Ebb and Flow

Traditional architecture, new building methods, and rainwater collection combine to lessen a home's imprint on its sensitive coastal site

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Morning on the marsh. *Windows on the east side of the house catch the early-morning sun as it rises over the estuary.*

BY STEPHEN SULLIVAN

I was honored when longtime friend Laura Sewall invited me to design her house at Small Point, Maine. Set at the mouth of the Sprague River as it spills into the Atlantic, the site witnesses the daily ebb and flow of the ocean's tides in a vast estuary. Laura saw this dramatic site, the setting for generations of family summer retreats, as a precious gift from her ancestors.

During a frigid January weekend in 2004, Laura and I gathered with her builder, Christopher Hahn, at Small Point. Warmed by a small campfire, we talked about the complex feelings that often accompany an intention to build, particularly when it involves disturbing such a fragile landscape.

Christopher, an old friend of Laura's who had recently moved to Maine, brought an extensive knowledge of building technologies and high standards of craftsmanship to the project. As a team, we shared a vision of a responsible, sustainable approach to building.

Efficiency in form and materials

Maine's historic coastal architecture provided us with three centuries' worth of fine New England homes that shared common goals

Deceptively simple. *Intersecting rooflines disguise the fact that the house is fundamentally a central box with a shed structure wrapped around two sides.*

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with our new design, a graceful form that would provide comfortable shelter against the often-harsh weather.

The home's basic form is square in plan and cubic in volume. The cubic form, in which a minimum of exterior surface is needed to contain the maximum amount of space, has strong architectural precedent in the area, undoubtedly for its thermal efficiency.

The plan is divided roughly into a nine-square pattern, with the great room and master bedroom as a larger central square. A lower shedlike roof surrounds the house on slightly more than two sides, creating a buffer to the north and west, where solar gain is negligible and weather is most harsh.

The east and south sides of this surrounding buffer, in contrast, are "carved away" to expose the central living space to light and solar energy from the south, and to allow a view of the tidal estuary to the east. We chose visually simple windows based on a golden-section proportion (1:1.618) to evoke the classical tradition of New England homes.

The central cube has four cross gables, one facing each of the cardinal directions—another allusion to local historic architecture. Windows are maximized to the south and minimized to the north, giving the north-entry elevation some of the noble austerity characteristic of early New England architecture while allowing the south elevation to express a contemporary openness.

The main floor contains a great room, an office, a small bedroom, a lavatory, and a pantry. The upper floor contains the master bedroom and bath. The basement, origi-

For water watchers. *A window-seat bump-out in the living area (interior, above, and exterior, at left) provides a broad view of the estuary. Interior photo taken at A on floor plan.*

Floor-plan drawings, facing page: Martha Garstang Hill

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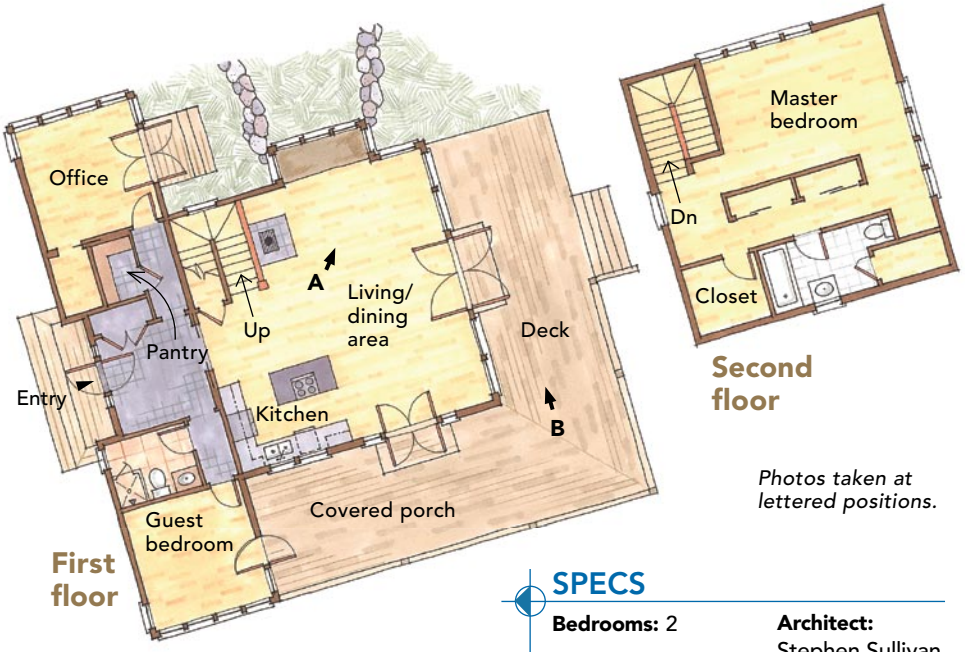
Climate change. *Minimal glass on the north side of the house shuts it off from punishing weather, while ample windows and open porches on the south and east capture the sun. Photo taken at B on floor plan.*



Photos taken at lettered positions.

