ROLL-AWAY WINDOW WALL

Tom Bender and Lane deMoll are the kind of people who live by their convictions. Together, they designed an energy-efficient house that expresses their feelings about shelter and open spaces. Tom, who trained as an architect at the University of Pennsylvania, and Lane, a writer for *RAIN: The Journal of Appropriate Technology,* wanted their house to be no more of a barrier than necessary between them and the world around them.

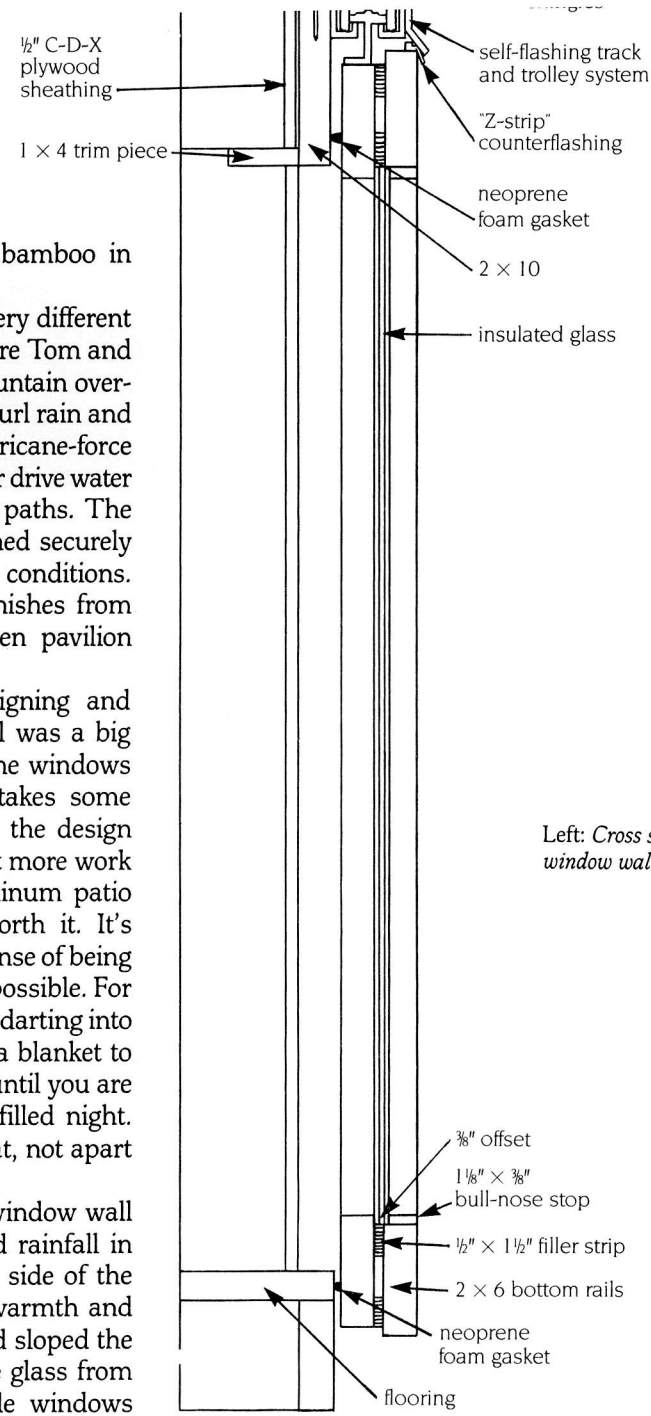
Travel to Japan, India and Persia convinced them that their house could connect them more closely to nature instead of separating them from it. They learned to love the Japanese garden pavilions whose paper screen walls can be moved aside to invite spring breezes into the house. They grew to understand why the Japanese value that same intimacy with nature in winter, when insulated clothes, rather than thick walls, provide warmth

as the snow falls softly onto the bamboo in the garden.

