribution throughout both buildings for all water demand. A separate system harvests and directs rainwater from the carport roof into two above ground cisterns, where it is available for landscape irrigation. An onsite wastewater treatment system collects and treats all of the wastewater from the Loom House. The system provides additional treatment through a recirculating textile filter before dispersing high quality effluent into the site landscaping through a subsurface drip dispersal system.

Although the City policy required buildings within the sewer service area, like the Loom House, to connect to the sewer main, the design team and the Living Future Institute was ablet o address the City's concerns. The City ultimately passed an ordinance allowing for onsite blackwater treatment, which enabled the project to move forward and opened the door for others to employ an onsite wastewater treatment practice that could help replenish the aquifer, lessen the burden on the municipal sewer system, and protect the Puget Sound. Loom House was the first renovated home to achieve LBC certification, and at the time of certification, was one of one four residences in the world to do so.