SPECS

Bedrooms: 2

Bathrooms: 2

Size: 2880 sq. ft.

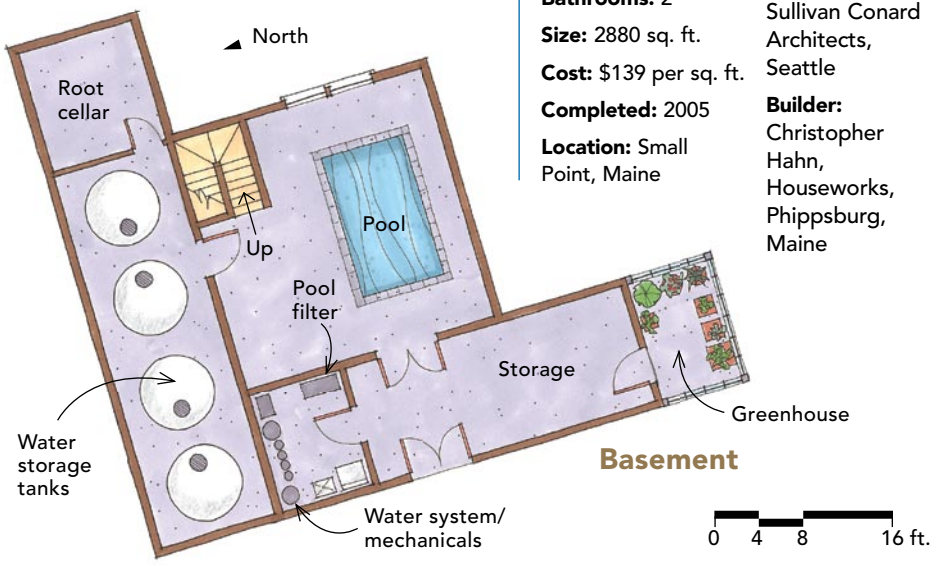
Cost: $139 per sq. ft.

Completed: 2005

Location: Small Point, Maine

Architect: Stephen Sullivan, Sullivan Conard Architects, Seattle

Builder: Christopher Hahn, Houseworks, Phippsburg, Maine



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nally designed to hold several large tanks for rainwater collection, was expanded after the original design to include a greenhouse and an "endless" swimming pool for exercise during the cold winter months. The rainwater-collection system was a response to the fact that Small Point's water system is shut down in winter, as well as Laura's hesitancy to draw water from the local ecosystem. Although designed as a traditional stick-built home, Laura and Christopher chose to construct the house using SIPs (structural insulated panels) and its foundation with ICFs (insulated concrete forms) to maximize its thermal efficiency. The heating is a propane-fired radiant-floor system, backed up with a Jøtel woodstove. □

Stephen Sullivan is the founder of Sullivan Conard Architects in Seattle. Photos by Brian Vanden Brink.

From sticks to SIPs

My biggest concern in building Laura's house was not only building it affordably, but also with outstanding thermal performance. I also was doing much of the project solo and wanted to have the house dried in before winter arrived.

I was intrigued with insulated concrete forms (ICFs) and considered them for both the foundation and the wall system. But the many windows on the south and east walls posed numerous structural challenges, so I decided it was better to learn about ICFs with the slightly less challenging foundation.

Structural insulated panels (SIPs) were my next option, offering good thermal performance, minimal thermal bridging, excellent structural values, and quick assembly. Panel Pros (www.panelpros.com) in nearby Keene, N.H., easily converted Stephen Sullivan's plans for a stick-built form to one made with SIPs. With 90% of their projects coming in as stick-built, the company is quite experienced in doing these conversions.

