

The Small House Expanded

To provide an in-depth description of the ways in which *any* small house can be designed to fit problematic sites and reflect an occupant's life-style, the first edition of this book focused on the design and construction of my house in Madison, Connecticut.

When the original home was built, it was intended that it would harbor two full-time professionals who were creating their first home—a 1,100-square-foot, single-bedroom house. The idea of expansion was a glimmer on the horizon, and was conceptually accommodated with a pocket of space available to the east of the house.

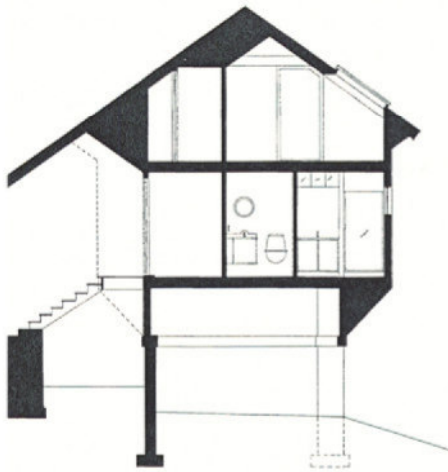
Any thoughts of our home's expansion were beset by the same limitations that were in effect when we built it in 1984:

1. *Wetlands.* Set adjacent to a salt marsh, the available land to build upon was restricted beyond the normal, town-required setback off the property line, and the regulations mandated that the level of the first-floor framing had to be set far above the existing contours of the landscape.
2. *Deed restrictions.* The sellers of the lot were also the neighbors to the south, and their home looked out over our lot to the salt marsh; part of the covenants of the land transaction was that our house could *not* be extended to the west as it would impinge on a sight-line restriction as defined in our deed.
3. *Septic capacity.* Given the proximity to wetlands, the size of our lot, and the new 100 percent reserve capacity provisions of the septic system code (briefly described in the Introduction), we simply could not move the septic from its present westerly location, nor could we build a home that was ultimately larger than three bedrooms.
4. *Vehicular access.* Given our sloped site and the nature of our driveway, which was set along a right-of-way, we simply could not change any configuration or destination of our driveway access.
5. *Existing trees.* Directly east of the house is a 200-year-old white oak whose presence was a beloved aspect of the original home's siting; therefore, eastwardly expansion was limited beyond the normal zoning code set-backs.
6. *Budget.* As with the original home, financial constraints did play a part in how we approached any addition, especially given the fact that renovating or adding onto any structure is almost always more costly per square foot than building from scratch.
7. *Timing.* This construction project had a short and undeniable deadline, as described below.

Consequently, there was but one place to go—east—and that area was limited by our sacred tree. The original design had placed the cross-axial entry and second-floor hall orienting to the east, setting up an easy, direct point of attachment.

Despite these limitations to adding onto our little home, any homeowner's life has changes, with the most unalterable and highly impactful life change being the advent of children. Fortunately, given the highly structured and planned life-styles of two-income childless couples, the advent of children is (more often than not) not only a planned experience but also a heavily anticipated one. Such was the case with our family, and we knew within a month of conception that we were going to have a child. This left eight months for the design and construction of an addition to our little house intended to harbor our child, a live-in caregiver, and (we hoped) a second child.

Photos © Mick Hales. Drawings by the architect.



Within the eight months allocated to us, we proceeded to add a 700-square-foot addition that had the following characteristics:

1. *Two bedrooms.* Upstairs for children, downstairs for caregiver
2. *A nursery.* An open area for a crib and changing table
3. *A new bathroom.* Shower and vanity were solely intended for the downstairs bedroom, with a separate toilet as part of an adjacent powder room (five years of a walk-up single bath came to an end)
4. *Storage.* A mud room area off the entry, deep walk-in closets on the second floor, and large closets in both new bedrooms
5. *A new entryway.* A replacement for the poetic (nonchild-proof) open millwork construction in the original home.