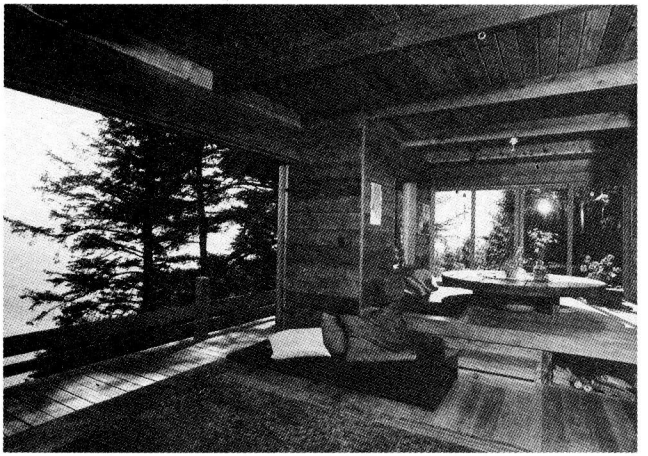
Of course, Japan's climate is very different from that of Nehalem, Oregon, where Tom and Lane built high on the side of a mountain overlooking the Pacific. Winter storms hurl rain and salt spray at the house with hurricane-force winds. Gusts up to 100 miles an hour drive water through even the most unexpected paths. The window wall Tom and Lane designed securely seals shut under these severe winter conditions. But on summer days, the wall vanishes from sight. The house becomes an open pavilion high above the waves.

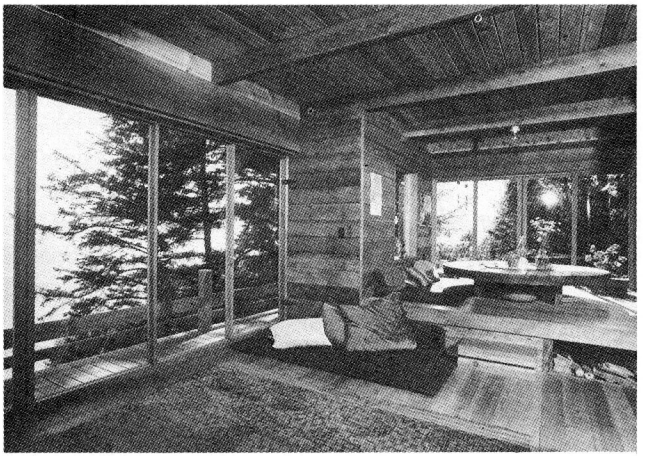
Tom acknowledges that designing and building the roll-away window wall was a big project, but he says, "Like any of the windows we've built, the first-time design takes some work. But once done, you can use the design over and over. This design took a lot more work than slapping in a couple of aluminum patio doors, but the result was well worth it. It's difficult to describe the wonderful sense of being outside *inside* a room that it makes possible. For that, you have to see hummingbirds darting into the room to pluck a bit of wool off a blanket to line their nest, or sit in the twilight until you are surrounded by the hush of a star-filled night. You are very simply a part of all that, not apart from it."

Tom and Lane designed the window wall with sun angle, wind direction and rainfall in mind. They placed it on the south side of the house for the greatest year-round warmth and protection from winds and rain, and sloped the roof overhang above it to shade the glass from the summer sun. Smaller operable windows



Left: *Cross section of roll-away window wall.*





installed across from the window wall permit cross-ventilation. "Whatever your orientation and climate," Tom cautions,"it is essential to keep air movement and temperature within reasonable limits inside the room or you'll find that you will never open your window wall."

Tom and Lane's design consists of two 9-foot-wide window wall sections suspended from an overhead track *outside* of the house. This allows Tom and Lane and their son Skye to sit on the edge of the living room floor without having hot and uncomfortable metal tracks under their thighs.

Tom built the window wall sections of construction-grade lumber and standard 34 by 76-inch sheets of tempered patio door glass. He needed the help of three friends to lift the 6-inch by 16-inch by 18-foot fir beam that spans the opening into place. He was able to do most of the remaining construction himself.

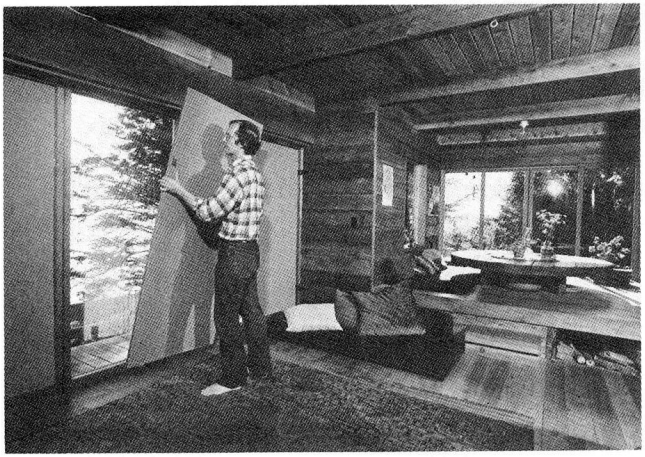
"When we started building, we pulled enough straight and clear 2 × 4s and 2 × 6s for the window wall out of the pile of framing lumber and stacked it aside to dry. If you do that," Tom cautions, "be sure to set aside enough extra to allow for the inevitable ones that develop some twist or bow as they dry.

