AT ONE WITH THE WATER The living room is lined with 85-mph impact-rated aluminum-clad windows with insulated glass, yielding 180° views of Skagit Bay. The prow sitting area is meant to give the sense of being on a boat; the wave-patterned Modular Arts wall panels fit the ocean theme.

POLISHED AND PROTECTED Garage doors from Overhead Door in the lower level open to a south-facing patio and an entry courtyard. Steel and concrete materials were chosen for their ability to withstand flood waters. All of the building materials on this level are completely waterproof.

Built For Cat

astrophe

This coastal Washington home is built to stay upright, even during weather events that would destroy the average house

BY KILEY JACQUES

Dan Nelson, principal of Designs Northwest Architects, is regularly hired to design and build houses ready to withstand major weather events. Much of that has to do with his firm's location in Washington State, where seismic risk runs high. He is an expert at designing homes in preparation for wildfire and earthquake scenarios. His Tsunami House is so named for the high-velocity wave walls it could withstand.

The project was a remodel of an aging fishing cottage on Camano Island in Puget Sound. Because the soils are sandy and prone to liquefaction, Dan designed a concrete floating slab. Code mandates that all new construction in a high-velocity wind and flood zone be built on piers, so the house sits on 9-ft. concrete columns, which are tied into the slab with a significant amount of rebar. The lower-level walls include custom industrial-style overhead garage doors and aluminum wall panels, operated with a plastic fastener system that enables them to break away if a tsunami hits. A steel moment frame is tied into the concrete slab, creating a hybrid structural system designed to withstand the impact of high-velocity

waves up to 8 ft. and 85-mph lateral winds, as well as a magnitude-7.8 earthquake. In the event of seismic activity, the entire structure will move as one unit.

The height of the piers allows for additional living space; the lower level functions as an open-air space, while the main living spaces sit above in case of flooding. The "Flood Room" on the lower level features water-resistant materials including buffed concrete floors with hydronic radiant heat, tiled walls, and a burnished steel staircase.

Of the style, Dan says: "We are working more and more with low-maintenance materials that perform better under severe conditions, and those materials naturally lend themselves to modern design." He also notes a shift that occurred about six years ago in his region, when clients began moving away from the rustic charm of the classic Northwest Craftsman style and toward modern forms and materials. He regularly specs standing-seam metal cladding, Hardie fiber-cement siding, VIVIX Lap siding, and Trespa phenolic panels, which he describes as akin to pressed-resin sheets.

Dan notes that modern design is often thought to be sterile, which doesn't resonate with the idea of home. For this project, he warmed the upper-floor interiors with wood-grain porcelain-tile flooring and clear western red cedar on the ceilings and walls—a nod to the former cottage's cedar panelling, which could not be salvaged.

Having a lot of glass to maximize views is one of the challenges when designing a vulnerable waterfront property. Dan used Fleetwood fiberglass aluminum-clad windows with thermal break and insulated glass, which are extremely durable and comply with Washington's stringent energy code.

On the south side of the small lot, a terraced courtyard separates the house from the road, and a deck disguises the septic system. Had it been left as is, it would have been an eyesore. The concrete frame for the sand-filter system protrudes 3 ft. above grade and runs nearly the entire length of the house.

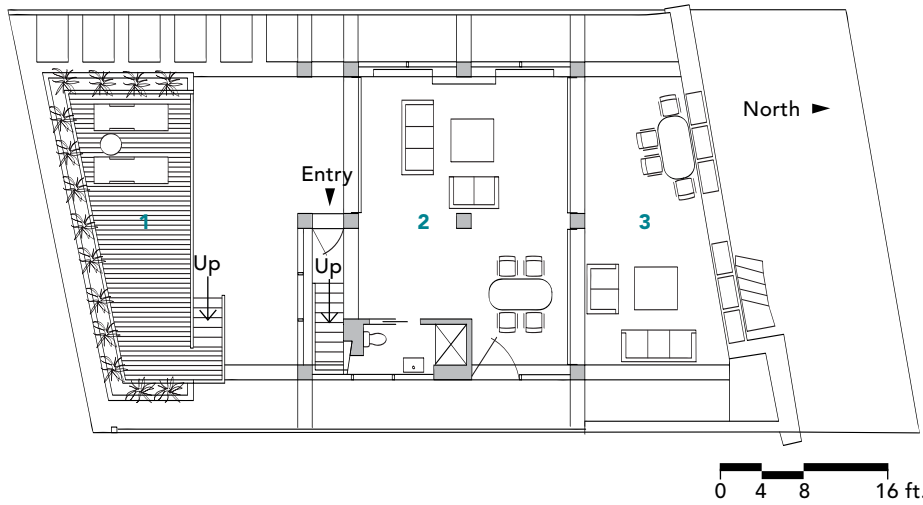
Asked about residential building in the face of climate change, Dan responds: "There's a lot architects and builders can do to start thinking about these issues up front. That will lead to advanced design strategies that we are just starting to explore." □

Kiley Jacques is design editor. Photos courtesy of Designs Northwest Architects.

SIMPLICITY BELIES THE BUILD The open-air "Flood Room" on the lower level is both a tsunami solution and a peaceful respite. The walls and overhead garage doors are designed to break away if a tsunami hits, allowing water to flow through.

SHELTER FROM THE STORM

The main living space is located on the second level in case of storm surges and flooding. It's oriented to protect against excessive sun exposure and optimize shade potential for maximum occupant comfort, while letting in light and views from the north.



SPECS

Bedrooms: 2

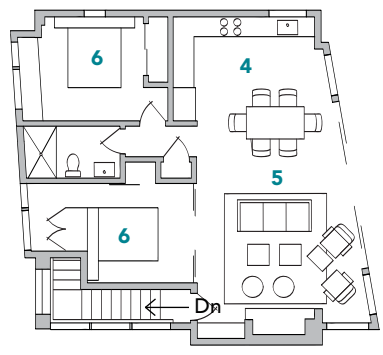
Bathrooms: 2

Size: 900 sq. ft.

Location: Camano Island, Wash.

Architect: Designs Northwest Architects, designsnw.com

Builder: J.P. Land Builder, jplandbuilder.com



1 Raised deck
2 Flood room
3 Patio
4 Kitchen
5 Dining/living
6 Bedroom

Floor-plan drawings: Patrick Welsh

LIFTED AND LOFTED The 30-ft. structure stands 9 ft. above grade, which contributes to the second story's lofty feel. Despite its modest square footage, the space feels voluminous and accommodates three living zones, a bedroom, and a sleeping loft that also houses mechanicals and a storage area.

WEATHERPROOFED The main floors are connected by a steel-plate stair with sapele-wood treads. All electrical recepticals, switches, and controls are located high up on the walls in case of flooding.

SMART STRUCTURE A translucent aluminum and frosted-glass wall allows for privacy and natural light.