The original home involved the architecture of open interconnected spaces and axial vistas. However, with

infants and unrelated people living within the confines of an 1,800-square-foot, three-bedroom house, there needed to be some sense of aural and visual separation. Thus—and not surprisingly—there are more doors present in the addition than there were in the entire original home. Similarly, our original home had five distinct spaces: living-dining-kitchen, study-office, bedroom-closet, bathroom, and mechanical room. Even though our addition was only two-thirds the size of the original house, it had six distinct spaces: entry/mud room, au pair bedroom, bathroom, powder room, children's bedroom, and nursery.

The planning of the addition was extraordinarily simple. Given the location of the existing front door, it was clearly evident where our new entry had to orient, and given the location of our waste-line access to the septic system, the new bathroom had to orient directly to the extant east exterior wall (this allowed for a code-compliant, pitch-to-drain waste pipe to precisely transition through the 2 x 10 floor joist cavity with no room to spare). Given the preplanning of the hallway orientation, we knew where we needed to "T" off the present floor plan. The existing exterior window at the east end second-floor corridor was reused to provide light at the top of the stair in an "art niche" harboring a large chest that had never found a satisfactory home in the original house.

A host of micromoves followed these broad strokes. The washer-drier went into the first-floor mechanical room (from our bedroom closet) to allow live-in help to do laundry without entering our bedroom. A changing table



2





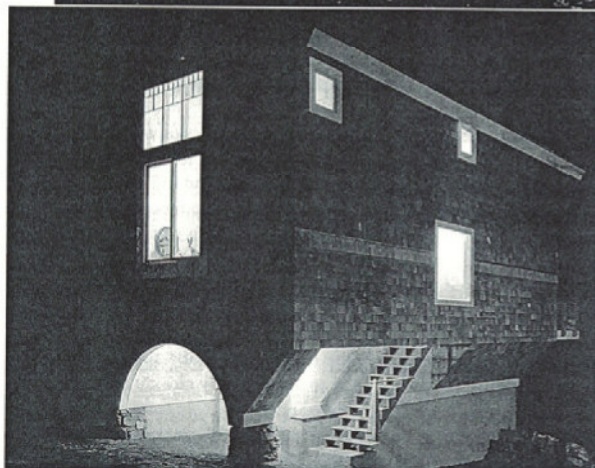
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Figure 1 Section. This cross section through the entry shows lowered eaves from the rest of the house, the walk-in skylight, the extended roof over the entry, and the relatively tight subdivision of internal spaces in the addition (versus the fairly open spaces present in the original home).

Figure 2 Floor plans. A simple "tack on" with a new entry, mud room, and bath and bedroom for a live-in au pair taking up the first floor (with the point of attachment set to the existing front door). On the second floor a nursery, child's bedroom, and storage were arrayed around the preexisting line of the second-floor corridor.

Figure 3 The small house expanded. An easterly expansion of a subordinate mass. To retain the dignity of the original home (left), the addition (right) perimeter has been pulled back in all directions.

Figure 4 The existing house. A simple box is elevated off the ground with a virtual "gangplank" of entry stairs set within the context an uninterrupted overall shape.



4

Figure 5 Easterly prospect ("the screaming-child façade"). Windows are conspired in a façade that almost no one sees. The existing home's siding, roof pitch, trim, and siding detailing are manipulated to form a visual event that would be unthinkable in the original house form.



5

and sink replaced the laundry. We opted to use a different color palette for the addition interior: Whereas light, pale tones of yellow were used throughout the original house, light blues, violets, and pinks were used in the addition. The kitchen was brought into full family status by the transition of the former entry closet into a full-blown pantry.

Perversely enough, given the requirements of physical separation and functional accommodation for the addition, the architectural implications of adding onto the semimonolithic presence of our original little house meant that the new construction needed to be subordinate in its massing. Its roof ridge and eave line had to be lower than the original. The addition became a large-scale transitional massing element providing better connection between the ground plane and the "pod-in-the-sky" original home. This intention was symbolized by a new set of stone entry steps set in stalagmite ascendance. These steps garnered two-thirds of the height needed to enter the house and were formed between large boulders that had been removed to provide water service into the original home. The final six steps that launch visitors into the home were built as a teak bridge spanning the stone steps, which elevated the ground plane and the visually floatational home. It should be noted that this "bridge" is child-friendly with no gaps between railings or treads larger than 6 inches and with handrails set into the railings at baby, toddler, child, and adult heights, and with 3-inch-thick stringers facing the inside of the steps to allow for toy race car use.