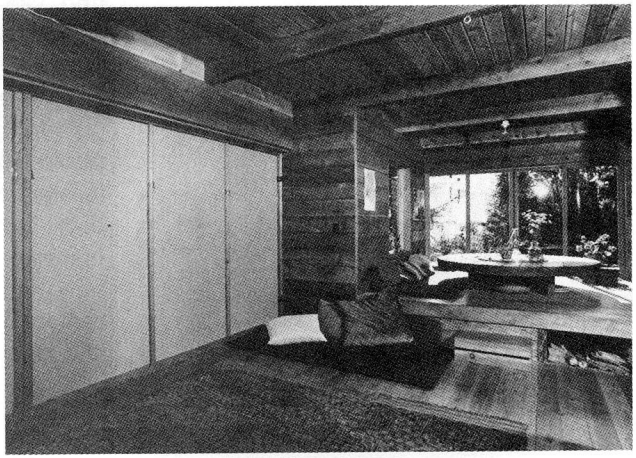
"When we were ready to construct the window units we sorted and coded the wood for each particular part. Straightest 2 × 4s were allocated for the end verticals, while others were used in between where the glass and joints would help keep them true. Similarly, the 2 × 6s were placed so that any bow would be on the inside where it could help the latches pull the whole 9-foot length of each window wall section in snug, and any camber in the boards would counter eventual sagging."

Tom rabbeted the 2 × 4s used for sash stiles and mullions and offset the pairs of 2 × 6s used as sash rails to receive the glass and stops. Then he notched out the joints and assembled the sash frame with screws and glue.

He bolted the self-flashing track to the beam and fastened trolleys to the sash rails, notching the rails wherever necessary to fit the trolley brackets. Then, with the help of a friend, he hung the unglazed window walls and made the necessary adjustments to make them hang true. A windowsill that projected into the path of one unit was trimmed, and a ½-inch-thick metal bumper was attached to the exterior walls to prevent the bottom of the window wall from scraping the cedar shingles.

Glazing was then installed, caulked with silicone sealant, and stopped with bull-nose





Putting in movable insulation requires securing the window wall, and popping in the cloth-covered Thermax boards to cover the glazing area within the window frame.

stops. The finished units received a good soaking with clear Cuprinol wood preservative.

Tom knew that closing the window wall against those winter storms would require a real "battening down of the hatches," so he used a combination of gaskets and latches to snug the window wall sections tight against the house. First he screwed a strip of aluminum "Z" flashing in place above the outer top rails to form a spring tension seal against the track. Then he attached a ½-inch tubular neoprene gasket all around the perimeters of the two window wall sections. (This weather stripping acts very much like a gasket on a refrigerator door to form a tight seal against air and moisture infiltration.) Finally, he added his hardware.

A well-stocked hardware store turned up some Nielson VHC 250-25 latches, made like oversize trunk latches. Installed on the sides and top of the frame, these cinch the window units against the house, compressing and sealing the gasket. A V-shaped bracket, welded by a friend, wedges the bottom edge of the windows against the floor, where latches would have been impractical.

Tom and Lane use movable insulation to boost the wall's R-value during the cold winter months. Using a kitchen knife, Tom cut 1-inch-thick rigid foam insulation (Thermax) ¼ inch smaller than the dimensions of the glazing opening. He cemented vinyl wall-covering material to the insulation panels. These panels fit snugly between the 2 × 4 mullions, with no need for fasteners. When the temperature drops and storms rage, the movable insulation covering the large expanse of glass in the window wall keeps the house cozy and warm.

Tom and Lane don't miss the open pavilions of Japan now. Their roll-away window wall gives their home the same closeness to nature whenever they want it—but keeps them dry and warm during Oregon winters. "We've gotten so we hate to close the window walls even on a cool day," Tom admits, "but we usually close them at night, as raccoons and other creatures get attracted to the kitchen. If we lived in another climate, where mosquitoes and other insects make outdoor living uncomfortable, we'd have to work out a different kind of solution." The window wall gives them such pleasure in their surroundings that it seems likely they would find a way to make it work, no matter where they lived.