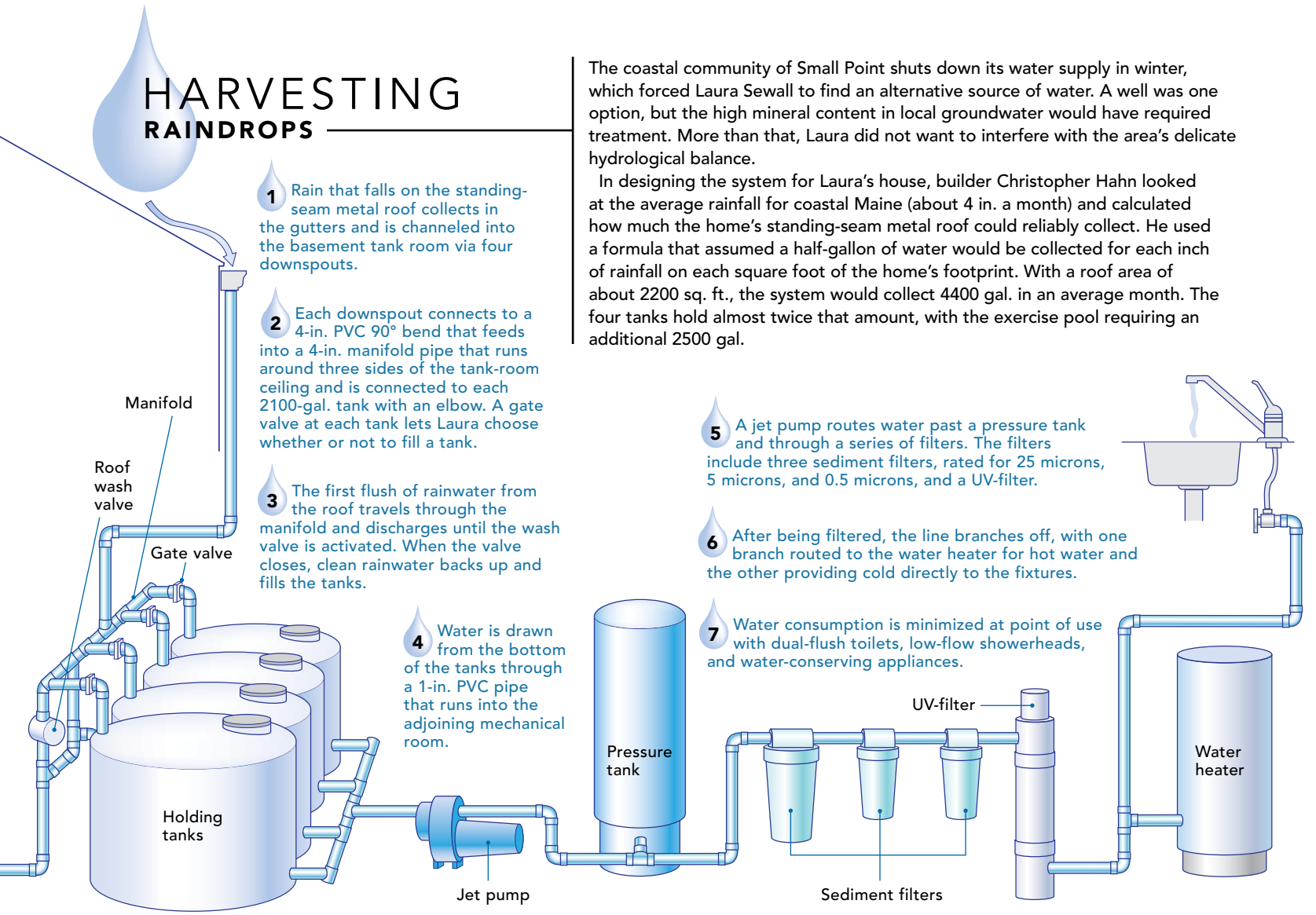
I used the company's crews to erect the panels so that I could learn by watching and have experts on hand to deal with any surprises. When the five-person crew arrived, I had the first floor sheathed and waiting. Three days later, they drove off with all the walls and the second floor in position. They returned a week later with the roof panels, large glulams, and hangers to carry the cross-gable roof. I provided the crane. Three days later, they left with the roof done and gaps filled with spray foam, leaving behind about a pickup-bed's worth of offcuts and foam waste in the dump trailer.

—Christopher Hahn

HARVESTING RAINDROPS

The coastal community of Small Point shuts down its water supply in winter, which forced Laura Sewall to find an alternative source of water. A well was one option, but the high mineral content in local groundwater would have required treatment. More than that, Laura did not want to interfere with the area's delicate hydrological balance.

In designing the system for Laura's house, builder Christopher Hahn looked at the average rainfall for coastal Maine (about 4 in. a month) and calculated how much the home's standing-seam metal roof could reliably collect. He used a formula that assumed a half-gallon of water would be collected for each inch of rainfall on each square foot of the home's footprint. With a roof area of about 2200 sq. ft., the system would collect 4400 gal. in an average month. The four tanks hold almost twice that amount, with the exercise pool requiring an additional 2500 gal.



Drawings this page: Dan Thornton

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