In accommodating the aesthetic desire for a recessive addition mass, the one-and-a-half-story framing system employed was wholly different from our original home, involving balloon-framing to facilitate knee walls at the second-floor level. The low walls and roof line necessitated the use of skylights (the largest stock operable units avail-



6

Figure 6 New entry. A seemingly opaque box is applied, sidesaddle, to the original house form while a cascade of rocks ascends to form a new entry.

Figure 7 Entry steps. This new teak bridge has handrails at infant, child, adolescent, and adult height. Note that this is made of unfinished teak with each piece of wood being taken from a single piece of raw lumber.



7

able on the market) set at a level to allow a 6-foot-high person to walk into the skylight well in the child's bedroom and the nursery. This was done more by necessity than design as, in order to obtain the diminished massing impact on the overall new house form, we needed to use every square inch of the cubic volume on the new second floor.

Additionally, because of the proximity of the sacred oak tree, we needed to change our foundation type to avoid any deleterious effect on its root system. The original home had the structurally minimalist design of two uninterrupted bearing walls slicing into the hillside for the entire 38 feet, 6 inch length of the house. Our rejection of a similar simple solution was derived from one of the few negative aspects of building the original home. When the original house was built, the only location available



8

for our new septic system was to the west, and it had to be set at the mandatory level above the existing grade because of its proximity to the adjacent salt marsh. These requirements necessitated large amounts of clean fill to be brought in and set over the roots of a fully mature sugar maple. The tree died a slow and tragic death. To avoid more arboricide, we minimized ground disruptions by using only one bearing wall and two separate concrete piers for the addition's foundation, and we pulled the lines of the foundation from the perimeter of the addition's finished floor outline. We were thus able to avoid hitting any existing roots, and the tree healthily survived construction.

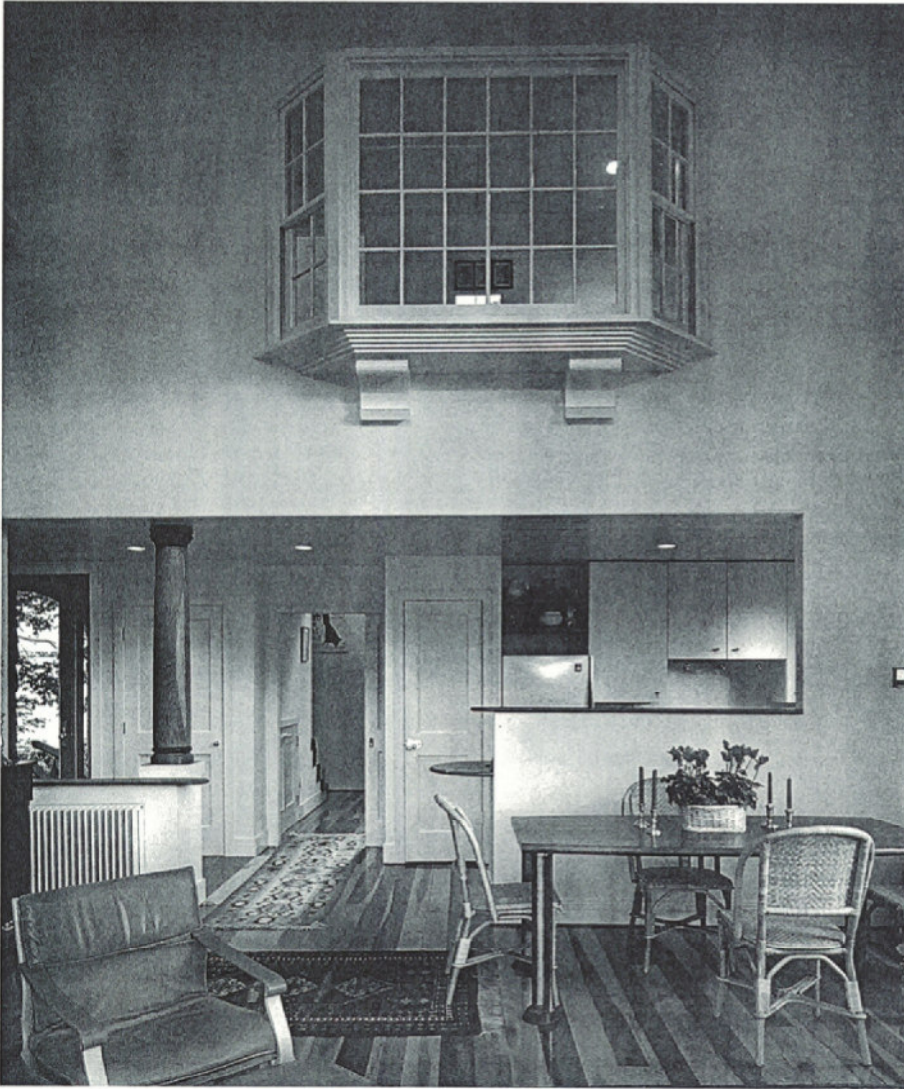
Many small moves helped escalate the cost of the addition. When we opted to limit the foundation's impact on the site, a double cantilever was employed to support the upper two occupied floors all about the addition, preempting the simple economy of the straight and consistent framing of the original building. Given the desire to internally relocate the washer and drier, provide a changing table with a new sink in the master bedroom, and provide the new "double-dip" downstairs powder room/guest bathroom described earlier, the plumbing work was virtually equivalent to that of our original home. All trim material matched that in the existing home both in color (gloss white) and in profile (once again, timing forced us to purchase the trim versus milling it up ourselves). Relatively expensive, highly durable ceramic tile was used in the entryway and bled into the new bathroom. A somewhat expensive extension of the tongue-and-groove board ceiling over the kitchen was set into the new entry space as well.

Fortuitously, the potential cost of accommodating the increased heating needs was greatly reduced as we only had to add two zones to the original boiler—providing four-zone heat control within the context of an 1,800-square-foot house (the heating bills have only increased by 50 percent even though we increased the mass of the house by approximately 70 percent). Obviously, the east side foundation wall was reused, as was the interior stairway, and the electrical service also proved to be adequate although the 100-amp service panel now has every possible circuit utilized. Given the fact that neither air-conditioning nor large-scale appliances were desired or feasible, the maxing out of the available power was adequate for this house.

Similarly, the septic tank was designed for a three-bedroom house, and because there was a fortuitous (unplanned) existing linkage of the two runs of leaching fields, there was no need for any septic work to accommodate our heightened usage.

The original home relied on 2 x 4 construction with 3/4-inch exterior polyurethane sheathing as the most economical form of insulation for the walls. With the vagaries of lumber prices versus insulation costs, this particular home achieves a similar (although slightly diminished) R value (but greater cost-effectiveness in 1989) by using 2 x 6 wall construction and 5 1/2-inch fiberglass batt insulation. The only area where the rigid insulation was used was on the underside of the home.

Given the absolute time imperative of the imminent birth of our first child, much of the owner-driven work executed in the first home became contractor-provided in the addition, including interior painting, installation of all millwork items and bathroom appointments, and provision of most, if not all, bathroom appliances and lighting fixtures. Costs were increased, but time was saved.



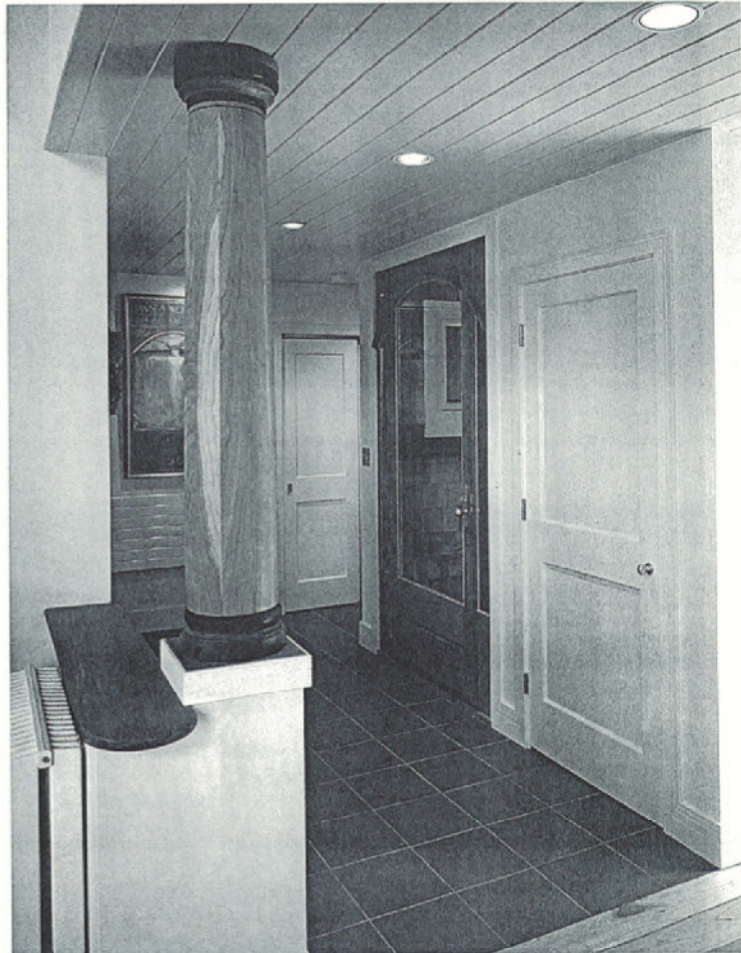
9

Figure 8 Site plan. The original house is built on an interior lot with the front of the house set tight to the setback, the westerly side set tight to a deed-mandated viewway, the salt marsh to the rear, and a 200-year-old white oak due east. These site plan determinates effectively located and sized the addition.

Figure 9 Living room. The new entryway is accommodated by an opening (left) within the context of the existing wall. The tongue-and-groove ceiling present over the original kitchen is extended into the new space (left).

Figure 10 Front door entry. The original front door is relocated and flanked by new sidelights. A mud room is around the corner in the background of this photograph, with a new cherry wood column set to receive the existing structural load of the original building's second floor, thus providing for the removal of a well that would have obscured the view upon entering the home. Note that the door to the right is set to the original point at which entry was achieved into the main home and now serves as a large-scale storage area set below the existing interior steps. Also note the imposition of a new tile floor in this high-traffic area.

Figure 11 New child's bedroom. Walk-in skylight (left) and a new window that plays off the original south- and west-facing window arrays (right) make for a lively ambience in this vaulted space. Note the low-knee wall height, appropriate for a child's room, and the highly durable quarter-sawn wood floors.



10

Because of all the above consequences, even with accounting for inflation, the net cost of building the addition was roughly equivalent to the cost of the building of the original house—even though the addition was approximately 25 percent smaller than its parent building, and there was no septic, utilities access, or driveway work performed.

Most importantly, this project shows that a small heroic gesture can evolve and accommodate a diverse and enriched life-style. Where two people had once lived and worked, the new parents, one child, and a live-in caregiver were provided for, and in the latest microgenerational shift, two parents, two children, and a live-out caregiver are now accommodated.

As with all homes that start out as a successful fit between owner and home, fine-tuning, versus a wholesale retooling or moving to a new address, can be executed on an ongoing basis as our lives change. Ultimately, the



11

nursery alcove and the child's bedroom will be combined into one large bedroom to accommodate two children. The downstairs bedroom is now relegated to a guest room and an exercise area to help forestall the ever softening and widening bodies of approaching middle age. Despite all the new storage areas adjacent to every new space and in the extended second-floor corridor, virtually every storage area is full, but there is very little need for more storage at present. Ultimately, a storage shed will have to be built on the site. (Obviously, these storage needs are generated by the impossibility of having a full basement given the wetlands ordinances and by the decision not to have a full attic given the zoning code height limitations as well as a desire for full and open spaces.) These decisions were made with full knowledge, and the results speak for themselves.

Ultimately, this house cannot tolerate two adults and two near adults. But its life expectancy in harboring our progression from a couple through parenting preadolescents will have lasted the better part of 15 years. Typically, during this time American households have progressed from "starter home" to "20-year home," and have involved three or four moves or major additions. As of this date we've adapted our home to the ever-changing contours of our day-to-day lives without either moving an inch in distance or compromising our values.